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FY 98 WORK PLAN INDEX OF DETAILED PROJECT DESCRIPTIONS/BUDGETS (Funded 8/6/97 & 12/18/97)

Proi No	Project Title
	Pecovery of Harbor Seals From EVOS: Condition and Health Status
000074	
90007A	
98012A-BAA	Comprenensive Killer vvnale investigation in Prince vvilliam Sound
98025	Mechanisms of Impact and Potential Recovery of Nearshore Vertebrate Predators (NVP)
98043B	Monitoring of Cutthroat Trout and Dolly Varden Habitat Improvement Structures
98052A	Community Involvement
98052B	Traditional Ecological Knowledge
98064	Monitoring, Habitat Use, and Trophic Interactions of Harbor Seals in Prince William Sound
98076	Effects of Oiled Incubation Substrate on Straying and Survival of Wild Pink Salmon
98100	Administration, Science Management, and Public Information
98126	Habitat Protection and Acquisition Support
98127	Tatitlek Coho Salmon Release
98131	Chugach Native Region Clam Restoration
98139A1-CLO	Salmon Instream Habitat and Stock Restoration - Little Waterfall Barrier Bypass Improvement
98139A2	Port Dick Creek Tributary Restoration and Development
98142-BAA	Status and Ecology of Kittlitz's Murrelets in Prince William Sound
98144A	Common Murre Population Monitoring
98145-CLO	Cutthroat Trout and Dolly Varden: Relation Among and Within Populations of Anadromous and Resident Forms
98149	Archaeological Site Stewardship
98159	Surveys to Monitor Marine Bird Abundance in Prince William Sound during Winter and Summer 1998
98161-CLO	Differentiation and Interchange of Harlequin Duck Populations Within the North Pacific
98162	Investigations of Disease Factors Affecting Declines of Pacific Herring Populations in Prince William Sound
98163	APEX: Alaska Predator Ecosystem Experiment in Prince William Sound and the Gulf of Alaska
98165-CLO	Genetic Discrimination of Prince William Sound Herring Populations
98166-CLO	Herring Natal Habitats
98169	A Genetic Study to Aid in Restoration of Murres, Guillemots, and Murrelets in the Gulf of Alaska
98170-CLO	Isotope Ratio Studies of Marine Mammals in Prince William Sound
98180	Kenai Habitat Restoration and Recreation Enhancement
98186-CLO	Coded Wire Tag Recoveries From Pink Salmon in Prince William Sound
98188	Otolith Thermal Mass Marking of Hatchery Reared Pink Salmon In Prince William Sound
98190	Construction of a Linkage Map for the Pink Salmon Genome
98191A	Field Examination of Oil-Related Embryo Mortalities in Pink Salmon Populations in Prince William Sound
98194-CLO	Pink Salmon Spawning Habitat Recovery

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FY 98 WORK PLAN INDEX OF DETAILED PROJECT DESCRIPTIONS/BUDGETS (Funded 8/6/97 & 12/18/97)

<u>Proj.No.</u>	Project Title
98195	Pristane Monitoring in Mussels
98196	Genetic Structure of Prince William Sound Pink Salmon
98210	Youth Area Watch
98220-CLO	Eastern Prince William Sound Wildstock Salmon Habitat Restoration
98225	Port Graham Pink Salmon Subsistence Project
98244-CLO	Community-Based Harbor Seal Management and Biological Sampling
98247	Kametolook River Coho Salmon Subsistence Project
98250	Project Management
98252	Investigations of Genetically Important Conservation Units of Rockfish and Walleye Pollock
98254-CLO	Delight and Desire Lakes Restoration
98256B	Sockeye Salmon Stocking at Solf Lake
98263	Assessment, Protection and Enhancement of Salmon Streams in Lower Cook Inlet
98273	Surf Scoter Life History and Ecology: Linking Satellite Technology with Traditional Knowledge to Conserve the Resource
98274	Documentary Film on Subsistence Use of Herring, Herring Spawn, and Resources in the Nearshore Ecosystem in Prince William Sound
98286	Elders/Youth Conference on Subsistence and the Oil Spill
98289-BAA	Status of Black Oystercatchers in Prince William Sound
98290	Hydrocarbon Data Analysis, Interpretation, and Database Maintenance
98297-BAA	Oceanography of Prince William Sound Bays and Fjords
98300	Synthesis of the Scientific Findings from the Exxon Valdez Oil Spill Restoration Program
98302-CLO	Prince William Sound Cutthroat Trout, Dolly Varden Char Inventory
98306	Ecology and Demographics of Pacific Sand Lance in Lower Cook Inlet
98311	Pacific Herring Productivity Dependencies in the Prince William Sound Ecosystem Determined With Natural Stable Isotope Tracers
98320	Sound Ecosystem Assessment (SEA)
98325-BAA	Assessment of Injury to Intertidal and Nearshore Subtidal Communities: Preparation of Manuscripts
98327	Pigeon Guillemot Restoration Research at the Alaska SeaLife Center
98329	Synthesis of the Toxicological Impacts on Pink Salmon
98330-BAA	Mass-Balance Model of Trophic Fluxes in Prince William Sound
98338	Survival of Adult Murres and Kittiwakes in Relation to Forage Fish Abundance
98339	Prince William Sound Human Use and Wildlife Disturbance Model
98340	Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem
98341	Harbor Seal Recovery: Controlled Studies of Health and Diet
98346	Publication of an Indexed Bibliography of the Genus Ammodytes (Sand Lance)

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FY 98 WORK PLAN INDEX OF DETAILED PROJECT DESCRIPTIONS/BUDGETS (Funded 8/6/97 & 12/18/97)

Proj.No.	Project Title
98347	Fatty Acid Profile and Lipid Class Analysis for Estimating Diet Composition and Quality at Different Trophic Levels
98348	Responses of River Otters to Oil Contamination: A Controlled Study of Biological Stress Markers

98424 Restoration Reserve

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98427-CLO Harlequin Duck Recovery Monitoring

Revised 6-20-97 Approved TC 8-6-97

COMMUNITY-BASED HARBOR SEAL MANAGEMENT AND BIOLOGICAL SAMPLING

Project Number:	98244
Restoration Category:	General Restoration
Proposer:	Alaska Native Harbor Seal Commission
Lead Trustee Agency:	Alaska Department of Fish and Game
Cooperating Agencies:	
Alaska SeaLife Center:	
Duration:	3 rd year, three year project
Cost FY 96:	128,500
Cost FY 97:	114,900
Cost FY 98:	84,700
Cost FY 99:	0.0
Cost FY 00:	0.0
Cost FY 01:	0.0
Cost FY 02	0.0
Geographic Area: Peninsula	Prince William Sound, Cook Inlet, Kodiak, Alaska
Injured Resource/Service:	Harbor seals; subsistence

ABSTRACT

This project continues work supported through previous harbor seal restoration projects. A biological sample collection program, implemented in FY96 and expanded in FY97, in Prince William Sound, lower Cook Inlet, and Kodiak Island will continue. Village-based technicians will be selected by the Alaska Native Harbor Seal Commission (ANHSC) and trained to collect samples and transport these samples to Anchorage or Kodiak for further sampling and analysis. The ANHSC will organize a two-day workshop, produce and distribute a newsletter, and coordinate the biological sampling program. **INTRODUCTION**

The goal of this continuing project is to support collaboration between subsistence hunters of harbor seals, scientists, and resource management agencies to assess the factors which are affecting the recovery of the harbor seal population of the oil spill area and to identify ways to reduce these impacts. In FY 94 (Project 94244) and FY 95 (95244), the Trustee Council provided funding for the Alaska Department of Fish and Game, Division of Subsistence, to compile available data, collect additional information, and to organize workshops and community meetings with scientists and subsistence users. Participants in the workshops concluded that the lack of a formal organization which represents subsistence users of harbor seals is a major impediment to communication between scientists and hunters and to the inclusion of subsistence hunters as full partners in harbor seal research and restoration. To fill this gap, Alaska Native participants in the harbor seal restoration workshop of March 2, 1995 voted to form an Alaska Native Harbor Seal Commission. In FY 96, Project 96244 assisted the ANHSC by providing it with funds to organize two workshops held in conjunction with commission meetings and to produce and distribute two newsletters and other communications. Another workshop took place under Project 97244 in March 1997.

A second consensus point reached at the workshops was that subsistence hunters are in an excellent position to assist in scientific studies through providing biological samples from subsistence-taken animals. A goal of 96244 was to test the practicality and effectiveness of a community-based harbor seal biological sampling program, designed and administered cooperatively between the University of Alaska, the Alaska Native Harbor Seal Commission, and the Department of Fish and Game. In FY 97, this program was expanded to collect samples from the Kodiak Island area and add Valdez to the sample communities in Prince William Sound. An additional goal is to assist the ANHSC to develop a long-term operating plan for biological sampling independent of restoration funds.

Another consensus point reached at the workshops was that there needs to be a cooperative exchange involving the traditional knowledge and skills of subsistence hunters and the research efforts of western scientists. In order to facilitate this exchange, the Division of Subsistence organized a traditional knowledge database (called "Whiskers!") which incorporates the available information about harbor seals. The Division demonstrated the database at the Restoration Workshop in January 1996 and at ANHSC workshops in March 1996 and September 1996. It was also distributed to subsistence users, resource managers, and scientists through an askSam read-only program. In FY 97, the database was updated through key respondent interviews in the Prince William Sound and lower Cook Inlet communities. The collection of TEK will not be a featured objective in FY 98, although information collected during other activities will be incorporated into the data base. The collection and application of TEK is a featured component of proposed new project entitled "Community-based Harbor Seal Research."

Finally, this project will support other restoration projects proposed for FY 98 and beyond, such as the Marine Mammal Ecosystem Study (\001, \064), the Community Involvement and Traditional Knowledge Project (\052), and the Youth Area Watch (\210), as well as a newly proposed project for FY 98, "Community-based Harbor Seal Research." The project will also contribute to the Trustee Council's recovery objectives for subsistence by facilitating involvement of subsistence users in the restoration process. **NEED FOR THE PROJECT**

A. Statement of Problem

The harbor seal populations of Prince William Sound and the northern Gulf of Alaska were in decline before the oil spill for unknown reasons. The spill injured these populations, adding to the decline, and they are not recovering. Harbor seals are a primary subsistence resource in the Alaska Native communities of the oil spill region. Subsistence harvests of harbor seals have declined in many of communities since the spill because of the reduced population size and voluntary efforts on the part of hunters to limit their harvests to aid in recovery. In order to assess these efforts and to identify

measures which subsistence users could take to further assist in harbor seal restoration, the Trustee Council funded projects in FY 94 and FY 95 to compile existing data, collect additional information, organize meetings of scientists and subsistence users, and develop recommendations for hunters. Two workshops took place. Among other things, participants at the workshops recognized that without a formal organization representing subsistence hunters of harbor seals, it was unlikely that a consensus on recommendations could be developed or that a dialogue between hunters and scientists could be maintained. Workshop participants stressed that strong involvement of hunters in research activities and management decisions was an essential ingredient in any plan for harbor seal recovery, as is the involvement of traditional knowledge in research efforts. Several other proposed restoration projects will examine the potential causes of the harbor seal population decline and lack of recovery, including mortality caused by humans. The need exists to follow through on the workshop recommendations to support these harbor seal restoration efforts.

B. Rationale/Link to Restoration

The recovery objective for harbor seals states that recovery will have occurred when harbor seal population trends are stable or increasing. Based on findings from two workshops which involved scientists and subsistence users of harbor seals (conducted under Projects 94244 and 95244), meeting this recovery objective will be enhanced by continuing dialogue between scientists and subsistence users, involving subsistence hunters in research efforts, involving traditional knowledge in scientific studies, and collaborating in the development of recommendations for subsistence hunters about how they can assist in harbor seal recovery. For example, subsistence hunters can provide substantial information about the winter location and abundance of seals, the condition of seals taken for subsistence purposes, and seal behavior. This project will implement the recommendations of the workshops by supporting the activities of the newly formed Alaska Native Harbor Seal Commission, funding a workshop and community meetings which review data and hypotheses, collecting and organizing traditional knowledge, developing a biological sampling program, and providing other technical support to the Alaska Native Harbor Seal Commission.

The FY 96 and FY 97 Work Plans included research projects to monitor seal population trends and conduct research to discover why harbor seals are not recovering. These are likely to continue in FY 98. Assessing parameters that affect marine mammal abundance and health requires access to and examination of animals or tissues. Marine mammals are inherently difficult to study and the collection and examination of tissues is further complicated by legal limitations imposed by federal protective measures and permitting procedures. Sacrificing animals for research purposes is either undesirable or illegal, and beachcast carcasses are often too decomposed to be of value. A potentially invaluable source of fresh specimens exists in Alaska, where coastal Alaska Natives still legally use marine mammals for subsistence or handicraft purposes.

For a harvest sampling program of this nature to succeed, it is important that:

1. Local people support the program and its goals, be involved in the sample collection, understand the significance of the data to be collected, be willing to store and ship samples from villages to a central receiver, and be trained and willing to record data and collect samples as instructed.

2. Samples must be easily collected, stored and shipped; may be subsequently subsampled by lab technicians; must be analyzed in due time; and results returned to villages.



Furthermore, over the last several years, the Trustee Council has attempted to involve spill-area communities more fully in the restoration process. The biosampling effort is a prime example of this involvement and collaboration.

C. Location

The biological sampling portion of the project will include the Prince William Sound communities of Cordova, Chenega Bay, Valdez, and Tatitlek; the lower Cook Inlet communities of Seldovia, Port Graham, and Nanwalek; and two Kodiak Island communities, Akhiok and Old Harbor. Other communities that will receive information from the project and may be included in the ANHSC Workshop include Seward, Ouzinkie, Kodiak, Port Lions, Larsen Bay, Karluk, Chignik Bay, Chignik Lagoon, Chignik Lake, Ivanof Bay, and Perryville.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

Community and subsistence user involvement in the restoration process and in harbor seal recovery is a central purpose of this project. A primary goal is support of the activities of the Alaska Native Harbor Seal Commission. With project funds, the ANHSC will organize a two-day workshop for representatives of oil spill area communities which use harbor seals for subsistence purposes conducted in conjunction with an ANHSC meeting. The ANHSC will also organize community meetings to inform hunters of restoration activities, harbor seal research, and ANHSC functions. These meetings can serve as a means to develop subsistence hunter involvement in ongoing research efforts. The ANHSC will also produce a newsletter. As part of the biological sampling effort, the ANHSC will select technicians (most of whom will be subsistence harbor seal hunters) in participating communities. These technicians will be trained by a marine mammals biologist to collect biological samples. Subsistence hunters will supply the samples and will be trained through the use of an instructional video (produced in FY 96), and through hands-on instruction as needed. Also, participants in the Youth Area Watch Project (210) will be included in project activities, including community technician training sessions and the workshop.

PROJECT DESIGN

A. Objectives

The primary premise upon which this project is based is that restoration of harbor seal populations will be facilitated by involving subsistence users in research and management activities, and through facilitating the involvement of traditional knowledge in scientific studies. Key to the success of this effort is support for the activities of the Alaska Native Harbor Seal Commission. Specific objectives include to:

1. Continue a community-based program to collect biological samples and other information from harbor seals in Prince William Sound and the northern Gulf of Alaska involving hunters from Cordova, Tatitlek, Chenega Bay, Valdez, Seldovia, Port Graham, Nanwalek, Akhiok, and Old Harbor. Specific sub-objectives include:

a. Train local technicians and hunters in biological sample collection procedures
b. Operate the program to maximize sampling for efficiency and coordination with other harbor seal projects

c. Evaluate the program's effectiveness and develop a more long-term funding plan.

2. Collect biological samples and other information from harbor seals harvested by subsistence hunters in 9 communities: Tatitlek, Chenega Bay, Valdez, Cordova, Seldovia, Port Graham, and Nanwalek, Akhiok and Old Harbor. Provide these samples to researchers for analysis.

a. Collect information about the number, sex, approximate age and place and date of harvest for harbor seals taken in each village

b. Collect biological samples to be analyzed in cooperation with other harbor seal projects, including blubber, whiskers, skin, female reproductive tracts, and stomachs
c. Store samples in a community freezer and periodically ship samples to Anchorage or Kodiak for further processing and distribution for analysis

3. Utilizing the services of the Alaska Native Harbor Seal Commission, communicate information about results of harbor seal studies to hunters and scientists on a regular basis through community meetings, workshops, and newsletters.

a. Conduct a two-day workshop, in conjunction with a meeting of the ANHSC, which includes hunters from oil spill communities, harbor seal biologists, and agency representatives, to review recent findings about harbor seals and discuss important issues b. Conduct one community meeting per year in each of communities participating in the biological sampling program for hunters and scientists to review and exchange scientific information and traditional knowledge

c. Produce an informational newsletter describing results of harbor seals studies, ongoing harbor seal research, and community involvement

4. Collaboratively produce recommendations for subsistence users of harbor seals which derive from study findings and the discussions at community meetings and workshops

a. These recommendations will be based on traditional knowledge, contemporary observations, and scientific findings

b. Recommendations will be developed at workshops and community meetings.

5. Evaluate the program's effectiveness and develop a more long-term funding plan for ANHSC activities and the biological sampling program

6. Coordinate with the Youth Area Watch Program (Project /210) to involve participants in that program in biological sampling and workshops

B. Methods

Objectives 1 and 2: Biological Sampling Program

For Objectives 1 and 2, the Biological Sampling Program, the following procedures will be used:

1. Training. As part of Project 96244 (and revised as part of 97244), a marine mammal biologist, Kate Wynne of the University of Alaska, and Vicki Vanek, a veterinarian with the Division of Subsistence (ADF&G) compiled protocols, synthesized these into useable formats, developed data forms, labels, and sampling kits, and incorporated instructions for their use into a training program. In FY 98, these materials will be revised as appropriate.

Instruction. Sampling requires instruction or training of community-based sampling technicians, who ideally are also subsistence seal hunters. Any new village-based technicians will attend a full-day sampling training session in Kodiak or Anchorage in which Wynne or Vanek will: provide a detailed explanation of project goals, and significance and use of data to be collected; distribute sampling kits; explain and demonstrate sampling techniques and use of equipment; and distribute written and graphic instructional materials to take to villages. An alternative is for Vanek to travel to the community to train a replacement.

Other hunters will be informed of program objectives and specified sampling requirements through communication with village technicians and other project personnel and through written, graphic, and video instructional materials. If hunters or technicians need additional "hands on" training, Vicki Vanek of the Division of Subsistence or other division personnel may be available to travel to the communities to provide this assistance.

2. Training materials.

Manual: This was produced in FY 96. It includes step-by-step diagrams and a visual guide. It is waterproof and is included in the sampling kit. In FY 97, the manual is being converted into a computerized format that can be easily updated, modified with regional information, and include some photos. Labor is also involved in laying out, laminating, and binding each book.

Examples: If a seal is available, at the training session participants work on an actual animal, filling in data forms and labels. Otherwise, the training relies on slides and the training video.

Video. In FY 96, a training video was produced by ADF&G, incorporating footage shot at the two training sessions. It has been distributed to the technicians trained at these sessions. The video includes: project rationale and objectives; footage of current research and population declines; significance and use of data to be collected; demonstrations of how to fill in data forms and labels; demonstrations how to use sampling kit and supplies; demonstrations of where and how to remove tissues from animals; and demonstrations of how to sub-sample, bag, and label tissues.

3. Sample collections

Technicians. There is a village-based technician in each participating community, whose responsibilities are to take samples from seals taken by themselves or participating hunters, record data as requested, assure access to freezer and sampling supplies, notify Wynne or Vanek when supplies are low or freezer is nearly full, and load and ship coolers with samples to Anchorage or Kodiak.

Key hunters. Ideally at least two hunters per village provide subsistence taken seals from which the technicians take samples, and record data as requested.

Sample size and distribution: It is difficult to predict the number of samples that may be collected in this program annually or by community, but we have assumed an average of 10 animals per community while designing the sampling strategy and estimating project costs.

Tissues to be collected. A minimal sample can be collected by technicians in each village with relative ease and subsequently sub-sampled in Anchorage or Kodiak to provide the

suite of tissue samples required. We have trained and asked technicians and hunters to record information about harvest location and animals' sex, evidence of tags or markers, and standard measures of length and girth. Technicians are trained to collect the whole head (with hide and blubber intact); stomach (after tying off both ends), samples of liver, heart, and kidney; and female reproductive tract. Although collecting the reproductive tracts and claws is highly desirable, it is realistic to assume they will be collected opportunistically only from those hunters willing to dedicate extra effort required to collect them.

Sampling procedure.

Step 1. In the community: village technician receives sample from the hunter, or works with an animal they have taken themselves. The data form is filled out by hunters in the field and in the community by the technicians, or by youth from the Youth Area Watch project. The data form is placed inside the specimen bag with samples for village-based storage. Technicians have a kit that includes supplies adequate for sampling of 10 animals. Among the items in each kit are 1) ziploc sampling bags for collection of the head, stomach, and tissues, 2) large garbage bags in which to place the sample bags collected from each animal, and 3) data forms and specimen labels. The head, stomach, and tissues will each be individually bagged in a two gallon ziploc bag. All these sample bags are placed in one large garbage bag along with the specimen label from the bottom of the data form. The specimen bag and the data form are placed in a freezer without subsampling, the technician contacts Kate Wynne (for Kodiak villages), Vicki Vanek (for Prince William Sound and lower Cook Inlet villages) or the ANHSC when a full shipment has accumulated, and then sends the samples to Kodiak or Anchorage.

Step 2. Kate Wynne in Kodiak receives samples and stores them at the Fisheries Technology Center; or, Vicki Vanek receives samples in Anchorage and stores them at ADF&G. Periodic sub-sampling efforts occur as depicted in Fig. 1. Subsamples from each seal are repackaged into individual bags and labeled, specifying organ and origin; tied securely, refrozen, and shipped to the appropriate laboratory (see Fig. 1).

Data collection.

Data are recorded on forms which will allow for standardization of data with other harvest-sampling programs. Sample label and freezer log forms have been developed to assure adequate sample tracking. Each animal receives a unique number that is tied to the UAF Museum Archive numbering system.

Sample analysis.

The attached Figure 1 provides a summary of the research programs involved in the tissue analysis. It is expected that participating scientists will acknowledge in any reports and publications the role of the ANHSC in facilitating the biological sampling program.

Data management and reporting

Biological data collected from this program are managed and maintained in a data base using software that is easily translated or integrated with software used by other agencies and organizations. This database is centrally maintained (initially by ADF&G) and a summary of the samples collected and analyzed will be included in the project's annual and final reports to the Trustee Council, with copies to pertinent agencies, such as NMFS. Additionally, ADF&G (Vanek) will collate the results of the sample analysis into a readily understandable newsletter, that will be provided to all the project participants. Summary: Proposed responsibilities of each cooperating group for Objectives 1 and 2:

Kate Wynne, University of Alaska, will:

- .Compile protocols, develop data forms and sampling kits, and incorporate instructions for their use into a training program (this was completed in FY 96; appropriate revisions will take place in FY 97).
- .Synthesize technical information into "user friendly" data forms, labels, and sampling kits

.Conduct a one-day training workshops in Kodiak, attended by two community technicians, ANHSC staff, and agency personnel

.Receive samples from village-based technicians from the Kodiak area, process samples in Kodiak, and ship samples to participating researchers for analysis

.Contribute to statewide database of biological data maintained by ADF&G

.Participate in the Alaska Native Harbor Seal Commission workshop

.Help collate results of sample analysis (provided by various researchers) into a readily understandable newsletter

.Work with ADF&G to integrate these results with information contained in the traditional knowledge data base being updated for this project

Write a brief summary of the project for inclusion in the interim and final reports for the Trustee Council

Vicki Vanek of the Alaska Department of Fish and Game, Division of Subsistence will:

Assist Wynne in appropriate revisions to the instruction manual

.Help answer community facilitators' questions

.Train new community assistants (replacements) if necessary

Receive samples from village-based technicians from the lower Cook Inlet and Prince William Sound, process samples in Anchorage, and ship samples to participating researchers for analysis

.Maintain database of biological data

.Collate the results of the sample analysis into a readily understandable newsletter.

The Alaska Native Harbor Seal Commission will:

.Identify and subcontract with 9 community technicians

.Purchase sampling kits and distribute kits and other supplies to village-based technicians .Set up air freight accounts for shipping samples

.Communicate study findings through workshops, community meetings, and the production of two workshop summaries

Objectives 3, 4, and 5: Communications, Recommendations, and Evaluation

Regarding Objectives 3, 4, and 5, communication of study findings, development of recommendations, project evaluation, and development of a long-term funding plan, is a collaborative effort met through a contract with the ANHSC, which will do the following:

Organize one, two-day workshop to be held in conjunction with meetings of the ANHSC. Because the ANHSC is limited to one representative from each region which uses harbor seals (southeast Alaska, the Chugach Region, Cook Inlet, Kodiak, and Aleutian/Pribilofs), participation in the workshop will be expanded to include hunters from spill area communities. This workshop will be modeled after those held under Projects 94244, 95244, 96244, and 97244, which involved review of

information by scientists and subsistence hunters. A goal of the workshop is discussion of potential recommendations for subsistence hunters concerning how they can support efforts to restore harbor seal populations.

- .Hold community meetings in the communities involved in the pilot biological sampling project, during which scientists and subsistence hunters review data, traditional knowledge is included in ongoing studies, and any recommendations developed at the workshops are discussed.
- .Writing and distribute a workshop summary which provides overviews of findings from harbor seal research and ANHSC activities.

Also,

4. The Commission co-lead for this project will attend Trustee Council workshops and contribute to Trustee Council's annual and final reports

The Division of Subsistence will provide technical assistance to the Commission as needed.

Kate Wynne, through work on the biological sampling program, will write a report which summarizes the results of analysis of the samples taken as part of this project. The report will be written for a general audience.

Interim and final reports: the Division of Subsistence will prepare interim and final reports for the project overall, with contributions from the collaborating groups.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

A. Kate Wynne, University of Alaska Sea Grant Marine Advisory Program, will be contracted through an RSA with the ADF&G to organize the training and coordinate the sampling components of this project. In FY 98, she will:

.Revise, as appropriate, protocols, data forms, sampling kits, and instructions for their use that were included in the training program developed in FY 96

.Receive samples from village-based technicians in Kodiak, process samples in Kodiak, and ship samples to participating researchers for analysis

.Provide information for the statewide database of biological data maintained by ADF&G .Participate in the Alaska Native Harbor Seal Commission workshop

.Help ADF&G collate results of sample analysis (provided by various researchers) into a readily understandable newsletter

.Work with ADF&G to integrate these results into the updated traditional knowledge data (Whiskers!)

.Write a brief summary of the project for inclusion in the interim and final reports for the Trustee Council

Proposed Contract A: Budget

Salary	and benefits Sampling handling and transfer Prepare project summary	0.50 0.50	months (0.25 per community) months
	Total, salary and benefits (1.0 months) 25% UAF overhead	=	\$ 5,600 1,400
	Total		7,000



Travel: will be arranged and paid for out of the ANHSC contract

In-kind contribution: The UAF Fisheries Industrial Technology Center will provide facilities at no cost for storing samples in Kodiak and laboratory facilities for Wynne to process samples and send them to participating researchers.

B. In FY 96 and FY 97, a contract was developed with the Alaska Native Harbor Seal Commission to undertake portions of the project. This contract will be amended to include the objectives for FY 98. Tasks for the ANHSC under this contract will include:

.Purchase sampling kits and distribute kits and other supplies to village-based technicians .Set up air freight accounts for shipping samples

.Identify and subcontract with local community technicians

.Organize and participate in community meetings in the communities involved in the biological sampling program

.Prepare brief (letter format) quarterly reports on its activities as related to this project.

Attend Trustee Council Workshops and contribute to Trustee Council's annual and final reports

Organize a two-day workshop during which, among other things, this project's performance and findings will be evaluated. This will include making all travel arrangements. The workshop will include hunters from the communities involved in the biological sampling program.

.Prepare a workshop proceedings summary report

Through subcontracts with the ANHSC, community technicians in 9 communities (Cordova, Tatitlek, Chenega Bay, Valdez, Seldovia, Port Graham, Nanwalek, Akhiok and Old Harbor) will do the following:

.Attend one day training session (if newly hired in FY 98)

.Collect samples (stomach contents, female reproductive organs, liver, heart, kidney, claws, head)

Record information about harvest locations, sex, evidence of tags or markers, length, and girth

Label and freeze samples, notify Kate Wynne, Vicki Vanek, or the ANHSC when freezers are full, and load and ship coolers with samples to Kodiak or Anchorage

Contract B: Budget

Personnel	Executive Director for 12.0 months @ \$2,000/month	\$24,000
Travel	Executive Director travel and	
	travel for workshop participants	13,800
Operational	costs	·
- phor	ne	2,400
mail	ing	1,200
Insurance	-	1,200
Sampling a	nd freezer supplies, freezer electricity, shipping	4,700
Subcontract	, village-based technicians	4,400
15% indirec	t program cost	7,800
Total		59,500

Note: in kind contributions for the operations of the ANHSC technical assistance from the Chugach Regional Resources Commission (Anchorage), the Alaska Sea Otter Commission (Fairbanks), and the Indigenous Peoples' Council on Marine Mammals

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(Anchorage).

Subcontract: Village-based Technicians

Training honorarium: \$100/day for three new technicians for one day each:	\$300
Compensation for taking biological samples of seals	4,050

Total

Note: it is anticipated that samples will be taken from an average of 10 seals per community, for a total of 90 seals, and that it will take about 3 hours per seal to take samples, store samples, and ship samples. At a rate of 15/hour, this gives: 15×3 hours x 10 seals x 9 communities = 4,550.

4,350

SCHEDULE

A. Measurable Project Tasks for FY 98

Start-up to October 15: Seal	Update contracts with the Alaska Native Harbor
	Commission and the University of Alaska; hire
technicians	•
October/November:	Hold training sessions for biological sampling for new community technicians
December to September 1998:	Biological sample collection
February 1998:	Two-day Workshop (Alaska Native Harbor Seal Commission):
March 1998:	Produce and distribute proceedings report (Alaska Native Harbor Seal Commission)
September 1998:	Evaluate third and final year of program

B. Project Milestones and Endpoints

.Development of sampling program: October/November 1995

- .Production and distribution of Instructional video: March 1996
- .Workshops to train local hunters and technicians in collection procedures: October/November 1995
- .Workshop in conjunction with meeting of Alaska Native Harbor Seal Commission: March 1996

.Produce and distribute first proceedings report: April 1996

.Maximize coordination with other programs: ongoing

.Ship samples to appropriate laboratories for subsequent analysis: ongoing

- .Advise villages and scientists of analytical results when available: ongoing
- ·.Conduct interviews with hunters to collect traditional knowledge: ongoing
- Second workshop in conjunction with Commission meeting: September 1996

Produce and distribute second proceedings report: September 1996

Train new village technicians: November 1996

Hold workshop in conjunction with ANHSC meeting: March 1997

- .Demonstrate updated Traditional Knowledge Database: March 1997
- Produce and distribute proceeding for 1997 workshop: April 1997
- Annual report: April 15, 1997
- .Complete map database and report: June 1997

.Evaluate the program's effectiveness and develop a more long-term funding plan:



September 1997 and September 1998 Annual report: April 15, 1998 Final project report: September 30, 1998

C. Completion Date

This project should continue as long as the Marine Mammal Ecosystem Research package is underway. Presently, fieldwork and data analysis for this study package are proposed through FY 97, with close-out in FY 98. The biological sampling program should be viewed as a pilot project to continue for a total of three years (FY 96, FY 97, and FY 98) in order to get the system in place and provide enough time for an evaluation of its performance.

PUBLICATIONS AND REPORTS

Annual report April 15, 1997 Annual report April 15, 1998 Final report September 30, 1998

PROFESSIONAL CONFERENCES

No attendance planned for FY 98.

NORMAL AGENCY MANAGEMENT

The Division of Subsistence of the Alaska Department of Fish and Game has no statutory or regulatory responsibilities for marine mammal management. Without this project, marine mammal biologists who are working on harbor seal recovery would lose a key source of biological information on this species. Trustee Council support of the activities of the Alaska Native Harbor Seal Commission is likely to improve management of the injured harbor seal resource by facilitating communications between scientists and subsistence users and providing traditional knowledge to factor in to harbor seal studies. The ANHSC is seeking funding from the National Marine Fisheries Service and Congressional support in accordance with provisions of the Marine Mammal Projection Act to support its long-term activities. Trustee Council support for ANHSC activities at this point enhances the likelihood that this long-term funding will be secured.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

This project will incorporate data on population status, distribution and degree of recovery of harbor seals from the Marine Mammal Ecosystem study package, including restoration project numbers \001 and \064. It will also draw on the results of research conducted by the Division of Subsistence under a contract with the National Marine Fisheries Service to monitor subsistence harvests. The project will provide information to researchers working on harbor seal restoration projects and facilitate their work with Alaska Native hunters. The project will provide biological samples from subsistence-taken harbor seals to address potential health and nutritional problems that may be impeding harbor seal recovery, for projects \001 and \064. Participants in the Youth Area Watch project (\210) will be invited to participate in community technician training sessions and attend the workshop.

Several programs exist to sample tissues from harbor seals from the spill area. As noted above, we will make every effort to coordinate our efforts with these programs to minimize the burden and confusion of hunters and communities, maximize logistical efficiency, collect comparable or standardized data whenever possible, and limit the likelihood of duplication of efforts. The National Marine Fisheries Service has expressed interest and may have funding available to expand this pilot program in subsequent years. This agency may also have funds available to perform analysis of samples as part of its normal agency management functions. Additionally, NMFS will assist with coordinating the harbor seal sampling and testing programs.

Additional funding for the operations of the Alaska Native Harbor Seal Commission has been sought from the National Marine Fisheries Service and the U.S. Congress. Such funding would support more extensive activities for the Commission across the entire range of the harbor seal in Alaska. As of April 1997, a congressional appropriation to support basic commission functions (office, accounting, travel to conferences) was being administered through NMFS. The ANHSC received a Title VIII ANILCA grant to assist in the development of co-management plans.

Also, the traditional knowledge database component of this project will directly support efforts under Project Number \052 to integrate traditional knowledge of injured resources more broadly into restoration efforts and scientific studies. This will include a model for database organization and training in uses of the database. In turn, Project \052 has, among other things, developed guidelines and protocols for collecting and using traditional knowledge which will be supportive of the efforts for harbor seal restoration.



EXPLANATION OF CHANGES IN CONTINUING PROJECTS

No additions to project objectives or methods of the detailed project description submitted and approved for FY 97 are being proposed. Efforts to collect traditional ecological knowledge are being shifted to a proposed new project, tentatively titled "Community-based Harbor Seal Research.

ENVIRONMENTAL COMPLIANCE

This project is a continuation of Projects 94244, 95244, 96244, and 97244, which were classified as categorically excluded under NEPA guidelines. While this project will collect biological samples from subsistence-taken harbor seals, the sampling effort will not result in any additional takings of seals.

PROPOSED PRINCIPAL INVESTIGATORS

James A. Fall Regional Program Manager Division of Subsistence, Alaska Department of Fish and Game 333 Raspberry Road Anchorage, Alaska 99518 Phone number : 907-267-2359 FAX number: 907-267-2450 E-mail address: jimfa@fishgame.state.ak.us

Monica Riedel Chairperson, Alaska Native Harbor Seal Commission



PO Box 1005 Cordova, AK 99574 Phone number: 907-424-5882 FAX number: 907-424-5883

PERSONNEL

Kate Wynne is a marine mammal biologist with the University of Alaska, stationed in Kodiak. She has extensive experience in working with Alaska Native subsistence hunters. In 96244 and 97244, Ms Wynne was responsible for designing and implementing the biological sampling program objectives in this project, including holding two village based technician workshops, and developing data forms and data management procedures. She will continue these responsibilities in FY 98, with funding support of one month. She will also write a report which summarizes findings from the sampling program, and assist the Alaska Native Harbor Seal Commission in reporting study findings to local communities.

Monica Riedel, an Alaska Native resident of Cordova, is the chairperson of the Alaska Native Harbor Seal Commission. She has extensive experience in marine mammal issues through her work with the Alaska Sea Otter Commission. Ms Riedel is responsible for the ANHSC activities under this project, including identifying and subcontracting with local village technicians, developing subcontracts, and participating in workshops and community meetings.

James Fall is the Regional Program Manager for the Division of Subsistence in Anchorage. Dr. Fall is responsible for overall project performance. He will also coordinate preparation of annual and final reports. No restoration funds are being requested for support of his time on this project.

Vicki Vanek is a Fish and Wildlife Technician with the Division of Subsistence in Kodiak. She holds a Doctor of Veterinary Medicine degree, and has worked on previous Division projects in collecting marine mammal samples and training hunters as well as on the biological sampling tasks of 96244 and 97244. She will be available as needed to assist hunters and community technicians, and will train newly hired technicians. Dr. Vanek will also process samples received from the Chugach Region communities. She will also prepare a newsletter which reports results of the biosampling efforts. One and three quarters months of funding is being requested for her work on this project.



