19.11.02 (2 of 12)

Pristane Monitoring in Mussels

Project Number:	02195
Restoration Category:	Research and Monitoring
Proposers:	Jeffrey W. Short and Patricia M. Harris NMFS, Auke Bay Laboratory ABL Program Manager: Dr. Stan Rice
Lead Trustee Agency:	NOAA
Cooperating Agencies:	None
Alaska Sea Life Center:	No
Duration:	Indefinite
Cost FY02:	$ 55,000
Cost FY03:	$ 55,000
Cost FY04:	$ 55,000
Geographic Area:	Prince William Sound
Injured Resource/Service:	Pink Salmon

ABSTRACT

This project has focussed on elucidating the transport mechanism of pristane from *Neocalanus ssp* copepods into mussels in PWS for the previous 6 years. In FY00 and FY01 the utility of monitoring the response of pristane in mussels to mass-release of juvenile pink salmon from PWS hatcheries was successfully initiated, using pristane concentration levels. This project will continue with this direction to assess feeding conditions for juvenile pink salmon during the critical period of initial marine residence, and will forecast survivals through this period. Forecasts will be compared to actual returns to assess reliability.

INTRODUCTION

Predicting recruitment is a fundamental goal of fisheries management, but an adequate understanding of the factors modulating recruitment are rarely achieved. This project has been funded in the hope that it would elucidate recruitment factors during the early marine phase of salmon and herring in Prince William Sound (PWS). Project results, augmented by agency-sponsored research, indicate that monitoring pristane in mussels may provide a basis for predicting marine survival of pink salmon, which might also be applicable to other salmon species (especially chum salmon). In 2000 this project advanced to the validation stage, and compared pink salmon survival forecasts with actual returns, to assess reliability. Preliminary analysis of 2000 data indicates that pristane monitoring provides fisheries managers with a new tool to improve salmon and ecosystem management in PWS.

Monitoring the response of pristane in mussels to mass-releases of juvenile pink salmon from PWS hatcheries indicated the key causal link required to predict marine survival. Prince William Sound Aquaculture Corporation (PWSAC) hatcheries in PWS have adopted a strategy of releasing juvenile salmon *en masse* in recent years to minimize predation. Numbers of released juveniles usually range from 20 to more than 100 million per release. Released juveniles immediately begin searching for adequate prey, and they become increasingly vulnerable to predation until prey adequate to support rapid growth are located.

By far the most available prey during spring in PWS are *Neocalanus* copepods, which contain pristane concentrations of about 1% (dry weight basis). High-density patches of these copepods accumulate near shorelines in response to wind-driven surface currents, and juvenile pink salmon remain close to shorelines during their first few weeks of marine residence searching for prey. Abundant fecal material rich in pristane is produced when large numbers of released pink salmon encounter concentrated near-shore patches of copepods. This pristane-laden fecal material is readily incorporated by mussels, so monitoring the increase of pristane concentrations in mussels near PWSAC hatcheries 2 to 3 weeks following releases of juveniles provides an indication that the released fish have located adequate prey. Conversely, failure to detect pristane increases in mussels anywhere within 25 km of hatcheries following a mass release strongly suggests low prey availability, leading to high vulnerability of fry to predators.

Most aspects of the transport pathway linking pristane generation in copepods to consumption by mussels have been validated by field and laboratory experiments. Field studies have demonstrated that high *Neocalanus* copepod abundance alone does not result in much pristane accumulation by mussels, hence direct incorporation of pristane dissolved into seawater from copepods, or of pristane in feces produced by these copepods, are negligible pathways to mussels. Other zooplanktivorous fishes may also produce pristane-laden feces during Spring, but are unlikely to pose significant confounding because compared with pink salmon they are not as abundant near hatcheries just after releases of pink salmon, and other these zooplanktivorous fishes are less closely associated with the shoreline. Shoreline association is important because both field and laboratory studies showed that effective incorporation of pristane by mussels

requires production of feces just above mussel beds at higher tidal stages. Laboratory studies also showed that mussels accumulate pristane within hours when exposed to pristane-laden feces, attaining thousand-fold concentration increases within a few days, and that depuration occurs much more slowly over a period of a few weeks.