1998 EXXON VALDEZ TRUSTER JNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

	Authorized	Proposed	штарула замащо — бала бала алана у тал					
Budget Category:	FY 1997	FY 1998						
Personnel	\$15.4	\$7.2						
Travel	\$3.9	\$3.2						
Contractual	\$85.7	\$67.5						
Commodities	\$1.2	\$1.0						
Equipment	\$0.4	\$0.0		LONG RA	NGE FUNDIN	G REQUIREN	IENTS	
Subtotal	\$106.6	\$78.9		Estimated	Estimated	Estimated	Estimated	
General Administration	\$8.3	\$5.8		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$114.9	\$84.7		\$0.0	\$0.0	\$0.0	\$0.0	
Full-time Equivalents (FTE)	0.3	0.2						
			Dollar amount	s are shown in	thousands of	dollars.		
Other Resources								
1998	Project Nun Project Title	nber: 9824 2: Communi	4 ty-based Ha	arbor Seal M	anagement	and		FORM 3A TRUSTEE

1998 EXXON VALDEZ TRUSTED JUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Personnel Costs:	<u> </u>	GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 1998
Vicki Vanek	Fish and Wildlife Technician III	11F	1.8	4.0		7.2
						0.0
	,					0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		1.8	4.0	U.U	67.0
		Tislas	David	Tetal	Sonnei Tota	\$7.2
Travel Costs:		Ricket	Round	lotal	Dally Der Diem	Proposed
Kediak Apphorana				Days		FT 1990
Anchorage - Seldovia/Phort G	aham/Nanwalek	0.2	2 1	3	0.1	0.0
Anchorage - Tatitlek	anarmanwaick	0.5	1	3	0.1	0.0
Anchorage - Chenega Bay		0.6	1	3	0.1	0.0
				Ũ		0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
				,	L	0.0
					Travel Tota	\$3.2
	[FORM 3B
1009	Project Number: 98244					Personnel
1990	Project Title: Community-based H	larbor Mana	gement and	Biological		& Travel
	Sampling		9			DETAIL
Prepared:6/18/07	Agency: Alaska Department of Fit	sh and Gam	_			DETAIL
- 16 pareu. 0/ 10/97						
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1998 EXXON VALDEZ TRUSTED JNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Contractual Cos	ts:		Proposed
Description			FY 1998
4A Linkage (1) 4A Linkage (2) Air frieght for ship	Contract with Alaska Native Harbor Seal Commission RSA with University of Alaska ping samples from Anchorage and Kodiak to participating labs		59.5 7.0 1.0
		•	
When a non-trust	ee organization is used, the form 4A is required.	Contractual Total	\$67.5
Commodities Co	osts:		Proposed
Description			FY 1998
		·	
		Commodities Total	\$1.0
1998	Project Number: 98244 Project Title: Community-based Harbor Seal Management ar Biological Sampling	id FC Cont Corr D	PRM 3B tractual & modities ETAIL
riepareu.urioisi	rigenoy. / adora Deparament of Fish and Game		

1998 EXXON VALDEZ TRUSTEL-COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FY 1998
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.0
Existing Equipment Usage:		Number	Inventory
Description		of Units	Agency
1998 Project Number: 98244 Project Title: Community-based Harbor Seal Management Biological Sampling Agency: Alaska Department of Fish and Game	and	F	FORM 3B quipment DETAIL

6/20/97

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	Authorized	Proposed						
Budget Category:	FY 1997	FY 1998						
Personnel	\$24.0	\$24.0						· · · · · · · · · · · · · · · · · · ·
Travel	\$8.2	\$13.8						
Contractual	\$30.3	\$12.4						
Commodities	\$2.0	\$1.5						
Equipment	\$0.0	\$0.0		LONG R	ANGE FUNDI	NG REQUIRE	MENTS	
Subtotal	\$64.5	\$51.7		Estimated	Estimated	Estimated	Estimated	
Indirect	\$9.7	\$7.8		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$74.2	\$59.5						
Full-time Equivalents (FTE)	6.0	6.0						
			Dollar amount	ts are shown ii	n thousands of	f dollars.		
Other Resources								
Comments: Indirect = 15% of	f program costs							
				•				
1								
L								
	[1 [5001444
1009	Project Nun	nber: 9824	4					FORM 4A
1330	Project Title	commun	ity-based H	arbor Seal M	Managemen	it and	N	Ion-Trustee
	Biological	ampling			nanagemen		!	SUMMARY
				0	_			
Prepared:6/18/97	Iname: Ala	ska native i	Harbor Seal	Commissio	n			
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Personnel Cos	its:			Months	Monthly		Proposed
Name		Position Description		Budgeted	Costs	Overtime	FY 1998
Monica Rie	del	Executive Director		6.0	4.0		24.0
							0.0
		Note: works half time for 12 months					0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
,		Subtotal		6.0	4.0	0.0	
					Per	sonnel Total	\$24.0
Travel Costs:			Ticket	Round	Total	Daily	Proposed
Description	1		Price	Trips	Days	Per Diem	FY 1998
Juneau - C	ordova (worksh	op)	0.3	1	2	0.2	0.7
Chenega E	Bay -Cordova (w	orkshop)	0.8	1	2	0.2	1.2
Tatitlek - C	ordova (worksho	(qc	0.6	1	2	0.2	1.0
Port Graha	m, Nanwalek an	d Seldovia - Cordova (workshop)	0.4	3	6	0.2	2.4
Akhiok, Po	rt Lions, Larsen	Bay, and Old Harbor - Cordova (wrkshp)	0.4	4	8	0.2	3.2
Chignik La	ke - Cordova (w	prkshop)	0.9	1	3	0.2	1.5
San Franci	sco - Cordova (/	A. Hoover -Miller to workshop)	0.6	1	3	0.2	1.2
Anchorage	- Cordova (wor	kshop and restoration workshop)	0.2	2	5	0.2	1.4
Valdez - C	ordova (worksho	(p)	0.1	1	2	0.2	0.5
Kodiak - C	ordova (Wynne i	o workshop)	0.3	1	2	0.2	0.7
							0.0
						T	0.0
L						Travel Total	\$13.8
		ſ <u> </u>]	F	ORM 4B
1009		Project Number: 98244				F	Personnel
1330		Project Title: Community-based H	arbor Seal I	Managemen	t and	•	& Travel
		Biological Sampling		J			
Proparad 6/49/		Name: Alaska Native Harbor Soul	Commission	n			DETAIL
~ 10/3		Anne. Alaska Hauve Haibut Seat	Commission	1			
b							6/2

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Contractual Costs:			Proposed
Description			FY 1998
Phone 12 months @ 200/month			2.4
Postage 12 months @ 100/month			1.2
Insurance			1.2
Elecricity for village freezers			2.2
Subcontracts with community technicians Training honorarium: 3 replacements/\$100 each = \$300 Sample processing: 9 communities, 10 seals/community, \$45/seal = \$4050			4.4
Shipping biological samples			1.0
	Contract	ual Total	\$12.4
Commodities Costs:			Proposed
Description			FY 1998
Purchase replacement materials for sampling kits (knives, gloves, plastic bags((6 kits)			0.1
Purchase new sampling kits (3 kits @ 120/kit)			0.4
Shipping supplies			1.0
	Commoditi	es Total	\$1.5
1998 Project Number: 98244 Project Title: Community-based Harbor Seal Management Biological Sampling Name: Alaska Native Harbor Seal Commission	and	FC Cont Com D	ORM 4B tractual & nmodities ETAIL

1998 EXXON VALDEZ TRUSTELE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

New Equipment Purchases:	` '	Number	Unit	Proposed
Description		of Units	Price	FY 1998
				0.0
				0.0
	·			0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
			1	0.0
				0.0
Those purchases associated with replacer	ment equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.0
Existing Equipment Usage:	anno anno anno anno 2015, anno 1185, anno 11		Number	
Description	,		of Units	
1998 ProjectProjectProjectBiologicBiologicName:Project	Number: 98244 Title: Community-based Harbor Seal Managemer cal Sampling Alaska Native Harbor Seal Commission	it and	F	ORM 4B quipment DETAIL



<u> </u>	Authorized	Proposed						، مومیر، یہ سے ہی دی۔ میں
Budget Category:	FY 1997	FY 1998						
Personnel	\$7.3	\$5.6						
Travel	\$0.0	\$0.0						
Contractual	\$0.0	\$0.0						
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG R	ANGE FUNDI	NG REQUIRE	MENTS	
Subtotal	\$7.3	\$5.6		Estimated	Estimated	Estimated	Estimated	
Indirect	\$1.8	\$1.4		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$9.1	\$7.0		\$0.0	\$0.0	\$0.0	\$0.0	
Full-time Equivalents (FTE)		1.0						
	·		Dollar amount	ts are shown in	n thousands of	dollars.		
Other Resources								



Pers	ionnel Costs:			Months	Monthly		Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FY 1998
	Kate Wynne	Research Associate Professor		1.0	5.6		5.6
							0.0
		×					0.0
							0.0
							0.0
							0.0
					[0.0
							0.0
							0.0
							0.0
							0.0
							0.0
Ļ		Subtotal		1.0	5.6	0.0	* 5.0
L					Per	sonnel lotal	\$5.6
Trav	el Costs:		Ticket	Round	Total	Daily	Proposed
	Description		Price	Irips	Days	Per Diem	FY 1998
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
						Travel Total	\$0.0
[P					
	1000	Project Number: 98244					
	1998	Project Title: Community-based H	larbor Seal I	Managamar	tand	1	-ersonner
		Dielegiest Complian		vialiagemen	it and		& ravel
L		biological Sampling					DETAIL
Prep	bared:6/18/97	Name: University of Alaska				•	
	10 of 12						6/20

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Contractual Costs:		Proposed
Description		FY 1998
·····		T
Commodities Costs:	Contractual	
Description		FY 1998
	Commodities	Fotal \$0.0
1998 Prepared:6/18/97	Project Number: 98244 Project Title: Community-based Harbor Seal Management and Biological Sampling Name: University of Alaska	FORM 4B Contractual & Commodities DETAIL

6/20/97



New Equipment Purchases:		Number	Unit	Proposed
Description		of Units	Price	FY 1998
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
Those purchases associated with	th replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.0
Existing Equipment Usage:			Number	
Description			of Units	
1998 Prepared:6/18/97	Project Number: 98244 Project Title: Community-based Harbor Seal Managemer Biological Sampling Name: University of Alaska	it and	F	ORM 4B quipment DETAIL
12 of 12			1	6/2

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Revision 6-26-97 approved TC 8-6-97

Kametolook River Coho Salmon Subsistence Project

Project Number:	98247	
Restoration Category:	General Restoration	
Proposer:	Perryville Village Council	
Lead Trustee Agency:	ADFG	
Cooperating Agencies:	NONE	JUN 2 5 1997
Alaska SeaLife Center:	NO	EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
Duration:	2nd year, 6-year project	
Cost FY 98	\$14.9	
Cost FY 99	\$14.8	
Cost FY 00	\$15.1	
Cost FY 01	\$ 15.4	
Cost FY 02	\$15.7	
Geographic Area:	Perryville/ Kametolook Riv	ver/ Alaska Peninsula
Injured Resources/ Service	Subsistence	

ABSTRACT

Subsistence users from the remote Alaska Peninsula Native Village of Perryville (Figure 1) have noted significant declines in the coho salmon run in the nearby Kametolook River since the *Exxon Valdez* oil spill (EVOS) in 1989. The Trustee Council began funding a project in Federal Fiscal Year 1997 with the intent of restoring this coho salmon run. This project is a continuation of an evaluative phase of the project funded through the EVOS criminal settlement (Grant Agreement Number 2168588). The criminal settlement funded the project for an assessment team consisting of 4 specialist staff from ADFG and 2 to 4 local assistants of the Native Village of Perryville, to assess the Kametolook River and determine what method would best be suited to restore the rivers coho salmon stock to historic levels. This phase ended with the approval of an Environmental Assessment (EA)

and a Finding of No Significant Impact (FONSI) by the US Fish and Wildlife Service in May 1997.

The EA supported instream incubation boxes as the preferred alternative for this restoration project. This project would provide funding through FY 2002 for ADFG and the Native Village of Perryville to try conservative and safe restoration methods best suited to the rivers salmon stocks. Instream incubation boxes have been evaluated and selected as the primary restoration tool to rebuild the depressed coho salmon stock needed for subsistence in the Kametolook River. Community involvement by the villagers of Perryville is an integral part of restoring Kametolook River coho salmon as a subsistence resource.

Prepared 6/18/97

<u> A</u>

INTRODUCTION

This subsistence project is designed to restore coho salmon subsistence opportunities in the Alaska Peninsula village of Perryville. The project was initiated during community workshops held by the Subsistence Restoration Planning Team. Workshops in Perryville took place in September 1994 and May 1995. The project was subsequently endorsed by the Perryville Village Council. The project was also discussed and endorsed by the Chignik Regional Planning Team in the spring of 1995 and again in December 1996. Alaska Department of Fish and Game, Division of Commercial Fisheries, westward region staff assigned to the Chignik and Alaska Peninsula regions and the Division of Subsistence, have been involved in the planning and development of the project. In addition, an ADFG biologist in the Norton Sound Region has provided technical expertise regarding the use of both instream incubator boxes and recirculating water incubators, which have been successful in the Norton Sound Region. Alaska Department of Fish and Game, Division of Habitat and Restoration staff have also been involved with the project, especially with the development of an Environmental Assessment

In 1996, funding for the evaluation phase of the project was provided through a grant to the Native Village of Perryville by the Alaska Department of Community and Regional Affairs, using EVOS criminal settlement funds. During consultation about this grant, the State members of the Trustee Council requested that a proposal to the full Trustee Council be prepared to support the implementation of the project in subsequent years. This was accomplished and the Trustee Council began funding this project in Federal Fiscal Year 1997. The Environmental Assessment was approved and the resulting FONSI for this project was received by the Trustee Council in May, 1997.

It has been determined by the assessment team that local salmon stock instream incubator boxes are the best method to help restore Kametolook River coho salmon runs. Applications for ADFG fish transport permits are being reviewed and a general habitat waterway/waterbody application has been granted for this project. The assessment team will work with the Principal Geneticist, Principal Pathologist and Area Management Biologist to have the most safe and satisfactory project possible to help restore coho salmon in the Kametolook River to historic levels.

NEED FOR THE PROJECT

A. Statement of Problem

Since Perryville was founded in 1912, the Kametolook River has provided the community with much of their supply of subsistence coho salmon. Since the *Exxon Valdez* oil spill, Perryville residents have noted that there are fewer and fewer coho salmon in the river. It has become such a problem that many families must travel further away from Perryville to find sufficient amounts of salmon. Their use of these other areas has put additional pressure on fish stocks used for subsistence by the neighboring villages of Ivanof Bay, and the three Chignik villages.

Salmon are very important for Native people of Perryville, and are relied on greatly for their subsistence as well as economic livelihoods. Commercial fishing is the mainstay of Perryville's cash economy, where many residents travel to fish camps in Chignik Lagoon and Chignik Bay in the summer months to commercial fish, as well as to put up fresh sockeye salmon for smoking, canning or freezing. Those people who spend summer months in Chignik return to Perryville in the fall to put up coho salmon that are also smoked, as well as dried. Many other Perryville residents, however, do not commercial fish and stay in Perryville year around. Gradually throughout the summer, they travel to the Kametolook River to catch their year's supply of subsistence salmon, which are primarily coho, pink, and chum salmon. (Sockeye, estimated at fewer than 100 adults annually, also spawn in the Kametolook River.)

Division of Subsistence personnel first did research in Perryville in 1984. Starting in 1990, the division has documented concerns by local residents that coho salmon availability in the Kametolook River are far below historical levels. Fish and Game biologists working in the Chignik region believe coho salmon stocks in the Kametolook River might be depressed, but have little data regarding historic or present escapement levels for this small, remote river.

B. Rationale/Link to Restoration

Salmon runs to the Kametolook River have been declining in recent years. Members of the village of Perryville requested the EVOS Trustee Council to fund a restoration project and they asked ADFG to assist with this project. The cause of the decline in salmon numbers is unknown. A restoration project cannot be successful unless the cause of the decline is understood and the project is "fixing" the "right problem".

An appropriate salmon restoration project will hopefully increase Kametolook River coho salmon relied on for subsistence by Perryville people back to historic levels. If more fish are available for subsistence, it will not only provide people with more coho salmon, but it will also take pressure off of other subsistence resources that were hurt by the spill, such as other salmon species, clams, seals and sea lions, as well as recent declines of local caribou.

C. Location

The remote Native village of Perryville is located approximately 500 air miles southwest of Anchorage on the Pacific side of the Alaska Peninsula. Veniaminof Volcano overlooks the village that is situated directly along the Pacific Ocean coastline with beaches of volcanic black sand. The Kametolook River is located four miles northeast of Perryville, and is easily accessible from the community via ATV, foot, or boat.
COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

The Trustee Council's goal of achieving additional local public involvement in the restoration process is addressed in that Perryville will be a partner with ADFG personnel in this project. This project has been discussed and endorsed by the Chignik Regional Planing Team and the Perryville Village Council. Through project funds, the Perryville Village Council is responsible for hiring local assistants, and providing necessary logistical support for the operation of this project. The community has also contributed much in terms of local knowledge of the environment, including: historic to contemporary salmon run timing and numbers, subsistence harvest levels over time, identifying physical changes to the Kametolook River over time, helping ADFG identify spawning and rearing areas, and identify potential characteristics of the river, such as where winter freeze over or spring and fall flooding might occur.

Several residents of Perryville have worked with ADFG during assessment and implementation phases of the project. In addition, local assistants will monitor the project throughout the year, when ADFG personnel will not be present. Local assistants through hands-on involvement have been trained by ADFG personnel to monitor temperature and water level stations, to monitor the egg incubation boxes, participate in egg takes for seeding the incubation boxes, transporting eggs to the classroom incubator, and will transport fry to nearby lakes or adjacent rivers (depending on what the current review of the Fish Transport Permits allow).

Perryville residents have been kept informed about the progress of the project through the Village Council and village meetings. During these meetings residents have been informed about salmon run strengths, harvest levels, and rearing and habitat issues. The community has been encouraged to come up with ways that they can contribute toward restoring the coho run, such as developing sanctuaries in coho ripening and spawning areas where people will not fish.

School children have had opportunities to learn, understand and appreciate the complexities of the growth cycle of salmon through the use of a classroom aquarium that is raising coho salmon from egg to fry stages. If the fish resource permits allow, these fry will be released into one of the two landlocked lakes or into the Kametolook River. In addition, when allowed by the teachers and parents, older school children have accompanied ADFG personnel to the Kametolook River and nearby lakes to assist with minnow trapping and biological and habitat sampling.

PROJECT DESIGN

The primary goals of the project are to increase the coho salmon runs to the Kametolook River, and include the people of Perryville through involvement in the project and education. The method(s) used to accomplish this have been determined in 1996 and 1997 by a team of ADFG specialists, and local Perryville residents. Funding for the first portion of the project was provided through a grant to the Native Village of Perryville from the criminal settlement funds. Beginning in Federal Fiscal Year 1997 funding has been provided by the Trustee Council. Personnel involved with the project have determined that the most appropriate rehabilitation method is through the use of instream incubation boxes. The team has acquired all the necessary permits, (with the exception of the Fish Transport Permits, which are currently being reviewed). The Environmental Assessment and a Finding of No Significant Impact by the US Fish and Wildlife Service has been approved. This project has the potential to make restoration of coho salmon in the Kametolook River possible. Similar projects in other regions of Alaska have proven to be successful.

In addition to school and village meetings where salmon life cycle processes were described, instream incubation boxes have been determined to be the preferred restoration method. A test incubation box was positioned in a head water tributary of the Kametolook River to use the natural flow of water from the stream to incubate coho salmon eggs. This portion of the project has been successful; swimup fry were produced during April 1997. In the production phase of this project, genetic integrity of the Kametolook River coho salmon will be assured under the guidance of the department's Principal Geneticist. The potential incubation site has water temperatures consistent with natural spawning sites to insure that fry development and emergence occur at the same time as naturally occurring fry. The small scope of this project is not expected to noticeably add any coho salmon to other common property harvest groups (i.e. commercial fisheries).

From similar projects in Norton Sound, it has been found that improved returns were noticeable in about five years. If the number of coho salmon spawners is sufficient to allow an egg take, (Fish Transport Permits will require a minimum of 60 naturally spawning pairs before an egg take can occur and then 50% of the escapement above the 60 spawning pairs will be available for an egg take) instream incubators will be employed. The incubators are expected to operate annually from 1997 through 2002. Since a major expense is in the boxes (materials and installation), and establishing an incubation site, the annual cost of operation and maintenance is not significant.

Other restoration methods evaluated included a recirculating water incubation facility in the village, potential habitat manipulation to create or provide access to better spawning and rearing habitats, and a remote incubation facility. All of these alternative methods were rejected in favor of the instream incubators.

A. Objectives

There are two main project objectives: the first is community involvement described above, and the second is to restore the coho salmon returns to the Kametolook River and provide local subsistence salmon opportunities. The species of interest for this project is

coho salmon. Phase 1 of the project included a complete assessment of the creeks and rivers habitat in proximity to Perryville and interviews to determine salmon run strength, run timing and physical changes to local drainages. Phase 2 (1996) included installation and testing of a streamside incubation box, continuation of the classroom aquarium and education programs for adults and high school students. Phase 3 will include installation (August/September 1997) of large capacity streamside incubation boxes and continuation of the school aquarium and education programs. Annually, egg takes for the incubation boxes and the school aquarium, continued education and habitat and harvest monitoring will occur.

B. Methods

(May 1996 through May 1997): This phase of the project is funded through the Criminal Settlement.

May 1996: Three ADFG assessment team members traveled to Perryville and joined with local assistants to assess the Kametolook River in order to make recommendations for the best restoration efforts. A small instream test incubator box (2 foot square plywood box) was installed at the headwaters of the river. The incubator box was also equipped with a thermograph to aid in determining the potential of the incubation site. Thermographs were also installed at three other habitat monitoring locations along the Kametolook River. Our guides showed us the different stream reaches; at this time, there was no evidence of blockages to adult or smolt migration. Blockage and breaching events apparently occur on a scale of about 2-10 years. We were given the impression that the river has relatively unstable spawning areas with current upstream spawning sites improved from prior years. Young-of-the-year and fingerling coho were observed in several slough habitats and small ponds. Several ponds, deep main-stem pools, sidechannel sloughs and spring areas apparently do not freeze solid and would provide over winter rearing habitat. During this trip preliminary investigations were also undertaken for possible stocking of rainbow trout or coho salmon into two landlocked lakes (Sandy and Sicken Lakes) in proximity to Perryville. At the high school we discussed potential education projects such as a classroom salmon aquarium and recirculating egg incubators. (A detailed field trip report is available.)

October 1996: Three ADFG assessment team members traveled to Perryville and joined with local assistants to expand the habitat surveys of drainages adjacent to Perryville, to place fertilized eggs in the experimental stream side incubation box and to initiate a cooperative educational program in the Perryville school. Local guides showed us much of the historic and potentially productive reaches of the Kametolook, Three Star and Long Beach Rivers. Long Beach River, although historically productive, presently had no quality spawning or rearing habitat. Three Star River, smallest of the three drainage's, had some stable reaches but about half of the discharge had changed course and currently flowed into Long Beach River. Some potential rearing habitat is present while spawning habitat appeared to be limited. Kametolook River currently showed the most salmon spawning and rearing potential. However, this system is dynamic and habitat quantity and quality may change annually.

Minnow trapping was conducted in all three drainages. Rearing and spawning habitat in Long Beach River appeared to be negligible. Three Star River had limited high quality slough habitat and supported juvenile coho salmon and Dolly Varden, spawning habitat appeared to be limited to several short stream reaches. Rearing habitat for juvenile coho salmon in the Kametolook River appeared to be quite abundant while upper stream reaches seemed able to support relatively good numbers of spawning salmon. Several high school students assisted with coho fingerling data collection efforts.

Trap catches and age-classes of juvenile coho salmon are summarized below:

			Total	Catch	per Trap-Ho	ur
Location	Site	No. Trap	s Trap Hr.	Coho	Dolly Varde	en
Kametolook	Candlefish Slough	4	2.50	36.1	150.5	
Kametolook	Fingerling Slough	5	5.40	44.6	10.5	
Kametolook	Cross Creek	4	2.16	19.9	34.0	
Kametolook	Average			33.4	58.9	
Three Star	"Lake"	2	9.09	5.2	16.1	
Long Beach	pond	1	0.50	8.0		

Fingerling coho salmon age classes from the Kametolook River-combined:

·	Number	Percent
Age 1.0:	45	45.0
Age 2.0:	55	55.0
Total San	nples: 100	100.0

A total of 32 adult coho salmon were collected from the Kametolook River during this trip. Few other adult salmon were seen. Genetic and kidney samples, otoliths and scales were taken from each salmon. All observed coho salmon appeared to be recent arrivals to the river and were not ripe; seeding fertilized coho eggs into the incubation box was not possible.

Age class distribution of adult coho salmon from the Kametolook River is as follows:

Number		Percent
Age 1.1:	9	28.1
Age 2.1:	18	56.3
Age 3.1:	2	6.3
Unknown:	3	9.4
Total Sampl	es: 32	100.0

Adult coho samples from the Kametolook River, sexed from internal observation:

	Male	Female	Unknown	Total
Number	15	16	1	32
Percent	46.9	50.0	3.1	100.0

High school students, in addition to assisting with fingerling sampling, also explained the field trip experience to their fellow students. Each presented some aspect of the field studies and we participated by asking questions and explaining details. We also demonstrated scale-reading techniques and presented representative samples of all species collected from the minnow traps. Plans were developed with the fisheries teacher to install and permit a classroom aquarium incubator for coho salmon eggs. (A detailed field trip report is available.)

November 1996: Two ADFG assessment team members traveled to Perryville and joined with local assistants to capture and spawn one pair of coho salmon for the incubation box in the Kametolook River. Gillnetting captured about 20 salmon including 4 sockeye, 13 male coho and 3 female coho salmon. Following standard delayed fertilization techniques, the eggs were fertilized and seeded into the incubation box. A thermograph was deployed in the substrate near the largest group of spawning salmon. Although only a one time event, a survey to enumerate spawning coho was conducted. About 75% of all observed coho were located within 1 mile downstream of the incubation box; the remaining 25% were scattered in small groups throughout the remainder of the drainage. The total observed coho escapement was about 100 salmon with no ocean bright salmon observed. The subsistence harvest will probably continue, the observed escapement may be higher than the actual spawning escapement.

At the high school we assembled the aquarium incubator. When the eggs reach the eyed stage, about 250 eggs from the stream side incubator will be transferred to the classroom incubator (January ADFG field trip). (A detailed field trip report is available.)

January 1997: Two ADFG team members traveled to Perryville. While waiting in King Salmon for the flight to Perryville we met with the Alaska Peninsula/Becharoff National Wildlife Refuge staff to discuss the Kametolook project and review the draft Environmental Assessment. In Perryville, we joined local assistants and checked the thermograph and staff gauge sites, shocked the incubating eggs, discarding dead eggs, and sorted out about 250 eggs which were transported to the school aquarium. An approved Fish Transport Permit allowed 250 eggs to be raised in the school aquarium and their release back into the Kametolook River. With the assistance of five high school students we measured physical characteristics of two landlocked lakes as potential coho fry or rainbow trout release sites and collected gravel for alevin habitat in the aquarium. A slide show of the restoration project and discussion of the life cycle of salmon was presented to all Perryville students. We also attended a meeting sponsored by the Village Council where we presented a similar slide show. At the village meeting the restoration project and the school aquarium were discussed as well as the life cycle of coho salmon, the 1996 coho salmon escapement, and potential production from the escapement. (A detailed field trip report is available.)

March-May 1997: ADFG personnel drafted an Environmental Assessment of the Kametolook River Coho Salmon Restoration Project. A FONSI was developed and in May was signed for NEPA compliance. A Habitat Permit was reviewed and accepted which allows the instream incubation boxes to be deployed. Fish Transport Permits were drafted and are currently being reviewed to insure that management, genetic, and pathology concerns are addressed. Approximately 125 coho salmon fry were released into the river of origin (Kametolook) from the school aquarium project (Fish Resource Permit P-97-021).

SCHEDULE

A.1. Measurable Project Tasks for FY 97 (June 1, 1997 - September 30, 1997)

June 1997:	Complete Fish Transport Permit reviews Purchase material for incubation boxes Plumb incubation boxes
	Meet with Chignik Regional Planning Team, Chignik Regional Aquaculture Association and public to development a Western and Perryville Districts coho salmon management plan.
August 1997:	Transport incubation boxes to Perryville (ADFG M/V Resolution) Arrange logistics and storage in Perryville
September 1997:	Install incubation boxes in Kametolook River Sample salmon and trout for age, length and abundance data Perryville personnel trained at Pillar Creek Hatchery in spawning and incubator maintenance techniques
A.2. Measurable P	Project Tasks for FY98 (October 1, 1997 - September 30, 1998)

November 1997: Meet with Perryville personnel and conduct escapement surveys Perform a coho salmon egg take

	Sample salmon for genetic and pathology tests Consult with teachers and set up school aquarium
January 1998:	Perryville personnel will transport eyed eggs to the aquarium Analyze subsistence and commercial harvest data Attend Alaska Board of Fish meeting
April 1998:	Review meeting with assessment team to evaluate the project Proposal for FY99
May 1998:	Perryville students release aquarium fry

B. Project Milestones and Endpoints

Annually through the duration of the project: One day every month, one or two trained Perryville researchers will return to the thermometer sites and note the condition of the thermographs and photograph the area. They will also be responsible for reporting their findings to the ADFG team.

Annually, ADFG staff will evaluate the Kametolook coho runs through subsistence harvest reports, evaluate incubator performance and stocking levels, perform egg takes, stocking, update project plan, review FTPs and FRPs, provide annual peer review and write annual reports. ADFG biologists will determine any significant changes to the coho salmon spawning and rearing habitat of the rivers to determine appropriate stocking levels. ADFG will also evaluate the use of Kametolook River coho salmon as brood stock and the release of fry back into the Kametolook, Three Star, and Long Beach Rivers and other potential stocking sites include Sandy and Sicken Lakes.

The best means to rehabilitate the coho salmon run in the Perryville area is to educate the villagers through a better understanding of the life cycles and conservation of salmon. We want to assist with an educational process that will focus on teaching the community through the both the school children and adults. We plan to continue working with the community and teachers and help with this process. Results from all samples will continue to be shared with the school and community.

In conjunction with all other aspects of this project we will be working with the Village Council to determine what can be done to increase the number of spawning coho salmon. Options to increase the number of spawning coho include: 1) after about October 5, closing the upper portion of the Kametolook River to all fishing, 2) after about October 5, allowing only the harvest of spawned out coho salmon, 3) provide sanctuaries along the entire river reach for resting/ripening coho salmon, 4) make salmon carcasses used in this project available to local residents, and 5) provide other fishing opportunities.

We expect the stream side incubation boxes, in conjunction with some fishing restraints, to provide sufficient coho salmon to rehabilitate the run within two to three life cycles. Coho fry from the incubation boxes and school aquarium could be stocked in both landlocked lakes (Sandy and Sicken), while the Kametolook, Three Star and Long Beach Rivers could be stocked with coho salmon fry.

C. Completion Date

The project is anticipated to be completed by September 30, 2002.

Cooperating Agencies, Contracts, and Other Agency Assistance

Perryville

Perryville Village Council has hired a local project administrator to track the project, arrange for logistical support, and assist ADFG with field work and long term monitoring of the project. Two additional Perryville residents have been hired (by the Village Council) to work annually, as needed, to assist ADFG and the project administrator with building and hauling materials, site selection, and placement of incubation boxes. For example, local assistants will help with capturing adult salmon, taking genetic and pathology samples, removing, fertilizing, and seeding eggs into incubation boxes. Village assistants will also need to continue providing a skiff and 4-wheelers as needed. The project administrator is responsible for checking the boxes and habitat monitoring sites throughout the winter to insure they are operating efficiently, and safe from natural or human harm. Wages for the three village assistants have been included in the cost of the grant.

Alaska Department of Fish and Game

Several ADFG personnel have provided technical assistance for the project. Personnel responsible for the project include: Jim McCullough, Fish Biologist III for Commercial Fisheries, Kodiak and Lisa Scarbrough, Subsistence Resource Specialist II for Subsistence, Anchorage. Personnel assisting the project include: Dave Owen, Fish Biologist III, Chignik/Kodiak, Bill Hauser, Fish Biologist IV for Habitat and Restoration, Anchorage; Joe Sullivan, Fish Biologist III for Habitat and Restoration, Anchorage, Wayne Dolezal, Habitat Biologist III for Habitat and Restoration, Anchorage and Pete Velsco, Fish Culturist II for Commercial Fisheries, Nome. Rita Miraglia of the Subsistence Division will replace Lisa Scarbrough while Lisa is on maternity leave.

Pete has several years of varied experience with instream and recirculating incubation box projects, particularly in Norton Sound. Jim McCullough with ADFG has several years of varied experience with fisheries enhancement and research projects as well as salmon management in the Alaska Peninsula. Dave Owen is Chignik's Area Management Biologist with several years of experience with fisheries in the Chignik/ Perryville region. Bill Hauser and Joe Sullivan have extensive experience in fisheries restoration and enhancement with the department. Wayne Dolezal is one of the state's leading experts on habitat restoration. Lisa Scarbrough, has been doing subsistence research in the Alaska

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Peninsula (including Perryville) and Aleutian Island communities for several years. Labor will be provided by ADFG as part of their normal salary, however, transportation costs and per diem will be covered through the grant.

PUBLICATIONS AND REPORTS

An annual report of activities will be submitted to the Restoration Office before 15 April of each year, commencing in 1998. Similar reports will also be presented to the Chignik Salmon Advisory Committee and the Alaska Board of Fish.

PROFESSIONAL CONFERENCES

None planned at this time.

NORMAL AGENCY MANAGEMENT

This proposed rehabilitation effort is not part of ADFG's normal management responsibilities in the Chignik area.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

This project is a continuation of Perryville 96-01, funded by DCRA funds from the EVOS Criminal Settlement and Trustee Council project 97247 funded in Federal Fiscal Year 1997.

PROPOSED PRINCIPAL INVESTIGATORS

Jim McCullough, Fish Biologist III Alaska Department of Fish and Game Division of Commercial Fisheries and Management 211 Mission Road Kodiak, Alaska 99615-6399 Phone: (907) 486-1813 Fax: 486-1841 E-mail: JimMc@fishgame.state.ak.us

1 Nov 1995 - Present: FB III Regional Resource and Development Biologist. Co-author of the Pillar Creek and Kitoi Bay basic and annual hatchery plans. Voting member of the Kodiak, Chignik and Alaska Peninsula/Aleutian Islands Regional Planning Teams. Author/Review regional Fish Transport and Fish Resource Permits. Regional Habitat Biologist. ADFG representative to the Kodiak Sensitive Areas Workgroup. Coleader of an EVOS project to restore a coho stock for subsistence purposes in the Chignik Area.

30 June 1990 - 1 Nov 1995: FB III Alaska Peninsula Herring and Southeastern District Salmon Management Biologist. Compiled salmon and herring catch data and herring biomass and salmon escapement data, which I analyzed to determine opening and closure of the various commercial fisheries as delegated by the Commissioner of ADFG.

16 July 1985 - 31 May 1990: FB II Alaska Peninsula and Aleutian Islands Areas Finfish Research Biologist involved the design, organization, and completion of the annual catch and escapement program.

Lisa Scarbrough, Subsistence Resource Specialist II Alaska Department of Fish and Game Division of Subsistence 333 Raspberry Road Anchorage, Alaska 99518-1599 Phone: (907) 267-2396 Fax: 267-2450 E-mail: LisaS@fishgame.state.ak.us

Lisa Scarbrough has been a subsistence resource specialist with the Division of Subsistence of the Alaska Department of Fish and Game since 1989. She has extensive research experience in the Chignik area, including the village of Perryville. This has included research on the effects of the oil spill on local subsistence patterns. Her work has also involved training residents of the Chignik area communities as research assistants.

OTHER KEY PERSONNEL

Prepared 6/18/97



Figure 1. Perryville/Kametolook River Coho Salmon Restoration Project Site



Kevised 50-9-1 approved TC 8-6-97

October 1, 1997 - September 30, 1998

	Authorized	Proposed						
Budget Category:	FFY 1997	FFY 1998						
Personnel	\$5.1	\$2.6						
Travel	\$7.3	\$6.4						
Contractual	\$11.4	\$4.7						
Commodities	\$6.0	\$0.0						
Equipment	\$0.0	\$0.5	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	\$29.8	\$14.2	Estimated	Estimated	Estimated	Estimated	Estimated	
General Administration	\$1.6	\$0.7	FFY 1999	FFY 2000	FFY 2001	FFY 2002	FFY 2003	
Project Total	\$31.4	\$14.9	\$14.8	\$15.1	\$15.4	\$15.7	\$0.0	
Full-time Equivalents (FTE)	1.0	0.5						
			Dollar amounts are shown in thousands of dollars.					
Other Resources								

Comments: Budget projections for FY 1998 and beyond assume that instream incubation boxes are the only rehabilitation method employed. If the evaluation in FY 1997 identifies other appropriate methods, future budgets will need to be modified to include the cost of these methods. An Environmental Assessment is being drafted so the rehabilitation method will have a wide review. The final evaluation of the project is projected to be FY 2002.

In 1996, this project was funded by Criminal Settlement funds. The budget estimate for 1998 through 2002 under the original Criminal Settlement budget differs from this budget estimate. The reason for additional requested funds is the TC recommended enhanced community involvement and assessment. In response, we added additional assessment trips by ADF&G to Perryville to study the coho spawning and rearing populations and stream habitats, to install water and temperature devices, to install a test incubation box to determine its success, to do minnow trapping, to collect genetic and pathology samples, to install a school aquarium, and to expand the community involvement component of the project. We also added increased training of local villagers by on the job training and propose sending two villagers to Kodiak for two weeks of work experience in a hatchery. After completion of the first year of assessment, the Principal Investigators have been able to develop a more realistic budget estimate than was originally proposed. In addition staff time was added in order to develop and monitor the subcontract with Perryville and provide other staff support for the project.



Project Number: 98247 **Project Title:** Kametolook River Coho Salmon Subsistence Project **Agency:** Alaska Department of Fish and Game



Prepared: 5/1/07/B



October 1, 1997 - September 30, 1998

Personnel Costs:		GS/Range/	Months	Monthly		Proposed	
Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 1998	
L. Scarbrough	Subsistence Resource Specialist II	16F	0.5	5.1	0.0	2.6	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
	Subtotal		0.5	5.1	0.0	¢0.0	
				Per	sonnei lotai	\$2.0	
Travel Costs:		licket	Round	lotai	Daily	Proposed	
Description		Price	i rips	Days	Per Diem	FFY 1998	
Kodiak - Perryville		1.0	2	13	0.10	3.3	
Anchorage - Perryvine		0.0	2	0	0.10	2.2	
Rouak - Anchorage		0.5	1	0	0.10	0.9	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
					Travel Total	\$6.4	
1					F	ORM 3B	
1998	Project Number: 98247					Personnel	
1550	Project Title: Kametolook River C	Coho Salmor	n Subsistend	e Project	1.	e Troubl	
	Agency: Alaska Department of Fish and Game						
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Prepared: 5/1/97	L						
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5/2/97

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October 1, 1997 - September 30, 1998

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Contractual C	osts:	Proposed
Description		FFY 1998
4A Linkage	Contract with Native Village of Perryville Perryville wages/gasoline/ATV use	4.7
When a non-tru	ustee organization is used, the form 4A is required. Contractual Total	4.7
Commodities	Costs:	Proposed
Description		FFY 1998
	Commodities Total	\$0.0
1998	Project Number: 98247 Project Title: Kametolook River Coho Salmon Subsistence Project Agency: Alaska Department of Fish and Game	ORM 3B ntractual & mmodities DETAIL

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5/2/97

October 1, 1997 - September 30, 1998

Free and the second				
New Equipment Purchases:		Number	Unit	Proposed
Description		of Units	Price	FFY 1998
General maintenance of incubatio	on boxes and egg take equipment	1	0.5	0.5
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
Those purchases associated with repla	acement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.5
Existing Equipment Usage:			Number	Inventory
Description			of Units	Agency
instream incubation box		2	ADFG	
				001400
Proje	ect Number: 98247			OKW 3R
1998 Proj	ect Title: Kametolook River Cobo Salmon Subsister	Do Broject	E	quipment
Floje	eur mie, Kamelolok Kivel Gono Samon Subsistent			DETAIL
Ager	ncy: Alaska Department of Fish and Game			
Prepared: 5/1/97				

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October 1, 1997 - September 30, 1998

	Authorized	Proposed			in a subscription of the		· · · · · · · · · · · · · · · · · · ·	
Budget Category:	FFY 1997	FFY 1998						
Personnel		\$4.3						
Travel		\$0.0						
Contractual		\$0.0						
Commodities		\$0.0						
Equipment		\$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	\$0.0	\$4.3	Estimated	Estimated	Estimated	Estimated	Estimated	
Indirect		\$0.4	FFY 1999	FFY 2000	FFY 2001	FFY 2002	FYY 2003	
Project Total	\$0.0	\$4.7	\$4.4	\$4.5	\$4.7	\$4.8	\$0.0	
			18.18					
Full-time Equivalents (FTE)		2.1						
			Dollar amount	s are shown ir	n thousands of	f dollars.		
Other Resources								
Comments: For FY 1998 and be	evond, budget	assumes that	instream incub	ator boxes wi	I be the only re	ehabilitation m	ethod used. I	fthe
evaluation in FY 1998 identifies	other appropria	ate methods, tl	he contract wit	h Perryville wi	ill be modified t	to reflect the n	eeded level of	involvement
by the local project facilitator and	by the local project facilitator and project assistants.							
L								
	r						1	
	Project Nu	mber: 9824	7					FORM 4A
1998	Project Title	e: Kametolo	ok River Co	ho Salmon	Subsistence	e Project	N	on-Trustee
	Name: Na	tive Village	of Perryville			-		UMMARY
Prepared: 5510978	L						J	5/

October 1, 1997 - September 30, 1998

Personnel Costs:			Months	Monthly		Proposed	
Name	Position Description		Budgeted	Costs	Overtime	FFY 1998	
To be determined	Project Facilitator and Assistants		2.1	2.0	0.0	4.3	
						0.0	
Note: about 43 days of work	anticipated @ about \$100/day					0.0	
Months and monthly cost es	stimated to accommodate this					0.0	
spreadsheet.						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
	Subtotal		2.1	2.0	0.0		
	the start from the second start of the start start start start starts	ing in the same second		Per	sonnel Total	\$4.3	
Travel Costs:		Ticket	Round	Total	Daily	Proposed	
Description		Price	Trips	Days	Per Diem	FFY 1998	
						0.0	
						0.0	
					·	0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
						0.0	
			L		Travel Total	\$0.0	
						in the second	
						ORM 4B	
1998	1998 Project Number: 98247 Project Title: Kametolook River Coho Salmon Subsistence Project						
	Name: Native Village of Perroville			, ,		& I ravel	
	I amo. Haive village of reflyville					DETAIL	
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October 1, 1997 - September 30, 1998

Contractual Costs:		T T	Proposed
Description			FFY 1998
]	
		j	
	Cont	tractual Total	\$0 .0
Commodities Costs:			Proposed
Description			FFY 1998
	Comm	odition Total	\$0.0
		ounces rotar	
	Project Number: 98247		
1998	Dreiget Titley, Kemeteleek Diver Oche Colmen Outestange Destant	Cor	itractual &
	Project Little: Nametolook River Cono Salmon Subsistence Project	Cor	mmodities
l ,	Name: Native Village of Perryville	C	DETAIL
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October 1, 1997 - September 30, 1998

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FFY 1998
			0.0
		1	0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.0
Existing Equipment Usage:		Number	
Description		of Units	
	1		
]		
Project Number: 98247			URIVI 4B
1998 Project Title: Kametolook River Coho Salmon Subsistenc	e Project		quipment
Name: Native Village of Perryville			DETAIL
Prepared: 5816978			5/3

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98250

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approved TC 8-6-97

Project Management

Project Number:	98250
Restoration Category:	Research, Monitoring, and General Restoration
Proposer:	All
Cost FY 97:	\$641.6
Cost FY 98:	\$560.1
Cost FY 99:	TBD
Cost FY 00:	TBD
Cost FY 01:	TBD
Cost FY 02:	TBD



ABSTRACT

Project management is an important element of the Trustee Council's restoration activities. Project Managers perform tasks which include coordinating the activities between the Principal Investigators and the Restoration Office, reviewing project expenditure activity, assisting in the development of project budgets, tracking of project reporting, and ensuring that each project is implemented consistent with applicable legal and regulatory requirements and the Council's operating procedures.

INTRODUCTION

The FY 98 proposal for project management reflects Trustee Council guidance to continue reductions in overall programmatic and administrative costs consistent with the reduced scale of the restoration program. In FY 97, the Trustee Council authorized a Work Plan budget of \$16,200,000 inclusive of project management costs of \$641,600. In FY 98, the Trustee Council has identified a Work Plan budget target of \$14,000,000 inclusive of project management costs which are anticipated to total \$560,100. Future year funding for Project Management will be assessed in light of annual Work Plan needs but is anticipated to decline consistent with the reduction of overall Work Plan funding.

NEED FOR THE PROJECT

The Project Manager provides an essential link between the Restoration Office and the Principal Investigators. Under supervision of the agency Liaison, the Project Manager:

- coordinates and tracks the progress of restoration projects;
- ensures that projects meet their stated goals, objectives, and schedules;
- monitors project expenditures to ensure that funds are expended consistent with project authorization;
- obtains information from and/or facilitates the exchange of information between the Restoration Office, the public, cooperating agencies, and project investigators;
- attends meetings relating to planning and progress reviews;
- ensures that all reports, documents, and contract deliverables are acceptable;
- facilitates the printing/distribution of project reports to the Oil Spill Public Information Center;
- helps to track the inventory of equipment purchased with Joint Settlement funds;
- assists in the preparation and review of project proposals and budgets; and
- ensures National Environmental Policy Act (NEPA) compliance.

COMMUNITY INVOLVEMENT

Project Managers for each project are available to the public to answer questions and provide information on the restoration projects that they manage. Project Managers also work with the Community Involvement Coordinator and Community Facilitators as appropriate to ensure that community involvement objectives are met.

PROJECT DESIGN

A. Objectives

Project Managers ensure that studies funded by the Trustee Council are accomplished on time and consistent with the legal and regulatory requirements governing each project as well as Trustee Council procedures including any applicable conditions or requirements at the time of authorization.

B. Methods

Project Managers track project expenditures and status information and provide progress updates to their respective Liaisons and the Restoration Office.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

The organizational structures and administrative structures vary by agency. Certain projects have multiple agencies involved; others don't. Some projects involve contracts; others do not.

SCHEDULE

A. Measurable Project	t Tasks for FY 98 (October 1, 1997 - September 30, 1998)
October 31:	Submit prior year fourth quarter expenditure and project status information to the Restoration Office.
December 31:	Submit updated inventory of equipment purchased with Joint Settlement funds to the Restoration Office.
January 29-30:	Attend Annual Restoration Workshop.
January 31:	Submit first quarter expenditure and project status information to the Restoration Office, submit the final expenditure information for the prior year to the Restoration Office.
April 15:	Submit Detailed Project Descriptions and detailed budgets for FY 1999 proposals to the Restoration Office. Submit annual and/or final reports consistent with the report writing procedures.
April 30:	Submit second quarter expenditure and project status information to the Restoration Office.
July 31:	Submit third quarter expenditure and project status information to the Restoration Office.

B. Project Milestones and Endpoints

Funding for Project Management will be necessary in each year in which restoration projects are funded.

C. Completion Date

Funding for Project Management will be necessary in each year in which restoration projects are funded.

PUBLICATIONS AND REPORTS



The Project Managers ensure timely completion of annual and/or final reports and do not prepare reports themselves.

PROFESSIONAL CONFERENCES

All Project Managers are required to attend the Annual Restoration Workshop.

NORMAL AGENCY MANAGEMENT

The Project Managers perform tasks specific to the *Exxon Valdez* oil spill restoration program that are not part of normal agency management.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

Project Managers facilitate communications between projects as well as between the researchers and the Restoration Office.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

Not applicable for this project.

PROPOSED PRINCIPAL INVESTIGATOR, IF KNOWN

Not applicable for this project.





October 1, 1997 - September 30, 1998

approved TE 8-6-97

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	Authorized	Agency	ED Rec.	P	ROPOSED F	Y 1998 TRUS	STEE AGENC	IES TOTALS	
Budget Category:	FY 1997	Proposed	FY 1998	ADEC	ADF&G	ADNR	USFS	DOI	NOAA
				\$0.0	\$282.7	\$24.8	\$33.4	\$76.1	\$143.1
Personnel	\$557.9	\$544.1	\$487.0						-
Travel	\$0.0	\$0.0	\$0.0						
Contractual	\$0.0	\$0.0	\$0.0						
Commodities	\$0.0	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0	\$0.0		LONG R/	ANGE FUNDI	NG REQUIRE	MENTS	
Subtotal	\$557.9	\$544.1	\$487.0		Estimated	Estimated	Estimated	Estimated	
General Administration	\$83.7	\$81.7	\$73.1		FFY 1999	FFY 2000	FFY 2001	FFY 2002	
Project Total	\$641.6	\$625.8	\$560.1		TBD	TBD	TBD	TBD	
Full-time Equivalents (FT	7.3	6.8	6.1						
			Dollar a	mounts are sl	nown in thous	ands of dollar	rs.		
Other Resources	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
									••••

Comments:

Of the total funding reflected for the National Oceanic and Atmospheric Adminstration, \$92.4 in personnel and \$13.9 in general administration will be allocated to the Alaska Department of Fish and Game to support the Interagency Personnel Act (IPA) agreement that assigns the Project Manager to NOAA. The balance of \$32.0 in personnel and \$4.8 in general administration will be retained by the National Oceanic and Atmospheric Administration will be retained by the National Oceanic and Atmospheric Administration.

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1998

Project Number: 98250 Project Title: Project Management Lead Agency: Various Agencies

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October 1, 1997 - September 30, 1998

	Authorized	Agency	ED Rec.						
Budget Category:	FY 1997	Proposed	FY 1998						
Personnel	\$265.1	\$245.8	\$245.8						
Travel	\$0.0	\$0.0	\$0.0						
Contractual	\$0.0	\$0.0	\$0.0						
Commodities	\$0.0	\$0.0	\$0.0						i
Equipment	\$0.0	\$0.0	\$0 .0		LONG RA	NGE FUNDIN	IG REQUIRE	MENTS	
Subtotal	\$265.1	\$245.8	\$245.8		Estimated	Estimated	Estimated	Estimated	
General Administration	\$39.8	\$36.9	\$36.9		FFY 1999	FFY 2000	FFY 2001	FFY 2002	
Project Total	\$304.9	\$282.7	\$282.7		TBD	TBD	TBD	TBD	
Full-time Equivalents (FT	3.5	3.1	3.1						
	Dollar amounts are shown in thousands of dollars.								
Other Resources									
Personnel Costs:					GS/Range/	Months	Monthly		Proposed
Name	Position Title				Step	Budgeted	Costs	Overtime	FFY 1997
W. Hauser	FB IV				20L	12.0	7.5		90.0
D. Moore	FB III		-		18K	9.0	6.4		57.6
J. Sullivan	FB III				18K	9.0	6.4		57.6
C. Rozen	LIB II				17J	7.0	5.8		40.6
						4			
	1			0					
L				Suptotal		37.0	26.1	0.0	245.8

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Project Number: 98250 Project Title: Project Management Agency: Alaska Department of Fish and Game



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October 1, 1997 - September 30, 1998

	Authorized	Agency	ED Rec.						· ".
Budget Category:	FY 1997	Proposed	FY 1998						
Personnel	\$36.4	\$36.4	<i>,</i> \$21.6						
Travel	\$0.0	\$0.0	\$0. 0						
Contractual	\$0.0	\$0.0	\$0.0						
Commodities	\$0.0	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0	\$0.0	-	LONG RA	NGE FUNDIN	IG REQUIRE	MENTS	
Subtotal	\$36.4	\$36.4	\$21.6		Estimated	Estimated	Estimated	Estimated	
General Administration	\$5.5	\$5.5	\$3.2		FFY 1999	FFY 2000	FFY 2001	FFY 2002	
Project Total	\$41.9	\$41.9	\$24.8		TBD	TBD	TBD	TBD	
Full-time Equivalents (FT	0.4	0.4	0.3						
	Dollar amounts are shown in thousands of dollars.								
Other Resources						·	·		
Personnel Costs:					GS/Range/	Months	Monthly		Proposed
Name	Position Title				Step	Budgeted	Costs	Overtime	FFY 1997
TBD	Natural Resource Manager II				20	3.0	7.2		21.6
J. Bittner	Chief, Histor	y and Archaed	ology		21	0.0	7.4		0.0
								н •	
	1								
	1			Subtotal		3.0	14.6	0.0	21.6

1998

Project Number: 98250 Project Title: Project Management Agency: Alaska Department of Natural Resources



Prepared: 6/18/97

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1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

	Authorized	Agency	ED Rec.						
Budget Category:	FY 1997	Proposed	FY 1998						
Personnel	\$44.8	\$43.5	\$29.0						
Travel	\$0.0	\$0.0	\$0.0						
Contractual	\$0.0	\$0.0	\$0.0						
Commodities	\$0.0	\$0.0	\$0.0						
Equipment	\$0. 0	\$0.0	\$0.0		LONG RA	NGE FUNDIN	IG REQUIRE	MENTS	
Subtotal	\$44.8	\$43.5	\$29.0		Estimated	Estimated	Estimated	Estimated	
General Administration	\$6.7	\$6.5	\$4.4		FFY 1999	FFY 2000	FFY 2001	FFY 2002	
Project Total	\$51.5	\$50.0	\$33.4		TBD	TBD	TBD	TBD	
Full-time Equivalents (FT	0.6	0.6	0.4						
	Dollar amounts are shown in thousands of dollars.								
Other Resources									
Personnel Costs:					GS/Range/	Months	Monthly		Proposed
Name	Position Title				Step	Budgeted	Costs	Overtime	FFY 1997
K. Holbrook	Program Ma	nager			GS-12	5.0	5.8		29.0
K. Rice	NEPA Coord	linator			GS-12	0.0	5.8		0.0
			•						
							•		
	L			Subtotal		5.0	11.6	0.0	20.0
L				Castoria		0.0	<u></u>	0.0	29.0

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Project Number: 98250 Project Title: Project Management Agency: Forest Service



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1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Budget Category: FY 1997 Proposed Personnel \$78.2 \$78.0 Travel \$0.0 \$0.0 Contractual \$0.0 \$0.0 Commodities \$0.0 \$0.0 Equipment \$0.0 \$0.0 Subtotal \$78.2 \$78.0 General Administration \$11.7 \$11.7 Project Total \$89.9 \$89.7	FY 1998 \$66.2 \$0.0 \$0.0 \$0.0 \$66.2 \$9.9 \$76.1 1.0 Dollar a		LONG RA Estimated FFY 1999 TBD	NGE FUNDIN Estimated FFY 2000 TBD	G REQUIRE Estimated FFY 2001 TBD	MENTS Estimated FFY 2002 TBD	
Personnel \$78.2 \$78.0 Travel \$0.0 \$0.0 Contractual \$0.0 \$0.0 Commodities \$0.0 \$0.0 Equipment \$0.0 \$0.0 Subtotal \$78.2 \$78.0 General Administration \$11.7 \$11.7 Project Total \$89.9 \$89.7	\$66.2 \$0.0 \$0.0 \$0.0 \$66.2 \$9.9 \$76.1 1.0 Dollar a		LONG RAI Estimated FFY 1999 TBD	NGE FUNDIN Estimated FFY 2000 TBD	G REQUIRE Estimated FFY 2001 TBD	MENTS Estimated FFY 2002 TBD	
Personnel \$78.2 \$78.0 Travel \$0.0 \$0.0 Contractual \$0.0 \$0.0 Commodities \$0.0 \$0.0 Equipment \$0.0 \$0.0 Subtotal \$78.2 \$78.0 General Administration \$11.7 \$11.7 Project Total \$89.9 \$89.7	\$66.2 \$0.0 \$0.0 \$0.0 \$66.2 \$9.9 \$76.1 1.0 Dollar a		LONG RA Estimated FFY 1999 TBD	NGE FUNDIN Estimated FFY 2000 TBD	G REQUIREI Estimated FFY 2001 TBD	MENTS Estimated FFY 2002 TBD	
Travel \$0.0 \$0.0 Contractual \$0.0 \$0.0 Commodities \$0.0 \$0.0 Equipment \$0.0 \$0.0 Subtotal \$78.2 \$78.0 General Administration \$11.7 \$11.7 Project Total \$89.9 \$89.7 Eulletime Equivalents (ET 1.3 1.2	\$0.0 \$0.0 \$0.0 \$66.2 \$9.9 \$76.1 1.0 Dollar a		LONG RA Estimated FFY 1999 TBD	NGE FUNDIN Estimated FFY 2000 TBD	G REQUIRE Estimated FFY 2001 TBD	MENTS Estimated FFY 2002 TBD	
Contractual \$0.0 \$0.0 Commodities \$0.0 \$0.0 Equipment \$0.0 \$0.0 Subtotal \$78.2 \$78.0 General Administration \$11.7 \$11.7 Project Total \$89.9 \$89.7	\$0.0 \$0.0 \$66.2 \$9.9 \$76.1 1.0 Dollar a		LONG RA Estimated FFY 1999 TBD	NGE FUNDIN Estimated FFY 2000 TBD	G REQUIRE Estimated FFY 2001 TBD	MENTS Estimated FFY 2002 TBD	
Commodities \$0.0 \$0.0 Equipment \$0.0 \$0.0 Subtotal \$78.2 \$78.0 General Administration \$11.7 \$11.7 Project Total \$89.9 \$89.7	\$0.0 \$0.0 \$66.2 \$9.9 \$76.1 1.0 Dollar a		LONG RA Estimated FFY 1999 TBD	NGE FUNDIN Estimated FFY 2000 TBD	G REQUIRE Estimated FFY 2001 TBD	MENTS Estimated FFY 2002 TBD	
Equipment \$0.0 \$0.0 Subtotal \$78.2 \$78.0 General Administration \$11.7 \$11.7 Project Total \$89.9 \$89.7	\$0.0 \$66.2 \$9.9 \$76.1 1.0 Dollar a		LONG RA Estimated FFY 1999 TBD	NGE FUNDIN Estimated FFY 2000 TBD	G REQUIRE Estimated FFY 2001 TBD	MENTS Estimated FFY 2002 TBD	
Subtotal\$78.2\$78.0General Administration\$11.7\$11.7Project Total\$89.9\$89.7Eull-time Equivalents (ET1.31.2	\$66.2 \$9.9 \$76.1 1.0 Dollar a		Estimated FFY 1999 TBD	Estimated FFY 2000 TBD	Estimated FFY 2001 TBD	Estimated FFY 2002 TBD	
General Administration Project Total Full-time Equivalents (ET 13 12	\$9.9 \$76.1 1.0 Dollar a		FFY 1999 TBD	FFY 2000 TBD	FFY 2001 TBD	FFY 2002 TBD	
Project Total \$89.9 \$89.7	\$76.1 1.0 Dollar a		TBD	TBD	TBD	TBD	
Full-time Equivalents (ET 13 12	1.0 Dollar a						
Full-time Equivalents /FT 13 12	1.0 Dollar a						
	Dollar a						
		mounts are sl	hown in thous	ands of dollar	S.		
Other Resources							
Personnel Costs:		GS/Range/	Months	Monthly		Proposed	
Name Position Title	Position Title				Costs	Overtime	FFY 1997
D. Irons Project Manager - FWS/MBM	Project Manager - FWS/MBM				6.8		34.0
L. Thomas Project Manager - USGS/BR	Project Manager - USGS/BRD			7.0	4.6		32.2
C. Berg Project Manager - FWS/NRD	DAR		GS-12	0.0	5. 9		0.0
I		Subtotal		12.0	17.3	0.0	66.2



Project Number: 98250 Project Title: Project Management Agency: Department of the Interior



October 1, 1997 - September 30, 1998

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	Authorized	Agency	ED Rec.						
Budget Category:	FY 1997	Proposed	FY 1998						
Personnel	\$133.4	\$140.4	\$124.4						
Travel	\$0.0	\$0.0	\$0.0						
Contractual	\$0.0	\$0.0	\$0.0						
Commodities	\$0.0	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0	\$0.0		LONG RA	NGE FUNDIN	G REQUIRE	MENTS	
Subtotal	\$133.4	\$140.4	\$124.4		Estimated	Estimated	Estimated	Estimated	
General Administration	\$20.0	\$21.1	\$18.7		FFY 1999	FFY 2000	FFY 2001	FFY 2002	
Project Total	\$153.4	\$161.5	\$143.1		TBD	TBD	TBD	TBD	
Full-time Equivalents (FT	1.5	1.5	1.3						
Dollar amounts are shown in thousands of dollars.									
Other Resources									
Personnel Costs:					GS/Range/	Months	Monthly	2 1 414 . 115	Proposed
Name	Position Title)			Step	Budgeted	Costs	Overtime	FFY 1997
B. Wright	Project Mana	ager			23D	12.0	7.7		92.4
B. Morris	Project Mana	ager				4.0	8.0		32.0
K NOTE: These	funde (plus	13.9 GA) go	+ ADFG	for the IN	A Agreer	nent.			
		•							
	<u> </u>			Subtotal		16.0	15.7	0.0	124.4
				Oddicia		10.0	15.7	0.0	124.4
<u> </u>									
	Project Nu	mber: 982!	50	-				PF	KOJECT

Project Title: Project Management

Agency: National Oceanic and Atmospheric Administration (ADF&G)

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Press ad: 6/181917

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98252

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Revised 6(30/97 Approved TC 8-6-97

Investigations of Genetically Important Conservation Units of Rockfish and Walleye Pollock

Project Number:	98252
Restoration Category:	Research
Proposer:	J. Seeb, L. Seeb, S. Merkouris/ADFG
Lead Trustee Agency:	ADFG
Cooperating Agencies:	None
Alaska SeaLife Center:	Yes
New or Continued:	New
Duration:	1st yr. 5 yr. project
Cost FY 98:	· · · · · · · · · · · · · · · · · · ·
	\$209.1
Cost FY 99:	\$263.8
Cost FY 2000:	\$272.0
Cost FY 01:	\$281.0
Cost FY 02:	\$290.0
Geographic Area:	Kodiak Island, Resurrection Bay, Gulf of Alaska
Injured Resource/Service:	Herring, commercial fishing, rockfish

ABSTRACT

This proposal consolidates an array of requests from the commercial fisheries industry for discrete stock research into a single proposal for work that the Alaska Department of Fish and Game would conduct at its Anchorage genetics laboratory. Also, the Alaska Department of Fish and Game proposes to develop experimental fish runs at the Alaska SeaLife Center; these are essential for study of genetics, physiology, or diseases of anadromous fish proposed by University of Montana, University of Alaska, or the Alaska Department of Fish and Game and other principal investigators seeking to conduct research at the Seward facility.



INTRODUCTION

The commercial fishing industry in the Gulf of Alaska spill area underwent radical alterations from the impacts following the 1989 *Exxon Valdez* oil spill (EVOS). Area closures, species closures, and price fluctuations cumulatively affected both the industry and the target species. This proposal is designed to address discrete stock concerns through (1) identification of the stock structure of marine species most affected by fishery alterations including Kodiak Island herring, walleye pollock, and rockfish; and (2) conducting experimental matings at the Alaska SeaLife Center (ASLC) to support the research and findings of other Trustee Council-funded studies.

A. Marine Fish

The understanding of the genetic structure of discrete stocks is a central feature of conservation and restoration of commercially exploited fisheries resources today. ADF&G received Trustee Council support to improve discrete stock management capabilities only within the confines of Prince William Sound and Cook Inlet through study of genetics and ecology. Yet, post-spill changes in stock dynamics and changes in fishing patterns continue to adversely affect commercially valuable marine species in the greater Gulf of Alaska (GOA) spill area. This project, designed to expand ADF&G genetics research into the greater Gulf, was developed in response to specific requests from industry and after consultation with representatives from groups including the Alaska Draggers, Alaska Groundfish Data Bank, North Pacific Processors, and the Chignik Seiners Association.

For example, the rapid post-spill escalation of fishing effort on Pacific herring stock(s) spawning near Kodiak Island has become a conservation concern. The Prince William Sound (PWS) herring fishery underwent a catastrophic decline beginning in 1992. In 1993, the total observed spawning population was less than one-third of preseason predictions, and the average sizes of herring in each age class were some of the smallest on record. Only limited commercial herring fishing occurred. In 1994, as in 1993, the PWS spawning population was below preseason predictions. No recovery was evident in 1995, and based on this, the 1996 commercial fishing season was cancelled. Because of these declines in PWS, commercial effort shifted to stocks spawning near the shores of Kodiak Island.

The observation of potential temporal and spatial isolation leads Kodiak managers to attempt to manage herring harvest based upon discrete stocks. Yet no clear demarcation of stock structure currently exists. Through Trustee Council project 9x165, ADF&G identified a battery of mitochondrial DNA (mtDNA) and nuclear DNA (nDNA) markers that is proving useful to discriminate the structure of PWS stocks; these markers can also be used to elucidate the presence of stock structure in the Kodiak Island spawners. However, following comments from first review of this proposal, we are deferring a funding request for the Kodiak herring element for FY 98. Upon receipt of a final report from project 165, Genetic discrimination of Prince William Sound herring populations, we will evaluate the potential to phase in genetic discrimination of Kodiak Island herring populations utilizing these mtDNA and nDNA markers.

Prepared 6/97

from Kachemak Bay in the northern GOA suggest that pollock have been a dominant fish species in the ecosystem for the past twenty years (Bill Bechtol, ADF&G Homer, personal communication). Though poorly documented, pollock also appear to be a major predator species in PWS. EVOS-funded acoustic surveys conducted by the PWS Science Center (Sound Ecosystem Assessment Project, SEA) showed that pollock are primary predators of pink salmon fry, and to a lesser extent, larval and juvenile Pacific herring and several species of phytoplankton. Pollock spawn primarily from late winter to early spring, but spawning fish may be found year-round. Although peak spawning times and locations are quite consistent within areas, the extent of spawning site fidelity is unknown. The harvest of pollock began in 1995 after the SEA surveys documented commercially viable biomass spawning within the confines of PWS.

This novel harvest of pollock within the three-mile limit of state jurisdiction developed into a controversy also because of conservation concerns; the harvest of GOA pollock is based upon sustainable quotas established through interjurisdictional research and negotiation. The Pacific Fisheries Management Council could add the PWS catch to the GOA quota if PWS pollock form a discrete stock. The PWS catch would need to be subtracted from the quota if discrete stocks do not exist. ADF&G is coordinating efforts with National Marine Fisheries Service and the University of Washington to adapt stock markers for identification of discrete pollock stocks within the GOA.

Finally, during post-spill years, ADF&G documented greatly elevated effort on the sport and commercial harvest of rockfishes. Rockfishes are a diverse group of species belonging to the genus *Sebastes*. Despite the fact that they are often managed as a group, there are over thirty-two species found in Alaskan waters. Rockfish harvests increased four-fold due to closures of the commercial salmon and shellfish fisheries following the EVOS, and harvest rates have remained high in some areas. Because rockfish exhibit extreme longevity, slow growth, and late maturity, depressed populations often recover very slowly, and even with the curtailment of all human use, the impacts and rebuilding of depressed or depleted rockfish populations may continue through several human generations. The Alaska Board of Fisheries has instituted conservation restrictions, but the structure of discrete stocks is currently unknown.

B. Experimental Matings

Components of the genetic and ecological research implemented by the *Exxon Valdez* Trustee Council were hampered by the inability of principal investigators to conduct experimental matings with the organisms. The ASLC now affords opportunities to conduct inheritance studies on Pacific salmon and marine fish.

One example of the need for experimental matings is that numerous novel genetic markers were developed to improve discrete stock management capabilities for Pacific herring and pink and sockeye salmon through Trustee Council Projects 9x165, 9x191, 9x196, and 9x255. Mendelian inheritance for some of these markers is poorly understood, and mating studies will provide the answers necessary to include these in stock identification applications. Additionally, matings



Prepared 4/97

with pink salmon are needed to complete the work now underway in the project 9x190 series.

Genetic markers are also potentially available to Trustee agencies from collaborating laboratories conducting research on sister species. The markers available for identification of Atlantic cod stocks (Brooker et al., 1994) appear to be promising for the study of pollock (Paul Bentzen, University of Washington, personal communication). However, use of some of these markers is hampered by the expression of null phenotypes in pollock, and mating studies are needed before data from such loci can be properly included in discrete stock studies.

NEED FOR THE PROJECT

A. Statement of Problem

Post-oil spill alteration of fishing pressure lead to escalated fishing effort on stocks of several marine species including Pacific herring from Kodiak Island, PWS walleye pollock, and rockfishes. These fisheries emerged as they are today as a direct consequence of changing fishery patterns following the *Exxon Valdez* oil spill. Fishery managers trying to facilitate these emerging fisheries need to know the structure of discrete stocks in order to better manage them on a sustained basis.

Also, experimental matings are needed to support genetic and other studies of marine organisms inhabiting the spill area. Currently, ADF&G genetic studies are conducted at the Anchorage laboratory, sometimes at various hatcheries across the state of Alaska, and now in five consulting laboratories in Nova Scotia, Washington, and Montana. Much of this dispersion occurred because of the paucity of wet lab and dry lab space available in the region. Consolidation of the wet-lab projects into one project at the ASLC, using the new fish pass and fish-rearing space, will increase efficiency and cost-effectiveness of the research. The Trustee Council funded project 97197 to construct the fish pass for development of experimental fish runs.

Experimental fish runs developed at the ASLC will support research from other Trustee Council projects as well as projects proposed by University of Alaska. Experimental matings of pollock, herring, pink salmon, cutthroat trout, and Dolly Varden char and other species will be invaluable for documenting the Mendelian inheritance of many of the new gene markers developed through Trustee Council studies.

B. Rationale/Link to Restoration

1. Pacific herring of Kodiak Island

Conservation of herring stocks commercially harvested near Kodiak Island has recently become a concern. The commercial fishery at Kodiak Island has sustained a rapid escalation of fishing effort due to the displacement of the commercial herring fishing fleet in Prince William Sound.

Prepared 4/97

Presently, the herring fisheries around Kodiak Island are managed for a spring (sac roe) season, and a late summer/winter (food and bait) season. Spring sac roe fishery harvest levels are set annually prior to each season. Preseason harvest levels are established for each fishing district based upon previous year's fishery performance and catch data and age composition data collected during test fisheries. Although there are differences among putative stocks of spawning herring based on meristic, morphologic, size-at-age, and age composition data, the underlying genetic basis for these differences is unknown. An additional herring food and bait harvest occurs annually near Kodiak Island during the fall and winter months. By regulation, this harvest may not exceed 10% of the herring sac roe harvest in each district for the previous season, and this harvest likely occurs on mixed stocks, including those of Kamishak Bay which are thought to overwinter in Shelikof Strait.

Incorporating genetically derived population structure is crucial to the success of any fisheries program. The findings of this project will contribute to the conservation and restoration of GOA herring by providing new genetic information for Kodiak fisheries managers to incorporate into harvest management strategies.

2. Commercial fishing (walleye pollock)

Since 1995 a commercial fishery for walleye pollock has been prosecuted in the inner waters of the Gulf of Alaska. The harvests in Prince William Sound, which have occurred primarily near Port Bainbridge and Knight Island, are regulated by ADF&G. The adjacent federal waters of the GOA are managed by the National Marine Fisheries Service (NMFS). Currently, pollock and other groundfish in federal waters of the GOA are assessed through a summer triennial bottom survey conducted by NMFS. ADF&G has based the PWS harvest guideline on summer population assessments. Fish present in the summer in PWS are not assessed by NMFS, and ADF&G has used summer assessment data from SEA to establish guideline harvest levels for PWS pollock. In addition, a cooperative project involving ADF&G, the PWS Science Center and the fishing industry has assessed the pollock spawning population in PWS in the spring. However, the degree of migration and mixing of pollock between PWS and outer GOA waters is unknown. For example, it is not known how these interactions affect the composition of both the commercially fished aggregations and the assessed summer populations.

Successful management of commercial fisheries relies on an understanding of the underlying stock structure. Genetics studies of pollock indicate that heterogeneity exists across large areas, such as between eastern and western Bering Sea. For example, allozyme studies delineated walleye pollock populations from the eastern Bering Sea and Sea of Japan (Iwata 1975a, 1975b). However, early attempts to identify stocks within the southeastern Bering Sea were largely unsuccessful (Grant and Utter 1980). In contrast, a mtDNA study suggested that at least two genetically discrete stocks exist in the eastern Bering Sea, a Donut Hole/Bogoslof Island group and an Adak Island group (Mulligan et al., 1992). That study suggested that the GOA and Donut Hole/Bogoslof Island stocks are more closely related to each other than to the Adak Island population. This may be due to the movement of adult fish from the GOA to the Bering Sea via

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Unimak Pass and/or southwestward movement of larval pollock from Shelikof Strait through Unimak Pass. At present, there is insufficient evidence to suggest that gene flow is restricted between the eastern Bering Sea and the western GOA.

The findings of this project will contribute to the conservation of GOA pollock by providing new genetic information for federal and state fisheries managers to incorporate into development of sustainable harvest quotas. Such information will be important to the small fleets that are attempting to restore their livelihood through this displacement fishery.

3. Rockfish

Little information is available on rockfish abundance and composition in the EVOS-impact area. Recently the Alaska Board of Fisheries effected new area management and district boundaries for rockfish and established rockfish guideline harvest caps and set new state management areas that extend to three miles offshore. This project would initiate a genetic study of black rockfish (S. melanops), a species common in both commercial and sport harvests in the oil spill area. Similar genetic studies were useful in documenting gene flow among other species of rockfish (Seeb and Gunderson 1988). Genetic studies which document the population structure within and outside of the study area will be used to identify self-recruiting populations and levels of gene flow in this rockfish species. Black rockfish tend to be sedentary but have pelagic larvae. The extent of gene flow among spawning aggregations in the oil spill area is currently unknown.

Other rockfish (Sebastes sp.) would be added in subsequent years as markers are developed.

C. Location

Field research will be conducted primarily within the confines of Prince William Sound, EVOSaffected areas of Kodiak Island, Kamishak Bay, Resurrection Bay, the outer Kenai Coast, and adjacent waters of the Gulf of Alaska. Exact sampling locations will depend on the distribution of commercial and assessment survey efforts on spawning herring and pollock and the distribution of commercial and sport fishing efforts on black rockfish. Sampling outside of Prince William Sound will be conducted by ADF&G area staff as appropriate.

Mating studies will be conducted at the ASLC in Seward. At this time rental fees for research at the Seward facility have not been finalized. Costs for this have not been budgeted and will be determined by negotiations between the Trustee Council and the Seward Association for Advancement of Marine Science. Laboratory sampling and data collection will be conducted at the ADF&G area offices in Cordova and Homer, and the regional office in Kodiak. Laboratory analysis, tissue archiving, and data analysis will be conducted at the ADF&G statewide genetics laboratory in Anchorage.

Because commercial, subsistence and sport harvests of herring, pollock and rockfish represent substantial contributions to local economies, intensive management is expected to benefit all

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communities in PWS. Restoration efforts can be directed and evaluated through improved fishery management and monitoring.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

Components of this proposal were driven by community request. ADF&G is currently grappling with the permitting of funded Trustee Council projects and the evaluation of potential restoration projects and new fisheries in the areas of Kodiak Island, Kenai Peninsula, Alaska Peninsula, and Prince William Sound. Local knowledge from years of fishery management will be used in defining the hypotheses for testing for genetic homogeneity within each species.

Representatives of the fishing industry of PWS and the GOA expressed support for the projects proposed herein, including the North Pacific Processors (Ken Roemhildt, Cordova, Alaska, personal communication); the Alaska Draggers (Jay Stinson, Kodiak, Alaska, personal communication); and Chris Blackburn (Alaska Groundfish Data Bank, Kodiak, Alaska, personal communication). Support includes but is not limited to input on study design, coordination among fishing fleets for acquisition of fishery samples, providing facilities for sample collections, and assisting ADF&G staff with sample collections. The Seward Association for the Advancement of Marine Science (SAAMS) will be consulted to insure projects are consistent with the schedules and processes already in place.

Wherever possible, local-hire will be used to fill positions required for both field sampling and routine laboratory positions. People from the communities in the spill area will have an opportunity to participate in this project as employees of the ADF&G which gives residents priority in hiring for state employment. ADF&G plans to participate in all of the educational and outreach programs scheduled for the Center. In addition, results from this project will be disseminated to the local community through Regional Planning Team meetings.

PROJECT DESIGN

- A. Objectives
- 1. Contribute to the conservation and restoration of GOA herring by providing new genetic information for Kodiak fisheries managers to incorporate into harvest management strategies.
- 2. Develop new markers and provide genetic information for federal and state fisheries managers to incorporate into development of sustainable harvest quotas for the displacement fishery on walleye pollock.
- 3. Utilize new genetic markers to test for gene flow among black rockfish inhabiting the oil spill area.



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4. Provide experimental runs of fish for use by visiting scientists for projects such as the Construction of a Linkage Map for the Pink Salmon Genome (Project 97190).

B. Methods

1. Sampling design

Detailed sampling designs for each of the three marine species are summarized in Table 1.

Pacific Herring

We propose to initiate examination of Kodiak Island herring populations by conducting laboratory analyses of three putative population collections from areas which sustain major fishing effort and commercial harvests. Initially, we propose to obtain samples from Paramanof and Uganik Bays (west side) and Old Harbor (east side) on Kodiak Island. In addition, we propose to sample spawning herring from Kamishak Bay in the northern GOA. A target sample size of 100 individuals will be set; fin clips from individual herring will be preserved in ethanol for the subsequent nuclear (microsatellites) and mitochondrial DNA analyses.

Walleye Pollock

To begin to address stock questions of inner vs. outer GOA walleye pollock, we propose to initiate sample collections and genetics analyses of spawning populations from the inner GOA waters of PWS and from outer GOA waters of Shelikof Strait (N=100 each site). We also will include samples from an outside stock for comparison from the Bering Sea such as Bogoslof Island (N=100). We propose to use a combination of both mtDNA and nuclear DNA approaches (allozymes and microsatellites) to begin to define the population structure of walleye pollock from the EVOS-affected areas of PWS and the GOA. We will also analyze larvae from known crosses to verify the mode of inheritance and to investigate the presence of null alleles in microsatellites.

Black Rockfish

We propose to develop genetic markers to test for panmixia among black rockfish populations inhabiting the greater oil spill area. We will estimate genetic structure and gene flow within the Spill area using analyses of mitochondrial and nuclear DNA. Rockfish samples will be collected from up to five sites from within the EVOS-affected area. During the first year, a target sample size of 100 individuals will be set for each site. Sites will be chosen to maximize the geographic representation within the affected areas. All specimens will be analyzed for mitochondrial DNA and microsatellites. Fin clips from individual fish will be placed in ethanol. Muscle, liver, eye, and heart tissues for allozymes analyses will be collected when convenient for shipment to Washington Department of Fish and Wildlife (WDF&W). WDF&W has been conducting an allozyme survey of black rockfish and has requested specimens from Alaskan waters.

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Table 1. Sampling design for genetic analysis of Pacific herring, walleye pollock, and black rockfish.

Species	Genetic Technique	Sampling Locations
Pacific herring	Microsatellite mtDNA	Kodiak Island
Walleye pollock	Microsatellite Allozymes mtDNA	Prince William Sound (Inner Gulf) Shelikof Strait (Outer Gulf) Bogoslof Island (Bering Sea)
Black rockfish	Microsatellite mtDNA	Prince William Sound Resurrection Bay Outer Kenai Coast Kodiak Island





2. Laboratory Analysis

DNA will be extracted using either phenol-chloroform extractions (Sambrook et al. 1989) or a rapid precipitation method (Gentra Systems, Inc. P.O. Box 13159, Research Triangle, N.C. 27709-13159). This process includes: (1) a cell lysis solution to break down cell and nuclear membranes; (2) a Proteinase K digest to denature proteins; (3) an RNase treatment to digest RNA; (4) protein precipitation to remove Proteinase K, RNase, and denatured proteins; (5) isopropanol to precipitate DNA; (6) 70% ethanol to wash DNA; and finally (7) a hydration solution to rehydrate DNA. DNA will be extracted from liver, muscle, and fin clips depending on the available tissue and species. The DNA stocks will be diluted to a final concentration of approximately 100ng/ μ l for use in the polymerase chain reaction (PCR). After extraction, the DNA will be amplified using species-specific microsatellite and mtDNA primers.

Microsatellite Analysis

Microsatellite primers and PCR conditions for herring will follow those developed by Restoration Study 9x165 Genetic Discrimination of Prince William Sound Herring Populations. The five microsatellite loci (*Cha17*, *Cha20*, *Cha63*, *Cha113*, *Cha123*) previously found to be informative will be used. Additional *Cha* primers may be incorporated after further evaluation of those currently under development as a part of 97165.

Analysis of walleye pollock microsatellites will be investigated using three approaches as pollock-specific primers are not yet available. First, samples will be screened utilizing existing Atlantic cod primers (*Gmo1, Gmo2, Gmo9, Gmo10, Gmo123, Gmo132, Gmo145*; Brooker et al. 1994). If available in time for this project, the small number of pollock-specific primers developed by the Stanford University under contract to National Marine Fisheries Service (NMFS) will also be surveyed (Dennis Powers, Hopkins Marine Laboratory, Stanford University, Pacific Grove, CA; personal communication). We will also develop additional walleye pollock primers through subcontracting. This approach has proven cost-effective in the past and was utilized in the development of the herring primers through Restoration Study 9x165.

Microsatellite primers from *Sebastes* rockfish species have been recently developed in the laboratory of Dr. Paul Bentzen at the University of Washington. Dr. Bentzen has been an investigator and subcontractor on Restoration Study 9x165 as well as Restoration Study 9x255 Restoration of Kenai River Sockeye Salmon. Dr. Bentzen along with his collaborator, Dr. Peter Wimberger (University of Puget Sound, Tacoma), indicate that they will make the primers available to our laboratory; we anticipate no additional primer development will be necessary.

All microsatellite analyses will be conducted at the ADF&G Genetics Laboratory on either an ABI 377 or ABI 373A automated sequencer. We chose to pursue an automated approach to the analysis of microsatellites as it allows for highly efficient detection of multiple loci in a single lane utilizing a fluorescent four-color dye system (Ziegle et al. 1992; Olsen et al. 1996). One color is devoted to an internal lane standard leaving three colors available for labeling primers.



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Band sizes are called automatically from the known standards using the GeneScan Software (ABI Applied Biosystems 1996), and genotypes are assigned using the Genotyper Software (ABI Applied Biosystems 1994). Our laboratory has resolved up to ten loci in a single lane separating loci by size and color.

Mitochondrial DNA

We will restrict our analyses of herring mtDNA variation to the ND1 gene, a region found to be highly polymorphic by Restoration Study 9x165. The primers designed by Cronin et al. (1993) will be used to amplify the gene. Four restriction enzymes, *BanII, CfoI, HinfI, RsaI*, are highly informative with each detecting between four and nine haplotypes in our previous survey of seven Alaskan sites.

Previous studies of mtDNA from walleye pollock have surveyed the entire mitochondrial genome for RFLP variation (Mulligan et al. 1992) and sequenced the control region (Shields and Gust 1995). Rather than follow either of those laborious approaches, we plan to use PCR to amplify specific sections of the molecule similar to our approach in Pacific herring. Initially we will test and optimize the use of primer sets that include but may not be limited to pairs that amplify ND1, ND5/6, and D-Loop. We will test at least ten restriction enzymes on at least two of the more promising fragments. Primer pairs will be chosen from those described by Park et al. (1993), Cronin et al. (1993), and Kocher et al. (1989).

Our approach to the study of mtDNA in black rockfish will be similar to that of walleye pollock. We have already successfully amplified ND5/6, ND3/4, Cytochrome b, ND2, 16S rDNA, cytochrome oxidase I, and D-Loop from other Sebastes species.

Amplified DNA will be cut with restriction enzymes and electrophoresed on agarose gels. Fragments will be visualized under UV light, and a photographic record will be made of each gel. Since genes which are encoded by the mitochondrial genome are inherited as a single unit (i.e., analogous to linked loci), the restriction sites detected for each enzyme, for all regions examined, will be pooled as composite haplotypes. The frequencies and distributions of these composite haplotypes will then be used to examine the structure of the populations under study.