Marine survival of juvenile pink salmon released *en masse* from PWS hatcheries was found to be significantly associated with pristane concentration increases in mussels near hatcheries 2 - 3 weeks following releases. Pristane concentrations have been monitored during Spring at a network of 30 stations for each of the last 6 years in PWS. Comparison of marine survival determined from adults returning to these hatcheries, with pristane concentration increases in mussels collected from sampling stations within 25 km of hatcheries before and 2 - 3 weeks following release of juveniles, showed that 33% of the interannual survival variability is explained by pristane increases ($P < 0.05$, $df = 13$). These results strongly suggest that continued monitoring of pristane in mussels may have predictive value to forecast marine survival of hatchery-released pink salmon.

This proposal emphasizes a shift from a research project to a validation project. This transition exploits the results of the research phase to optimize the monitoring design. Six samplings are proposed, biweekly beginning early April through end of June, to address the temporal variability of the spring zooplankton production and hatchery release strategies. The network of sampling stations was increased in 2000 by 11 to optimize geographic coverage near the hatcheries. Two stations were dropped because of the difficulty of access. The current network of stations permits assessment of the relation of marine survival estimates for hatchery pink salmon to wild stocks in PWS.

NEED FOR THE PROJECT

A. Statement of Problem

Pink salmon are a recovering species in PWS. This project will assess feeding conditions for juvenile pink salmon during the critical period of initial marine residence, and will forecast survivals through this period. If these forecasts are sufficiently reliable, they may help improve management of salmonids in PWS. Improved management will aid the full recovery of this species.

B. Rationale

Pristane in PWS mussels has been monitored for the last 6 years to assess whether seasonal variability of tissue concentrations may be related to recruitment of salmon. Pristane is an environmentally persistent hydrocarbon naturally produced by *Neocalanus* copepods in PWS. These copepods account for nearly all of the planktonic biomass available as prey for zooplanktivorous fishes during early Spring, especially juvenile pink salmon during initial marine residence. Laboratory and field experiments have confirmed that these fishes excrete

some of the pristane ingested with *Neocalanus* copepods in feces, and the feces are subsequently ingested by mussels. The time scale for pristane accumulation by mussels exposed to pristane-laden feces is a few days, and for depuration of accumulated pristane a few weeks. Monitoring pristane concentration increases in mussels during Spring thus indicates the conversion of nearby copepods into fish feces, implying growth of the zooplanktivorous predators. Rapid growth during early life history is essential for high survival. Verification of survival forecasts will permit more precise assessment of human impacts on this species.

C. Location

Mussel samples will be collected in Prince William Sound and will be analyzed for pristane concentrations at the Auke Bay Laboratory, Juneau, Alaska. Marine survival forecasts for pink salmon will help improve management of salmonids in PWS.

COMMUNITY INVOLVEMENT

We will continue to involve Prince William Sound residents in this project to share knowledge and interest in PWS ecosystems and to reduce sampling costs. Since 1994, the Prince William Sound Aquaculture Association has collected mussels near their 4 hatcheries at the appropriate times and stored them until the end of the season for pick-up. If Youth Area Watch program continues in 2002(EVOS Project 02210), students will again be collecting mussels near their hometowns, Tatitlek, Whittier, Chenega Bay, Valdez, Cordova, and Seward, and may be assisting with collections at other sites. We will provide materials for each participating school that explains the rationale of the project, and compares specific results for each school with the results for the whole effort. The underlying biology of this project gets to the heart of how the Sound turns sunlight into fish, which we believe can provide a very useful local teaching resource. Youth Area Watch students will also continue to participate in a 1 day workshop at Auke Bay Laboratory on laboratory analysis techniques for pristane in mussels.

PROJECT DESIGN

A. Objectives

In 2002 and onward this project has 1 objective:

1. Forecast marine survival of pink salmon in PWS.

B. Methods

The project objective will be addressed by determining the variability of pristane concentrations in mussels (*Mytilus trossulus*) from 40 sites in PWS during April through June. Collected mussels will be stored frozen and analyzed for whole-body pristane concentration.

Mussels (15) will be collected from selected mussel beds and placed into a plastic bag together with collection documentation (i.e. date, time, location, collector). Selected mussels will ideally be in the length range 20 - 45 mm. Mussels are collected along a transect parallel with the shoreline; 1 mussel is collected every consecutive meter. Previous results archived in the *Exxon Valdez* restoration database for hydrocarbons indicates that pristane concentrations in mussels collected in this way are representative of entire mussel beds.