Allozymes

Allozyme electrophoresis will be conducted on pollock samples following the techniques of (Iwata 1975a, 1975b; Grant and Utter 1980). Allozyme techniques will follow those of Harris and Hopkinson (1976), May et al. (1979), and Aebersold et al. (1987); nomenclature will follow the American Fisheries Society standard (Shaklee et al. 1990). Gels will be scored using on-line scoring programs developed by ADF&G.



3. Statistical Analyses

Nuclear markers (allozymes and microsatellites)

S-plus analytical software (Mathsoft, Inc., Seattle WA) and GENEPOP Version 3.1 (Raymond and Rousset 1995) will be used to calculate allele frequency estimates, to test for conformation of genotype frequencies to Hardy-Weinberg expected frequencies using log-likelihood ratios, calculate genetic distances and heterogeneity among collections, and to estimate gene flow among collections. Sequential Bonferroni corrections (Rice 1989) will be used to adjust significance levels as required. Neighbor-joining (Saitou and Nei 1987), UPGMA, and maximum likelihood trees will be constructed using NTSYS (Rohlf 1993) and PHYLIP (Felsenstein 1993).

Mitochondrial DNA

Nucleotide (π) and haplotype (*h*) diversity measures (Nei 1987) will be calculated for all collections using the restriction enzyme analysis package (*REAP*; McElroy et al. 1992). These measures estimate the number of nucleotide substitutions per site between DNA sequences (i.e., sequence divergence) and the amount of DNA polymorphism within collections, respectively. To test for heterogeneity among populations, Monte Carlo simulations with 10,000 replicates will be performed (Roff and Bentzen 1989) using the *REAP* analysis program (McElroy et al. 1992). An analysis of the distribution of molecular variance will be made using AMOVA (Excoffier et al. 1992) and utilizing a matrix of Euclidean distances between haplotypes. Haplotype correlation measures are expressed as Φ -statistics. Φ_{ST} is the correlation of random haplotypes within collections relative to that of random pairs of haplotypes drawn from the entire set of collections. Pairwise Euclidean distances will be calculated as the total number of site changes between haplotypes. Φ_{ST} between pairs of populations, a modified coancestry coefficient (Excoffier et al. 1992), will also be calculated as a genetic distance and examined with tree building algorithms as for nuclear markers.

4. Experimental matings and fish runs

A plan for implementing experimental runs of fish will be initiated and developed within the guidelines of ADF&G. Runs of anadromous fish will be small, for experimental purposes only. The plan will address: 1) species to be included, 2) source and timing of broodstocks, 3) schedule for developing the runs, and 4) permit acquisition for stock transfer and fish rearing and release.

Initial efforts will focus on development of a run of pink salmon to support ASLC research proposed by University of Montana. Broodstock will be collected from a local Resurrection Bay source. The release of coho salmon to support general university research will be limited to a subcomponent of the current coho salmon releases conducted by ADF&G in Resurrection Bay. Other experimental matings will be conducted to test the Mendelian inheritance of Pacific herring microsatellite markers developed as a component of project 97165 and Atlantic cod

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microsatellite markers for use in pollock studies (see above).

C. Cooperating Agencies, Contracts, and Other Agency Assistance

Seward Association for Advancement of Marine Science; UAF Institute of Marine Science (IMS); University of Montana

NORMAL AGENCY MANAGEMENT

This project is not required of ADF&G by statute or regulation.

ADF&G spends approximately \$500.0K from State of Alaska general funds annually on genetics studies. Salaries and benefits of principal investigators J. Seeb and L. Seeb are fully covered by these general funds. S. Merkouris is funded for three months from Trustee Council funds and three months by general funds. These funds also support the basic operation of and enhancements to the Anchorage genetics laboratory for ADF&G management projects as well as EVOS projects. These general funds from the legislature are ear-marked for specific projects; although they may be used for leadership of EVOS studies, no general funds are available to institute new research such as this. The *Exxon Valdez* Trustee Council has shouldered the burden of research into the ecology and genetics of species within the spill zone. The studies outlined herein would not have been conducted by the State in the absence of the oil spill.

Commercial Fisheries Management and Development Division scientists perform managementoriented studies to identify conservation units of commercially important resources at the direction of the Director. Funds are limited and generally restricted to major contentious issues facing the Alaska Board of Fisheries. The need for characterization of the genetic structure of the species in this proposal has increased as a direct result of the EVOS either because the species were injured and have not recovered or because their recovery is unknown (*Exxon Valdez* Oil Spill Trustee Council 1996). Understanding of stock structure of these species is critical to fisheries management because it provides managers with the appropriate scale by which to base management decisions aimed at restoring the species to pre-spill abundance.

Once the data have been collected on the genetic structure of the proposed species, they will be useful to the Department for future management and the database will be maintained and updated by the Department after the project funding ends.

The Trustee Council has funded genetic study of injured resources at levels approaching \$1,000.0K during many years post-spill. These major projects resulted in an improved knowledge of fisheries resources and provided permanent improvements to resource management.



This project is designed to be a restructuring of these major, short-lived projects into a longerterm project with several minor elements addressing population genetics issues in the spill area. Elements may be modified in future years to address population issues identified through collaborative research at the Alaska SeaLife Center. Additionally, this project offers a core genetics presence to other principal investigators at the SeaLife Center and provides experimental fish runs for long-term research.

SCHEDULE

A. Measurable Project Tasks for FY98

January - April 1997:	Literature review, proposal development
February -March 1997:	Collect pollock tissue samples (NMFS assessment survey
	crews, area ADF&G staff, commercial fishing vessels)
April 1997:	Collect herring tissue samples (area ADF&G staff)
May - August 1997:	Collect rockfish tissue samples (area ADF&G staff)
Sept December 1997:	Recruit and hire ASLC staff
Oct. 1997-Sept. 1998:	Begin protocol development, begin lab analysis of herring,
	pollock and rockfish samples
December 1997:	Plan 1998 pollock collections
January 1998:	Attend Annual EVOS Restoration Workshop
January - March 1998:	Pollock tissue collections and matings
February - March 1998: -	Plan 1998 herring collections
March - April 1998:	Herring tissue collections
April 1998:	Plan 1998 rockfish collections
March - April 1998:	Prepare 99252 proposal
May - August 1998:	Rockfish tissue collections
June - August 1998:	Pink salmon spawning
July-September 1998:	Analyze laboratory data

B. Project Milestones and Endpoints

	February, 1998	Experimental pollock matings
	April 15, 1998:	Proposal for Project 99252
+ funder	April, 1998	Experimental herring matings
۴ ⁰¹	Sept. 30, 1998:	First pink salmon egg take at ASLC
	April 15, 1999:	Reporting 98252, proposal for Project 00252
		First Recommendations for herring, pollock, and rockfish management
	Sept. 30, 1999:	Egg take for odd-year pink salmon run
	April 15, 2000:	Reporting 99252, proposal for Project 01252
	Sept. 30, 2000:	First adult returns from pink salmon run
	April 15, 2001:	Reporting 00252, proposal for Project 02252
	Sept. 30, 2001:	Odd-year return pink salmon



ended

Sept. 30, 2002: Final Report

C. Completion Date

September 30, 2002

PUBLICATIONS AND REPORTS

Annual Reports, annual reporting of significant findings in the peer-reviewed literature

PROFESSIONAL CONFERENCES

Results from one or more elements will be presented at the annual meeting of the American Fisheries Society.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

Efforts will be coordinated through regional and area staff of ADF&G as appropriate to design genetics studies that guide the Trustee Council restoration projects, especially those that involve stocking or transport of fish. Special effort will be expended to coordinate with and offer use of the core facility to IMS faculty and NOAA and NBS staff that conduct research at the Alaska SeaLife Center in Seward. Tissue archival and biometric analyses will be coordinated among all Trustee Council projects related to genetics including 98196 and 98165.

Data collection techniques will be coordinated through the inter-agency consortium of laboratories that cooperate on similar projects of conservation genetics of marine fishes in the North Pacific Ocean.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

This is a new project.



PROPOSED PRINCIPAL INVESTIGATORS

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October 1, 1997 - September 30, 1998

	Authorized	Proposed						
Budget Category:	FFY 1997	FFY 1998						
Personnel		\$104.3						
Travel		\$10.3						
Contractual		\$26.5						
Commodities	·	\$30.3						
Equipment		\$7.0		LONG RA	NGE FUNDIN	G REQUIREN	IENTS	
Subtotal		\$178.4	Estimated	Estimated	Estimated	Estimated	Estimated	
General Administration		\$17.5	FFY 1999	FFY 2000	FFY 2001	FFY 2002	FFY 2003	
Project Total		\$195.9	\$263.8	\$272.0	\$281.0	\$290.0		
Full-time Equivalents (FTE)		2.3						
			Dollar amount	s are shown ir	n thousands of	dollars.		
Other Resources								
					_			
				Total	l Project	Funding	: 95.9	
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				Total	l Project	Funding 1 + \$ 10	: 95.9 13.2 As 9.1	cc bench fe
				Total	l Project	Funding 1 + \$ 10	: 95.9 13.2 As 9.1	cc bench fe
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1998	Project Nur Project Title Units of Sp Agency: A	nber: 9825 e: Investiga ecies Inhabi K Dept. of F	2 tions of Ger iting the EV ish & Game	To to l netically Imp OS Area	Project	Funding 1 + \$ 10	: 95.9 13.2 As 9.1	FORM 3A TRUSTEE AGENCY SUMMARY

1998 EXXON VALDEZ TRUSTILE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 1997
Kerkvliet	FBI(PCN 7043)	14D	3.0	4266.0		12.8
Kretschmer	FBI (PCN 7112)	14B	3.0	3896.0	I	11.7
Vacant	FBI(PCN 7018)	14A	2.0	3896.0		7.8
FWTII	FWTII(PCN 5227)	9C	2.0	3145.0		6.3
FWTIII	2 positions	11A	2.0	3318.0		6. 6
						0.0
SeaLife Center (Seward)						
Vacant	FBIII	18A	6.0	5000.0		30.0
Vacant	FWTIII	11A	6.0	3318.0		19.9
Vacant	FWTII2 positions	9B	3.0	3051.0	ļ	9.2
						0.0
						0.0
		Subtotal	27.0	29890.0	0.0	
				Per	sonnel Total	\$104.3
Travel Costs:		Ticket	Round	Total	Daily	Proposed
Description		Price	Trips	Days	Per Diem	FFY 1997
Anch to Cordova, full far	9	224.0	2			0.5
Anch to Kodiak, full fare		216.0	0			0.0
Anch. to Homer		148	0			0.0
Per diem				5	150.0	0.8
Anchorage to Lower 48,	Professional Meeting	500.0	1			0.5
Per diem				5	150.0	0.8
SeaLife Center						-
Seward to Anchorage		100.0	12			1.2
Anchorage to Seward		100.0	20	_	_	2.0
Per Diem				30	150.0	4.5
						0.0
					Travel Total	\$10.3

1998	Project Number: 98252 Project Title: Investigations of Genetically Important Conservation Units of Species Inhabiting the EVOS Area Agency: AK Dept. of Fish & Game	FORM 3B Personnel & Travel DETAIL
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Contractual Costs:			Proposed	
Description			FFY 1998	
Pollock primer d	levelopment		15.0	
Freight			0.7	
Photography			0.9	
Telephone			0.4	
DNA Sequencer	r maintenance contract, equipment repair		4.0	
SeaLife Center ((Seward)			
Office costs (tele	ephone, copies, etc.)		2.0	
Freight		1	0.5	
Broodstock colle	ection		3.0	
Rent (to be paid	separately by Trustee Council)		0.0	
When a non-trustee	organization is used, the form 4A is required. Cont	ractual Total	\$26.5	
Commodities Costs	<u>}:</u>		Proposed	
Description			FFY 1998	
DNA chemicals	(pollock)		10.3	
DNA chemicais	(herring)		0.0	
DNA cnemicais			6.0	
Allozyme cnemic			1.8	
Plastics (cryovia	ais, disposable pipers, etc.)	ĺ	0.7	
			0.3	
SeaLife Center ((Seward)			
Laboratory setu	p (glassware, plastics, pipettors, etc.)		6.0	
Wet lab equipme	ent	1	4.7	
Office supplies			0.5	
·	Commo	odities Total	\$30.3	
	Project Number: 98252	FOF	RM 3B	
4000	Project Title: Investigations of Genetically Important Conservation Cont			
1998	Lipite of Species Inhediting the EVOS Area	Com	nodities	
	Units of Species Innabiting the EVOS Area			
	Agency: AK Dept. of Fish & Game			

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October 1, 1997 - September 30, 1998

New Equipment Purchases	;; · · · · · · · · · · · · · · · · · ·	Number	Unit	Proposed
Description		of Units	Price	FFY 1998
SeaLife Center (Seward)			0.0
Computers		2	3.5	7.0
Laboratory equipment				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
Those purchases associated	with replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$7.0
Existing Equipment Usage			Number	Inventory
Description			of Units	Agency
1998 Prepared: 4 of 4	Project Number: 98252 Project Title: Investigations of Genetically Important Cons Units of Species Inhabiting the EVOS Area Agency: AK Dept. of Fish & Game	servation	F(Ec	ORM 3B quipment DETAIL
				0/4/5



1998 EXXON VALDEZ TRUSTER COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

	Authorized	Proposed						
Budget Category:	FY 1997	FY 1998						
Personnel		\$0.0						
Travel		\$0.0						
Contractual		\$12.3						
Commodities		\$0.0						
Equipment		\$0.0		LONG RA	NGE FUNDIN	IG REQUIREN	MENTS	
Subtotal	\$0.0	\$12.3		Estimated	Estimated	Estimated	Estimated	
General Administration		\$0.9		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$0.0	\$13.2						
Full-time Equivalents (FTE)		0.0						
			Dollar amount	s are shown ii	n thousands of	dollars.		
Other Resources								
Comments:								
1998 Prepared: 1 of 1	Project Nur Project Title Agency: Al	nber: 9825 e: Bench Fe DFG	2 ees: Rockfis	h/Poliock G	enetics		- S	FORM 3A TRUSTEE AGENCY SUMMARY 8/2

7/97

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Project Title:	DELIGHT AND DESIRE LAKES RESTORATION					
Project Number:	98254					
Restoration Category:	General Restoration					
Proposer:	Alaska Department of Fish and Game (ADF&G)					
Lead Trustee Agency:	Alaska Department of Fish and Game					
Cooperating Agencies:	US Department of Interior (D National Park Service (NPS)	OI), USGS/Biological Resources,				
Duration:	<1 year (pre-fertilization final	report)				
Cost FY/97:	\$123,100	DECEIVED				
Cost FY/98:	\$11,700	M APR 1 1 1997				
Cost FY/99:						
Cost FY/00:		EXXON VALUEZ OIL SPILL				
Geographical Area:	Delight and Desire Lakes are the Kenai Peninsula on the eas East Nuka Bay.	located on the Outer Gulf Coast of stern shore of McCarty Fiord of				
Injured Resource/Service:	Sockeye salmon/subsistence a	nd commercial fishing.				

ABSTRACT

This project evaluates the quality of the rearing habitat and the feasibility of lake fertilization in Delight and Desire Lakes. Limnological and fisheries data were collected during 1997 (97254), and funding of this project would be for report preparation. Nutrient enrichment has increased the forage base for rearing sockeye salmon fry in other Alaskan lakes (Kyle 1994ab; Kyle et al. 1997). The expected result of nutrient enrichment is larger/more numerous sockeye smolts and a corresponding increase in adult returns. An enrichment program in Delight and/or Desire Lakes would increase lake fertility, which in turn, should accelerate the recovery of the currently depressed sockeye salmon runs in these two lakes. Results from this project will be reviewed by st = 1 + CADF & G, DOI, and NPS to determine the feasibility and merit of implementing nutrient enrichment in these lakes.

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Prepared 3/96

Project 98254

INTRODUCTION

The outer district of the Kenai Peninsula has many salmon stocks that are important to the region's salmon ecology as well as the local commercial, sport and subsistence salmon harvests. Sockeye salmon of Delight and Desire Lake are the only wild sockeye salmon found in the outer district that are of commercial importance. Delight and Desire Lakes are located in the East Arm of Nuka Bay approximately 77 km southwest of Seward and 70 km east of Homer. Based on data collected in the 1980s, both lakes are oligotrophic (lakes with low nutrient levels). Delight Lake has a surface area of 2.8 million km² and a mean depth of 20 m; Desire Lake has a surface area of 1.8 million km² and a mean depth of 14 m. Both lakes have outlet streams that empty into McCarty Fiord. The *Exxon Valdez* oil spill caused heavy oiling to the beaches and near shore waters at the entrance to McCarty Fiord. Light oiling was documented near the outlet streams of Delight and Desire Lakes (ADNR, 1989). Sockeye salmon and lost fishing time has been identified as injured resources and services by the *Exxon Valdez* Trustee Council (EVTC).

NEED FOR THE PROJECT

A. Statement of the Problem

The targeted resource is sockeye salmon of Delight and Desire Lakes. Catches of sockeye salmon in the East Nuka Subdistrict have averaged 5,750 fish since the first return of adult salmon after the 1989 oil spill. This compares to an average annual catch of 23,100 fish for 1971 through 1990. The Aialik Bay sockeye catch has also experienced similar results since 1991. Aialik Bay is also located on the outer coast of the Kenai Peninsula approximately 20 km southwest of Seward and 32 km northeast of Delight and Desire Lakes. The beaches and near shore waters to the entrance of Aialik Bay, including the narrow passages and capes, were heavily oiled during the *Exxon Valdez* oil spill (ADNR, 1989). The average annual harvest for Aialik Subdistrict from 1979 through 1990 was 12,900 sockeye; in comparison, since 1991 (the first year adult sockeye returned from the 1989 smolt outmigration) the average harvest was 1,600 sockeye.

In addition to lost fishing time for the commercial fishery and inadequate adult escapements, the sport and subsistence fisheries may have been effected. Sport fishing effort has expanded in the general area of Delight and Desire Lakes. In fact, the eastern shore of Nuka Bay is a popular location for sport fishing charter operations as well as a popular remote fly-in sport fishery; however, no sport harvest data are available. In addition, there is evidence of historic and recent use of Delight and Desire sockeye salmon for subsistence by residents of Port Graham and Nanwalek (R. Stanek, 1997). The potential benefit from nutrient enrichment would be the restoration of sockeye salmon in Delight and Desire Lakes, as well as an increase in the commercial, sport, and subsistence harvest of sockeye in the East Nuka Bay area.

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The FY-97 detailed project description (DPD) contained two phases for this project. Phase one (pre-fertilization phase conducted in 1997) is a comprehensive limnological and fisheries investigation of Delight and Desire Lakes. Phase two would implement a nutrient enrichment program. If phase one reveals that one or both of the lakes would benefit from nutrient enrichment, a financial source other than (or supplement to) oil spill funds would be required to finance the project. Currently, fishery enhancement projects in Lower Cook Inlet are financed by revenue generated by selling fish (cost recovery) caught in special harvest areas designated by ADF&G and the Cook Inlet Regional Aquaculture Association. By expanding the revenue goal through cost recovery additional revenue would become available to fund a new lake fertilization project.

B. Rationale/Link to Restoration

The limnological and fisheries investigations are not being conducted to link oil spill injury to salmon survival (fry or adult) in the East Nuka Bay area. Although no link to damage from the oil spill can be developed for the Delight and Desire Lakes sockeye salmon, this restoration project has potential to accelerate the recovery of these currently depressed stocks. Lake enrichment would provide an increased forage base for rearing sockeye fry and would be expected to produce larger/more numerous sockeye smolts that should lead to increased adult runs.

The FY97 (phase one) investigations included assessment of nutrient levels, primary and secondary production, and the condition and abundance of sockeye smolts in Delight and Desire Lakes. The FY-98 budget will cover the cost of analyzing the data and preparing a report on both lakes that contains results of the FY-97 pre-fertilization investigation, along with historical data from the 1980s. The report will provide information on the current rearing capacity of these lakes, and recommendations on restoration (stocking/nutrient enrichment).

C. Location

Delight and Desire Lakes are located in the East Arm of Nuka Bay (McCarty Fiord) on the Eastern Kenai Peninsula approximately 77 km southwest of Seward and 70 km east of Homer. Communities that would benefit from the proposed project include the villages of Port Graham, Nanwalek and Seldovia as well as Homer and Seward.

COMMUNITY INVOLVEMENT

Land adjacent to Delight and Desire Lakes have recently been transferred from the federal government to the Port Graham Corporation. Pat Norman, president of the Port Graham Corporation, has advocated and supported this project through the Lower Cook Inlet Seiners Association and the Lower Cook Inlet Fisheries Development Association.



PROJECT DESIGN

A. Objectives

The objective of the report funded in this DPD is to provide a comprehensive assessment of the physical, chemical and biological aspects of Delight and Desire Lakes. This assessment will include a description (and interpretation) of the limnology of the two lakes, the historical salmon fisheries data, and recommendations regarding restoration potential (lake fertilization/stocking).

B. Methods

Analysis and data interpretation will follow established (and standardized) procedures used for other similar projects. Sample analysis procedures will follow methods described in Koenings et al. (1987), and nutrient enrichment criteria is described in Koenings et al. (1979).

C. Cooperating Agencies, Contracts, and Other Agency Assistance

Agencies that have been contacted or will be involved in this project include the DOI/USGS Water Resources Section, the National Park Service, Lower Cook Inlet Seiners Association, Lower Cook Inlet Fisheries Development Association, the villages of Port Graham and Nanwalek, and ADF&G Subsistence and Commercial Fisheries Management and Development Divisions. Currently, the only contracts anticipated with the private sector would be contractual services with local air taxi services.

SCHEDULE

A. Measurable project Tasks for FY-98 (October 1, 1997 - September 30, 1997)

1 Oct - 31 Nov 1997:	Data summaries and historical data compilation
1 Dec - 31 Jan 1998;	Preparation of final report and submission for review
1 Feb - 1 Mar 1998:	Revisions of final report

B. Completion Date

The project (report) will be completed March 31, 1998.

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PUBLICATIONS AND REPORTS

There are numerous memos and draft reports (from the 1980s) in ADF&G files concerning nutrient enrichment of Delight and Desire Lakes.

PROFESSIONAL CONFERENCES

There are no plans to attend any conferences.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

ADF&G has been and is currently involved in cooperative projects similar to the proposed project in lower Cook Inlet. Research and historical data are available from these projects for use with this proposed project. ADF&G currently operates a lake fertilization program on Leisure Lake in cooperation with the Cook Inlet Aquaculture Association and the Cook Inlet Seiners Association.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

Phase two of this project is implementation of nutrient enrichment if the feasibility investigation recommends this type of restoration project. A proposed funding source for phase two would include increasing the revenue goal for one or more of the currently operating special harvest areas located in lower Cook Inlet.

PRINCIPAL INVESTIGATOR

Gary B. Kyle Alaska Department of Fish and Game 34828 Kalifornsky Beach Road Soldotna, Alaska 99669 907-260-2908 Garyk@fishgame.state.ak.us

Experience: From April 1977 to April 1988 Mr. Kyle served as a Project Biologist and later as the Area Biologist for the Division of Fisheries Rehabilitation, Enhancement, and Development of the ADF&G in Soldotna Alaska. Duties included conducting and evaluating various fisheries enhancement and evaluation projects in the Cook Inlet watershed including limnological

investigations of sockeye salmon producing lakes, and evaluation of hatchery stocking programs. Also, during the period Mr. Kyle served as a project limnologist for the Limnology Section which involved the collection, analysis, and interpretation of limnological data from sockeye nursery lakes for assessment of rearing capacity and for modeling purposes. Since April 1988, Mr. Kyle serves as the Regional Limnologist for the Limnology Section for ADF&G in Soldotna, Alaska. As the Regional Limnologist for the Southcentral Region comprising of the Interior, PWS, Cook Inlet, and Alaska Peninsula; the primary purpose of this position is the supervision of staff in the coordination, assignment, prioritization, analysis, and review of subordinates work and interagency contract work related to lake fertilization and stocking projects, water quality monitoring projects, and fisheries and limnological research. In addition, the position is responsible for training subordinates, reporting and review of project results for publications and meetings, and administrating state and non-state (contract) budgets. Mr. Kyle has authored/coauthored 41 technical reports and 13 peer-reviewed journal manuscripts dealing with lake fertilization, lake stocking, and in-lake assessments of juvenile sockeye production.



October 1, 1997 - September 30, 1998

approved TC 8-6-97

	Authorized	Proposed						
Budget Category:	FFY 1997	FFY 1998			rih:			
								· ·
Personnel	\$91.2	\$10.2						100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100
Travel	\$0.9	\$0.0						
Contractual	\$8.2	\$0.0				i		
Commodities	\$8.3	\$0.0						
Equipment	\$0.2	\$0.0		LONG	RANGE FUNDIN	NG REQUIREME	NTS	
Subtotal	\$108.8	\$10.2	Estimated	Estimated	Estimated	Estimated	Estimated	1
General Administration	\$14.3	\$1.5	FFY 1999	FFY 2000	FFY 2001	FFY 2002	FFY 2003	
Project Total	\$123.1	\$11.7				1		1
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Full-time Equivalents (FTE)	2.1	0.2						
			Dollar amoun	ts are shown in	thousands of	dollars.		
Other Resources								
Comments:								

This project is designed to assess the productivity of Delight and Desire Lakes and the resident sockeye salmon population through limnological and fisheries investigations conducted in 1997 (97254). This budget is for analyzing the 1997 limnological and fisheries data, and completion of a final report that will make recommendations regarding restoration of sockeye salmon in these two lakes.

		FORM 3A
1998	Project Number: 98254	TRUSTEE
	Project Title: Delight and Desire Lakes Sockeye Salmon Restoration	AGENCY
	Agency: AK Dept. Fish and Game	SUMMARY
Prepared: GBK	1 of 4	4/10/97





1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 1998
Shields, Pat	Fishery Biologist II	.16C	1.5	4.8		7.2
Carsion, Stan	Biometrician II	19D	0.5	6.0		3.0
						0.0
						<i>'</i> , 0.0
						0.0
						0.0
						0.0
						0.0
						ٽ.0
						0.0
	· ·					0.0
<u> </u>						0.0
	Subtotal		2.0	10.8	0.0	
					ersonnel Total	\$10.2
Travel Costs:		LICKET	Hound	lotal	Daily	Proposed
Description		Price	irips	Days	Per Diem	FFY 1998
None						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
L					Travel Total	\$0.0
						FORM 3B
1998	Project Number: 98254					Personnel
	Droject Number, 30204					& Travel
	Project The: Delight and Desire Sock	leye Salmon	Restoration			DETAIL
	Agency: AK Dept. Fish and Game				L	DLIAIL
Prepared:	2 of #	. 	1994 - Young and the Data of the Difference of t			4/10/97
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1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Contractual Costs:		Proposed
Description		FFY 1998
None		۰.
When a non-trustee organization is used, the form 4A is required.	Contractual Tota	1 \$0.0
Commodities Costs:		- Proposed
		FFY 1998
None		
	Commodities Total	\$0.0
1998 Project Number: 98254 Project Title: Delight and Desire Lakes Sockeye Salmon Restorat Agency: AK Dept. Fish and Game	ion F(Con Cor	DRM 3B tractual & nmodities DETAIL
Prepared: GBK 3 of #		4/10/97

1998 EXXON VALDEZ TRUSTER UNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

New Environment Burchasses	Alexander and	I	D
	Number	Unit	Proposed
	of Units	Price	FFY 1998
			0.0
None			0.0
			, 0.0
			' 0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
	1		0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	Nev	w Equipment Total	\$0.0
Existing Equipment Usage:		Number	Inventory
Description		of Units	Agency
1998 Project Number: 98254 Project Title: Delight and Desire Lakes Sockeye Salmon Restor Agency: AK Dept. Fish and Game	ation	FO Equ D	RM 3B Jipment ETAIL 4/10/97

98256B

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Sockeye Salmon Stocking at Solf Lake.

Project number:	98256b	
Restoration Category:	General Restoration	
Proposer:	USFS	DECEIVEN
Lead Trustee Agency:	USFS	APR 1 5 1997
Cooperating Agencies:	ADF&G	EXXON VALDEZ OU SPUL
Duration:	3rd year, 7-year project	TRUSTEE COUNCIL
Cost FY 1998:	\$95.5	
Cost FY 1999:	\$78.5	
Cost FY 2000:	\$68.5	
Cost FY 2001:	\$68.5	
Cost FY 2002:	\$48.1	
Geographic Area:	Prince William Sound	
Injured Resource:	Subsistence/Sockeye Salmon	

ABSTRACT

This project is designed specifically to benefit subsistence users of Prince William Sound and especially for residents of Chenega Bay. Solf Lake has been recognized for many years as an opportunity to establish a self-sustaining sockeye salmon run. Habitat improvements were made in 1978, 1980 and 1981 to provide access to the lake for anadromous fish. The lake was never stocked and subsequent investigations suggest that it is currently fishless and has adequate zooplankton biomass to support a salmon population. There are two phases to this project: Phase 1 the feasibility phase which began in FY96 has verified the ability of Solf Lake to support a sustainable population of sockeye salmon. Phase 2 plans to initially stock the lake with 400,000 sockeye salmon fry in 1998 and ensure access to Solf Lake for returning adult sockeye salmon.

INTRODUCTION

Subsistence resources and services were injured throughout Prince William Sound as a result of the *Exxon Valdez* Oil Spill. This project proposal continues an investigation of the potential to improve subsistence opportunities through the stocking of sockeye salmon (*Oncorhynchus nerka*) in Solf Lake, Herring Bay, in Prince William Sound (PWS). Solf Lake has been recognized as an opportunity for establishing a self-sustaining sockeye salmon population since the 1960s. The lake now provides an excellent opportunity to establish a replacement fishery to benefit subsistence users in Prince William Sound, particularly for residents of Chenega Bay.

This 1996 project began as a feasibility assessment. In Fiscal Year 1996 (FY96) the Trustee Council funded project 96256 which was a combined proposal to assess the feasibility of establishing a stocking programs at Columbia and Solf Lakes. Interim reports and the proposers recommendations on the feasibility of these two Lakes for stocking were provided to the Trustee Council in the fall of 1996. It was determined that Solf Lake could support stocking levels of as many as 400,000 fry with close monitoring of the effects however a more conservative level of stocking of 100,000 fry is recommended at this time. Brief summaries of the feasibility phase and history of this project are presented in this introduction to assist the Trustee Council with the decision to continue funding the Solf Lake Project.

Although Solf Lake was once accessible to sockeye salmon, an earthquake in the 1930's blocked the existing access (Nickerson, 1978). Solf Lake has two outlets, an eastern one which had provided anadromous access, and a western outlet that was impassable. For many years Dolly Varden have been the only recorded species of fish in Solf Lake. In 1978 the Forest Service removed the barriers from the east channel and created a dam at the western outlet to provide adequate stream flows in the newly improved access channel, allowing access for sockeye salmon. The improvements to the new outlet channel and dam were made in 1980 and 1981 but the system was never stocked with salmon. The feasibility phase of the project (FY96) include investigations of zooplankton and algal biomass, temperature and light profiles, dissolved oxygen and water chemistry as well as an inventory of fish and macro- invertebrate populations and their available habitats.

The improvement structures at the lake's outlets were also evaluated. It was determine that the old structure which dams the impassable western outlet requires extensive reconstruction to provide adequate flow for fish passage at the lakes eastern outlet. This eastern outlet, that would provide fish access to the lake requires reconstruction of the "irrigation type" control dam (planned in FY97) and stream channel modifications. An engineering survey of this channel and subsequent fishway and dam design can be completed once the control structure at the eastern outlet is in place and operational.

The results from the limnology work and water chemistry testing in FY96 were analyzed by personnel from the ADF&G Limnology Lab in Soldotna along with data collected in 1982, 1984, and 1986 to determine if the lake is capable of sustaining a sockeye salmon population and at what level stocking should occur. Only a partial summation of the data is presented in this proposal, a complete report is available upon request from ADF&G.

Prepared 4/96

Project 98256b

Stream information was collected by Forest Service Personnel in 1996, the results indicated that Solf Lake and it's tributaries are capable of providing a shoal spawning area within the lake of 10,710 m² and 4,258 m² in the inlet streams. However spawning success in the inlet stream may be limited by winter low flows. Peak flows in the inlet stream are approximately 333 cfs. with winter low flows estimated to be as low as 0.366 cfs.

Aquatic macroinvertebrate samples from the inlet stream were, analyzed through *Alaska Water Watch: Stream Macroinvertebrates*. Ephemeropteras, Plecopteras and Trichopteras (EPTs) function as the control because of their sensitivity to the environment and water quality. The EPT Index represents the number of EPT families collected. Higher EPT Indexes (>8) are indicative of healthy and diverse systems. The healthier the system, the greater number of EPT families to be found. Solf Stream, lies in the upper mid-range with a EPT index of 8, indicating no diversity problems are likely. Water Quality Assessment (WQA) ratings also based on macroinvertebrate populations delineate relative health. High quality conditions, (rating of 4), denote healthy and diverse systems with clean water. Solf Stream rates as a sustainable system, with a WQA rating of 3.75.

The lake inventory study of 1983 included 239 hours of gillnetting and minnow trapping during which no fish were captured. Subsequent to this initial effort, a total of over 5,500 hours of similar effort resulted in the capture of 9 Dolly Varden ranging in size from 213 to 300 mm. In 1996, 421 hours of effort yielded 114 Dolly Varden ranging from 58 to 230 mm. No other species of fish were captured during this sampling period. For the purposes of supplementation Solf Lake is considered to be a fishless lake. Stream survey results of the 2 outlets indicate that while smolt passage is possible, upstream migration by adults is questionable.

Solf Lake has a surface elevation of 8 m, a surface area of 60.9 ha (150.4 acres), a volume of $25.9 \times 10^6 \text{ m}^3$ and a mean depth of 42.5 m. With a watershed area of 534 ha. and a calculated annual discharge of 13 x 10^6 m^3 , Solf Lake has a theoretical water residence time of 2 years. A small percentage of littoral area is evident at the northern (outlet) and southern (inlet) ends of the lake while the east and west shorelines are relatively steep sided.

For the years 1982-1984, 1986, and 1996 the total macrozooplankton biomass averaged 500 mg m^2 . Assuming this amount of forage is available each year to sockeye fry and a slope parameter estimate of 2.11, the estimated rearing capacity for smolt production in Solf Lake would be:

500 mg. m² x 2.11 = 1,050 kg smolt / km² 1,050 kg/km² x .609 km² = 642.5 kg. of Smolt 642,500 g. / 5 g. = 128,500 5 g. Smolt Assuming a 15% fry to smolt survival this number of smolt equates to 856,667 spring fry. Assuming a 15% smolt to adult survival this number of smolt equates to 19,275 adults.

Stocking Recommendations by ADF&G: The instability of the macrozooplankton community in barren lakes when faced with predation necessitates stocking programs based on a conservative and gradual approach with close evaluation, and experimenting with stocking strategies that ameliorate significant impacts to the macrozooplankton community. Major reasons for the



disparity of response to stocking barren lakes include 1) the inherent low productivity of these lakes; 2) macro zooplankton abundance, composition, and ability to adapt to predation; 3) stocking density; 4) morphometric factors and 5) variability in the indirect effects of predation in individual lakes. Consequently, based on limnological information for the first three years the stocking level in Solf Lake could be 400,000 fry with monitoring of the zooplankton once per month during June-October would be required. After three years of stocking at this level, if the zooplankton community did not show a significant impact, the level could be increased to perhaps 500,000 fry. This level of stocking could be done for another three years with continued evaluation of the zooplankton community.

After stocking has discontinued, based on the available spawning area it is estimated that Solf Lake could sustain a run of approximately 10,000 sockeye without supplementation. An escapement goal of approximately 4,500 fish would be required to fully seed the system without depleting the zooplankton populations, leaving 5,500 sockeye available for harvest.

Solf Lake is included in the Prince William Sound - Copper River Comprehensive Salmon Plan (PWSRPT, 1994) where it is recommended for implementation if funds become available. In April 1995 the original proposal for this project was presented to the Prince William Sound Copper River Regional Fisheries Planning Team (RPT.) for consideration and approval a Project Checklist has been submitted. On April 7th of this year the Forest Service participated in a teleconference with the RPT and discussed brood stock source, mixed stock issues and stocking levels. The RPT approved the project in concept but recommended a lower level of stocking than the at the 400,000 fry level. The RPT's recommendation was to stock 100,000 fry to achieve the goal of 10,000 adult fish returning to Solf Lake. This reduction was based on meeting the stated objective of the project, and on the probability of very high fry to smolt to adult survival rates during the stocking phase of the project. The RPT also approved the use of the early run Eyak fish as a brood stock.

The Prince William Sound Aquaculture Corporation (PWSAC) has prepared the Fish Transport Permit (FTP) based on using the RPT's recommendations and has included the Solf Lake Project in their Area Management Plan.

NEED FOR THE PROJECT

A. Statement of Problem

Subsistence use of resources in the oil spill area declined following the spill. Although restoration studies have shown that harvest levels have since returned to pre-spill levels in most oil spill communities, Chenega Bay and Tatitlek are exceptions (Seitz and Fall, 1995; Seitz and Miraglia, 1995). These communities showed reduced harvest levels in 1993/94 and an increased reliance on salmon harvests (Seitz and Fall, 1995; Seitz and Miraglia, 1995). Solf Lake provides an opportunity to establish a large replacement fishery that is easily accessible for subsistence users from Chenega Bay. Projects available for the restoration or replacement of lost subsistence

services are limited - this proposal would utilize one of the few opportunities available.

This project has determined the feasibility of stocking Solf Lake with sockeye salmon and proposes the steps required to establish a replacement fishery for subsistence use. Based on historical limnological data from the 1980's, and stream survey data collected in 1996 it is reasonable to expect that the lake is capable of supporting a sustainable sockeye population with an adult return of approximately 10,000 fish.

B. Rationale/Link to Restoration

The *Exxon Valdez* Restoration Office's Invitation to submit proposals for FY97 stated that subsistence users are traveling greater distances and must invest more time in subsistence harvesting than they did prior to the spill. Unlike many other oil spill communities, Chenega Bay still shows reduced subsistence harvest levels and a greater reliance on subsistence harvest of salmon (Seitz and Fall, 1995; Seitz and Miraglia, 1995). Solf Lake is located approximately 40 miles from Chenega Bay and provides an opportunity to establish a replacement fishery that is accessible to subsistence users. The lake is a clear water lake with a mean depth of 42.5 m and a surface area of approximately 0.61 km² (Barto and Nelson, 1982). Analysis of current data suggest that the lake may support a self sustaining population of 10,000 sockeye with roughly half being available for harvest. Establishing this fishery would directly benefit subsistence users in Western Prince William Sound.

Background. Solf lake has been recognized as an opportunity to re-establish a sockeye salmon run in Prince William Sound for many years. According to Nickerson (1978), "This system had historic runs of sockeye salmon. An earthquake in the 1930's caused blockages of the natural outlet resulting in water flowing over an impassable fall." Since the early 1970's various attempts have been made to reestablish sockeye salmon in Solf Lake. During two years in the early 1970's, ADF&G personnel transported adult sockeye salmon from Eshamy River to Solf Lake (Jackson, personal communication). Unfortunately, necessary stream improvements had not been completed when the transplanted fish returned. The attempt to reestablish the population failed. In 1978, 1980 and 1981, the USFS implemented improvements to the lake and outlet stream. The work consisted of creating a new outlet channel, and a partial dam at the existing outlet. The dam was designed to raise the level of the lake to provide adequate water flow through the newly created outlet. The new outlet channel is less than 100 meters in length with an average gradient of 23 percent. Stocking of the lake never occurred after the habitat improvements because of other priority projects for both the USFS and ADF&G.

ADF&G surveyed Solf Lake in 1985/1986 as part of a lake investigations study. The results of this survey, which included attempts to capture fish, suggest that the lake may be fishless (Pellissier and Somerville, 1987). However 1996 trapping by USFS crews indicated a larger population of Dolly Varden than has been previously observed, but still not significant. These results are also supported by the composition and biomass of the zooplankton populations which were last sampled in 1986 (P. Shields, personal communication 1996). The Pellissier and Somerville (1987) survey also documented that water was flowing through the original outlet where an incomplete seal in the dam structure occurred. Three minor barriers to fish passage

were identified in the created outlet channel. The report suggests that if all the outlet flow were directed down the created channel these barriers may disappear.

C. Location

Solf Lake is located off of Herring Bay on Knight Island. The lake is approximately 40 miles by boat from Chenega Bay and 46 miles from Whittier. The lake is unnamed on USGS maps; however, Nickerson (1978), PWSRPT (1983 and 1986) and Barto and Nelson (1982) all refer to the lake as Solf Lake (ADF&G Stream 690). The lake is described in the Anadromous Waters Catalog as number 226-10-16900-0010 (ADF&G, 1992).

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

This project is designed specifically to benefit subsistence users of PWS; therefore, community involvement is an important component for the success of the project. The feasibility phase of this project (FY96) has determined the ability of Solf Lake to support a resident population of sockeye salmon. Contacts with the Chenega Bay community liaison will be maintained throughout the feasibility and implementation phases of this project to discuss what the potential adult sockeye production might be for the lake and project schedules. Opportunities will be identified to include residents of Chenega Bay in habitat improvement work or in the post-stocking monitoring program.

PROJECT DESIGN

A. Objectives

<u>Phase 1.</u> The overall objective of this phase of the project was to determine the feasibility of stocking Solf Lake with sockeye salmon. There are four components to this objective:

- 1. Determine if Solf Lake can sustain a population of sockeye salmon; (completed).
- 2. Determine appropriate stocking levels; (completed).
- 3. Coordinate with PWSAC and Main Bay hatchery to establish an appropriate brood stock and the necessary logistics to begin a stocking program; (completed).
- 4. Evaluate the existing habitat improvement structures to ensure adequate conditions for adult migration; (to be completed in FY97).

Phase 2. This is the implementation phase of the project. There are three objectives to this phase.

- 1. Design and construct necessary improvements to the outlet channel and dam to ensure adequate passage for adult salmon migration.
- 2. Stock Solf Lake with sockeye salmon to produce a self-sustaining population that can provide an adequate subsistence harvest.
- 3. Monitor zooplankton and smolt out-migration to ensure appropriate stocking levels.

<u> (</u>

B. Methods

Project 96256 included one season of data collection to determine presence of resident fish and the potential carrying capacity of Solf Lake. A second year of limnological data will be collected in 1997 at Solf Lake and combined with previous data to finalize stocking recommendations. Information collected in 1997 will also identify the habitat improvements needed to establish a sustainable sockeye run and allow for their design. The following section is divided into two parts. Part 1 describes the methods needed to establish a self-sustaining sockeye salmon population. Part 2 describes the possible types of habitat improvements that may be needed to provide access for returning adult salmon. Sampling methods used in 1996 and 1997 are also attached to this proposal as Appendix A.

Part 1. This section outlines the methods to implement a stocking program at Solf Lake.

Interagency Coordination (1997): Close coordination between the USFS, ADF&G, PWSAC and the PWS/CR RPT is mandatory for the success of this project. Prince William Sound is a complex ecosystem and the potential stocking of Solf Lake needs to be considered in perspective with the overall management of the Sound. Interagency coordination has occurred in 1996 and 1997 to identify appropriate brood stocks, determine appropriate stocking levels, meet hatchery-related requirements, and to address mixed-stock fisheries issues.

Stocking Program (1998 to 2002): Appropriate stocking levels and strategies will be determined in coordination with ADF&G and PWSAC using all available data. If the decision is made to stock the lake, fry would be short-term reared at the Main Bay Hatchery and transported to the lake for release. The Eyak and Coghill stocks are identified in the PWS/CR Phase 3 Comprehensive Salmon Plan (PWS/CR RPT, 1994) as potential stocks for Solf Lake. Based on current information, 1998 would be the earliest release date possible, but the actual release time will be dependent upon space availability at Main Bay and/or ice cover and other conditions at the lake. At least four years of fry transplants would be required to establish a sockeye salmon run.

Part 2. This section recognizes that additional work may be needed to provide access to the lake for returning adults. Until the engineering survey is completed in 1997, it is unknown what specific type of work may be needed to ensure salmon have access to Solf Lake.

Monitoring (1998 and beyond): Limnological data will be collected each year of the stocking program to evaluate the affect of the stocking program on the plankton population. This monitoring will include a summer and fall sampling period for water chemistry analysis and monthly zooplankton sampling from May through September. These procedures are described in detail in Koenings et. al. (1987). This would be a reduced sampling design from the one used during the feasibility assessment of the lake.



The success of the stocking program would also be monitored through sampling the fish population during the smolt out migration and during adult escapement. Smolt will be collected by fyke net or weir to estimate the total out migration. Fish will be sampled to determine age, length and weight characteristics which can be used to evaluate the health of the population. Coded wire tags or thermal marking would be used to monitor the adult population. Returning adults will be enumerated at a weir on the outlet stream and if possible with aerial surveys. Scales will also be collected and the age structure of the returning fish will be analyzed.

Solf Lake was visited by ADF&G personnel as part of a PWS lake investigations project in 1985 (Pellissier and Somerville, 1987). Three minor barriers to fish migration were identified in the outlet channel. These barriers were velocity barriers that ranged in size from 1.5 to 2.5 meters. The barriers may potentially be removed through the creation of plunge pools or by installing steeppasses. The report also suggested that the barriers may not exist if more water were in the outlet channel which could be achieved by repairing or rebuilding the dam at the waterfall of the original outlet channel. The actual methodologies used will be dependent upon the results of the habitat evaluation from 1996 and engineering surveys conducted in 1997.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

Personnel from the ADF&G Limnology Lab in Soldotna will conduct the limnological data collection. ADF&G will also complete the water chemistry and plankton analysis laboratory work. USFS will conduct the habitat surveys, evaluations of the habitat improvement structures, determine available spawning and rearing habitats, and evaluate the resident fish populations. Coordination will occur with PWSAC to make any necessary adjustments at the Main Bay Hatchery to accommodate additional incubation and short-term rearing. Coordination will also occur with PWSAC to perform any necessary fish culture work and transport the fry to the lake. Interagency coordination is essential to establish a successful population at Solf Lake. The PWS/CR RPT will be involved in assessing opportunities and for developing strategies for the stocking program.

SCHEDULE

A. Measurable Project Tasks for FY98

Oct - June:	PWSAC. rears sockeye to fry at Main Bay.
Oct - Dec:	USFS. complete final design of fishway and dam.
January:	Attend Annual Restoration Workshop.
Jan - April:	USFS. prepare for field season award contracts for logistics.
Jan - April:	USFS. prepare and submit Annual Report and updated DPD.
June:	PWSAC. releases first year of sockeye fry at Solf Lake.
May - July:	USFS. reconstruct dam at old outlet.
May - Sept:	ADF&G. conduct limnological sampling and prepares report.
Aug:	PWSAC. conduct egg take for 1999 stocking at Solf Lake.
B. Project Milestones and Endpoints

<u>Phase 1.</u> The overall objective of this stage of the project was to determine the feasibility of stocking Solf Lake with sockeye salmon. This objective will be completed when limnological samples are collected and analyzed; and mixed-stock fisheries and genetic risk issues are resolved. This objective will be completed in early FY97.

<u>Phase 2.</u> This is the actual stocking phase of the project. With the near completion of Phase 1. and the favorable recommendation stocking is planed to begin in FY98. If the evaluation of the existing habitat structures at Solf Lake indicate that additional work is needed to allow for adequate fish passage, these improvements would have to be made before adult fish are expected to return to the lake in the year 2001. The following is a tentative schedule and measurable endpoints that apply to the two phases of this project.

Oct - Dec. FY97:	Determine appropriate brood stock and potential stocking levels.
	Coordinate with PWSAC and the PWS RPT for production planning.
Jan April FY98:	Apply for necessary permits and hatchery space; complete NEPA process; prepare for field season.
May - July:	Design and implement necessary habitat improvements (if needed).
June/July:	Collect eggs for brood stock.
FY98 - 2002:	Release hatchery-reared fry
	Monitor zooplankton and smolt out-migration (FY2000 - FY2003)
	Submit annual reports
FY2001:	Enumerate adult returns

C. Completion Date

The project completion date will be at the end of FY2003.

PUBLICATIONS AND REPORTS

Annual reports and an updated DPD will be submitted during each year of the project.

PROFESSIONAL CONFERENCES

At this time there are no plans to present this project at professional conferences. However a poster board display is planned for presentation at the District Office and at science conferences.

NORMAL AGENCY MANAGEMENT

Given current budgets and agency priorities the opportunity to conduct this project under normal agency management either now or in the near future is unlikely. However, some aspects of the

long term maintenance and monitoring of the project, may fall under the normal agency management of other similar structures in PWS. Shared cost proposals for each of the phases of construction and monitoring of this project will be presented in the future project work plans for the Forest Service but given budget fluctuations secure funding is not a certainty.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

Initial coordination with ADF&G biologists in Cordova, with the Regional Planning Team, and with PWSAC will continue throughout FY97 to address the mixed-stock fisheries and genetic risk issues that will influence the feasibility of this project. USFS Personnel attend the 1996 summer Regional Planning Team meeting to initialize the necessary coordination. The results from FY96 will be presented to the RPT outlining, potential size of the stocking program and brood stocks. The information will be used to assess the potential effects of this project on local wild stocks and on the commercial fisheries in the area.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

This proposal covers only one of the two locations described in the original proposal 96256. The proposal for the other site, Columbia Lake, was resubmitted as 97256a. This split occurred because the work schedule for FY97 differs substantially between Solf and Columbia Lakes. And that the feasibility study of Columbia Lake determined that it would not be a good candidate for stocking at this time and has since been dropped from further study.

PROPOSED PRINCIPAL INVESTIGATOR

The principal investigator of this project will be the Fisheries Biologist at the Glacier Ranger District of the Chugach National Forest. This position is currently vacant and expected to be filled in FY97. Daniel Gillikin (Fisheries Biological Technician; Glacier Ranger District) is the interim biologist and will coordinate this project for the USFS. until a permanent principal investigator is assigned. Dan will also provide technical support and field coordination of the seasonal employees assisting in data collection and construction for the project.

ADF&G is the cooperating agency on the project. Pat Shields, Fishery Biologist I, will be the principal investigator for the limnological and bathymetry work. Marsha Spafard, Fish and Game Technician III and Denise Cialek, Fish and Game Technician III, will assist in the data collection and laboratory analysis of the limnological data.

Dan Gillikin Chugach National Forest P.O. Box 129 Girdwood, AK. 99587 271-2348 271-3992 (FAX) Patrick Shields Limnology Laboratory (ADF&G) 3428 Kalifornsky Beach Rd. #8 Soldotna, AK 99669 262-9368 262-4709 (FAX)

Prepared 4/96

Project 98256b

APPENDIX A

Limnological Sampling (1996-1997): Data collection and analysis will include: Algal biomass (chlorophyll <u>a</u>), zooplankton populations (biomass, body-sizes, species composition etc.), temperature and light profiles, dissolved oxygen, and water quality (nutrients) to estimate the potential productivity of the lake. Procedures for the collection of these samples are detailed in Koenings et. al. (1987). Samples would be collected from a minimum of two permanent collection sites every three to four weeks May - September to assess seasonal variation.

Fisheries Sampling (1996): Sampling for fish was intented to determine the presence or absence of a particular species. Age classes, the strength of the different classes, and the condition factor for each particular species will be determined provided representative samples can be collected. Semi-quantitative estimates of relative fish abundance can also be made using catch per unit effort at the time of the survey. The initial sampling techniques included using fyke nets and baited minnow traps to collect fish at different depths throughout the lake and associated streams. Baited minnow traps and larger tyvex traps will be used to sample for fish in the inlet streams. Pelagic regions of the lake will be sampled in a random pattern using a floating fyke net at three to seven meter depths.

<u>Macroinvertabrate Sampling (1996)</u>: The main inlet tributaries of Solf Lake were analyzed through *Alaska Water Watch: Stream Macroinvertebrates*. Ephemeropteras, Plecopteras and Trichopteras (EPTs) function as the control groups because of their sensitivity to the environment and water quality. The EPT index represents the number of EPT families collected. Higher EPT indexes (>8) are indicative of healthy and diverse systems. Midranges (2-8), indicates there may be a diversity problem present. Aquatic macroinvertebrate bioassessments were also analyzed by Water Quality Assessment Ratings, (WQAR) determine: health, oxygen content, habitat and species diversity on a scale of 1-4.

<u>Habitat surveys</u>: Surveys will be conducted in 1996 on Solf Lake, and inlet streams to determine the availability of spawning and rearing habitats. Stream surveys will follow a modified Hankin and Reeves (1988) procedure which provides quantitative measurements of habitat types. Stream reaches are divided into habitat types based on flow patterns and channel bed shape (pools, riffles, glides etc). Physical parameters of the habitat types would be measured or estimated and descriptions of substrates and available cover will be recorded. Water residence times will be determined using flow estimates made from the watershed based on procedures described in the Forest Service Water Resources Atlas (Blanchet, 1983). Lake surveys will be focused on developing a shoreline map, identifying potential spawning areas and on available cover for rearing habitat.

<u>Sustainable Sockeye Returns</u>: Are based on the available spawning area times a redd density of 6.7 m^2 and a fecundity of 2,000 eggs / gravid female, and a 1:1 sex ratio. Survival rates assume a 10% egg to fry survival, a 15% fry to smolt survival and a 15% smolt to adult return.





Project 98256b



1998 EXXON VALDEZ TRUSILE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

approved TC 8-6-97

		Authorized	Proposed		PROPOSED	FY 1998 TRUS	TEE AGENCIES	TOTALS	
Budget Category:		FY 1997	FY 1998	ADEC	ADF&G	ADNR	USFS	DOI	NOAA
Personnel		\$16.2	\$47.8						
Travel		\$2.8	\$0.0						
Contractual		\$21.5	\$26.5						
Commodities		\$3.6	\$12.1						
Equipment		\$2.0	\$0.0		LONG	RANGE FUNDI	NG REQUIREME	ENTS	
Subtotal		\$46.1	\$86.4		Estimated	Estimated	Estimated	Estimated	
General Administrati	on	\$3.9	\$9.1		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total		\$50.0	\$95.5		\$78.5	\$68.5	\$68.5	\$48.1	
								n ann daeann daean 1997 an 1997 an	ale fan e hier eronenen ei of of or en en
Full-time Equivalents	s (FTE)	0.0	1.0						
				Dollar amount	s are shown in	thousands of d	ollars.		
Other Resources		\$0.0	\$0.0		\$0.0	\$0.0	\$0.0	\$0.0	
1998		Project Numl Project Title: Lead Agency	oer: 98256E Solf Lake St : US Forest	s ocking Service			÷	FOR MULTI- AGENCY	M 2A TRUSTEE SUMMARY

1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

	Authorized	Proposed					and the second	
Budget Category:	FY 1997	FY 1998						
Personnel	\$16.2	\$43.8						
Travel	\$2.8	\$0.0						
Contractual	\$21.5	\$24.0						
Commoditi e s	\$3.6	\$12.1						
Equipment	\$2.0	\$0.0		LONG F	RANGE FUNDIN	G REQUIREMEN	NTS	
Subtotal	\$46.1	\$79.9		Estimated	Estimated	Estimated	Estimated	
General Administration	\$3.9	\$8.3		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$50.0	\$88.2		\$43.5	\$33.5	\$33.5	\$13.1	
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Full-time Equivalents (FTE)		0.9						
			Dollar amour	nts are shown in	thousands of c	lollars.		
Other Resources								
F								
				, <u>, , , , , , , , , , , , , , , ,</u>				
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	Project Numl	Der: 98256	3		- <u> </u>			FORM 3A
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1998	Project Num Project Title:	per: 982566 Solf Lake S	3 Stocking					FORM 3A TRUSTEE AGENCY
1998	Project Num Project Title: Agency: US	ber: 98256E Solf Lake S S Forest Serv	3 Stocking vice				S	FORM 3A TRUSTEE AGENCY UMMARY
1998 Prepared: 2 of 9	Project Numl Project Title: Agency: US	ber: 98256E Solf Lake S S Forest Serv	3 Stocking vice				S	ORM 3A TRUSTEE AGENCY UMMARY 4/14/97

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Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 1998
	Fish Biologist	GS-9	1.0	5.2		5.2
	Crew Leader	GS-9	4.0	4.3	,	17.2
	Tech	GS-7	3.0	4.0		12.0
	Tech (2)	GS-5	2.0	3.4		6.8
	Engineer	GS-11	0.5	5.2		2.6
						0.0
						0.0
						0.0
				-		0.0
						0.0
ll i i i i i i i i i i i i i i i i i i]]				0.0
						0.0
		Subtotal	10.5	22.1	0.0	
T		Tistisal			rsonnei Total	\$43.8
Travel Costs:			Round	Total	Daily	Proposed
Description		Price	Trips	Days	Per Diem	FY 1998
						0.0
						0.0
						0.0
						0.0
						0.0
			1			0.0
						0.0
						0.0
				-		0.0
						0.0
						0.0
					Travel Total	\$0.0

1998	Project Number: 98256B Project Title: Solf Lake Stocking Agency: US Forest Service	FORM 3B Personnel & Travel DETAIL
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4/14/97



October 1, 1997 - September 30, 1998

Contractual Costs			ALLAND MARKING AN AND AND AND AND AND AND AND AND AND	Proposed
Description				FY 1998
Barge Contract	2000/day for	3	••••••••••••••••••••••••••••••••••••••	6.0
Helo Contract	2000/hour for	5		10.0
PWSAC Contract				3.0
Bucket rental				1.0
Cement truck				3.0
flight time 250/h	r for 4 hours			1.0
When a non-truste	ee organization i	s used, the form 4A is required.	Contractual Tota	\$24.0
Commodities Cost	ts:			Proposed
Description				FY 1998
Boat Fuel				2.0
Train Tickets	4 ticket for ve	hicle and 2 for cement truck plus passengers		1.0
supplies	construction	materials		6.1
camp food				1.5
camp supplies				1.5
materials				
			Commodities Total	\$12.1
	-			
			F	FORM 3B
1000		Project Number: 98256B	Co	ntractual &
1998		Project Title: Solf Lake Stocking		mmodities
		Agency: US Forest Service		DETAIL
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October 1, 1997 - September 30, 1998

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New Equinment P	irchases:	Number	Uni	t Proposed
Description		of Units	Price	E FY 1998
				0.0
				0.0
		× .		0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
Those purchases a	issociated with replacement equipment should be indicated by placement of an R.	New E	quipment lota	II \$0.0
Existing Equipmen	t Usage:		Numbe	r Inventory
Description			of Unit	s Agency
1998 Prepared:	Project Number: 98256B Project Title: Solf Lake Stocking Agency: US Forest Service			FORM 3B Equipment DETAIL

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1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

	Authorized	Proposed	Annua Billion II AP No			and a second	an a fair fair fair fair fair an an an Art fair fair fair fair fair fair fair fair	news for an else we a
Budget Category:	FY 1997	FY 1998						
Personnel	\$0.0	\$4.0						
Travel	\$0.0	\$0.0						
Contractual	\$0.0	\$2.5						
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG F	RANGE FUNDIN	IG REQUIREMEI	NTS	
Subtotal	\$0.0	\$6.5		Estimated	Estimated	Estimated	Estimated	Estimated
General Administration	\$0.0	\$0.8		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
Project Total	\$0.0	\$7.3		\$35.0	\$35.0	\$35.0	\$35.0	\$35.0
			an de los - de los estes son anti-anti-anti-anti-anti-anti-anti-anti-		e a speciel of the end of the	and a second of the second second second	in 2 million frankrike forski million og en 16 million og en	we en gewaarpegen in oor
Full-time Equivalents (FTE)		0.1						
			Dollar amoun	ts are shown in	thousands of c	lollars.		
Other Resources								
Comments:								
Estimates for 1999 and beyond in	iclude limnologic	al sampling an	d the operation	of a smolt weir	r at Solf Lake o	utlet.		
1998	Project Numl Project Title: Agency: AD	ber: 98256B Solf Lake F&G	Stocking				S	FORM 3A TRUSTEE AGENCY SUMMARY
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Personnel Costs:			GS/Range	/ Months	Monthly	· · · · · · · · · · · · · · · · · · ·	Proposed
Name	Position Description		Ste	Budgeted	Costs	Overtime	FY 1998
Pat Shields	FB2		16D	0.5	4.9		2.5
Lab Tech	Analysis of samples			0.5	3.0		1.5
				1			0.0
		1					0.0
				1			0.0
							0.0
							0.0
				}			0.0
							0.0
							0.0
							0.0
							0.0
		Subtotal	ويتعمر المتحمر	1.0	7.9	0.0	D
					F	Personnel Tota	l \$4.0
Travel Costs:			Ticke	t Round	Total	Dail	Proposed
Description			Pric	e Trips	Days	Per Dien	n FY 1998
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
		{					0.0
							0.0
							0.0
							0.0
				<u> </u>	·		0.0
						Travel Tota	\$0.0
			<u></u>				
	Project Number: 98256B						FORM 3R
1998	Broject Titley Solf Lake Stee	lina					Personnel
	Project Title: Soll Lake Stoc	кіпд					& Travel

Agency: ADF&G

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DETAIL 4/14/97



October 1, 1997 - September 30, 1998

Contractual Costs:					Proposed
Description					FY 1998
Air Charter (\$250/h	our for 6 hours	;)			2.5
When a non-trustee	organization is	s used, the form 4A is required.	Cont	ractual Total	\$2.5
Commodities Costs	*				Proposed
Description					FY 1998
			Commo	odities Total	\$0.0
1998		Project Number: 98256B Project Title: Solf Lake Stocking Agency: ADF&G		F Cor Co	ORM 3B htractual & mmodities DETAIL
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1998 EXXON VALDEZ TRUS ... 2 COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

New Equipment Purchases:		Number	Unit	Proposed
Description		of Units	Price	FY 1998
				0.0
				0.0
	· ·			0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
Those purchases associated with	replacement equipment should be indicated by placement of an R.	New E	quipment Total	\$0.0
Existing Equipment Usage:			Number	Inventory
Description			of Units	Agency
·				
1998 Prepared: 9 of 9	Project Number: 98256B Project Title: Solf Lake Stocking Agency: ADF&G		F	ORM 3B quipment DETAIL

98263

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apprived TC 12/18/97

As modified, by "rended project forms," attached Assessment, Protection and Enhancement of Salmon Streams in Lower Cook Inlet

Project Number:	98263
Restoration Category:	General Restoration
Proposer:	W. Meganack, Jr./Port Graham Corporation
Lead Trustee Agency:	ADFG
Cooperating Agencies:	None
Alaska SeaLife Center:	No
New or Continued:	Cont'd
Duration:	2nd yr. 4 yr. project
Cost FY 98:	\$107.0
Cost FY 99:	\$23.6
Cost FY 2000:	\$23.6
Cost FY 01:	\$0.0
Cost FY 02:	\$0.0
Geographic Area:	Kenai Peninsula
Injured Resource/Service:	Salmon, subsistence

ABSTRACT

This project will replace lost subsistence services resulting from the oil spill by constructing enhancement projects on major salmon streams in the Lower Cook Inlet spill area (the Port Graham River and Windy Creek). Protection and enhancement will be implemented using instream fisheries habitat improvement techniques, primarily creation of spawning channels, removal of natural barriers to spawning, and construction of wall-based rearing structures. Local subsistence users will be employed as technical assistants during field surveys and construction.

INTRODUCTION

Subsistence users in the LCI area and specifically the residents of Port Graham are heavily dependent on these four major salmon streams and the salmon they produce for subsistence needs. These major salmon streams and their tributaries will be inventoried and evaluated using existing data including aerial photos, and local knowledge from residents to determine the historic level of runs and the current, depressed level due to EVOS.

Site specific protection and restoration projects will be implemented from the field inventory done in FY 97. PGC management, with advice from an ADF&G fisheries specialist, will supervise the project and coordinate with a professional fisheries scientist and resource consultants. Local subsistence users will be employed extensively for the field and office work.

For several decades fisheries biologists have successfully utilized modifying existing stream structures as a technique to improve habitat conditions for salmon spawning and rearing in Alaska and the Pacific Northwest. Opening up currently dry side-channels and oxbows can be very effective in adding spawning and rearing habitat using, the existing wildstock salmon. These structures will be installed after a through inventory and analysis of the current habitat conditions in the entire watershed and the specific needs of a particular salmon species. This project will primarily target pink, coho and chum salmon and possibly sockeye salmon for habitat enhancement.

For FY 97 Phase One of Project Number 97263 will consist of habitat surveys using local residents from the Native Village of Port Graham under the direction of a professional fisheries biologist. This project will be supervised by Dr. Douglas Martin, formerly of Pentec Environmental. Standardized fisheries habitat survey techniques developed by ADF&G and the USDA Forest Service will be used. The appropriate prescriptions for structural improvement will then be prepared based upon the species and the objectives desired for that stream. Consultation, coordination and approval of ADF&G fisheries professionals will be an important part of this project.

Construction and enhancement are proposed during FY 98 and FY 99 for Phase Two of 97263. These streams are accessible by the Port Graham Corporation Forest Road System and heavy equipment is available from the logging contractors on an extremely cost effective basis. In addition, hand tools and manual labor will be utilized extensively by the local subsistence users when appropriate.

Environmental Assessment (EA) reports, as needed, will be prepared from December 1997 to March 1998.

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The emphasis on employing local subsistence users for this project will provide for the high quality protection and enhancement of these valuable resources by the owners and stewards of the land and the users of the subsistence resource.

NEED FOR THE PROJECT

A. Statement of Problem

The loss of traditional subsistence resources and services has been extensively documented in this area. Some subsistence resources may never recover to their pre-oil spill levels. There is a need to substitute and increase the subsistence resources for the residents of LCI using the existing wildstocks of pink, coho and chum salmon. Subsistence harvests remain depressed compared to pre-spill levels. Other species damaged or impacted by the oil spill which would benefit from this project include the marbeled murrelet, the black oyster catcher, the river otter and the harlequin duck. Subsistence will be deemed to be recovered when the local residents have restored confidence of the abundance and safety of this important resource and service This project seeks to replace lost or damaged resources by replacing or enhancing the habitat of wildstocks of salmon important to the people who live in Lower Cook Inlet.

B. Rationale/Link to Restoration

The inventory and assessment of these major salmon producing streams and lakes done in FY 97 will provide the information necessary for the construction of habitat protection and enhancement projects on these streams. This in turn will increase the salmon runs and therefore increase the available subsistence resources. It will compensate and substitute for the damaged and lost resources available to subsistence users in the LCI. The protection and enhancement of these streams will not only aid the subsistence users but also the impacted commercial and sport users.

The policy of the Trustee Council, as stated in the Restoration Plan, is that projects designed to restore or enhance an injured resource: 1) must have a sufficient relationship to the injured resource 2) must benefit the same user group that was injured 3) should be compatible with the character and public uses of the area. This project meets all three portions of the Trustee Council's policy toward restoring or enhancing an injured resource.

C. Location: Lower Cook Inlet

These streams are located in Port Graham drainage and Kachemak Bay, Windy Bay, Rocky Bay on the Kenai peninsula. The project benefits will be felt in the entire Lower Cook Inlet region.

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COMMUNITY INVOLVEMENT

This project will have upwards of 60 percent direct involvement of Port Graham residents and other local subsistence users. This project will be the direct responsibility of PGC. Through the training of PGC people for the field and office work, the depth of understanding of the streams and the fisheries resource will be enhanced. This will develop an awareness of the needs for protection and enhancement of these valuable resources.

Port Graham, Nanwalek and Seldovia residents will be consulted as to their local knowledge of these streams and their historic levels of spawning return. Local hire for field work will be used extensively. Study area is remote, extensive use of locals boats and housing will be required. Subsistence use will be inventoried and assessed for pre and post spill utilization.

PROJECT DESIGN

A. Objectives

1. Improve the in-stream spawning and rearing habitat for Coho, Pink and Chum salmon through enhancement projects, e.g. fish ladders, spawning channels, wall-based rearing ponds, etc.

2. Enhance existing wildstocks of salmon to serve as substitution and compensation for the lost and damaged subsistence resources important to the subsistence users of Lower Cook Inlet.

3. Educate and involve the subsistence users in the concepts of fisheries management and wise land stewardship.

4. Consolidate existing information on wildstock salmon habitat and augment with new information from surveys. Enter relevant data into a GIS, when available, for future management.

5. Study historic levels of salmon returns to present returns and extrapolate potential for building runs to historic highs.

6. Improve quality and quantity of wildstock salmon as a subsistence resource in the LCI. Gauge success by comparing returns in next ten years with historic averages.

7. Prepare EA's to address any potential environmental impact. Discuss and coordinate with Federal, State and local agencies. Ensure NEPA compliance. Obtain permits for enhancement projects.

B. Methods

Field: Instream restoration and enhancement will occur during the early summer of 1998. Most salmon in these streams have runs which occur in the late summer to fall and this timing would avoid conflicts with not only the salmon but with the subsistence harvest. Enhancement projects will be coordinated with the ongoing timber sale operators and their equipment. It is anticipated that with the excellent road access and the availability of heavy equipment, that PGC will be able to implement these projects on a cost effective basis. Work crews will be necessary for most projects and will consist of four to five individuals. Projects will include: spawning channel expansion and/or creation, construction of fish ladders or removing impediments to spawning habitat through removals of rock, etc. creation of wall-based structures through exploiting old channels or oxbows for rearing habitat.

All structures or projects will subsequently be mapped using the GIS, with the aid of a GPS. Future monitoring will be critical to assess the rate of success and to determine which objectives have been met or exceeded. Monitoring will continue for ten years conducted by PGC. Final reports and GIS data will be compiled in FY 1999.

C. Cooperating Agencies, Contracts and Other Agency Assistance

ADF&G will be the lead trustee agency. ADF&G will then contract through KPB-EDD who will then contract with the Port Graham Corp. for the entire project. Cooperation will be needed with the EPA for any NEPA compliance necessary and KPB for Coastal Zone Management AMSA Compliance. EA's will be prepared under ADF&G direction. Contracts with heavy equipment or boats, if necessary will be through the Port Graham Corp. Technical assistance from the Alaska Dept. of Fish and Game will be required and sought for all phases of this project. Additional technical assistance will be provided by Dr. Peter Armato of Seward, the lead watershed and coastal ecologist for the National Park Service in southcentral Alaska.

SCHEDULE

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A. Measurable Project Tasks for FY 1998

October 1-December:	Assemble information, maps & photo data. Coordinate project with ADF&G. Coordinate with fisheries scientist. Begin EA's.
January—March 15:	Develop final enhancement plan. Hire personnel, develop construction plans. Consult with users. Complete EA's
April 30—May 15:	Train field crews.
May 15—July 1:	Conduct habitat enhancement projects in Rocky River & Windy Creek.
October 15:	Annual report project. Prepare field construction plan for additional enhancement projects for FY 1999.
B. Project Milestones	s and Endpoints
September 1997:	Finish inventory and assessment.
October 1997:	Complete inventory of all streams and lakes. Revisit selected areas designated for development, protection and enhancement projects.
December 1997:	Develop project plans for enhancement and protection projects for EVOS funding.Environmental Assessment (EA) reports, as needed, will be prepared from December 1997 to March 1998.
April 1998 :	Finalize plan for constructing enhancement projects. Hire contractors and field crews.
April-August 1999	Finish Phase Three of Enhancement Projects and inventory returns on Phase Two projects.
C. Completion Date	
September 1999:	Complete report and review protection and enhancement projects for effectiveness. Complete plans and request for restoration funding.

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Proposed Enhancement Projects:

Woody Debris: Analyze stream reaches with excess woody debris and determine optimum level of debris. Identify stream reaches lacking in woody debris and design segments for introducing woody debris structure.

Fish Ladders: Identify impediments to productive spawning habitat. Design costeffective fish ladders or other bypasses for fish passage.

Wall-based Rearing Habitat Enhancement: Study opening oxbows, old channels or beaver dam areas to create flow through ponds to mainstream and tributaries for enhancing coho rearing habitat.

Side Channel Enhancement: Study areas of old channels either cut off from mainstream by meandering or the 1964 earthquake. Propose cost-effective reopening for enhancing spawning habitat for all targeted salmon species.

Instream Log Structures: Study modification of stream flow dynamics to enhance spawning and rearing habitat for all targeted salmon species.

PUBLICATIONS AND REPORTS

Annual Reports: Annual Reports will be prepared for each FY. The survey reports, database and accompanying maps will be delivered to ADF&G upon their completion. The final report will be prepared in FY 1999 and will emphasize the subsistence resource enhancement success of this project. EA's will be prepared as needed.

PROFESSIONAL CONFERENCES

The project results will be presented at the appropriate EVOS conferences and technical sessions and other conferences.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

This project will be coordinated with all previous and ongoing ADF&G and PGC/EVOS Projects. Coordination between the Port Graham Corporation, the Port Graham Village Council, ADF&G and the KPB-EDD will be critical for the success of this project.

The results will be used in the Proposed Port Graham Village Council and Port Graham Landowners and Land Use Ethic EVOS projects.

Attachment B: Revised Project Forms. (page 1 of 3)

From Contract (ADFG - Kenai Peninsula Bonrogh Ecun. Development District)

Revised Projects Forms: December 15, 1997 (27Jan98-wjh)

Title: Port Graham River Fish Pass for Salmon.

Introduction:

Subsistence resources were severely damaged in the coastal waters of the lower Kenai Peninsula. The additional harvest of pink and coho salmon would replace other lost or damaged subsistence resources. The original oil spill restoration survey involved the identification of EVOS impacted areas and the determination of the optimal methods of restoration with habitat rehabilitation and fish enhancement methods.

Project Description:

The upper Fort Graham river contains excellent spawning and rearing habitat for salmon. The falls in Section 20 prevent the migration of anadromous fishes in this watershed. The proposed fish pass would allow the upstream and downstream migrations of fish.

A preliminary channel profile was measured during the field inventory. These upper reaches contain a total of 10,127 meters of habitat suitable for coho spawning and rearing, including 82,596 square meters of habitat with 20,004 square meters of spawning habitat and 24,318 square meters of rearing habitat. The dominate substrates for reaches which were field inventoried were gravel (67%), cobble (19%) and boulder (0.5%) the remainder is in bedrock and sand. The reaches in lower Port Graham contain 19,428 meters of stream length with 285,203 square meters of potential habitat with 64,662 square meters of available spawning habitat and 121,480 square meters of available rearing habitat. The upper Port Graham reaches contain 23 percent of the total available spawning and 16 percent of the total available rearing habitat for the entire Port Graham River watershed. Construction of a fish pass could result in additional 6,345 coho spawners annually. Sufficient rearing habitat exists throughout the entire watershed to support the additional production from these spawners. Based upon a cost-benefit analysis with each coho valued at \$22.50 for subsistence purposes this creates a net benefit over 20 years, the expected life of the fish pass of \$3,094,630. The introduction of coho fry into the upper river for the next four years will be studied. Coho fry native to Port Graham River are available from the EVOS funded Port Graham Fish Hatchery Project.

The goal of this proposal involves the final engineering analysis during the winter of 1997-98 and actual construction of the Upper Port Graham Fish Pass during the summer of 1998. This project's goal is to provide an additional 9,058 coho salmon available for subsistence harvest.

Performance Monitoring:

Coho salmon use will be monitored and evaluated each fall for the next ten years to ensure that optimal use of the fish ladder is being utilized. Fish pass maintenance will be the responsibility of the Port Graham Corporation.



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Attachment B: Revised Project Forms. (page 2 of 3)

Schedules:

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The following milestones and completion dates are proposed as follows.

- FY98 Phase 1: Determine NEPA compliance level. Draft EA. Submit applications for the necessary permits. Secure approval from Cook Inlet Regional Planning Team. Contract for preliminary engineering design and evaluation.
- FY98 Phase 2: Finalize engineering design. Contract for project construction through resources available to PGC. Complete the fish pass during the 2nd Quarter 1998 (Deadline July 1). Monitor fish pass usage by current native salmon during the fall of 1998.

FY99-00. Monitor adult spawners beginning in the falls of 1999 62000.

Environmental Compliance/Permit/Coordination Status:

The Upper Port Graham fish pass site lies on private ANCSA corporation land. It is assumed that the federal agency that will be responsible for the compliance of NEPA will be the USDA Forest Service. If needed, an environmental assessment will be conducted by Port Graham Corp. in conjunction with Dr. William Hauser of ADF4G Habitat and Restoration. A determination of the level of NEPA compliance will be necessary on this project. Attachment B: Revised Project Forms. (page 3 of 3)

Title: Windy Creek Left Wall Based Rearing Ponds for Coho Salmon.

Introduction:

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Subsistence resources were severely damaged in the coastal waters of the lower Kenai Peninsula. The additional harvest of coho salmon would other lost or damaged subsistence resources. The original oil spill restoration survey involved the identification of EVOS impacted areas and the determination of the optimal methods of restoration in terms of habitat rehabilitation and fish enhancement methods.

Project Description:

Windy Creek Left (WCL) contains substantial spawning but limited winter rearing habitat for coho salmon. Construction of two wall based rearing ponds could result in additional 2,059 of harvestable coho annually. Based upon a cost-benefit analysis with each coho valued at \$22.50 for subsistence purposes this creates a net benefit over 20 years, the expected life of the rearing ponds of \$607,420.

The goal of this proposal involves the final engineering analysis during the winter of 1997-98 and actual construction of the WCL Wall Based Rearing Ponds during the summer of 1998. This project's goal is to provide an additional 5,084 coho salmon available for subsistence harvest.



Performance Monitoring:

Coho salmon use will be monitored and evaluated each fall for the next ten years to ensure that optimal use of the ponds is being utilized. Pond maintenance will be the responsibility of the Port Graham Corporation.

Schedules:

The following milestones and completion dates are proposed as follows.

- Phase 1. Determine NEPA compliance level. Draft EA. Submit applications for necessary permits. Secure approval from Cook Inlet Regional Planning Team. Contract for preliminary engineering design and evaluation.
- Phase 2. Finalize engineering design Contract for project construction through resources available to PGC. Construct the ponds during the second quarter of 1998.
- FY99. Monitor ponds usage by current native salmon during the spring of 1999.
- FY00. Monitor fry & smolt usage beginning in the spring of 2000.

Environmental Compliance/Permit/Coordination Status:

The WCL Ponds site lies on private ANCSA corporation land. It is assumed that the federal agency that will be responsible for the compliance of NEPA will be the USDA Forest Service. If needed and environmental assessment will be conducted by Port Graham Corp. to determine if an environmental impactstatement will be necessary.