Maximum increases of pristane concentrations in mussels at stations within 25 km of hatcheries 2 weeks following mass-releases of pink or chum salmon will be normalized to the size of the release. This ratio, denoted as the pristane index (PI), will be regressed against marine survival of released hatchery salmon (denoted S). Historical regressions of S vs. PI for each hatchery will be used as the basis for survival predictions. Pristane increases at more distant stations will be compared with increases near hatcheries to evaluate wild-stock survivals. The regression relation of S vs. PI for all hatcheries combined will be used as the basis for wild-stock survival estimates. Wild-stock estimates will be made for each salmon management district within PWS.

The chemical analysis of pristane involves pentane extraction of macerated tissues, lipid removal with silica gel, and separation and measurement of pristane by gas chromatography equipped with a flame ionization detector. Pristane measurement will use the internal standard method, with deuterated hexadecane and deuterated eicosane added to the pentane initially as the internal standard. Pristane identification will be based on retention time relative to the internal standard. Quality control samples include method blanks, spiked method blanks, and reference sample analyzed with each batch of 20 samples to verify method accuracy, precision, and absence of laboratory introduced artifacts and interferences. Recovery of the internal standard will be determine by adding a second internal standard prior to instrumental analysis. Method detection limits will be assessed annually for the mussel tissue matrix, and these detection limits will be assumed for the other matrixes analyzed. Based on previous performance, we anticipate accuracy of ± 15% of National Institute of Science and Technology (NIST)-certified values for the spiked blank and reference samples, precision of 95% of reference samples within ± 15% of sample means, and laboratory artifacts below detection limits more than 99% of the time. This level of analytical performance will insure that variability due to sample analysis is negligible compared with variability among replicate mussel samples.

Percent moisture will also be determined in samples so that results may be analyzed on dry weight weight bases. Dry weights will be determined by heating samples at 60 C to constant final weight.

Because there is no other practical way of estimating energy conversion from *Neocalanus* to their near-shore predators over a broad geographic area such as PWS, there are no alternative methodologies to consider here.

C. Contracts and Other Agency Assistance

It will be necessary to contract a chemical technician to process samples.

SCHEDULE

A. Measurable Project Tasks for FY02

FY01:

Apr 1 - June 30: Collect mussel samples.

Jul 1 - Sep 30: Analyze 2002 samples for pristane, summarize results in a report

B. Project Milestones and Endpoints

Write report by Dec. 31, 2002

C. Completion Date

Dec. 31, 2002

PUBLICATIONS AND REPORTS

An annual report will be produced by December 31, 2002.

NORMAL AGENCY MANAGEMENT

NOAA/NMFS has statutory stewardship for most living marine resources; however, if the oil spill had not occurred, NOAA would not be conducting this project. NOAA/NMFS proposes to make a significant contribution (as stated in the proposed budget) to the operation of this project, making it truly cooperative.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

We are cooperating closely with Youth Area Watch (02210), which is providing us with samples and to whom we are providing training and educational materials.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

There are no major changes in the study design from the 2001 proposal.

PROPOSED PRINCIPAL INVESTIGATOR

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PRINCIPAL INVESTIGATOR

Jeffrey W. Short

Education:
BS, 1972, University of California, Riverside (Biochemistry & Philosophy)
MS, 1982, University of California, Santa Cruz (Physical Chemistry)

Relevant Experience:
1989- Present: Established and managed the hydrocarbon analysis facility at ABL to analyze hydrocarbon samples generated by the *Exxon Valdez* NRDA effort (about 20% of these samples were analyzed at ABL).
1989 - 1992: Principal Investigator, Exxon Valdez project Air/Water #3: Determination of petroleum hydrocarbons in seawater by direct chemical analysis and through the use of caged mussels deployed along the path of the oil spill.
1991 - 1996: Principal Investigator, Exxon Valdez project Subtidal #8: Development of computer-based statistical methods for global examination of sediment and mussel hydrocarbon data produced for the Exxon Valdez NRDA effort for systematic bias, and for identification of probable sources of hydrocarbons. In addition, this project produced both hard-copy and computer display maps of all the sediment and mussel hydrocarbon data.
1994 - 1995: Initiated data analysis and pilot projects that established the role of pristane in Prince William Sound.
1996-2001 Principal Investigator 96195, 97195, 98195, 99195, 00195, and 01195