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Budget Catego	ory:		FY 1997	FY 1998						
Personnel		F		\$0.0						
Travel		Γ		\$0.0						
Contractual				\$100.0						
Commodities				\$0.0						
Equipment				\$0.0		LONG RA	NGE FUNDIN	IG REQUIREN	MENTS	
Subtotal			\$0.0	\$100.0		Estimated	Estimated	Estimated	Estimated	
General Admin	istration			\$7.0		FY 1999	FY 2000	FY 2001	FY 2002	
Project To	tal		\$0.0	\$107.0		\$23.6	\$23.6	\$0.0	\$0.0	
Full-time Equiv	alents (FT	E) [0.0						
					Dollar amount	ts are shown ir	n thousands of	dollars.		
Other Resource	es	İ								
Comments:	This budg	get is co	mprised of two	o project phas	ses; each of w	hi <mark>ch includes</mark> t	wo componen	ts:		
- Phase I inclu	des the des	sign, pla	inning and pe	mitting each	of the two com	ponents, Port	Graham River	fishpass and	Windy Creek r	rearing
ponds.										1
- Phase II inclu	ides the im	plement	tation and con	struction wor	k .					
- Administrativ	e cost for t	he contr	ractor, Kenai F	Peninsula Bor	ough Economi	c Developmen	t District is 10	% of of the Pha	ase I and II pro	oject costs.
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Budget Item	Phase I	Phase		ai						
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Contractual	1.9	1.0	3.4 70 7							
Commodities	20.0	40.9	7.0							
Equipment	0.4	0.5	7.0							1
Sum	35.0	<u>55 0</u>	\$00.0							
Indirect (KPRF	DD) 35	5.6	φə0.9 Q 1							
Project Cost	\$38.5	\$61.5	\$100.0							
ADF&G GA	\$ 00.0	Ψ01.0	7.0	Total Proie	ct Cost = \$107	7.0K				
		-								
	7],	Project Num	abor 0826	3					ORM 3A
					u data ale Octor		A			DUOTEE
1998		1			ustock Salm	ion Stream	Assessment	Ğ		RUSIEE
		1]	Enhanceme	ent						AGENCY
			Agency: Ał	CDept. of F	ish & Game)			S	UMMARY
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Personnel Costs:			GS/Range/	Months	Monthly		Proposed
Name	Position Description		Step	Budgeted	Costs	Overtime	FY 1998
	,L	Subtotal		0.0	00	0.0	
					Per	sonnei Total	\$0.0
Travel Costs:			Ticket	Round	Total	Daily	Proposed
Description			Price	Trips	Days	Per Diem	FY 1998
·							
	<u> </u>					Travel Total	\$0.0
				·····			
						F	ORM 3B
	Project Number: 98263	3					Personnel
1998	Project Title: PGC Wild	lstock Salm	on Stream	Assessment	:&		8 Traval
	Enhancement						
	Agency: AK Dent of Fi	sh & Game					DETAIL
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Prepared:

2 of 8



Contractual Costs:	Proposed
Description	FY 1998
Contract with Kenai Peninsula Borough Economic Development District	100.0
When a non-trustee organization is used, the form 4A is required.	\$100.0
Commodities Costs:	Proposed
Description	FY 1998
	•
Commodities Total	\$0.0
1998 Project Number: 98263 Project Title: PGC Wildstock Salmon Stream Assessment & Enhancement Agency: AK Dept. of Fish & Game	ORM 3B htractual & mmodities DETAIL

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October 1, 1997 - September 30, 1998

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FY 1998
			0.0
			0.0
			0.0
			0.0
			· 0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.0
Existing Equipment Usage:		Number	Inventory
Description		of Units	Agency
1998 Project Number: 98263 Project Title: PGC Wildstock Salmon Stream Assessment Enhancement Agency: AK Dept. of Fish & Game	&	F	ORM 3B quipment DETAIL

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		1	Authorized	Proposed						
Budget Catego	ory:		FY 1997	FY 1998						
Personnel		Γ		\$6.9						
Travel				\$3.4						
Contractual				\$72.7						
Commodities				\$7.0						
Equipment		Γ		\$0.9		LONG R	ANGE FUNDI	NG REQUIRE	MENTS	
Subtotal		Γ	\$0.0	\$90.9		Estimated	Estimated	Estimated	Estimated	
Indirect		Γ		\$9.1		FY 1999	FY 2000	FY 2001	FY 2002	
Project To	tal	Γ	\$0.0	\$100.0		\$25.9	\$23.5	\$0.0	\$0.0	
Full-time Equiva	alents (FTE	≣) [1.8						
		Γ			Dollar amount	s are shown ir	n thousands of	dollars.		
Other Resource	es	Γ								
ponds. - Phase II inclu - Administrative Budget Item Personnel Travel Contractual Commodities Equipment Sum Indirect (KPBE Project Cost	Ides the im e cost for the Phase I 4.4 1.9 26.8 1.5 0.4 35.0 DD) 3.5 \$38.5	plement he contr 2.5 1.5 45.9 5.5 0.5 55.9 5.6 \$61.5	tation and cor ractor, Kenai I \$6.9 3.4 72.7 7.0 0.9 \$90.9 9.1 \$100.0	nstruction wor Peninsula Bor tal	k. rough Economi	c Developmen	nt District is 104	% of of the Ph	ase I and II pr	oject costs.
1998			Project Nur Project Title Enhanceme Name: Por	mber: 9826 e: PGC Wil ent rt Graham (33 Idstock Salm Corporation	non Stream	Assessmen	t &	N S	FORM 4A on-Trustee SUMMARY

Prepared: 5 of 8

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ersonnel Costs:						Months	Monthly	1	Proposed
Name		Position Desc	ription			Budgeted	Costs	Overtime	FY 1998
	Phase I - Pla	anning							
Walter Mega	nack, Jr.	Project Mana	gement			0.5	\$7.5		3.8
TBN		Administrative	e Support			0.5	1.2		0.6
e	Phase II - In	nplementation		_					
Walter Mega	l nack, Jr.	Project Mana	gement			0.25	\$7.5		1.9
TBN		Administrative	L e Support			0.5	1.2		0.6
	1		<u>.</u>	Subtotal		1.8	17.4	0.0	
							Per	sonnel Total	\$6.9
ravel Costs:					Ticket	Round	Total	Daily	Proposed
Description	1	-	r		Price	Trips	Days	Per Diem	FY 1998
	Phase I - Pla								
RT PG-Home	er	1			60	4	20	50	1.2
						0	0		0.0
RT PG-Anch	orage				180	1	5	100	0.7
	Phase II - Im								
RT PG-Home	er		· · · · · · · · · · · · · · · · · · ·	<u> </u>	60	4	20	50	1.2
				1		0	0		0.0
RT PG-Anch	orage	1		 .	180	1	1	100	0.3
				<u> </u>					
	L		L	L	L	J	I	Travel Total	\$3.4

1998

Project Number: 98263 Project Title: PGC Wildstock Salmon Stream Assessment & Enhancement Name: Port Graham Corporation FORM 4B Personnel & Travel DETAIL

Prepared: 6 of 8



October 1, 1997 - September 30, 1998

Description Months Monthly Cost FY 1998 Phase I - Planning 0.0 Preliminary Engineering Evaluation 1.5 Dougtas J. Martin, Ph.D. Professional Fisheries Scientist 0.1 \$12.8 1.3 John Hall Land & Resource Consultants 1.1 10.0 11.0 Arvid Hall Land & Resource Consultants 1.3 10.0 13.0 Phase II - Implementation 1.3 1.0 13.0 13.0 Construction of Fish Pass 1.1 10.0 13.0 Douglas J. Martin, Ph.D. Professional Fisheries Scientist 0.1 \$12.8 1.3 Construction of Fish Pass 1.3 1.0 13.0 13.0 13.0 Douglas J. Martin, Ph.D. Professional Fisheries Scientist 0.50 10.0 5.0 Arvid Hall Land & Resource Consultants 0.50 10.0 \$6.0 Douglas J. Martin, Ph.D. Professional Fisheries Scientist 0.50 10.0 \$72.7 Commodities Costs: Constructual Total \$72.7 \$72.7	Con	tractual Cost	s:		<u></u>				Ì	Proposed
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Preliminary Engineering Evaluation 1.5 Douglas J. Martin, Ph.D. Professional Fisheries Scientist 0.1 \$12.8 1.3 John Hall Land & Resource Consultants 1.1 10.0 11.0 Arvid Hall Land & Resource Consultants 1.3 10.0 13.0 Phase II - Implementation 1.3 10.0 13.0 Construction of Fish Pass 1.3 1.3 10.0 13.0 Douglas J. Martin, Ph.D. Professional Fisheries Scientist 0.15 \$12.8 1.9 John Hall Land & Resource Consultants 0.50 10.0 5.0 Douglas J. Martin, Ph.D. Professional Fisheries Scientist 0.15 \$12.8 1.9 John Hall Land & Resource Consultants 0.50 10.0 8.0 Arvid Hall Land & Resource Consultants 0.80 10.0 8.0 Ormodities Costs: Contractual Total \$72.7 Proposed FY 1998 Phase I - Planning 0.0 0.0 0.0 1.0 0.0 Engineering Supplies 0.0 0.0 5.5 0.5 5.5 1.0 <td></td> <td>Phase I - Plan</td> <td>ning</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.0</td>		Phase I - Plan	ning							0.0
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1998

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Project Number: 98263 Project Title: PGC Wildstock Salmon Stream Assessment & Enhancement Name: Port Graham Corporation FORM 4B Contractual & Commodities DETAIL

Prepared: 7 of 8



October 1, 1997 - September 30, 1998

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FY 1998
Field Equipment - PHASE I	1	0.4	0.4
Field Equipment - PHASE II	1	0.5	0.5
hose purchases associated with replacement equipment should be indicated by placement equipment should be indicated by placement equipment because the province of the provinc	cement of an R. New Equip	ment Total	\$0.9
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1998 Project Number: 98263 Project Title: PGC Wildstock Salmon Strea Enhancement	am Assessment &	FC Eq D)RM 4B uipment ETAIL

Surf Scoter Life History and Ecology: Linking Satellite Technology with Traditional Knowledge to Conserve the Resource

Project Number:	98273
Restoration Category:	Research
Proposer:	D. Rosenberg/ADFG
Lead Trustee Agency:	ADFG
Cooperating Agencies:	None
Alaska SeaLife Center:	No
New or Continued:	New
Duration:	1st yr. 3 yr. project
Cost FY 98:	\$170.4
Cost FY 99:	
Cost FY 2000:	
Cost FY 01:	\$0.0
Cost FY 02:	\$0.0
Geographic Area:	Prince William Sound, Lower Cook Inlet
Injured Resource/Service:	Subsistence, intertidal community

ABSTRACT

This project will study the life history and ecology of surf scoters wintering in Prince William Sound and lower Cook Inlet, and integrate this information with traditional ecological knowledge. Scoter populations in Alaska are declining for unknown reasons. Local residents harvest scoters for subsistence purposes. Scoters will be marked with surgically implanted satellite transmitters to define the breeding areas, molting areas, and wintering areas. Local participation will be solicited and information will be conveyed to local residents through the Youth Area Watch program (Project \210).

INTRODUCTION

This project will study the life history and ecology of surf scoters (*Melanitta perspicillata*) wintering in Prince William Sound (PWS) and lower Cook Inlet (LCI) and integrate this information with traditional ecological knowledge collected from community members within the study area. In the first year (FY98) we will initiate a pilot project to test the feasibility of catching scoters in PWS and marking them with a limited number of surgically implanted satellite transmitters. Satellite telemetry will allow us to define the breeding areas, molting areas, and wintering areas of this subsistence resource. Information will be conveyed to residents of Tatitlek through the Chugach School District and Youth Area Watch programs, and their participation in the capture and monitoring of scoters will be solicited. In future years, we propose additional satellites transmitters be implanted in scoters in the same areas and additional sites closer to Nanwalek, Port Graham, and Chenega, and also incorporate the participation of residents of these communities through the Chugach School District and Youth Area Watch programs. In future years, we also propose to collect ecological information on breeding and molting sites, as well as more information on wintering sites and migration routes.

Residents of the communities affected by the *Exxon Valdez* Oil Spill remain concerned about the abundance and safety of their traditional food resources (*Exxon Valdez* Oil Spill Trustee Council, 1996). In 1993, 55% of the households in Tatitlek reported using scoters harvested for subsistence purposes, as did 40% of the households in Nanwalek and almost 12% of Port Graham households (Scott et al. 1996). From 1957 through 1993, scoters in Alaska have been estimated to decline by as much as 30% (Hodges et al. 1996). However, regional trends have not been compared. The cause of this decline is unknown and can only be speculated. Quite likely, it may be the result of a combination of factors such as habitat loss, contaminants, or climate change. Several studies have shown scoters to bioaccumulate trace metals and organochlorines from their environment (Vermeer and Peakall 1979; Henny et al. 1991; Olendorf et al. 1991; Henny et al. 1995).

Scoters are among the least studied of North American waterfowl (Godfrey 1989, Savard and Lamothe 1991, Henny et al. 1995). Little is known of their life history, ecology, and breeding, wintering, and molting distributions (Bellrose 1976; Herter et al. 1989; Goudie et al. 1994). Surf scoters, black scoters (*M. nigra*), and white-winged scoters (*M. fusca*) all occur in PWS and lower Cook Inlet. Among these, the surf scoter is the most abundant (Isleib and Kessel 1973). It occurs as both a year-round resident and migrant. Surf scoters are most numerous in spring due to the influx of migrants probably in response to spawning Pacific herring (*Clupea pallasi*) (Isleib and Kessel, 1973; Bishop et al. 1995). Nonbreeders remain in PWS in summer.

Most scoters depart PWS in spring to unknown nesting areas, perhaps in interior Alaska and the Yukon (Gabrielson and Lincoln 1959). Male seaducks abandon incubating females in early summer and congregate at communal molting sites (Salomonsen 1968). Often these areas are distinct from nesting or wintering areas. As with other waterfowl, wing feathers are lost simultaneously, rendering birds flightless for about one month until new feathers emerge.

In winter, surf scoters feed in intertidal and subtidal zones, areas susceptible to contaminants (Vermeer and Peakall 1979). They feed primarily on blvalves, especially mussels, but in spring they may switch to a diet composed primarily of herring roe (Vermeer 1981; Goudie et al. 1994, Bishop et al. 1995). White-winged scoter die-offs occurred in the Cape Yakataga area in southeast Alaska during 1990-1992 (Henny et al. 1995). Although no definitive cause could be identified, elevated levels of cadmium were detected in the birds, but no source of contamination could be identified. The difficulty of detecting a source of contamination was confounded by lack of specific information on breeding, molting, or wintering areas of these birds.

Human activities, such as hydroelectric development (Savard and Lamothe 1991), estuarine pollution (Ohlendorf et al. 1991), or introductions of exotic species (Bordage and Savard 1995) on the breeding, wintering, or molting areas potentially have profound affects on abundance or distribution of a population. The lack of information on distribution and migration patterns can prevent the identification of potential harmful environmental exposures or alterations and make it extremely difficult to determine possible causes of population declines. Location of breeding grounds, migration routes, and timing of migration are important factors used to evaluate contaminant uptake or loss in a migratory species as well as changes to food resources and other environmental changes (Henny et al. 1991).

Scoters are an important subsistence resource to the people living in the communities of PWS and LCI (Scott et al. 1996). Populations appear to be declining and breeding area affiliations are unknown. The susceptibility of scoters to contaminants is a concern to resource managers and subsitence consumers. We propose a program that will integrate traditional knowledge, scientific methods, and modern technology to perpetuate the subsistence patterns of these communities by understanding more about scoter life history and ecology, sharing knowledge with local community members, involving the youth of the communities in the restoration process, and improving conservation strategies for this species.

Little is known about scoter ecology, breeding areas, molting areas, and migration routes. Basic reproductive ecology information is lacking for surf scoter populations wintering in PWS. Determination of breeding distribution is the first step in assessing breeding ecology. Potential breeding sites range throughout Alaska and the Yukon Territory. Once satellite telemetry has defined breeding areas, we propose to define habitat associations and measure productivity beginning in FY 99 and continuing in FY 00. If we can obtain adequate sample sizes and scoters exhibit philopatry to winter areas, mark and recapture data will be analyzed to estimate annual survival rates by age and sex (Lebreton et al. 1992).

Black scoters, white-winged scoters, and Barrow's goldeneyes (*Bucephala islandica*) are also an important subsistence resource to communities in PWS and LCI (Scott et al. 1996). In subsequent years, we will attempt to incorporate these species into our study if local residents express an interest or have preferences. However, due to the larger numbers of surf scoters present in PWS in winter, we have chosen to begin our study with this species. At present, wildlife satellite transmitter technology has yet to produce a transmitter small enough to be used safely in goldeneyes or harlequin ducks.



This project is integrated with project \052B Traditional Ecological Knowledge, project \210 Youth Area Watch, project \025 Nearshore Vertebrate Predator Project. (Predation on Herring Spawn), project \427 Harlequin Duck Recovery Monitoring, project \159 Prince William Sound Marine Bird Surveys, and proposed project 98426-Harlequin Duck Population Dynamics-Patterns and Processes.

NEED FOR THE PROJECT

A. Statement of Problem

Surf scoters have been used as a subsistence resource for centuries by the native inhabitants of PWS and along with black scoters and white-winged scoters are the most abundant avian species found at archeological sites (Linda Yarborough, USFS, pers. comm). In recent times, among the three species of scoters in PWS, surf scoters are the most abundant in winter (Dan Esler, USGS-BRD, pers. comm.). However, little is known about the distribution or movements of these birds within or outside of PWS. Although surf scoters are known to breed throughout much of Alaska and Canada (Gabrielson and Lincoln 1959; Godfrey 1986) nothing is known about specific populations and the link between winter, breeding, and molting areas. The few studies that have identified molting sites have not made the link between these and winter and breeding areas (Johnson and Richardson 1982; Dau 1987).

Since the USFWS initiated breeding pair surveys in 1957, breeding populations of scoters have declined in Alaska (Hodges et al. 1996). In marine environments, scoters feed on bivalves, especially blue mussels (*Mytilius edulis*), species known to concentrate contaminants. As mentioned, scoters are known to bioaccumulate contaminants and die-offs have occurred, including several among white-winged scoters at Cape Yakataga, in southeast Alaska (Henny et al. 1995). The cause of this die-off was undetermined. In addition, scoters are susceptible to environmental changes and habitat alterations over their entire range. As scoters have different winter, breeding, and molting areas they are susceptible to changes over a wide geographic area.

Because little is known about their ecology, breeding areas, molting areas, and migration routes, it is difficult to determine the cause or source of a declining population and which sub-populations may be affected. Without understanding the cause of a population decline it becomes extremely difficult to implement conservation and management strategies to reverse its course. Identifying the distribution of a population is the first step in this process.

B. Rationale/Link to Restoration

The location of breeding grounds, migration routes, winter areas, and the timing of migration are all critical factors used to evaluate contaminant uptake or loss in a migratory species as well as evaluating the consequences of other environmental disturbances or changes (Henny et al. 1991). Scoter populations are susceptible to natural and man-made disturbances over a wide and inaccessible geographic area.
To conserve this subsistence resource and restore the traditional activities associated with this species, we have proposed to identify the movements, distribution, and ecological relationships of surf scoters using satellite telemetry. This information is necessary to identify problems and develop and implement management strategies to promote the species long-term conservation. We hope this information and the activities associated with collecting this data will allow resource managers to reverse the decline in scoter populations; renew local confidence in the health of this food supply; help maintain traditional lifestyles; provide opportunities to the youth of local communities to promote their historical connection with this subsistence resource; merge traditional knowledge with modern science to develop a more complete understanding of scoter life history and ecology; and help students develop skills to promote the conservation of this species and others important to their economy and lifestyle.

Restoration requires assessment of population health and definition of impediments to recovery. This proposed work will begin the process of understanding the factors that affect population dynamics in surf scoters and develop management strategies to ensure the long-term health and welfare of the population. Without an understanding of the underlying events that influence population change, we can not prescribe specific activities to conserve or enhance the population.

C. Location



In FY98, community involvement (Chugach School District, Youth Area Watch, traditional knowledge) will be focused on the village of Tatitlek. In future years we plan on expanding community involvement to include the communities of Chenega, Nanwalek and Port Graham.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

This program will incorporate residents of the communities of Prince William Sound and lower Cook Inlet in the collection and monitoring of data. Project personnel will adhere to the protocols for including indigenous knowledge in the restoration process presented in Appendix C of the Invitation to Submit Restoration Proposals for Federal FY 1998. The project will inform and coordinate our community involvement activities, including the collection of indigenous knowledge with Dr. Henry Huntington, TEK specialist EVOS Restoration Office; Martha Vlasoff, community coordinator; Roger Sampson and Rick DeLorenzo, Chugach School District: and the Subsistence Division of the Alaska Department of Fish and Game.

We will solicit advice from the above parties and gather information on Traditional Ecological

Knowledge (TEK) through local community facilitators and residents. We will attempt to involve local youth in bird capture and monitoring and TEK data collection through the Youth Area Watch

Efforts will be made throughout the restoration process to participate in and provide public involvement in the design and implementation of this project. Project staff will be available to present information to local communities or prepare articles or photographs for Trustee Council publications. Boat and air charter contracts, telemetry observers, other services will be contracted from local sources when possible.

PROJECT DESIGN

A. Objectives

<u>FY 98:</u>

program.

- 1) Develop techniques to capture surf scoters in spring on saltwater;
- 2) Mark 6 adult males and 4 adult females with surgically implanted satellite telemetry transmitters;
- 3) Determine migration routes, breeding areas, and molting and wintering sites;
- Document traditional ecological knowledge about scoters from residents of Tatitlek (and other communities if opportunities are available); and
- 5) Incorporate local community members through the Chugach School District and Youth Area Watch program in the collection and monitoring of data, including traditional knowledge.

B. Methods

ADF&G will capture, mark, and monitor scoters with professional staff, veterinarians, and local assistance. We will capture adult surf scoters in late March and early April during the herring spawn, when large flocks of sea ducks aggregate to feed on herring roe. The commercial herring gillnet fishery which precedes major spawning events by a few days ranges from April 9-28 for the period from 1972-1993 (Donaldson et al. 1995). Capture sites will be determined by monitoring known areas of herring spawn deposition (Morstad et al. 1996), scoter concentrations, ADF&G Commercial Fisheries Division aerial spawn and survey maps, and local knowledge. Scoters will be captured at a minimum of two sites, one located in northern PWS, as near Tatitlek as feasible, and the other on northern Montague Island. We will attempt to capture and implant satellite transmitters in 3 male and 2 female surf scoters at each site.

Surf scoters will be captured with either floating or land-anchored mist nets suspended among

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decoys or in passive drive traps consisting of two 100' wings which lead birds into a holding pen in shallow water. Sea kayaks will be used to slowly herd flocks towards a trap. Trap locations will be mapped using Global Positioning Systems and nautical charts (NOAA).

All captured scoters, in addition to those marked with telemetry, will be banded with USFWS aluminum leg bands and with individually coded plastic tarsus bands. Sex will be identified based on plumage characteristics and age will be determined by bursal probing. Adults do not have a bursa; if possible, second-year birds will be distinguished from third year subadults by bursa depth. Prior to release, birds will be weighed, measured (culmen, tarsus, and wing length) and blood and feather samples will be collected and archived for future contaminant, genetics, and radio isotope studies.

Once transported to the work vessel, a certified veterinarian, trained in avian implant surgeries, will place transmitters in the peritoneal cavity with the antenna exiting caudally, following procedures described by Petersen et al. (1995). Satellite transmitters will measure 10 mm deep, 55 mm long, 35 mm wide and weigh approximately 30 g (<3% body weight) (Telemetry 2000, Columbia, Maryland). Battery life can be expected to last from 6 - 12 months depending on advances in technology at time of purchase. Efforts will be made to maximize battery life. Each transmitter will be hermetically sealed with a teflon-coated multi-strand stainless-steel antenna. Transmitters will be programmed and calibrated to record and transmit body temperature to confirm that signals are being emitted from live birds. After surgery, scoters will be held in an appropriate container and provided water. Scoters will be released when the veterinarian determines they have recovered from the effects of surgery. In the case of immediate post-release mortality, conventional radio transmitters will be attached to each bird to facilitate retrieval of satellite transmitters. Attachment of conventional transmitters will be designed to ensure that radio packages fall off after 1-2 weeks. All ducks will be released at the point of capture.

Satellite transmitters will be programmed to transmit a signal at a time and frequency to be determined to ensure they will not interfere with existing telemetry studies. Signals will be analyzed using Argos (Landover, Maryland) Data Collection and Location System. Argos Standard and Animal-Tracking data processing services will provide information on the precision of each location. Movements will be monitored throughout the life of the transmitter. Locations will be mapped using a Geographic Information System (GIS). Movements and locations of scoters will be forwarded to the Chugach School District so students can monitor the progress and movements of birds between breeding, molting, and wintering areas.

The Chugach School District, through Youth Area Watch, will provide interested students and teachers to participate in capture and monitoring. The school district will provide classroom aides (computer and software, maps etc.) to be used in local schools for monitoring scoter movements throughout the year. ADF&G will relay satellite monitoring information to local communities. Students will assist in collecting information from local residents on TEK, current scoter distribution and abundance, and band returns from marked birds shot by local hunters.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

Dan Esler, USGS-BRD, will cooperate to assist in radio telemetry implants. This project and proposed project 98426 Harlequin duck population dynamics - patterns and processes, will coordinate and attempt to share resources whenever feasible.

All data collection and analysis will be supervised by ADF&G. Private sector contracts for fuel purchase. equipment, vessel support and air charter will be solicited, usually from the local Prince William Sound or lower Cook Inlet region. Contracts for satellite transmitters and data downloading will be solicited from the private sector.

Cooperation for community involvement will be sought through the EVOS Restoration Office. Chugach School District, and the Alaska Department of Fish and Game Subsistence Division (see above).

SCHEDULE

A. Measurable Project Tasks for FY 98

November-February:	Coordinate and plan community involvement, Youth Area Watch and TEK. Attend Synthesis Workshops in local communities. Meet with local subsistence harvesters. Attend Restoration Workshop. Order satellite transmitters and field gear. Contract for vessel support, veterinary services. Organize field gear, test equipment.
March-April:	Reconnaissance surveys for scoter concentrations. Capture birds for radio implants. Maintain and store field equipment.
May-September:	Monitor satellite transmitters. Coordinate community involvement, Youth Area Watch and TEK.
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B. Project Milestones and Endpoints

<u>FY99</u>

October-March:	Monitor radioed birds.
	Coordinate and plan community involvement.
March-April:	Capture birds for radio implants.
April:	Submit annual report.
May-September:	Monitor birds for defining migration routes, breeding areas, and molting
	areas.

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July-August:	Coordinate with local communities. Breeding and molting site habitat assessment, productivity studies.
<u>FY'00</u>	
October-March:	Monitor radioed birds. Coordinate and plan community involvement, Youth Area Watch and TEK.
March-April: April:	Capture birds for radio implants. Submit annual report.
May-September:	Monitor birds for defining migration routes, breeding areas, and molting areas. Coordinate with local communities.
July-August:	Breeding and molting site habitat assessment, productivity studies.

C. Completion Date

All project objectives, except final reports and publications, will be met following FY00.

PUBLICATIONS AND REPORTS

An annual report of FY98 activities will be submitted to the Restoration Office before 15 April 1999. Because FY98 is the first year of this project, journal publications will not be generated until completion of all field work and community involvement.

PROFESSIONAL CONFERENCES

None in FY 98.

NORMAL AGENCY MANAGEMENT

The work proposed here is not part of normal agency management and is related specifically to research addressing oil spill restoration concerns. No similar work has been conducted, is currently being conducted, or is planned using agency funds.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

As described in the Introduction, this research relies on incorporation of methods and data from other EVOS Trustee sponsored research, including projects /427, /025, and proposed project 98426. Equipment purchased under those projects will be used to conduct the proposed research; and research sites, data collection and analysis will follow previously established standards. All

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efforts will be made to share vessel support, telemetry monitoring, study sites, and equipment with proposed project 98426. Proposed March demographic survey: for harlequin ducks (98426) will be used to help identify scoter concentrations.

This project is integrated with project \052B Traditional Ecological Knowledge, project \210 Youth Area Watch, project \025 Nearshore Vertebrate Predator Project, (Predation on Herring Spawn), project \427 Harlequin Duck Recovery Monitoring, project \159 Prince William Sound Marine Bird Surveys, and proposed project 98426-Harlequin Duck Population Dynamics-Patterns and Processes.

See Community Involvement and Traditional Ecological section above for more details on coordination of TEK and Youth Area Watch activities.

PROPOSED PRINCIPAL INVESTIGATORS

Dan Rosenberg Alaska Dept. of Fish and Game 333 Raspberry Road Anchorage, Alaska 99518 (907) 267-2453 FAX: (907) 267-2433 danr@fishgame.state.ak.us

PERSONNEL QUALIFICATIONS

Dan Rosenberg has been a waterfowl biologist for The Alaska Department of Fish and Game (ADF&G) since 1985. From 1980-1983 Mr. Rosenberg conducted field research in Alaska as a waterfowl biologist for the U.S. Fish and Wildlife Service and from 1983-1984 as a Habitat Biologist for ADF&G. Mr. Rosenberg received a Bachelor of Science degree in Wildlife Management from Humboldt State University, Arcata, CA in 1979.

Mr. Rosenberg has conducted harlequin duck population (age and sex structure) and production surveys in Prince William Sound since 1994 as the Principle Investigator of a Trustee sponsored restoration project. He has conducted extensive waterfowl population monitoring and habitat assessment surveys on the Copper River delta, Stikine River delta, Kenai wetlands, upper Cook Inlet, Aleutian Islands, and Kodiak Island. As project leader, Mr. Rosenberg has assessed impacts to waterfowl and wildlife populations from hydroelectric development, urban expansion, habitat alterations, chemical pollutants, timber harvest, and surface mining.

OTHER KEY PERSONNEL

Mike Petrula, Wildlife Biologist, ADFG. Field logistics, capture, data analysis, telemetry monitoring, report preparation.





1998 EXXON VALDEZ TRUST SECURICIL PROJECT BUDGET

							upp av	a i to i
	Authorized	Proposed						
Budget Category:	FY 1997	FY 1998						
Personnel		\$66.4						
ravel		\$7.6						
Contractual		\$42.3						
Commodities		\$38.4						
quipment		\$2.8		LONGRA	ANGE FUNDIN	GREQUIREN	MENIS	
Subtotal		\$157.5		Estimated	Estimated	Estimated	Estimated	
General Administration		\$12.9		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total		\$170.4		\$232.0	\$240.0	\$0.0	\$0.0	
Full-time Equivalents (FTE)		1.1				• •		
			Dollar amoun	ts are shown ir	n thousands of	dollars.	.	···
Other Resources								
purchasing easily transportable	infitable kayal	ks will result in	long-term cos	st savings.				
1998	Project Nur Project Title technology Agency: A	mber: 9827 e: Surf Sco with traditic DFG	3 ter life histo onal knowled	ry and ecolo dge to conse	ogy: Linking erve the reso	Satellite burce.		FORM 3A TRUSTEE AGENCY SUMMARY
Prepared: Aptilo 74] "	6/



October 1, 1997 - September 30, 1998

Personnel Costs:		GS/Range/	Months	Monthly		Proposed	
Name Position Description		Step	Budgeted	Costs	Overtime	FY 1998	
D. Rosenberg	WBIII, Principle Investigator	18F	4.5	6.2		27.9	
Mike Petrula	WBI, Data analysis, report prep., graphics	14C	4.5	4.1	1.0	19.5	
2 F&G Tech.	F&G Tech. III, Field Technicians	11F	2.5	3.7	1.0	10.3	
E. Becker	Biometrician II	19L	0.5	6.9		3.5	
C. Barnhill	Cartographer II	16L	1.0	5.2		5.2	
						0.0	
						0.0	
						0.0	
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						0.0	
						0.0	
						0.0	
						0.0	
	Subtol	al	13.0	26.1	2.0		
				Per	sonnel Total	\$66.4	
Travel Costs:		Ticket	Round	Total	Daily	Proposed	
Description		Price	Trips	Days	Per Diem	FY 1998	
Portage-Whittier A	laska Railroad vehicle, boat, and 1 psng.	0.4	4			1.6	
Portage-Whittier A	laska Railroad vehicle and psng.	0.2	4			0.8	
Portage-Whittier A	Maska Railroad Psg. fare	0.1	1			0.1	
Anchorage-I atitle	k by air	0.5	3	3	0.1	1.8	
Anchorage -value	z by air	0.3	2	4	0.1	1.0	
Airport parking, ta	xi fare, excess baggage			20		0.3	
Per alem, Coraov	a, valdez, vvnittler			20	0.1	2.0	
						0.0	
						0.0	
						0.0	
						0.0	
			I		Travel Total	\$7.6	
	Project Number: 08272		•			FORM 3B	
	Floject Number. 90275			O ()))		Personnel	
1998	Project Litle: Surf Scoter life hist	ory and ecolo	gy: Linking	Satellite	& Travel		
	technology with traditional knowl	edge to conse	erve the reso	ource.	DETAIL		
2 of	Agency: ADFG				L	6/2	
Premared: April 97							

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5/97



October 1, 1997 - September 30, 1998

Contractual Cos	ts:		Proposed
Description			FY 1998
Warehouse for ea	uipment storage and maintenance - 7 months @ \$775/mo		5.5
Air charter for fiel	d support 4 hrs @ \$250/hr		3.0
Boat and outboar	d motor repair		3.0
Trailer and boat r	noorage Valdez/Cordova		0.1
Photo processing			0.2
Vessel support fo	r winter surveys 10 days @1500/day	,	15.0
Satellite telemetry	/ data downloading		10.0
Air freight - equip	ment shipment		0.5
Veterinarian	Surgical Implants		3.0
Anesthetist	Administer anesthetics		2.0
When a non-trust	ee organization is used, the form 4A is required. Con	tractual Total	\$42.3
Commodities Co	osts:		Proposed
Description			FY 1998
Boat fuel 1/5 gai	ions @ \$1.50/gai electronic parte press fuel lines fuel filters water filters bettes: cheerbest room oil emersons room		0.3
Eigld supplies- re	biacement parts, props, ruer lines, ruer liners, water liners, battery, absorbent rags, oil, emergency pro	ovisions	1.0
Computer active	refer enclusion arophical menoine		0.3
Computer soliwa	ie for analysis, graphing, mapping		0.8
Surf scotor lea b	ind supplies		0.0
Mist nots and tra	nius 200@ \$ mband		0.2
Satellite radio tra	pring equipment permitters = 10 @ \$3,000 each		1.0
Veterinarian sura	ical supplies		30.0
2 - Inflatable Sea	Kavake and 6 sets naddles		1.0
2 - Pet carriers	\$60.00 each		1.0
10 - External radi	o transmitters w/2-3 week duration @\$145 each		1.5
TU - External radi	Comm	odities Total	1.0 (29 A
IL		vulles IUIdi	μφ30.4
ſ <u>`</u>	Decide at Number 20072		
	Project Number: 982/3		
1998	Project Title: Surf Scoter life history and ecology: Linking Satellite	၂၂၀၀	ntractual &
	technology with traditional knowledge to conserve the resource.	Co	mmodities
	Agency: ADFG		DETAIL

Prepared:April 974

OUNCIL PROJECT BUDGET 1998 EXXON VALDEZ TRUST

October 1, 1997 - September 30, 1998

New Equipment Purchases:		Number	Ünit	Proposed
Description		of Units	Price	FY 1998
Innnova Inflatable Kayaks-	telephone bid REI	4	0.7	2.8
(these kayak	s serve different functions than those ordered under commodities			0.0
and will often	all be in use simulaneously with the others)			0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
Those purchases associated wi	th replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$2.8
Existing Equipment Usage:			Number	Inventory
Description			of Units	Agency
20 ft. Caribe rigid hull inflatable			1	ADFG
17 ft. Boston Whaler			1	ADFG
10x40 binoculars			4	ADFG
Spotting Scopes			2	ADFG
Achilles 8 ft inflatable dinghy			2	ADFG
Remington Shotguns			2	ADFG
Honda generators			3	ADFG
Survival Suits			2	ADFG
Outboard Motors/various hp			6	ADFG
Mageilan GPS			3	ADFG
Marine VHF radios			4	ADFG
	Decident Numbers 00072			
			F	ORM 3B
1998	Project Litle: Surt Scoter lite history and ecology: Linking	Satellite	E	quipment
	technology with traditional knowledge to conserve the reso	ource.		DETAIL
	Agency: ADFG			
Prepared: April-97			B-second	e 10
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Revision 6-25-97 approved TC 8-6-97

PROPOSAL FOR A DOCUMENTARY FILM ON THE SUBSISTENCE USE OF HERRING AND HERRING SPAWN AND RESOURCES IN THE NEARSHORE ECOSYSTEM IN PRINCE WILLIAM SOUND

Project Number:	98274	
Restoration Category:	Subsistence Restoration	
Proposer:	Tatitlek Village Council	
Lead Trustee Agency:	Alaska Department of Fish and Game	UU JUN 2 5 1997
Alaska SeaLife Center:		
Duration:	1 st year, 1 year project	TRUSTEE COUNCIL
Cost FY 98:	\$89.6	
Cost FY 99:	0.0	
Cost FY 01:	0.0	
Cost FY 02:	0.0	
Geographic Area:	Prince William Sound	
Injured Resource/Service:	Herring; the nearshore ecosystem and su	ibsistence

ABSTRACT

The purpose of this project is to produce a 28 minute documentary film on the subsistence use of herring, herring spawn, and nearshore ecosystem resources in Prince William Sound. Historically, the nearshore ecosystem produced critical resources for subsistence users including: herring spawn, octopus, clams, mussels, sea otters, harlquin ducks, and chitons. In the harbor seal documentary (project 96214) Tatitlek residents discussed their view of the relationship between the *Exxon Valdez* oil spill, Pacific herring populations, harbor seals populations and their ability to pursue subsistence. This film will expand on this discussion by documenting all facets of herring and nearshore ecosystem resource use including the ecological and biological knowledge people use to harvest those resources.

INTRODUCTION

Subsistence uses of natural resources are essential to the economies and cultures of the communities in the oil spill region. In FY 96, the Trustee Council provided funding (96214) to produce a documentary on subsistence harbor seal hunting in Prince William Sound. The project was proposed by the village of Tatitlek, which depends heavily on subsistence harvests of harbor seal, Pacific herring and other marine resources. When first proposed, it was the intention of the village council and the Department of Fish and Game, Division of Subsistence to produce a series of films that would cover each species effected by the oil spill. This proposal is for a film on the subsistence uses of herring, herring spawn, and nearshore ecosystem resources in Prince William Sound.

NEED FOR THE PROJECT

A. Statement of Problem

The injured service this project addresses is subsistence. The injured resources are Pacific herring and those resources found in the nearshore ecosystem including herring spawn, clams, cockles, mussels, octopus, chitons, and harlequin ducks. In Prince William Sound, chitons and octopus provide fresh, easily accessible sea food during the winter months. For example, in 1988, households in Tatitlek harvested a total of 1,600 pounds of octopus and 173 pounds of chitons (Stratton 1990). In the spring, spawning activity around Tatitlek draws the community out on to the beaches to pick herring spawn for home use and children fish for herring with rod and reel. In 1988 Tatitlek residents harvested 3,100 pounds of roe on kelp and 1,500 pounds of herring (Ibid.). Throughout the summer, people harvest clams, cockles, and mussels.

Much of the oil from the *Exxon Valdez* was deposited in the nearshore zone severely disrupting harvest activities and creating concerns about the safety of those resources contaminated by the oil spill. The 1993 population crash of herring in Prince William Sound brought a further halt to important subsistence and commercial activities and increased residents unease regarding the long term effects of the oil spill. This project will provide local people an opportunity to be a part of the effort to help in the recovery of herring and nearshore resources, and in so doing, put them in contact with researchers and information about these critical resources. It is the hope of the community that their knowledge of these resources, and their view about the importance of the subsistence be communicated through the film to the Trustee Council, scientists, and the general public.

B. Rational/Link to Restoration

The restoration objective for subsistence states that recovery will have occurred when "the cultural values provided by gathering, preparing, and sharing foods are integrated into community life" (p.82). One strategy to meet this objective is to "facilitate the participation of and communication with subsistence users in the restoration process" (p.86). The decline in herring roe on kelp and nearshore resources such as octopus has greatly affected subsistence harvesting, resulting in lost opportunities to teach subsistence skills and traditional knowledge associated with these resources. One means of preserving these skills and knowledge are transmitted to the next generation and integrated into on going restoration efforts is to document them on film.

The intent of this project is to contribute to the restoration of herring and nearshore ecosystem resources and subsistence uses by providing a medium for harvesters to transmit their knowledge and observations, gained from years of experience, to the scientific community. Currently no medium exists that presents harvesters' knowledge within its own contextual framework. Producing this video will help fill this void and enhance the restoration of Pacific herring and nearshore resources by providing a harvester's perspective on herring and nearshore ecology. As such, this project will contribute to various restoration strategies including: Sound Ecosystem Assessment; the Enhancement of Subsistence Resources; Increase Involvement of Subsistence Users in the Restoration Process; and project 97248 Documentation of Herring and Other Forage Fish Natural History Through Local and Traditional Ecological Knowledge.

C. Location

Filming will take place in Tatitlek and other locations in Prince William Sound.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

This project was initially proposed by the Tatitlek village council. A subcontract will ensure community involvement in the production of the film. The council and chief Gary Kompkoff, will be involved in selecting a contractor for the film and in decisions concerning content of the film.

PROJECT DESIGN

A. Objectives

The overall objective of this project is to promote the recovery of injured Pacific herring populations and nearshore resources and the subsistence use of herring, herring spawn and nearshore resources through the production of a documentary on the subsistence uses of these resources in Prince William Sound. This includes harvesting techniques, methods of processing, the distribution of resources and the traditional knowledge employed in the harvest of herring, roe on kelp and nearshore resources.

B. Methods

A twenty-eight (28) minute documentary film will be produced through a professional services contract. The film will document subsistence nearshore and herring harvests in Prince William Sound, primarily focusing on the village of Tatitlek. A film crew will visit the village for several days in January to film the distribution of subsistence resources during the celebration of Russian Christmas, and for one week in April and May of 1998 to document the harvest and distribution of herring and herring roe on kelp, octopus, clams and other nearshore resources. Interviews will be conducted with a wide spectrum of the community to gather traditional knowledge and views about the importance of these resources and subsistence to the community. In collecting this information the film project will also tie in with project 97248 Documentation of Herring and other Forage Fish Natural History through Local and Traditional Ecological Knowledge. A subcontract within the contract supports community involvement. In FY 99, the documentary will be completed, presented in a public screening in Tatitlek and Anchorage, and distributed to oil spill affected communities, libraries, tribal authorities, agencies, and non-governmental organizations.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

The production and post production work on the film will be contracted out to an experienced film maker who has the expertise to make a quality film. In contracting out for this production the proposers want to hire someone who will actually create and produce the product rather than contracting out for creative talent. By hiring a video production company the proposers will maintain control over all aspects of the process. In consultation with the community and ADF&G staff the video production company will create a story line before shooting the film. All footage will be shot on location and include interviews with members of the community and footage of harvesters. Once the film is completed the production company will edit the footage using digital state of the art editing equipment.

SCHEDULE

A. Measurable Project Tasks for FY 98 (October 1, 1997-September 30, 1998)

October 1, 1997:

Project Approval

October - November 1997:	Develop contract guidelines, evaluate bids, award contract.
December 1997 - January 1998:	In consultation with harvesters and ADF&G staff, contractor will develop story line for
January 1008	Travel to Tatitlek and film necessary
January 1996.	footage.
April 1998 - May 1998:	Travel to Tatitlek and Prince William Sound
June 1008 - November 1008	Edit film
Julie 1998 - November 1998.	
December 1998:	Contractor will provide completed film and
	deliver 100 copies.

A. Project Milestones and Endpoints

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A. Completion Date

December 1998

PUBLICATION AND REPORTS

The film will be widely distributed to federal and state agencies, nongovernmental agencies, and interested parties. Showings will take place in Tatitlek, Anchorage, and Cordova.

PROFESSIONAL CONFERENCES

The film may be shown at professional conferences.

NORMAL AGENCY MANAGEMENT

This project does not fall under existing statute or regulation governing the activities of the Alaska Department of Fish and Game, Division of Subsistence.



COORDINATION AND INTEGRATION OF RESTORATION EFFORT

This project will contribute to various restoration strategies including: Sound Ecosystem Assessment; the Enhancement of Subsistence Resources; Increase Involvement of Subsistence Users in the Restoration Process; and especially project 97248, Documentation of Herring and Other Forage Fish Natural History Through Local and Traditional Ecological Knowledge. The proposer has been in contact with the principal investigator of project 97248 and we have discussed coordinating efforts regarding documentation of local knowledge of Pacific herring. For example, we plan to film sessions when local people discuss their knowledge of herring.

PROPOSED PRINCIPAL INVESTIGATOR

Gary Kompkoff Chief, Tatitlek Village Council Tatitlek, Alaska (907) 325-2311

William E. Simeone Subsistence Resource Specialist II Alaska Department of Fish and Game Division of Subsistence (907) 267-2309

PRINCIPAL INVESTIGATOR

Gary Kompkoff

Mr. Kompkoff is a life long resident of Tatitlek and life long harvester of subsistence foods. He has president and chief of the Tatitlek village council for over ten years.

William E. Simeone

Dr. Simeone has worked in oil spill and subsistence related projects in Prince William Sound for the last seven years. Two of those years have been with the Alaska Department of Fish and Game, Division of Subsistence. Dr. Simeone also administered, coordinated, and consulted on the harbor seal documentary.



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and a subtraction of the second s	Authorized	Proposed						
Budget Category:	FY 1997	FY 1998						
Personnel		\$11.2						
Travel		\$1.8						
Contractual		\$70.0						
Commodities		\$0.0						
Equipment		\$0.0		LONG RA	NGE FUNDIN	G REQUIREN	MENTS	
Subtotal	\$0.0	\$83.0		Estimated	Estimated	Estimated	Estimated	
General Administration		\$6.6		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$0.0	\$8 9.6		\$0.0	\$0.0	\$0.0	\$0.0	
Full-time Equivalents (FTE)		0.2						
			Dollar amount	s are shown in	thousands of	dollars.		
Other Resources								
, 1998 Prepared: 6/23/98 9	Project Nun Project Title Agency: Al	nber: 98274 e: Herring a aska Depai	I nd Nearshor tment of Fis	re document h and Game	ary e			FORM 3A TRUSTEE AGENCY SUMMARY



Personnel Costs:		GS/Range/	Months	Monthly	1	Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 1998
Bill Simeone	Coordinator/Consultant/Administrator	SRS II	2.5	4.5		11.2
						0.0
						0.0
						0.0
]	0.0
						0.0
						0.0
						0.0
						0.0
					1	0.0
						0.0
	L		2.5	4.5	0.0	0.0
	Subiolai		2.5		0.0 sonnel Total	\$11.2
L		Ticket	Round	Total	Doilu	Qrepood
Description		Price	Trine	Tulai Dave	Por Diam	EV 100
Two round trips to Tatitlek and F	Prince William Sound	0.4	2		0 1	18
		0.4	-	10	0.1	1.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
					Travel Total	\$1.8

1998Project Number: 98274
Project Title: Herring and Nearshore documentary
Agency: Alaska Department of Fish and GameFORM 3B
Personnel
& Travel
DETAILPrepared:6/23g93f 96/2

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6/24/97



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1998 EXXON VALDEZ TRUS October 1, 1997 - September 30, 1998



Contractual Cos	ts:	Proposed
Description		FY 1998
The Alaska Depa maker. Of this to	rtment of Fish and Game, Division of Subsistence will develop a request for proposal for a documentary film tal, \$10k will go to the local community.	70.0
		670.0
vvnen a non-trust	tee organization is used, the form 4A is required.	\$70.0
Commodities Co)5(5.	FV 1908
Description		111330
	Commodities Total	\$0.0
		ORM 3B
1000	Project Number: 982/4 Col	ntractual &
1330	Project Title: Herring and Nearshore documentary	mmodities
	Agency: Alaska Department of Fish and Game	DETAIL
Prepared:6/23/9/	f9	6/2

COUNCIL PROJECT BUDGET 1998 EXXON VALDEZ TRU

October 1, 1997 September 30, 1998

New Equipment Purchases:	Number	Unit	Propose
Description	of Units	Price	FY 199
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.0
Existing Equipment Usage:		Number	Inventor
Description		of Units	Agenc
1998 Project Number: 98274 Project Title: Herring and Nearshore documentary Agency: Alaska Department of Fish and Game		F Ec	ORM 3B quipment DETAIL

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Revision 12/22/97 adopted TC 12/18/97

Project Title:Native Village of Eyak
Youth/Elders Subsistence Conference

Project Number: 98286

Restoration Category: General Restoration

Proposer Native Village of Eyak Tribal Council

Lead Trustee Agency: Department of Interior

Cooperating Agencies: None

Duration: 1 year

Cost FY98: \$90,200.00

Geographic Area: Oil Spill Area

ESTERNE DEC 29 1901 DEC 29 1901 EXXON WALDEZ OIL SPILL EXXON WALDEZ COMMON TRUSTEE COMMON

Injured Resource/Service: All Injured Resources/Services



ABSTRACT

This project would bring together Elders and other traditional knowledge bearers, students who are participating in the Youth Area Watch Project (/210), and principal investigators from EVOS-sponsored research projects to create a forum for the exchange of information between Western scientific ways of knowing and traditional ways of knowing. The forum will give rise to possible collaborative efforts between local community members and research scientists in designing FY99 EVOS projects. In addition, it will facilitate a re-examination of the positive outcomes from the Community Conference on Subsistence and the Oil Spill, which was held in September of 1995.

INTRODUCTION

The goal of this project is to promote the recovery of subsistence uses of natural resources through the exchange of relevant information of the Exxon Valdez oil spill from two cultural perspectives. One perspective is that of the local person who has lived through the experience and who now uses tradition knowledge, knowledge which has been observed and handed down throughout the cultural heritage of the people, to base their assessment of the recovery of the ecosystem. The other perspective, the western scientific approach, is grounded in a quantitative orientation that uses a process of hypotheses, controlled experiments and formal confirmation Throughout the conference, there will be presentations from a panel of principal investigators and local resource experts. These panelists will be clustered in groups similar to the ones used in the annual work plan by the Restoration Office. Individuals from both traditions will speak about their research and/or knowledge about a specific species or ecosystem. Such a conference will facilitate the discussion between the generations and between natives and the scientific community regarding subsistence practices, means of assisting in the recovery of injured resources, and to share information on current research in an easy-to-understand forum.

In FY97, the Exxon Valdez Oil Spill Trustee Council provided \$15,000 to plan for this conference. Although the funding did not become available until late FY97, planning activities continued as originally proposed to make this conference a reality. Community meetings have been held over the past year to plan for this conference. The conference is scheduled for the first week in May, 1998, and will be held alternatively between the local high school and the tribe's conference hall (Masonic temple). Suggested speakers include Evelyn Biggs-Brown (herring); Dave Scheels (octopus); Craig Matkin (killer whales); Kathy Frost and/or Kate Wynn (harbor seals); Ted Cooney (SEA Project); and someone to speak on behalf of the APEX and NVP projects. In addition, speakers from the oil spill impacted communities will also be invited, including Don Kompkoff, Bob Henrichs, Lydia Robart, Mike Eleshansky, Elenore McMullen, Walter Meganack, Jr., Larry Evanoff, Fr. Michael Oleksa, as well as speakers from Kodiak and the Alaska Peninsula.

Participants will include all people from the oil spill affected area; however, we are proposing to pay for travel for at least one elder and two youth from each of the 21 communities. An estimated 300 participants are expected at this event. A tentative agenda has been developed as well as a conference planning guide to assist the planning committee in their efforts. Both of these documents are attached to this Detailed Project Description.

NEED FOR THE PROJECT

A. Statement of Problem

The need for this project is established by three factors:

- 1. The request by local communities to continue the momentum established under the first elders/youth conference.
- 2. The need to discuss the results of the Traditional Ecological Knowledge projects(s) with a broad range of elders from the region, while simultaneously making the youth aware of this information.
- 3. The difficult process of providing the communities, and the public in general, the often technical results of the many EVOS-sponsored biological/ecological research efforts.



B. Rationale/Link to Restoration

Subsistence uses of natural resources are essential to the economies and ways of life of communities affected by the oil spill. After the spill, these uses were severely disrupted due to natural resource injuries and concerns about the safety of using subsistence foods that may have been contaminated by oil. Because of these reduced subsistence uses, opportunities to teach subsistence skills and traditional knowledge have also been diminished.

The restoration strategy for subsistence has four parts, including an objective "to accelerate recovery of subsistence resources and services." One means to achieve this goal is "through increasing availability, reliability or quality of subsistence resources, or increasing the confidence of subsistence users." Increasing the confidence and understanding of subsistence users will be achieved from two directions:

1. By gathering of knowledgeable individuals (including elders) and young people to address how natural resource injuries and other problems raised by the spill have been overcome by the employment of traditional knowledge and values.

2. By having western scientists provide their perspective on the recovery and health of resources in the region.

The conference will discuss and disseminate traditional knowledge about resource conservation and subsistence uses, and about the common experiences shared by subsistence users and researchers since the spill. This would complement the work done under the Subsistence Foods Testing Project (93017/94279/95279), which has principally involved bringing scientific information to subsistence users. Additionally, this project will assist with the restoration of subsistence resources through monitoring of the recovery of subsistence uses.

C. Location

This conference will take place in Cordova at both the Cordova High school and the Native Village of Eyak's conference hall (Masonic temple). In addition, Cordova also has an Elks Hall, Moose Hall, City Library, two motels, many bed and breakfast businesses, and the tribe may be able to gain limited access to the North Pacific Processors bunkhouse.

COMMUNITY INVOLVEMENT

Representations made by local communities have been the impetus for this proposal. The conference will be run locally and with the exception of some airline charters, all logistical issues will be addressed with local resources. The Native Village of Eyak will organize a planning committee which will include members of the local community and other community facilitators.

PROJECT DESIGN

A. Objectives

The major objective of this conference is to provide a context for the exchange of information and understanding on the health and recovery of resources within the oil spill area. This information will be exchanged from two perspectives, that of traditional ecological knowledge and that of Western science. Written conference proceedings and a video which summarize the conference and its findings and recommendations will also be produced and distributed. It is hoped these materials will provide the foundation for a public outreach effort intended to communicate the health and well being of the region ten years after the spill.

It is also hoped that conference participants will identify, discuss and bring examples of positive and sustaining processes that have dealt with the injured suffered by the natural resources and the activities associated with subsistence uses.

B. Methods

A Conference Planning Coordinator has been hired and will be responsible for putting together a conference planning committee comprised of local community members, community facilitators, principal investigators, and Restoration Office staff to perfect the draft agenda, and to plan, organize and develop conference logistics as outlined in the attached conference planning guide. It is anticipated that the following contacts will be made during the conference planning and development process:

1. Elders, hunters, and fishers in oil spill impacted communities to discuss their agenda issues, select potential speakers, and to secure their logistical support for conference provisioning.

2. Community Facilitators, the Spill Area Wide Community Involvement Coordinator, and the TEK Specialist to integrate their issues into the conference agenda and obtain their support in developing this Elders/Youth Conference.

3. EVOS staff and EVOS principal investigators to coordinate their participation and to explicitly develop their contributions to the conference.

The conference will be video-taped and audio-taped. A proceedings volume will be prepared. A summary video, approximately 30 minutes in length, will also be produced to present the conference highlights and recommendations. A full video of the conference could be made available for viewing upon request. It is intended that the proceedings and video be used as educational tools to promote an exchange of information and to strengthen subsistence traditions throughout the region. In addition, conference materials can serve as a basis for subsequent graphic or multimedia presentations that may be jointly developed by the TEK and various other science projects to commemorate the status of the spill area ten years after the oil spill.

The conference will last two and one-half days. Each community of the spill area will nominate one elder, two students (high school or college aged) and one additional representative. In addition, a variety of principal investigators will be solicited to participate in the conference. A balance will be sought between specific species/resource projects and overall ecosystem and analytical investigations. The conference itself will likely consist of formal presentations, panel discussions, and question/answer periods.

Milestones of this project will be accomplished, as follows:

- 1. A noted regional facilitator will be appointed to serve as the conference moderator.
- 2. The conference-will occur in early May, 1998
- 3. A separate contract will be awarded to videotape the conference and to produce an edited video presentation
- 4. Conference proceedings and products will be produced in draft form and sent to participants for their review and analysis
- 5. Final products of the conference will be distributed by the end of the project period.

C. Cooperating Agencies, Contracts, and other Agency Assistance The Bureau of Indian Affairs, Department of Interior, will implement this project through a cooperative agreement with the Chugach Regional Resources Commission and the Native Village of Eyak under P.L. 93-638.

BUDGET

Budget Line Items	Budget Amount
Salaries	\$8,000.00
Fringe (20%)	2,000.00
Travel	48,400.00
Staff Travel	2,500.00
Participant Travel	41,000.00
Speakers Travel	4,900.00
Conference Materials	2,500.00
Reproduction	500.00
Conference Proceedings	6,000.00
Telephone	1,200.00
Meeting Expenses	4,000.00
Cooks	500.00
Rentals	500.00
Meeting Facility	3,000.00
Administration of Grant	7,700.00
Total	\$84,300.00

<u>Salaries</u>: Salaries are for the Conference Planning Coordinator, who will be paid at the rate of \$20,000 per annum for a full time position. Specific duties for this position are included in the Conference Planning Guide.

<u>Fringe</u>: Fringe is calculated at the rate of 20% which includes all payroll tax related costs, including workers compensation.

<u>Travel</u>: Travel is broken down into three categories for administrative purposes. The Conference Planning Coordinator is allocated \$2,500 to travel to the villages in the spill area to meet with the communities and obtain their input into the agenda and other aspects of the conference. \$41,000 is included in this line to pay for travel for at least two individuals from each spill affected community to attend the conference. This figure was derived by utilizing known costs for traveling to Cordova from those particular communities participating in this project. Finally, the project is proposing to pay for speakers travel, which is calculated at \$4,900 for approximately 7 speakers not including community members, whose travel will be paid out of the \$41,000 mentioned above.

<u>Conference Materials</u>: This includes conference folders, pens, tablets, and educational materials which will be provided for the conference participants.

<u>Reproduction</u>: This will cover the cost of printing the agenda and other information the presenters may wish to include in the conference packets.

<u>Conference Proceedings</u>: A contract will be developed with a professional videographer to record the conference and edit the conference material into a 30 minute video which will be available for distribution after the conference.

<u>Telephone</u>: Local and long distance telephone costs for the Conference Planning Coordinator are covered by this line item, as well as any conference calls that may need to be made for the Conference Planning Committee. This is calculated at a rate of \$100/month.

<u>Meeting Expenses</u>: Although donations will be solicited for the coffee breaks and traditional feast, it is anticipated that approximately \$4,000 is needed to pay for coffee, donuts, and soda for the coffee breaks, eating utensils, paper plates, salt/pepper, butter, bread, and other basic items needed for the traditional feast.

<u>Grant Administration</u>: It is anticipated that the Native Village of Eyak will require 10% of the total grant for administration purposes.

SCHEDULE

A. Measurable Project Tasks for FY98

October 1, 1997	Hire Conference Planning Coordinator
November 15, 1997	Select Conference Planning Committee and conduct first planning meeting
November 30, 1997	Send out letters of invitation to speakers identified in Year I to participate
December 15, 1997	Confirm selected speakers for conference from draft agenda developed in Year I; conduct second Conference Planning Committee meeting; identify subcommittees for traditional feast, dance groups, fundraising, agenda development, conference proceedings, etc. Identify host hotel and meeting site; prepare conference announcement
January 5, 1998	Send out first conference announcement with agenda; Place announcements in appropriate newsletters and newspapers
January 15, 1998	Conduct 3rd Conference Planning Committee meeting; work on second draft of agenda
February 15, 1998	Conduct 4th Conference Planning Committee meeting; reports made on progress to ensure planning is on track; finalize agenda and speakers
March 1, 1998	Send out second conference announcement, including mailings to newspapers, regional organizations, EVOS newsletter, Chugachmiut newsletter, etc.
April 15, 1998	Conduct 5th Conference Planning Committee meeting; reports made to finalize last minute details
May 7-9, 1998	Hold Conference
June 15, 1998	Send out thank you letters to speakers, dancers, granting agencies, volunteers, and other participants who contributed to the conference
September 30, 1998	Distribute Conference Proceedings

B. Completion Date

The project will be completed by September 30, 1998.



PUBLICATIONS AND REPORTS

The Conference Proceedings will be submitted under the EVOS final report procedures on September 30, 1998.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

Information about the status of injured natural resources and potential means towards recovery based upon scientific studies should be integrated into the conference. Conference findings, including observations by subsistence harvesters of natural resource populations, will be available for use by other researchers through written conference proceedings and video tapes. Other proposed subsistence restoration projects (e.g., 98052/Community Involvement; 98352/TEK: Consolidated Approach; 95244/Seal and Sea Otter Cooperative Harvest Assistance) also have public information components that will benefit from information which is shared through the conference and its resultant products. This project (93017/94279/95279).

PROPOSED PRINCIPAL INVESTIGATOR

Bob Henrichs, President Native Village of Eyak Tribal Council P.O. Box 1388 • Cordova, Alaska 99574

YOUTH/ELDERS SUBSISTENCE CONFERENCE May 7-9, 1998 - Cordova, Alaska

DRAFT AGENDA

Thursday, May	<u>7, 1998</u> :
9:00 a.m.	Welcome - Bob Henrichs, President, Eyak Tribal Council
9:15 a.m.	Dance Group - Eyak Tribal Dancers
9:45 a.m.	Panel Presentation - SEA Project (Ted Cooney, Moderator)
10:30 a.m.	Break
10:45 a.m.	Panel Presentation (continued)
Noon	Break for Lunch
1:00 p.m.	Panel Presentation - Community Involvement/TEK Project (Hugh Short/Henry Huntington, Moderators)
2:00 p.m.	Response from Communities
3:00 p.m.	Elders Panel - Sharing of Knowledge
5:00 p.m.	Nanwalek Dance Group and Adjourn for the Day
<u>Friday, May 8,</u> 9:00 a.m.	<u>1998</u> : Panel Presentation - APEX Project
10:30 a.m.	Break
10:45 a.m.	Panel Presentation - NVP Project (Lisa Thomas, Moderator)
12:00 p.m.	Break for Lunch
1:00 p.m.	Herring Project - Evelyn Biggs-Brown Octopus Research - David Scheels Killer Whales - Craig Matkin Harbor Seals - Kathy Frost/Kate Wynn Clam Restoration Project - Jon Agosti/Jeff Hetrick
Friday, May 8,	<u>1998 (continued)</u> :

9

2:30 p.m.	Response from Communities
3:00 p.m.	Break
3:15 p.m.	Roundtable Discussion on Ways to Assist Recovery Effort
5:00 p.m.	Kodiak Dance Group and Adjourn for the Day
6:30 p.m.	Traditional Feast/Video/Storytelling by Elders
<u>Saturday, May</u> 9:00 a.m.	<u>9, 1998</u> : Atka Dancers
9:15 am.	Youth Panel - Visions for the Future
10:1 5 a.m.	Break
10:30 a.m.	Open Discussion on Recovery of Subsistence Ways
12:00 p.m.	Adjourn





1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

	Authorized	Proposed						
Budget Category:	FY 1997	FY 1998						
Personnel		\$0.0						
Contractual		\$0.0						
Commodities		\$0.0						
Equipment		\$0.0			ANGE EUNDIN	G REQUIREMEN	NTS	
Subtotal	\$0.0	\$84.3		mated	Estimated	Estimated	Estimated	
General Administration		\$5.9	FY	1999	EY 2000	EY 2001	FY 2002	
Project Total	\$0.0	\$90.2		\$0.0	\$0.0	\$0.0	\$0.0	
	+0.0	+00.2	I		+0.0		+0.0	
Full-time Equivalents (FTE)		0.0						
			Dollar amounts are s	shown in	thousands of d	ollars.		
Other Resources				-				
Comments:								
DEC 2 9 1997								
						ľď.	DEC 291	
						EXX	DEC 2 9 1 ON VALDEZ (TRUSTEE CO	AED 997 DIL SPILL
						EXX	DEC 291 DEC 291 ON VALDEZ (TRUSTEE CO	VED 997 DIL SPILL IINCIL
	Project Numl	ber: 98286				EXX	DEC 291 DEC 291 ON VALDEZ (TRUSTEE CO	FORM 3A
1998	Project Numl Project Title:	ber: 98286 Elders/You	th Conference			EXX	DEC 291 DEC 291 ON VALDEZ O TRUSTEE CO	JED 997 DIL SPILI INCII FORM 3A TRUSTEE
1998	Project Numl Project Title: Name: U.S.	ber: 98286 Elders/You Department	th Conference of Interior			EXX	DEC 291 DEC 291 ON VALDEZ (TRUSTEF CO	JED 997 DIL SPILI INCII FORM 3A TRUSTEE AGENCY
1998	Project Numl Project Title: Name: U.S.	ber: 98286 Elders/You Department	th Conference of Interior			EXX	DEC 291 DEC 291 ON VALDEZ O TRUSTEE CO	FORM 3A TRUSTEE AGENCY SUMMARY





1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 1998
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		0.0	0.0	0.0	
			······	F	Personnel Total	\$0.0
Travel Costs:		Ticket	Round	Total	Daily	Proposed
Description		Price	Trips	Days	Per Diem	FY 1998
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
					Travel Total	\$0.0
····		·		1		
	Designed Numbers 00000					FORM 3B
1009	Project Number: 98286		-			Personnel
1330	Project Title: Elders/Youth Conferen	се				& Travel
	Name: U.S. Department of Interior					DETAIL



Contractual Costs:	Proposed
Description	FY 19 98
638 contract with Native Village of Eyak	84.3
When a non-trustee organization is used, the form 4A is required. Contractual Total	\$84.3
Commodities Costs:	Proposed
Description	FY 1998
Commodities Total	\$0.0
1998 Project Number: 98286 Project Title: Elders/Youth Conference Con Name: U.S. Department of Interior Interior	ORM 3B stractual & mmodities DETAIL

1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET October 1, 1997 - September 30, 1998

New Equipment Purchases:	adan kanan ang ang ang ang ang ang ang ang ang	Number	Unit	Proposed
Description		of Units	Price	FY 1998
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
Those purchases associated with I	replacement equipment should be indicated by placement of an R.	New E	quipment Total	\$0.0
Existing Equipment Usage:			Number	Inventory
Description			of Units	Agency
1998 Prepared: 12/28/97	Project Number: 98286 Project Title: Elders/Youth Conference Name: U.S. Department of Interior		E	FORM 3B Equipment DETAIL
4 01 8				12/29/97


1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

	Authorized	Proposed						
Budget Category:	FY 1997	FY 1998						
Personnel	· · · · · ·	\$10.0						
Travel		\$48.4						
Contractual		\$11.7						
Commodities		\$6.5						
Equipment		\$0.0		LONG	RANGE FUNDI	NG REQUIREMI	ENTS	
Subtotal	\$0.0	\$76.6		Estimated	Estimated	Estimated	Estimated	
Indirect		\$7.7		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$0.0	\$84.3		\$0.0	\$0.0	\$0.0	\$0.0	
Full-time Equivalents (FTE)		5.0						
		<u></u>	Dollar amounts	are shown in	thousands of o	Iollars.	· ·	
Other Resources		· <u>·····</u>	l		. <u></u>			<u> </u>
1998 Prepared: 12/28/97 5 of	Project Num Project Title Name: Nati 8	nber: 98286 : Elders/You ve Village of	th Conferenc Eyak	e				FORM 4A Non-Trustee SUMMARY 12/29/97



1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Pers	onnel Costs:			Months	Monthly		Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FY 1998
	Altana Olson	Conference Planner (includes 20% fringe)		5.0	2.0	0.0	10.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
		Subtotal		5.0	2.0	0.0	
					F	ersonnel Total	\$10.0
Trav	el Costs:		Ticket	Round	Total	Daily	Proposed
	Description		Price	Trips	Days	Per Diem	FY 1998
	RT to Cordova from:						0.0
	Participant travel						0.0
	Nanwalek, Port Graham, S	Seldovia	0.5	9	27	0.1	7.20
	Kodiak, Akhiok, Old Harbo	or, Karluk, Port Lions, Larsen Bay, Ouzinkie	0.8	21	63	0.1	23.1
	Chignik Bay, Chignik Lago	oon, Chignik Lake, Perryville	0.8	12	36	0.1	13.2
	Seward		0.3	3	9	0.1	1.8
	Tatitlek - charter		0.3	1	9	0.1	1.2
	Chenega Bay, Valdez - ch	arter	0.4	2	18	0.1	2.6
	Negative amount to offset	t per diem rounding (\$50 instead of the round	ed \$100)				-8.1
	Speaker Travel - 7 speakers a	it \$700 per speaker	0.7	7			4.9
	Staff travel - three round trips	s to Anchorage, two trips to locations for Con	ference Coordin	ator			0.0
	not yet specified (average am	ount used for ticket price).	0.5	5			2.5
L	<u></u>				·····	Travel Total	\$48.4
	·						<u></u>
							FORM 4B

1998		Project Number: 98286 Project Title: Elders/Youth Conference Name: Native Village of Eyak	PORM 4B Personnel & Travel DETAIL
Prepared: 12/28/97	6 of 8		 12/29/97



Contractual Costs:			Proposed
Description			FY 1998
Reproduction			0.5
Conference proceeding			6.0
Telephone expense			1.2
Meeting facility			3.0
Cooks			0.5
Rentals			0.5
		Contractual Total	\$11.7
Commodities Costs:			Proposed
Description			FY 1998
Meeting expenses (coffee,	refreshments, soda, utensils, plates, condiments, etc.)		4.0
		Commodities Total	\$6.5
1998 Prepared: 12/28/97	Project Number: 98286 Project Title: Elders/Youth Conference Name: Native Village of Eyak	F Co Co	FORM 4B ntractual & ommodities DETAIL

7 of 8



October 1, 1997 - September 30, 1998

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FY 1998
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an B	I New F	uinment Total	<u>\$0.0</u>
Existing Equipment Massay		Number	÷0.0
Description		of Linits	
		01 01113	
		Г	
Project Number: 98286			FORM 4B
1009		E	auioment
Project litle: Elders/Youth Conference			DETAIL
Name: Native Village of Eyak			
Prepared: 12/28/97			
			12/20/07

12/29/97

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Revision 6/27/97 approved TC 12/18/97

Status of Black Oystercatchers in Prince William Sound

Project Number:	98289-BAA
Restoration Category:	Research
Proposer:	S. Murphy/ABR, Inc.
Lead Trustee Agency:	NOAA
Cooperating Agencies:	None
Alaska SeaLife Center:	No
New or Continued:	New
Duration:	lst yr.
Cost FY 98:	
	\$80.4
Cost FY 99:	
Cost FY 2000:	\$0.0
Cost FY 01:	\$0.0
Cost FY 02:	\$0.0
Geographic Area:	Prince William Sound
Injured Resource/Service:	Black oystercatcher

ABSTRACT

Black oystercatchers currently are considered to be "injured with recovery unknown." Because most of the unresolved issues for this species pertain to impacts to the breeding population in Prince William Sound, this study is designed to assess aspects of the life history (e.g., phenology and productivity) of oystercatchers that potentially are spill-related for th same population of oystercatchers that was studied during 1989 - 1993. Year 1 will entail an examination of the life-history parameters that were identified by previous researchers as having been negatively impacted by the oil spill and an evaluation of whether these birds have recovered from the previously identified impacts. Data analyses will focus on comparisons of previously oiled sites with unoiled sites and among-year analyses.

INTRODUCTION

Black Oystercatchers are conspicuous denizens of intertidal and supratidal habitats throughout southcentral Alaska (Isleib and Kessel 1973), a region that was affected by the Exxon Valdez oil spill (EVOS). Because much of the long-term damage from EVOS was manifested in the intertidal zone (Day et al. 1995, 1997; Stekoll et al. 1996; Murphy et al. 1997), and because Black Oystercatchers are obligate users of the intertidal zone throughout the year, they potentially were among the most vulnerable of all birds to both acute and chronic effects of the oil spill. Indeed, virtually all bird studies following the oil spill identified Black Oystercatchers as having been negatively impacted (Klosiewski and Laing 1994; Day et al. 1995, 1997; Sharp et al. 1996; Murphy et al. 1997). Acute effects in the form of mortality (9 carcasses were recovered; EVOS Trustee Council 1996), region-wide population declines (Murphy et al. 1997), and oiled eggs (none were found in 1989; Sharp et al. 1996) did not appear to be substantial, however, suggesting that ovstercatchers were adept at avoiding direct contact with oil. On the other hand, sublethal effects due to habitat degradation and disturbance from clean-up activities were substantial, and clear signals from these impacts were evident in post-spill assessments of use of oiled habitats by oystercatchers (Klosiewski and Laing 1994; Day et al. 1995, 1997; Murphy et al. 1997) and assessments of the performance of the breeding population (Andres 1994a, 1994b; Sharp et al. 1996). Overall, there perhaps was greater consensus among the various studies on the nature of impacts to this species than for any other bird species identified as negatively impacted by EVOS.

NEED FOR THE PROJECT

A. Statement of Problem

The Black Oystercatcher currently is identified on the Trustee Council's official list of injured resources as "injured with recovery unknown" (EVOS Trustee Council 1996). Despite the known vulnerability of this species and the impacts identified by various studies after the spill, research and monitoring were curtailed prior to resolution of this species' recovery. Although reoccupancy of oiled habitats has been demonstrated by several studies (Andres 1994a; Day et al. 1995, 1997; Sharp et al. 1996; Murphy et al. 1997), impacts associated with reproductive performance of Black Oystercatchers in Prince William Sound (PWS) still were evident when studies were terminated in 1993. Hence, recovery of all aspects of breeding functions of this population has not been documented, primarily because of the termination of studies in 1993. In addition, the marine bird abundance surveys, which acquired abundance and distribution data on Black Oystercatchers as recently as summer 1996, indicated that there were no significant signs of recovery for this species (Dave Irons, USFWS; pers. comm.).

B. Rationale/Link to Restoration

This study will evaluate the status of recovery of Black Oystercatchers in western PWS. To determine whether Black Oystercatchers have recovered from the effects of EVOS, it will be necessary to evaluate the status and reproductive performance of the breeding population in formerly oiled areas and to compare those parameters with those of Black Oystercatchers from unoiled areas. Because Black Oystercatchers are conspicuous birds that are ubiquitous in PWS during summer and have readily identifiable breeding territories, they are an ideal species for conducting a cost-efficient but thorough examination of spill-related effects on the breeding population. In addition, existing pre-spill (Irons et al. 1988) and post-spill (Andres 1994b; Day

et al. 1995, 1997; Sharp et al. 1996; Murphy et al. 1997) data provide the basis for quantitatively addressing both population-level and reproductive recovery. This proposed study also will provide indirect evidence of the status of recovery of other organisms and communities that inhabit the intertidal zone in PWS, because Black Oystercatchers use some of the most heavily oiled habitats in PWS and prey on invertebrates, such as blue mussels (*Mytilus trossulus*), that are known to have been impacted by the spill (Highsmith et al. 1996).

C. Location

We propose to conduct this study in western PWS, with field work planned for Knight (Bay of Isles/Marsha Bay), Green, Little Green, Channel, and Montague (Port Chalmers) islands. These sites are the same as those studies by Sharp et al. (1996) and Andres (1994b). Thus, we propose to study the same population of Black Oystercatchers for which all of the impacts on the reproductive performance were identified.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

In FY98, we will charter a boat from a local PWS community. When requested, we will provide articles and photographs for the Trustee Council Newsletter and will be available to make public presentations of our study at appropriate forums.

Opportunities for community involvement in this project include:

- 1. Chartering boats from PWS residents;
- 2. Principal Investigators will be available to present highlights of the research program to PWS communities; and
- 3. Principal Investigators will write an article for the Trustees newsletter each year during the life of the project.

PROJECT DESIGN

A. Objectives

The overall goals of this proposed research program are to assess the status of the breeding population of Black Oystercatchers in PWS and to evaluate whether these birds have recovered from the previously identified impacts of EVOS. We propose to accomplish these goals in two phases, with Phase I (Year 1) representing a modest effort intended to evaluate efficiently but thoroughly the status of Black Oystercatchers with respect to the claims of injury made to date. If continued injury (i.e., lack of recovery) is detected, a more focused and intensive investigation will be pursued in Phase II (Year 2). If recovery can be demonstrated based on Phase I data, Phase II simply will entail publishing the results of Phase I in a peer-reviewed journal.

In Phase I, we propose to collect data on Black Oystercatchers during the breeding season in western PWS and to compare these data between oiled and unoiled territories and regions and with data collected in previous years. The specific objectives of Phase I are:

1. To evaluate the breeding status of adult Black Oystercatchers during nesting in.

- 2. To document the phenology of breeding events.
- 3. To measure the dimensions and estimate the volume of Black Oystercatchers eggs.
- 4 To assess the hatching success of Black Oystercatchers.
- 5. To estimate the mortality rate of Black Oystercatchers chicks.
- 6. To measure rates of development of Black Oystercatcher chicks.

B. Methods

This study proposes to evaluate the status of recovery of Black Oystercatchers during the breeding season in southwestern PWS. We propose to conduct 30 days of sampling from late May/early June to late June/early July that would overlap with most of the nesting and brood-rearing periods for oystercatchers in this region. Project personnel will live in field camps on Green Island and Knight Island; survey work primarily will be conducted from a 12–15 ft inflatable skiff. Two biologists will conduct the field work, which will entail 3 distinct periods of activity, each of which will take approximately 10 days to complete.

1. Nesting Surveys—Two sets of nearshore boat surveys will be conducted from late May/early June to ~10 June to locate all breeding pairs of Black Oystercatchers in the study area. Established nests will be located and checked for clutch size, phenology (egg floating technique; Alberico 1995), egg volumes (calculated from length and width measurements, following Andres 1994b). Intertidal and supratidal and habitat characteristics will be evaluated and recorded at each nest site.

The second nesting survey will be begun immediately after the initial survey, to find new nests or second nests of pairs that had failed in their initial attempt, to check on the status of known nests, and to collect data at any nest sites not recorded during the first visit. We anticipate that the earliest nesters will have hatched young and begun brood-rearing late in the nesting surveys.

- 2. *Hatching Success Survey*—During the hatching period, we will opportunistically monitor hatching success (i.e., number of young hatched) at as many nest sites as possible. Because we anticipate that hatching will occur over a period of up to 2 weeks, we will move among the nests in a sequence based on estimated hatching dates (as derived from floating eggs). Numbers of chicks hatched at each site will be determined, and nest contents will be inspected for signs of predators. Any unhatched eggs will be collected for future analyses.
- 3. **Brood Surveys**—Brood surveys will commence as soon as chicks are known to be at least 7 days old. During these survey, we will capture, band, and measure developmental rates (mass, exposed culmen length, flattened wing length, and diagonal tarsus length) for individual chicks. Feather development will be assessed to help with aging the brood (following Prater et al. 1977). Chicks also will be photographed for comparative aging after the field season. Although we will not be able to band and acquire growth measurements for all chicks in the study area, we will monitor chick survival at all nests in the study area. We then will revisit the brood-rearing areas where the chicks were banded and capture and recapture as many chicks as possible. Optimally, recaptures of

individuals will occur 7–10 days after the initial measurements were taken. Growth measurements again will be taken for all captured chicks, and feather development will be reassessed. Again, all nests in the study area will be visited to locate the brood and assess chick survival.

Nearshore surveys will be conducted by slowly driving a skiff 20–50 m from shore and counting and mapping the locations of all Black Oystercatchers seen during the survey. We carefully will observe the birds to determine if any already are banded. All oystercatchers seen will be classified as "single," "non-nesting pair," or "nesting pair." We will locate nests by beaching the boat and searching the supratidal area on foot. When nests are found, we will count and measure the eggs and record habitat data, both at the nest sites and within the breeding territories (≥ 100 m on either side of the nest). Habitat characteristics that will be recorded include: (1) shoreline substrate (e.g., bedrock, bedrock/ rubble, boulder/ cobble, pebble, gravel, sand); (2) intertidal and supratidal slope at the nest site (0–30°, 31–60°, and 61–90°); and (3) qualitative descriptions of intertidal flora and fauna. Supratidal habitats will be classified according to a hybrid classification system that we derived from Kessel (1979) and Viereck et al. (1986) specifically for use in PWS (Day et al. 1997).

When appropriate, field methods will follow those used by Andres (1994b) and Sharp et al. (1996). For example, measurements of eggs and chicks will closely follow the protocols outlined by these researchers to ensure comparability of data collection among years. Estimates of egg volumes and instantaneous change in bill length and body mass also will be calculated with the same formulas used by these researchers.

During the hatching period, we will use spotting scopes to observe nest sites from a distance, being careful not to attract predators to newly hatched chicks. Glaucous-winged Gulls, in particular, are a concern in this regard (pers. obs.), and we will be extremely careful during this and subsequent visits to avoid providing opportunities for predators to snatch young birds. Numbers of young will be counted to determine hatching success. Known hatching dates will be used to calibrate the egg-floatation data. For nests that we do not directly observe during hatching, we will count young in the brood-rearing territory and inspect nest sites. These observations, coupled with clutch-size data, should allow us to estimate hatching success accurately for all nests in the study area.

During brood-rearing surveys, we will visit all nests in the study area to assess chick survival. At a subsample of the nests, a variety of capture techniques will be employed, depending on the habitat. In rocky habitats, we probably will have to locate chicks that are hiding among the rocks and capture them by hand or with a small net. Along sandy beaches, we may be able to herd chicks into enclosures. All captured birds will be banded with USFWS aluminum bands and unique combinations of color bands for identifying individual young on subsequent visits. (Robert Ritchie of ABR, Inc., has a Master Banding Permit, and we will become subpermitees on this permit if the project is funded.)

Data analysis will focus on comparing data on abundance, distribution, reproductive performance, and growth of Black Oystercatchers between previously oiled and unoiled territories and areas and with data collected in previous years. Habitat information may be used to stratify the nesting data and, if injury to this species is ongoing, to aid in designing more indepth investigations in Year 2. Our Year 1 analyses will address the following hypotheses:

- $H_o l$: The ratio of breeding pairs to nonbreeding pairs of Black Oystercatchers does not differ between oiled and unoiled areas or among habitats in PWS.
- $H_o 2$: Egg volumes of Black Oystercatchers do not differ between oiled and unoiled areas or among habitats in PWS.
- $H_o 3$: Hatching success of Black Oystercatchers does not differ between oiled and unoiled areas or among habitats in PWS.
- H_{o} 4: Chick survival rates do not differ between oiled and unoiled areas or among habitats in PWS.
- $H_o 5$: The rate of chick development does not differ between oiled and unoiled areas or among habitats in PWS.
- $H_{a} 6$: The phenology of nesting events does not differ between oiled and unoiled areas or among habitats in PWS.
- H_o 7: The abundance and distribution of Black Oystercatchers in the study area in 1998 does not differ from that recorded during previous years, including prior to the spill.