OTHER KEY PERSONNEL

Patricia M. Harris

Education: University of Alaska Fairbanks; B.S. Biological Science 1966
Graduate work at U of A Fairbanks, U of A Southeast, University of British Columbia
Relevant Experience:
1989-1992: Co-principal investigator of NRDA study Subtidal 3, was responsible for field

logistics and sample collection and assisted in data analysis and report preparation; also assisted other NRDA projects in field collections.
1992 -1996: participated in study design, field work, proposal preparation, data analysis, and report preparation for mussel bed monitoring and restoration (R103-96090).
1994-2001 Participated in logistic planning, sampling, and community involvement coordination for the pilot pristane project, 96195-001195

Relevant publications: Co-author of final reports for NRDA study Subtidal 3 and several publications pertaining to distribution of *Exxon Valdez* oil in mussels and underlying sediments. Several public presentations of oil-related scientific research.

Responsibilities: Coordinate sample collection logistics and collect mussel samples; data analysis; report and proposal preparation; and preparation of science educational materials, posters, and reports.

2002 EXXON VALDEZ TRUS' :OUNCIL PROJECT BUDGET

October 1, 2001 to September 30, 2002

Budget Category:	Authorized FY2001	Proposed FY 2002
Personnel	$21.9	$17.4
Travel	$26.2	$26.2
Contractual	$1.0	$5.0
Commodities	$2.5	$3.4
Equipment	$0.0	$0.0
Subtotal	$51.6	$52.0
General Administration	$3.4	$3.0
Project Total	$55.0	$55.0
Full-time Equivalents (FTE)	0.3	0.2
Other Resources	23.3K	29.2k

LONG RANGE FUNDING REQUIREMENTS					
		Estimated FY 2003	Estimated FY 2004		
		$55.0	$55.0		

Dollar amounts are shown in thousands of dollars.

Comments:

NOAA contribution: Principle Investigator, Senior Research Chemist Jeff Short 2 months@20 K, Zoologist Pat Harris 1.5 mo @ 9.9K for a total NOAA contribution of 29.9K.

FY02

Prepared: 4/11/01

Project Number: 02195
Project Title: Pristane Monitoring in Mussels
Agency: National Oceanic and Atmospheric Administration

FORM 3A
TRUSTEE
AGENCY
SUMMARY

2002 EXXON VALDEZ TRUS' :OUNCIL PROJECT BUDGET

October 1, 2001 to September 30, 2002

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 2002
Pat Harris	Zoologist	11/4	1.0	6.6		6.6
Josie Lunasin	Chemist	9/6	1.8	6.0		10.8
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		2.8	12.6	0.0	
					Personnel Total	$17.4

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 2002
anchorage Workshop	0.4	1	3	0.2	1.0
					0.0
Cordova	0.4	6	24	0.2	7.2
					0.0
air charter 18 days @ 1K/day	1.0	18			18.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$26.2

FY02

Project Number: 02195
Project Title: Pristane Monitoring in Mussels
Agency: National Oceanic and Atmospheric Administration

FORM 3B
Personnel
& Travel
DETAIL

2002 EXXON VALDEZ TRUS COUNCIL PROJECT BUDGET

October 1, 2001 to September 30, 2002

Contractual Costs:	Proposed
Description	FY 2000
Temporary labor to analyze pristane samples	5.0
When a non-trustee organization is used, the form 4A is required. **Contractual Total**	$5.0

Commodities Costs:	Proposed
Description	FY 2000
Chemicals, glassware and chemistry laboratory supplies to analyze samples, field supplies	3.4
Commodities Total	$3.4

FY02

Prepared: 4/11/01

Project Number: 02195
Project Title: Pristane Monitoring in Mussels
Agency: National Oceanic and Atmospheric Administration

FORM 3B
Contractual & Commodities DETAIL

2002 EXXON VALDEZ TRUS COUNCIL PROJECT BUDGET

October 1, 2001 to September 30, 2002

New Equipment Purchases: Description	Number of Units	Unit Price	Proposed FY 2000
			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 Equipment Total**	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
GC/MS		
HPLC		