Analyses of differences between oiled and unoiled sites will be accomplished with two-sample tests (t-tests or Mann-Whitney tests, depending on the distribution of the data). We will analyze differences among sites and among habitats with two-way analysis of variance, so that the separate effects of habitat and oiling can be evaluated. Specifically, we will assess whether there are differences in reproductive performance among habitats, and determine whether habitat and oiling are correlated in any way. Among-year analyses will be dependent on acquiring data from previous investigators and will examine differences in the amount of change with time between oiled and unoiled sites using paired differences (e.g., 1989 egg volumes minus 1998 egg volumes; see Andres 1994b) in two-sample tests (t-tests or Mann-Whitney tests) where appropriate. Differences in distribution of oystercatcher nests among sites will be tested with multi-factor analysis of variance.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

Although we have not specifically figured out a way to share resources with studies, we may not be aware of all of the possibilities. We certainly are amenable to pursuing cost-saving alternatives to our proposed study plan, and we would welcome the participation of other scientists in our field camp.

ABR, Inc. will donate all of the equipment necessary for our base camp. This will include an inflatable raft and outboard motor, tents, cooking equipment, etc.

We will contract a 20–24 ft boat from Whittier or Valdez to provide a platform from which to conduct most surveys and to move gear and personnel to and from field camps. All field and office work will be conducted by ABR, Inc. The Trustee Council will need to fund an outside agency for a program management and general administration. (These management costs will be funded directly from the lead Trustee agency to the managing agency, which is how ABR's 1996 Kittlitz's Murrelet contract was set up. Hence, that management money is not listed on the enclosed budget.)

Prepared 06/27/97

6

SCHEDULE

A.



Measurable Project Tasks for FY98 (October 1, 1997–September 30, 1998)

April-May 1998:Arrange logistics (boats, equipment, etc.)May 28-July 2 1998:Conduct field samplingJuly-August 1998:Keypunch data and QA/QCSeptember-October 1998:Data analysisNovember 1998-January 1999:Preparation of Annual Report

B. Project Milestones and Endpoints

- 1. "To evaluate the breeding status of adult Black Oystercatchers during nesting." This objective will be addressed during field work in summer 1998 (and, if impacts are found in 1998, again in 1999). Analyses and reporting will commence in late summer; thus, all work associated with this objective will be completed in FY98 (and, if impacts are found in FY98, again in FY99).
- "To document the phenology of breeding events." This objective will be addressed during field work in summer 1998 (and, if impacts are found in 1998, again in 1999).
 Analyses and reporting will commence in late summer; thus, all work associated with this objective will be completed in FY98 (and, if impacts are found in FY98, again in FY99).
- 3. "To measure the dimensions and estimate the volume of Black Oystercatchers eggs." This objective will be addressed during field work in summer 1998 (and, if impacts are found in 1998, again in 1999). Analyses and reporting will commence in late summer; thus, all work associated with this objective will be completed in FY98 (and, if impacts are found in FY98, again in FY99).
- 4 "To assess the hatching success of Black Oystercatchers." This objective will be addressed during field work in summer 1998 (and, if impacts are found in 1998, again in 1999). Analyses and reporting will commence in late summer; thus, all work associated with this objective will be completed in FY98 (and, if impacts are found in FY98, again in FY99).
- 5. "To estimate mortality of Black Oystercatchers chicks." This objective will be addressed during field work in summer 1998 (and, if impacts are found in 1998, again in 1999). Analyses and reporting will commence in late summer; thus, all work associated with this objective will be completed in FY98 (and, if impacts are found in FY98, again in FY99).
- 6. "To measure rates of development for Black Oystercatcher chicks." This objective will be addressed during field work in summer 1998 (and, if impacts are found in 1998, again in 1999). Analyses and reporting will commence in late summer; thus, all work associated with this objective will be completed in FY98 (and, if impacts are found in FY98, again in FY99).

C. Completion Date

Sampling for the project will be completed in FY98. Data analysis and preparation of the Annual Report will be completed by 15 April 1999. By January 1999, we anticipate knowing

what our recommended strategy for Phase II will be. If there is evidence of continued injury (i.e., lack of recovery) to Black Oystercatchers from Phase I, we will recommend that we use Phase II funding to conduct a more-in-depth study that examines the proximate causes for the impacts and impediments to recovery. The proposed budget for Phase II was designed to accommodate a four-person field crew that might, for example, conduct detailed behavioral observations of brood-rearing oystercatchers or habitat analyses to try to identify impediments to recovery. It should be noted, however, that the Phase II budget represents an estimate for an expanded study, and the results of Phase I may not warrant that expansion. If we detect no evidence of continued injury during Phase I, we will propose that Phase II simply entail producing a Final Report and preparing a manuscript for publication in a peer-reviewed journal.

PUBLICATIONS AND REPORTS

We will submit an Annual Report after the first year of the study. This report will be submitted to the Chief Scientist no later than 15 April 1999 and will cover all Phase I (Year 1) activities.

PROFESSIONAL CONFERENCES

Because FY98 will be the first year of data collection, we will not attend any conferences this year. We will consider attending scientific meeting in FY99, after the Phase-1 data have been analyzed.



COORDINATION AND INTEGRATION OF RESTORATION EFFORT

Although our study is not an integrated component of the Nearshore Vertebrate Predator Program, the data that we collect on Black Oystercatchers will be of value to the these other investigators for its indications of intertidal recovery and health.

PROPOSED PRINCIPAL INVESTIGATOR

Stephen M. Murphy ABR, Inc. P.O. Box 80410 Fairbanks, AK 99708-0410 PH: 907-455-6777 FAX: 907-455-6781 E-mail: smurphy@abrinc.com





1998 EXXON VALDEZ TRUSTEL COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

	Authorized	Proposed						
Budget Category:	FY 1997	FY 1998						
Personnel		\$0.0						
Travel		\$0.0						
Contractual		\$75.1						
Commodities		\$0.0						la ser al a br>La ser a ser al a ser
Equipment		\$0.0		LONG RA	NGE FUNDIN	IG REQUIRE	MENTS	
Subtotal	\$0.0	\$75.1		Estimated	Estimated	Estimated	Estimated	
General Administration		\$5.3		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$0.0	\$80.4		\$231.9				
			APPENDER AND ALL A					and the second se
Full-time Equivalents (FTE)		0.0						
			Dollar amount	ts are shown ir	n thousands o	f dollars.		
Other Resources								
Comments:								
- -								
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T			·					
	F						1	
_							Г	EOPM 2A
	Project Nur	nber: 9828	9					
1998	Project Title	e: Status of	Black Ovste	ercatchers in	PWS after	EVOS		IKUSIEE
								AGENCY
	Agency. N	UAA						SUMMARY
Prepared: 6/2176974]	12/15/9
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1998 EXXON VALDEZ TRUSTEL-COUNCIL PROJECT BUDGET

May 1, 1997 - April 30, 1998

<u>annikozet, otnikak eljenovo kot</u> elitikovo in 1995. : :	Authorized	Proposed						
Budget Category:	FFY 1997	FFY 1998						
Personnel	N/A	\$59.9						
Travel	N/A	\$3.5						
Contractual	N/A	\$10.8						
Commodities	N/A	\$0.9						
Equipment	N/A	\$0.0		LONG F	RANGE FUNDI	NG REQUIRE	MENTS	
Subtotal	N/A	\$75.1	Estimated	Estimated	Estimated	Estimated	Estimated	Estimated
Indirect	N/A	\$0.0	FFY 1999	FFY 2000	FFY2001	FFY 2002	FFY 2003	FFY 2004
Project Total	N/A	\$75.1	\$216.7	N/A	N/A	N/A	N/A	N/A
Total Personnel Hours *	N/A	1,016						
			Dollar amou	ints are shown i	n thousands of o	lollars.		
Other Resources								
Comments:								
ABR, Inc. has used Hourly	Rates instead of Mo	onthly Costs.	The hourly ra	te shown is ar	n all inclusive r	ate. ABR, Inc	. requested pe	rmission
from EVOS Trustee Counci	I and received verb	al permission	from Sandra	Schubert on A	April 4, 1997 to	substitute ful	ly burdened ho	ourly rates
for monthly costs and indire	ect costs.						-	
-								
Full-Time Equivalents (FTE	's) have been chan	ged to fully bu	rdened Total I	Personnel Hou	irs.			
Break Down of Project Co	osts for FY 98							
Report Writing	\$18915							
Publications	\$0							

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Publications	\$0
Professional Conferences	\$0
Workshop Attendance	\$7245
NEPA Compliance	\$0
Community Involvement	\$0

1998

Project Number: 98289 Project Title: Status of Black Oystercatchers in Prince William Sound after the *Exxon Valdez* oil spill Name: ABR, Inc.

FORM 4A Non-Trustee DETAIL

Prepared: 4/10/1997



Personnel C	Costs:				* Hours	* Hourly		Proposed
Name			Position Description		Budgeted	Costs	Overtime	FFY 1998
Ritchie	e R		Principal		0.0	\$96.00	\$0	0.0
Murph	y S		Research Coordinator		300.0	\$89.00	\$0	26.7
DeLon	ng T		Office/Contracts Manager		0.0	\$66.00	\$0	0.0
Mabee	: T		Research Biologist II		440.0	\$49.00	\$0 ⁻	21.6
Zusi-C	Cobb A		Graphics Technician/GIS		24.0	\$48.00	\$0	1.2
Staff			Technician III		212.0	\$43.00	\$0	9.1
Barkle	y C		Word Processor/Administrative Assistant	اد . با	24.0	\$37.00	\$0	0.9
Staff			Expediter / Field Specialist		16.0	\$27.00	\$0	0.4
				8 - 194 1				
a da								
			Subtotal	s - Standard Anna	1016.0	<u>N/A</u>	0	
						Pe	ersonnel Total	\$59.9
Travel Cost	ts:			Ticket	Round	Total	Daily	Proposed
Descri	ption			Price	Trips	Days	Per Diem	FFY 1998
EVOS	Meetings i	n Anchorage		350	1	3	150	0.8
Techni	ical Review	Meeting in	Anchorage	350	1	2	150	0.7
Travel	to/from Cr	uises (Fairba	anks to Valdez)	400	3	0	150	1.2
Charter	r Flight (V	aldez to Prin	ce William Sound)	600	1			0.6
Fee (59	%) on Trav	el Costs						0.2
6	······						Travel Total	\$3.5
								4 7 .7

1998

Project Number: Project Title: Status of Black Oystercatchers in Prince William Sound after the Exxon Valdez oil spill Name: ABR, Inc.

FORM 4B Personnel & Travel DETAIL

Prepared: 4/10/1997

1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

May 1, 1997 - April 30, 1998

Contractual Costs:			Proposed
Description			FFY 1998
1 Boat Charter (3	0 days @ \$325 per day)		9.8
2 ABR Spotting S	copes (2.33 scope-months @ \$175 per month) (ABR Donation)		0.0
3 Phone/Fax/Mod	em		0.2
4 Printing/Off-Site	e Photocopying		0.3
5 Fee (5%) on Co	ntractual Costs (excluding ABR Equipment Lease)		0.5
	Contract	al Total	\$10.8
Commodities Costs:			Proposed
Description			FFY 1997
1 Misc. Gear and	Supplies		0.9
2 Fee (5%) on Co	mmodity Costs		0.0
<i>,</i>			
	Commodit	ies Total	\$0.9
·		l	·····
	Project Number:	F	ORM 4B
1000	Project Title: Status of Black Ovstercatchers in Prince William Sound after	Cor	ntractual &
1998	the Exxon Valdez oil spill		mmodities
	INAME: ABH, INC.		

Prepared: 4/10/1997

1998 EXXON VALDEZ TRUSHE COUNCIL PROJECT BUDGET

May 1, 1997 - April 30, 1998

New Equipment Purc	hases:	Number	Unit	Proposed
Description		of Units	Price	FFY 1996
Those purchases assoc	iated with replacement equipment should be indicated by placement of an R.	New Eq	uipment Total	\$0.0
Existing Equipment U	sage:		Number	
Description			of Units	
 Library reference Computer Resour GIS/Digitizing St Office Space Equipment Storage Binoculars Cameras 	books rces tation (s) ge		2 2 2	
1998	Project Number: Project Title: Status of Black Oystercatchers in Prince William S Exxon Valdez oil spill Name: ABR, Inc	Sound after	the E	FORM 4B quipment DETAIL
Prepared: 4/10/1997				

4 of 4

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Project Title: Hydrocarbon Data Analysis, Interpretation, and Database Maintenance for Restoration and NRDA Environmental Samples Associated with the *Exxon Valdez* Oil Spill

Project Number: 98290

Restoration Category:

Proposer:

Jeffrey W. Short and Bonita D. Nelson NMFS, Auke Bay Laboratory ABL Program Manager: Dr. Stan Rice NOAA Program Manager: Bruce Wright

NOAA



EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

Lead Trustee Agency:

Cooperating Agencies:

Alaska SeaLife Center:

Duration:	Service Ongoing
Cost FY 98:	75.7
Cost FY 99:	75.0
Cost FY 00:	75.0
Cost FY 01:	75.0
Cost FY 02:	75.0
Cost FY 03:	75.0
Geographic Area:	Not Applicable
Injured Resource/Service:	Maintenance of the Trustee hydrocarbon database, archival of environmental samples, interpretative services

ABSTRACT

This project is a continuation of the NRDA and Restoration database management, sample storage, and interpretive service. New data will continue to be incorporated into the Trustee hydrocarbon database. Updated summary report for investigators and managers will be produced along with an electronic copy of the data for all data queries.

INTRODUCTION

The Auke Bay Laboratory provides data and sample archiving services for all samples collected for hydrocarbon analysis in support of *Exxon Valdez* Trustee Council projects. These data represent samples collected since the oil spill in 1989 to the present and include environmental and laboratory Response and Restoration data as well as Subsistence data. Additionally, we provide interpretive services for the hydrocarbon analyses. Currently, the database contains results of the hydrocarbon analysis of more than 13,000 samples and collection information from more than 46,000 sediments, tissues, water, or oil samples. The primary purpose of this project is to maintain the integrity of the database, incorporate new data and continue hydrocarbon data interpretive services. The second purpose is to make the results of the hydrocarbon analyses available to principal investigators, resources managers and to the public. This service is expected to have activity through synthesis period of the next two years. The third purpose of this project is to maintain the integrity of archived samples in freezers many of which have not yet been analyzed for hydrocarbons.

This database not only contains sample collection and hydrocarbon analyses information, but also has data concerning sample shipping and location information as well as lists of other database identifiers (such as species and location codes). A public version of this database containing the sample collection and environmental hydrocarbon sample analyses was released in 1996 (*Exxon Valdez* Oil Spill of 1989: State/Federal Trustee Council Hydrocarbon Database 1989-1995 -EVTHD). This year we will produce a new product which will include environmental data analyzed since 1995 as well as data collected and analyzed from Trustee funded laboratory studies, analytical quality control data as well as Subsistence data.

The hydrocarbon interpretive service is designed specifically for investigators and managers. This includes: (1) identification of the probable sources of the hydrocarbons observed in the samples, (2) evaluation of new hydrocarbon data for evidence of systematic bias, (3) hydrocarbon data editing according to consistent criteria. This is a continuation of project 96290 and previously funded under TS#1, 93053, 94290 and 95290.

NEED FOR THE PROJECT

A. Statement of Problem

The Trustee hydrocarbon database is a dynamic structure which requires updating and maintenance. Currently, the database contains an inventory of the Trustee hydrocarbon sample collection and provides for retrieval of hydrocarbon analyses by principal investigators and managers. This project is designed to provide easy access to the Trustee hydrocarbon database and ensure the accuracy of the data. The volume of data contained in the database suggests that other users will benefit from access.

B. Rationale/Link to Restoration

Archiving of the Trustee hydrocarbon sample data will insure that these data are available to principal investigators, government agencies, and the interested public on a timely basis. The database allows direct comparison of restoration and NRDA data, and contains an inventory of hydrocarbon samples and

Prepared 4/1/97

Project 98290

information about their collection, storage and analysis. The continued use of the methods for hydrocarbon data evaluation and interpretation developed for the *Exxon Valdez* NRDA samples will insure direct comparability of future with previous samples. This will substantially increase the probability that temporal trends in these data will be detected when actually present. Principal investigators will be able to get assistance with chemical interpretation of hydrocarbon results from their project or other projects that relate to their project when needed. Since most investigators are not chemists, this type of assistance is usually required for proper interpretation of hydrocarbon results.

C. Location

While this project resides at the Auke Bay Laboratory, Juneau, Alaska, the service provided serves the entire spill area.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

Community involvement includes and extends beyond the spill area. Science centers, public schools, native corporations, universities, environmental organizations and other concerned groups will have access to the database with guidelines on how the data can be used.

PROJECT DESIGN

A. Objectives

1. Continue maintenance of the Trustee hydrocarbon database by updating the database with new information and continue the sample archiving procedures developed under NRDA.

2. Continue interpretation of hydrocarbon data, including new data produced for principal investigators and resources managers as needed.

3. Provide a new software product for the publicly accessible database which includes hydrocarbon samples analyzed through 1997, Trustee funded laboratory studies, analytical quality control data and Subsistence data.

B. Methods

Data associated with hydrocarbon samples are added to the existing Trustee hydrocarbon database. The samples and data currently reside at the Auke Bay Laboratory of NMFS. Incoming samples are inventoried and stored in laboratory freezers, and sample collection information is entered into the database. Samples are released for hydrocarbon analysis after ABL receives a written request from the responsible project leader. Hydrocarbon data, reported by the analytical laboratory, are matched to the sample collection information and all the data are checked for errors and electronic copies are sent to principal investigators or other requesters. The new version of the public release of the database will be developed in Visual Basic software using *Exxon Valdez* Oil Spill of 1989: State/Federal Trustee Council Hydrocarbon Database 1989-1995 (EVTHD) as a template and will include data collected from Trustee funded laboratory studies, Subsistence sampling and analytical quality control procedures as

Prepared 4/1/97

Project 98290

well as environmental samples analyzed since 1995.

The Auke Bay laboratory will continue to keep all environmental samples collected for hydrocarbon analysis under all phases of the oil spill process frozen in locked storage.

C. Contracts and Other Agency Assistance

No contracts are anticipated

SCHEDULE

A. Measurable Project Tasks for FY98

Samples will be stored and data analyzed throught fiscal year. Release of the updated public version of the database software: Exxon Valdez Oil Spill of 1989: State/Federal Trustee Council Hydrocarbon Database 1989-1995 to include laboratory data.

B. Project Milestones and Endpoints

April 15: Annual report in the form of updated release of hydrocarbon data software.

The primary objective of this project is to provide an ongoing service, consequently there are few set milestone dates or endpoints.

C. Completion Date

This is an ongoing service project to be completed when samples are no longer collected for hydrocarbon analysis and the Trustee Council terminates this service.

PUBLICATIONS AND REPORTS

The public release of the hydrocarbon database for projects funded in FY97 will be available 15 April, 1998 in the form of the annual report.

PROFESSIONAL CONFERENCES

One meeting, an annual Quality Assurance Control meeting which ABL's Senior Chemist attends, is the results of an international calibration exercise for the integrity and created bility of chemical analyses. This meeting occurs in the Washington D.C. area.

NORMAL AGENCY MANAGEMENT

NOAA and NMFS has statutory stewardship for all living marine resources; however, if the oil spill had

Prepared 4/1/97

Project 98290

not occurred NOAA would not be conducting this project. NOAA NMFS proposes to make a significant contribution (as stated int he proposed budget) to the operation of this project making it truly cooperative.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

This project is a continuation of NRDA database and chemical interpretation work.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

This ongoing service project has no significant project design or schedule differences from the project funded in FY97, it is a continuation of the same service.

PROPOSED PRINCIPAL INVESTIGATOR

Jeffrey W. Short NMFS Auke Bay Laboratory 11305 Glacier Highway Juneau, Alaska 99801 907-789-6065 907-789-6094 jshort@abl.afsc.noaa.gov









	1998 E)				JECT BUDGI	ET		
		October	r 1, 1997 - Sep	tember 30, 19	98		app	Loved TC 8-6
Budget Category:	Authorized FFY 1997	Proposed FFY 1998						
Poreoppol	¢55.0	¢56.4						
Fravel	\$35.2							
Contractual	\$3.0	\$3.0						
	\$5.5	\$3.5						
Fauinment	\$0.0	\$0.0	the first state of the second s	LONG BA	NGE FUNDIN		AENTS	nelaennik istakkas eindendelse einden versen, en bie
Subtotal	\$67.8	\$67.0	Estimated	Estimated	Estimated	Estimated	Estimated	
Seneral Administration	\$8.5	\$8.7	FFY 1999	FFY 2000	FFY 2001	FFY 2002	FFY 2003	
Project Total	\$76.3	\$75.7	\$75.0	\$75.0	\$75.0	\$75.0	\$75.0	<u></u>
	••••	0.0						
Full-time Equivalents (FTE)	1.0	1.8						
			Dollar amount	s are shown ir	thousands of	dollars.	n fall de la complete	
Other Resources	\$38.2	\$33.6	\$35.0	\$25.0	\$25.0	\$20.0	\$20.0	<u>, </u>
NOAA Contribution: Habitat Program Manager, S Senior Chemist, M Larsen, 2 Total NOAA contribution: \$3	. Rice, 1 mo @ \$ mo = \$ 10.4K fo 3.6K	9.6K: Principa r a total of \$3	al Investigator, 3.6K	J. Short, 2 mc	o @ \$ 13.6K =	\$ 17.2K:		
			<u> </u>					

Prepared: 4/11/97



1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 1998
B Nelson	Database Manager/Fish Biologist	9/6	6.0	5.0	1	30.0
M Larsen	Senior Research Chemist	11/6	2.5	6.0		15.0
J Maselko	Fishery Research Biologist	7/3	2.5	3.2		8.0
J Short	Senior Research Chemist	13/0	0.5	6.8		3.4
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
		,				0.0
						0. 0
	Subto	tal series and the series	11.5	21.0	0.0	
				Per	sonnel Total	\$56.4
Travel Costs:		Ticket	Round	Total	Daily	Proposed
Description		Price	Trips	Days	Per Diem	FFY 1998
Anchorage, Workshop, 1		0.4	1	4	0.2	1.2
Miscellaneous (Car re	ental, telephone chgs, POV mileage, etc.)	•				0.3
						0.0
Quality Assurance/Quality	Control Annual Meeting,1 Senior Chemist	1.6	1	4	0.2	2.4
Miscellaneous (Car re	ental, telephone chgs, POV mileage, etc.)					0.2
National Institute for S	Standards & Technology	10 A.				0.0
Washington, D. C.:	Annual meeting for analytical					0.0
perform	nance review					0.0
						0.0
						0. 0
						0.0
			LL			0.0
	and a second			Yana ilaya kata kata kata kata kata kata kata k	Iravel Iotal	\$4.1
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	Project Number: 09200		· · · · · · · · · · · · · · · · · · ·		F	ORM 3B
1008	Dreiset Tiles Undersecher Det-		·	х. 	P	ersonnel
1990	Project Litle: Hydrocarbon Data	ibase & interpi	retation		8	& Travel
	Agency: National Oceanic and	Atmospheric A	dministration			DETAIL
				[Prenared.



1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1997 - September 30, 1998

Contractual Costs:						Proposed
Description						FFY 1998
Disposal of Archived Samples (c	lassified as hazardous materials)		•			• 3.0
		. •	:	. •		
			. ·			
When a non-trustee organization	is used, the form 4A is required.			Contractual	Total	\$3.0
Commodities Costs:	· · · · · · · · · · · · · · · · · · ·					Proposed
Description				······································		<u>FFY 1998</u>
New interfaces and computer so Production of updated public info Freezer maintenance and repairs	Itware upgrades Irmation discs of chemical data	•	· ·			3.0 0.5
		······		Commodities 1	Fotal	\$3.5
1998	Project Number: 97290 Project Title: Hydrocarbon D Agency: National Oceanic ar	atabase and In nd Atmospheric	terpretation Administration		FOI Contr Comi DE	RM 3B ractual & modities ETAIL

3 of 4

4/11/97

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New Equipment Purchases:		Number	Unit	Proposed
Description		of Units	Price	FFY 1997
				0.0
				• 0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
hose purchases associated v	with replacement equipment should be indicated by placement of an B	New Equ	linment Total	\$0.0
visting Equipment Usage:		iten aqe	Number	Inventory
Assuring Equipment Usage.			of Units	Agency
reezers Computer, Compaq Power Supply			2 2 1	NOAA NOAA NOAA
1998	Project Number: 98290 Project Title: Hydrocarbon Database and Interpretation Agency: National Oceanic and Atmospheric Administratio	n.	F	ORM 3B quipment DETAIL
4 of 4	L		1	Prepared: 4/1

98297-BAA

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Oceanography of Prince William Sound Bays and Fjords

Project Number:	98297-BAA		
Restoration Category:	Research		
Proposer:	S. Vaughan/PWSSC		
Lead Trustee Agency:	NOAA		
Cooperating Agencies:	None		
Alaska SeaLife Center:	No		
New or Continued:	New		
Duration:	lst yr. 1 yr. project		
Cost FY 98:			
	\$94.2		
Cost FY 99:	\$0.0		
Cost FY 2000:	\$0.0		
Cost FY 01:	\$0.0		
Cost FY 02:	\$0.0		
Geographic Area:	Prince William Sound		
Injured Resource/Service:	Pacific herring		

ABSTRACT

Eaglek Bay, Whale Bay, Simpson Bay, and Zaikof Bay are the focus of the Sound Ecosystem Assessment Herring project (/320T) based on historical observations of large numbers of juvenile Pacific herring. Hydrographic surveys and current velocity measurements from October 1995 to November 1996 show significant differences in water mass properties and circulation patterns between these four bays in Prince William Sound. The SEA Physical Oceanography project (/320M) has provided support for SEA Herring in the past, but support in FY 98 will not be possible because of scheduled funding cuts. Without continued funding, physical data will not be available for the SEA Herring project in its third and final winter sampling period. The goal of this research is to identify physical factors that control the production of Pacific herring in Prince William Sound.

INTRODUCTION

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The goal of the SEA Herring project (320-T) work was to determine habitat overwintering quality for juvenile herring, and identify retention mechanisms in the nearshore regions. The physical oceanographic support for the herring project in FY94 - FY97 came from the SEA Physical Oceanographic project (320-M). Because SEA project 320-M is scheduled for closeout in FY99, emphasis in FY98 SEA Oceanography wil be on modelling, data synthesis, monitoring program development, and collaborative manuscript submission. No field work was proposed for FY98 under 320-M. Since the SEA herring project field work started approximately one year after the other SEA projects, SEA herring has remaining field work in FY98. Two cruises are planned in October 1997 and March 1998. Because of scheduled reductions in funding, SEA Physical Oceanography will be unable to provide oceanographic field support

for SEA herring in FY98. This proposal is for addition funding, separate from SEA 320-M, to provide the oceanographic support for the two FY98 SEA herring cruises, data analysis, and to address reviewers' comments regarding circulation model validation in relation to dispersal of herring larvae.

Starting in October 1995, measurements of temperature, salinity, oxygen, current velocity, fluorescence, and zooplankton data were collected in several bays and fjords around PWS by SEA Physical Oceanography (320-M). In 1996, the number of bays was reduced to 4: Whale, Eaglek, Simpson, and Zaikof Bays. Vertical sections of temperature, salinity, density, and current velocity were created for each cruise. Horizontal contours of temperature, salinity, and density, and horizontal velocity vector plots were also created. These hydrographic data show that unlike most of PWS, Eaglek Bay and Whale Bay (fjords) retain their upper layer stratification throughout the year. The fresh, cold suface layer is never entirely mixed. In contrast, Simpson Bay and Zaikof Bay resemble the neutrally stratified majority of PWS in March. This may mean that Eaglek Bay and Whale Bay are less connected to the Sound than Simpson Bay and Zaikof Bay. Large differences in temperature and salinity exist between bays at the same time of year. A temperature and salinity (and density) front is present at the mouth of Zaikof Bay in March 1996, but not at other bays. No anoxic deep layers were found in any of the bays.

Vertical sections of horizontal velocity show the currents in these bays to be extremely complex and seasonally variable. Differences exist between the head and the mouth of the bay in nearly all cases. Except for Eaglek Bay, the currents at 10 meters are generally weaker at the head than at the mouth of the bays. A strong current shear exists at the mouth of Zaikof Bay on both flood and ebb tide. The density fronts and horizontal velocity shears could be responsible for the retention of zooplankton and juvenile fish in the bay. An anticlyclonic eddy was observed at the mouth of Zaikof Bay in October 1996, which could also act as a retention mechanism.

In FY97, the herring nearshore hydrographic and current velocity data will continue to be analyzed. Several nearshore cruises are planned as part of the SEA herring project (320-T). Hydrographic, current velocity, and zooplankton measurements will be made by SEA oceanography (320-M) as in previous years. Comparisons will be made with the fish catch data. Physical retention mechanisms will be identified.

This proposal is for support to continue measurement in FY98 of water mass properties (temperature, salinity, and potential density), and current velocities, using a hull mounted acoustic Doppler current profiler (ADCP). Continued measurement of zooplankton densities, using an optical plankton counter (OPC), will be compared to small scale temperature, salinity, and fluorescence data measured by the Aquapack (towed with the OPC). To document the variability of the temperature in each bay as a function of time, deployment of temperature logger moorings (3 per bay) is proposed. Finally, to verify the predictions of the larval herring drift model being developed under SEA project 320-J, deployment of 9 satellite tracked drifting buoys is proposed.

NEED FOR THE PROJECT

A. Statement of the Problem

Pacific herring resources continue to be listed as injured and non-recovering. SEA is an interdisciplinary ecosystem approach to understand which biological and physical factors in the environment might be constraining the recovery of this species (320-T). Coupled biological and physical data (temperature, salinity, and current velocity) are not available for the Sound. The dominant physical processes that influence Pacific herring production in PWS mostly unknown. The proposed project will continue the observations previously funded under SEA Oceanography (320-M), and perform the analysis necessary to understand critical processes. This coupling of physical data with juvenile herring research has been strongly supported by the peer reviewers. Following the SEA herring review in Anchorage in February, the reviewers strongly urged increasing physical-herring links, and in particular recomended using drifters to test the simulation model for drift of larval herring away from the spawning grounds.



B. Rationale/Link to Restoration

Without understanding how environmental and ecological factors might be influencing the recovery of injured species, there is no clear means for interpreting the past and present production status of Pacific herring in Prince William Sound. Further, restoration activities undertaken in the absence of knowledge about ecosystem function could conceivably cause more damage than they are intended to remedy. In the short term, development of improved stock assessment techniques and their application to building and evaluating numerical models of the herring ecosystem will improve the tools available for harvest management. Over the long term, as the SEA Herring program obtains a better understanding of ecosystem form and function in Prince William Sound, the risks associated with proactive restoration activities will become much less uncertain. The numerical models developed by SEA will allow a variety of "what if" restoration options to be evaluated prior to their implementation as a measure for protecting all resources in the region.

C. Location

This project has been designed for Prince William Sound. All communities that utilized the marine resources of Prince William Sound will benefit from this research.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

Local fishing vessels and ships will be chartered for oceanographic cruises in FY98. This project will contribute information to local news letters and newspaper articles. Scientific results will be posted on the SEA web page, and will be accessible to the public.

PROJECT DESIGN

A. Objectives

The main objective of this research is to extend the work done by SEA Observational Oceanography (320-M) in support of SEA herring (320-T) into FY98. The overall goal of both SEA 320-M and this project is to identify the dominant physical processes (tides, storms, water temperature, salinity, etc.) that influence Pacific herring production in PWS. Specific goals for FY98 are:

1. Document the seasonal and interannual changes in water mass properties (temperature, salinity, and density), current velocity patterns in Eaglek Bay, Whale Bay, Simpson Bay, and Zaikof Bay, during the final year of the SEA Herring project (FY98).

2. Correlate fluorescence and zooplankton distributions with water mass properties, and current velocity.

3. Identify physical retension mechanisms (fronts, eddies, etc.) within the bays.

4. Obtain time series of temperature changes throughout winter (Oct. 97 - March 98) in each bay for use in the herring bioenergetics model.

5. Verify predictions of a larval drift simulation by the numerical circulation model developed under SEA project 320-J.

B. Methods

1. Temperature, salinity, and current velocity data will be collected with a CTD and a hull mounted ADCP on cruises in October 1997 and March 1998. In FY98, SEA Herring (320-T) has proposed using

only one vessel for field work. The fish acoustics sonar (SEA project 320-N) will be operated from this vessel. The ADCP and the fish sonar can not be operated simultaneously because of acoustic interference. To obtain both current velocities and fish abundances, funding for a separate vessel to operate the ADCP (and the CTD and OPC) is requested.

2. In addition to the CTD and ADCP, the Aquashuttle will be flown from the oceanography vessel. The Aquashuttle consists of an OPC to measure zooplankton, and an Aquapack to simultaneously measure temperature, salinity, oxygen, and fluorescence. Zooplankton densities and fluorescence will be correlated with water mass properties, and current velocities.

3. Potential physical retension mechanisms have been identified in FY96 field data. Density fronts were documented by the CTD and Aquapack surveys. Regions of strong velocity shears and eddies were documented by the ADCP. These features do not appear at all bays in all times of year. Continued CTD and ADCP measurements will allow more confident predictions of when and where these retention mechanisms occur.

4. Moored temperature loggers at 5, 25, and 50 meter depths, will be deployed at the head, middle, and mouth of each of the 4 bays to provide a continuous time series of temperature from October 1997 to March 1998. Previous results have indicated substantial differences in current velocities and water mass properties between the head and the mouth of some bays. Three moorings positioned along the bay axis will provide a coarse estimation of the spatial variations in temperature. Temperature loggers were deployed in FY96 under the SEA Herring project (320-T), however the majority of those were lost or malfunctioned, so that winter-time temperature data are inadequate for use in overwintering models.

5. ARGOS satellite tracked drifting buoys will be deployed just outside of Valdez Arm at the prime herring spawning site in May 1998. This corresponds to the beginning of the herring larval drift period. The release location could be modified depending on spawn location data in April (from ADF&G). As suggested by Chief Scientist Bob Spies and numerous reviewers, the larvel drift model requires field validation. Drifters will be deployed at 3 locations along the spawning site (about 50 km alongshore) at intervals of 2 to 3 days, and allowed to drift for roughly 2 months. Vessels or aircraft of opportunity will be used for the deployment. It is necessary to have several drifting buoys (9) to provide the necessary statistics to verify possible paths in the model predictions, and to show if retention is present or not.

C. Cooperating Agencies, Contracts and Other Agency Assistance

Vessel charters will contracted to the private sector through competitive bid.

SCHEDULE

A. Measurable Project Tasks for FY 98

October 1997:		SEA herring October cruise
October 1997:		Deploy temperature loggers
Oct Jan. 1998:	Analyze	field data
January 1998:	•	EVOS Workshop - Anchorage
March 1998:		SEA herring March cruise
March 1998:		Retrieve temperature loggers
March - Sept.:		Analyze field data, prepare manuscripts
May 1998:		Deploy drifting buoys
September 1998:	Manuscr	ipts submitted for pubilication

B. Project Milestones and Endpoints

All objectives listed under Project Design will be completed by the end of FY98. Depending on the status of injured Pacific herring resources at that time, additional research/monitoring may be needed. This contingency will be evaluated near the end of FY98 in cooperation with the EVOS Chief Scientist and the Trustee Council.

D. Completion Date

The completion data of this project is September 30, 1998.

PUBLICATIONS AND REPORTS

Manuscripts will be submitted on the following topics by the end of FY98:

1. Circulation and water mass properties in the bays and fjords of PWS. In Continental Shelf Research, or Journal of Geophysical Research.

2. Retention mechanisms for juvenile Pacific herring (joint with SEA herring). In Transactions of the American Fisheries Society.

PROFESSIONAL CONFERENCES

Travel is requested to present results at the EVOS Workshop in January 1998 in Anchorage.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

This research will be coordinated with all components of the SEA program. Research cruises and much of the data collected will shared with other SEA investigators. This project will also cooperate with APEX and other EVOS-sponsored programs to provide the most efficient means for investigating biological and environmental factors common to all projects.

PROPOSED PRINCIPAL INVESTIGATOR

Shari L. Vaughan, Ph.D. Prince William Sound Science Center P. O. Box 705 Cordova, Alaska 99574 (907) 424-5800 Office (907) 424-5820 Fax vaughan@grizzly.pwssc.gen.ak.us



October 1, 1997 - September 30, 1998 approved TC 8-6-97 Proposed Authorized FY 1997 FY 1998 \$0.0 \$0.0 \$88.0 \$0.0 \$0.0 LONG RANGE FUNDING REQUIREMENTS \$0.0 \$88.0 Estimated Estimated Estimated Estimated \$6.2 FY 1999 FY 2000 FY 2001 General Administration FY 2002 \$0.0 \$94.2 Full-time Equivalents (FTE) 0.0 Dollar amounts are shown in thousands of dollars.

Comments:

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Other Resources

Budget Category:

Personnel

Contractual

Commodities Equipment

Subtotal

Project Total

Travel

1998

Project Number: 98297 Project Title: Oceanography of PWS Bays and Fjords Agency: NOAA

FORM 3A TRUSTEE AGENCY SUMMARY

Prepared: 1 of 1

8/28/97
1998 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

February 1, 1998 - September 30, 1998

[Authorized	Proposed			· · · · · · · · · · · · · · · · · · ·	alise shelling and an		
Budget Category:	FY 1997	FY 1998R						
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Personnel		\$26,652.0						
Travel		\$580.0						
Contractual		\$29,800.0						
Commodities		\$900.0						
Equipment		\$15,396.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	\$0.0	\$73,328.0		Estimated	Estimated	Estimated	Estimated	
Indirect (20%)		\$14,665.6		FY 1999	FY 2000	FY 2001	FY 2002	
Project Total	\$0.0	\$87,993.6						
Full-time Equivalents (FTE)		0.4						
	Dollar amounts are shown in thousands of dollars.							
Other Resources								I
1009	Project Nur	mber: 9	8297-(2	BAA NE Bava an	d Eiordo			FORM 4A
Prepared: 1 of 4	Name: Prince William Sound Science Center				SUMMARY			

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February 1, 1998 - September 30, 1998

		Bull	1 1 1			
Personnel Costs:			Months	Monthly		Proposed
Name	Position Description		Budgeted	Costs	Overtime	FY 1998
Shari Vaughan	Physical Oceanographer (PI)		1.0	7000.0		7,000.0
Kenric Osgood	Physical Oceanographer		0.0	4900.0		0.0
Shelton Gay	Physical Oceanographer		2.0	5176.0		10,352.0
Loren Tuttle	Biological Oceanographer		2.0	4650.0		9,300.0
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	L			01700.0		0.0
	Sudiotal		5.0	21/26.0	0.0	000 050 0
				Per	sonnel otal	\$26,652.0
Travel Costs:	Travel Costs:			Total	Daily	Proposed
Description	Price	Inps	Days	Per Diem	FY 1998	
EVOS Workshop - Anch J	Jan.98 (1r/t @\$160, 3 days @\$140)	160.0	1	3	140.0	580.0
						0.0
						0.0
						0.0
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					Travel Total	\$590.0
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Project Number:					F	ORM 4B
1998 Project Title: Oceanography of PWS Bays and Fjords				F	ersonnel	
					& Travel	
Name: Prince William Sound Science Center						DETAIL
Prepared:				L		
2 of 4						4/1



Contractual Costs		num 18. –	Proposed
Description			FY 1998
Phone, fax, co	pying		200.0
Publication Co	bsts		0.0
Mail, freight, sl	hipping		200.0
Vessel Charte	r (2 cruises, 10 days ea. \$1200/day)		24,000.0
ARGOS fee (9	drifters, 60 days ea. @ \$10/day)		5,400.0
Commodition Coo		Contractual Total	\$29,800.0
Commodities Cos	515;		FY 1998
Office supplies	<u> </u>		200.0
Computer sup	plies		200.0
Marine supplie	98		500.0
		Commodities Total	\$900.0
1998	Project Number: Project Title: Oceanography of PWS Bays and Fjords Name: Prince William Sound Science Center	F(Con Cor	DRM 4B stractual & nmodities DETAIL

Prepared:





Nev	/ Equipment Purchases:		Number	Unit	Proposed
Description				Price	FY 1998
	ARGOS satellite tracked dr	ifting buoys	9	1500.0	13,500.0
II.	Temperature loggers (4 bays, 3/bay)			158.0	1,896.0
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				1	0.0
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I					0.0
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The		th replacement equipment should be indicated by placement of an R	Now Equ	inment Total	0.0 \$15.306.0
	ting Equipment Llegge:	in replacement equipment should be indicated by placement of an R.	New Equ	Number	\$15,590.0
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		Project Number:		F	ORM 4B
	1998	Project Title: Oceanography of PWS Bays and Fiords		E	quipment
		Name: Prince William Sound Science Center		i	DETAIL
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