FY02

Prepared: 4/11/01

Project Number: 02195
Project Title: Pristane Monitoring in Mussels
Agency: National Oceanic and Atmospheric Administration

FORM 3B
Equipment
DETAIL

Youth Area Watch

Project Number:	02210
Research Category:	General Restoration
Proposer:	Chugach School District
Lead Trustee Agency:	ADF&G
Cooperating Agency:	DNR
Alaska SeaLife Center:	Yes
Duration:	7th year, seven year project
Cost FY 02:	$90,000 (project) plus $6.3 (ADF&G GA) = $96.3 total
Geographic Area:	Prince William Sound, Resurrection Bay and Lower Cook Inlet including: Cordova Harbor and Orca Inlet, Port San Juan and Evans Island, Tatitlek Narrows, Boulder Bay, Landlocked Bay
Injured Resource/Service:	Harbor seal, mussels, pink salmon, killer whales, subtidal and intertidal communities, subsistence, passive.

ABSTRACT

Youth Area Watch links students in the oil spill impacted area with research and monitoring projects funded through the Trustee Council. The project involves students in the restoration process and provides these individuals the skills to participate in oil spill restoration now and in the future. Youth conduct research identified and delegated by principal investigators who have indicated interest in working with students. Youth Area Watch fosters long-term commitment to the goals set out in the restoration plan and is a positive community investment in that process. Participating communities include: Cordova, Chenega Bay, Nanwalek, Port Graham, Seldovia, Seward, Tatitlek, Valdez, and Whittier.

INTRODUCTION

Since the inception of Youth Area Watch, coordination between research and restoration projects and the communities affected by the oil spill continues to increase. Resulting from many factors, community involvement in the restoration process continues to grow and strengthen; Youth Area Watch is an example of this coordinated effort through the connection that students, the communities and researchers maintain. This relationship creates an environment where youth are encouraged to interpret the data collected and apply the information to the ecosystem.

Students from the oil spill impacted communities are screened and selected for participation in Youth Area Watch at the beginning of each school year. Those showing an interest, academic ability and concern for the oil spill effects on local ecosystems are invited to represent their community as a student of the project. Students work with principal investigators of research projects and community facilitators, as well as independently to achieve the set project objectives.

Three core research projects funded by the Trustee Council serve as the central link for all Youth Area Watch activities. Initial cooperating projects include pristane mussel analysis (02195), harbor seal management and biological sampling (02244F) and comprehensive killer whale investigation in Prince William Sound (02012A). These projects continue to work with Youth Area Watch, providing specific research activities for students to conduct and protocol training for those duties. According to protocol, students collect samples and data for the cooperating research and monitoring projects. The samples and data are compiled by a Youth Area Watch project coordinator located in Anchorage and sent on to the principal investigator of the respective projects. Information on the data collected is maintained by the project coordinator for project analysis conducted by the students during group project sessions.

Yearly, students select a local restoration project to conduct. As in previous years, students will begin by completing a planning process during the winter months. Students work with local Community Involvement coordinators to integrate, where possible, their knowledge and expertise.

Students will post project information on their web site (http://www.micronet.net/users/~yaw) for the public to view. This information will be updated throughout the project year.

NEED FOR THE PROJECT

A. Statement of Problem

Youth Area Watch, identified by the Trustee Council as a "general restoration" project, is committed to collecting the requisite samples and data for principal investigators of research projects to make informed decisions concerning the ecology of oil spill impacted areas. Research and restoration project PI's identify needed data collection within the oil spill impacted communities that in many instances can best be facilitated through local involvement of community residents.

Given the finite resources available for project activities, cost containment is necessary. By working with local community youth, information can be collected at a minimal cost. In addition, a greater quantity of data collection from an increased number of sites throughout the year can be accomplished by Youth Area Watch project activities.

As a part of the Memorandum of Agreement and Consent Decree approved by the U.S. District Court, "meaningful public participation in the injury and assessment and restoration process" is recognized as an important component of the restoration process. While there are a variety of instituted mechanisms for this involvement, Youth Area Watch offers positive examples of meaningful public participation expressed by the oil spill impacted communities through the involvement of community facilitators (Community Involvement \052A) and other community-based projects. The project continues to receive strong support both within the communities that it is conducted as well as among the principal investigators involved with the youth.

B. Rationale/Link to Restoration

Community-based participation in ecosystem restoration is supported by recent research. Graduate field ecology work conducted through SUNY, Stony Brook applied co-management principles to revitalize the Oak Brush Plains Preserve of Long Island, New York (Block, p. 38). In this exercise, a local group familiar with the environment assisted in replanting and management efforts while the researcher actively participated in their experiential activities so that cooperative management strategies could best be achieved. This approach is supported by research techniques used in other ecological restoration projects such as fisheries (Pinkerton) and tropical rain forests (Allen). Furthermore, the link between Native cultures and environmental revitalization has gained significant support as a mechanism for sustaining ecological practices within communities (Rogers-Martinez). Given this research, appropriate extension is made to youth within the restoration region so that "the issue of how people will inhabit, utilize and maintain the area in a manner that sustains its integrity" can be addressed (Block, p. 38).

Youth Area Watch is based on the commitment by principal investigators of research and restoration projects to involve students in their work. Participating projects are funded by the Trustee Council and have met the guidelines under the settlement. It is through the

cooperating projects that Youth Area Watch holds an interest in the immediate restoration activities.

As a long-term goal, project activities are expected to provide the foundation for long-term commitment to restoration of the impacted area to pre-spill levels. Involvement of youth in research and monitoring activities is essential in developing local commitment to the restoration plan adopted by the Trustee Council. Cooperating PI's request precise and detailed sampling/data collection from the youth. Students, in turn, have increased their knowledge and participation through their connection to the projects. As a result, students are now stakeholders in the restoration process.

C. Location

While Youth Area Watch is administered through the Chugach School District's main office in Anchorage by project coordinators, project activities currently take place in the nine participating communities and in the oil spill impacted area. Local communities include Chenega Bay, Cordova, Port Graham, Nanwalek, Seldovia, Seward, Tatitlek, Valdez and Whittier.

The science teacher (site teacher) within each of the nine communities oversees the day-to-day activities pertaining to the project. Project coordinators travel to the local communities to facilitate in-class integration of project activities and off-shore research in specific locations of importance to the identified research projects. Local projects activities identified by each site occur at or near the community.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

One of the main goals of Youth Area Watch is to facilitate community involvement in the restoration process at a primary and secondary school age. It is through community interest and participation that the project has had a positive impact on students. Ultimately, long-term impacts, to include local ongoing restoration and ecosystem sustainability, are anticipated as youth conduct established research and apply this knowledge to community efforts to understand and preserve species affected by the oil spill. As a result, communities continue to request participation in Youth Area Watch.

Local oil spill impacted communities are involved and participate in Youth Area Watch. The local facilitators of Community Involvement (/052A) continue to work with students and the community Youth Area Watch activities to involve youth. Local facilitators and parents of participating youth assist with various aspects of project activities such as serving as chaperones, providing traditional ecological knowledge and coordinating opportunities for youth to work with local projects. Through this cooperative effort, information is exchanged between projects and across generations.

As a component of the project scope, students at each site are asked to identify a local project that they will conduct. Through these local projects, students gain a greater understanding of what the research and restoration process means at the community level, as well as an interest in meaningful project outcomes.

PROJECT DESIGN

A. Objectives

Selected students from the identified communities participate in research and restoration activities set out by Alaska Department of Fish and Game principal investigators, NOAA staff, University of Alaska, Fairbanks biologists and other project principal investigators working with Youth Area Watch. As part of an area watch project that works with existing research and restoration projects, students collect samples and data that is then provided to the respective projects.

Youth Area Watch objectives include:

1. Research project principal investigators interacting with students.
2. Identifying all research and data collection activities.
3. Updating memoranda of agreement with school districts.
4. Completing site teacher orientation.
5. Conducting school orientations for students on Youth Area Watch.
6. Selecting students to participate in Youth Area Watch.
7. Conducting site teacher training on project activity protocol.
8. Completing the student project orientation and training.
9. Conducting oceanographic data collection.
10. Assisting local hunters/technicians collecting harbor seal biological samples.
11. Conducting a local research/restoration projects.
12. Maintaining a Youth Area Watch web site.
13. Collecting blue mussels for pristane/mussel analysis.
14. Facilitating project follow-up training for site teachers.
15. Conducting killer whale monitoring

B. Methods

The Chugach School District currently works with the Kenai Peninsula Borough School District, Cordova School District and Valdez School District through memoranda of agreement so that the communities of Chenega Bay, Cordova, Nanwalek, Port Graham, Seldovia, Seward, Tatitlek, Valdez and Whittier may participate. School districts will operate under the existing agreements during the seventh project year.

Youth Area Watch project coordinators work with the principal investigators of the cooperating projects to solidify project expectations. Protocol is established for

sample/data analysis. In addition, principal investigators commit to working with the students for a period of time during the training and/or data collection stage.

The Chugach School District developed an application and screening tool to select students for participation in the project. Up to 28 students will be selected from the communities to be a part of Youth Area Watch. While the distribution may vary according to the interest and ability of students that apply, it is expected that the distribution will be as follows: two students from Chenega Bay, three students from Cordova, two students from Port Graham, two students from Nanwalek, two students from Seldovia, six students from Seward, three students from Tatitlek, four students from Valdez, three students from Whittier, and one remote site student.

Prior to the beginning of school in the fall, participating Youth Area Watch teachers at the local sites will come together for an orientation session facilitated by project coordinators. It is anticipated that site teachers will again receive protocol training directly from principal investigators. This training will occur at one community site and the training will be videotaped for future referral.

Youth Area Watch relies on the participation of research projects, sites and program resources to successfully fulfill the project objectives. Throughout the project year, students travel to research vessels, specific project sites near their community and research labs in the process of project activity completion. In the past year, Youth Area Watch was able to coordinate with projects conducting research cruises and work cooperatively on task completion while sharing the costs of vessel hiring. In FY99, FY 00 and FY01, Youth Area Watch coordinators assisted with the coordination of harbor seal protocol training. It is expected that this type of cooperative effort will continue in the present and coming years.

Students will participate in the core research projects as a group. This will consist of coming together as a group to work on collection protocol, as well as conducting activities for these projects in their community. In addition, students will participate in local projects that pertain to their geographic area. It is during the local project work that students receive a high degree of one-on-one interaction and involvement with principal investigators and their research. Youth Area Watch coordinators will continue to be open to working with other projects funded by the Trustee Council if students can have meaningful participation in these projects.

Ongoing Youth Area Watch research and restoration projects include:

1. Pristane/mussel analysis, Project Number 01195. Jeff Short and Pat Harris at the NOAA Auke Bay laboratory study the pristane levels in blue mussels. There are approximately thirty mussel collection sites in Prince William Sound. Students will continue to collect mussels twice a month at sites appropriate for collection according to set protocol. During the fall and winter months, students are responsible for overall mussel bed seasonal watch. Students will tag, identify mussel bed characteristics and predator/prey activities.

2. Harbor seal management and biological sampling, Project Number 01244F. The project is conducted by Monica Reidel of the Alaska Native Harbor Seal Commission, in cooperation with Vicki Vanek from the Department of Fish and Game in Kodiak. After they have participated in traditional ecological knowledge and protocol training, students will pair up with local technicians/hunters and assist with bio-sampling activities. Students collect different parts of the seal, including the skin, blubber, teeth and stomach. Adherence to sampling protocol is ensured by working directly with the local hunters.

3. Comprehensive Killer Whale Investigation in Prince William Sound, Project Number 01012A. The principal investigator is Craig Matkin. The project tracks the killer whale population in Prince William Sound and Kenai Fjords. Whales are photographed and cataloged based on identifying markings and family relationships. Genetic studies on the whales are also conducted through the use of darting. Students will assist in locating and identifying the whales during day cruises in and around Resurrection Bay.

In addition to the core projects in which Youth Area Watch students participate, each site is selecting a restoration project to work on in their local community. This restoration activity is something that the students select and not necessarily a project that is currently funded by the Trustee Council. However, local projects are closely linked to existing restoration activities.

Coordination between Youth Area Watch and participating research projects remains strong. Where possible, research vessel costs are shared to maximize resources for project activities. In the case of the pristane/mussel project, Youth Area Watch has paid for the biologist's chartered flights to sites for mussel collection to allow students to participate in the process. In other instances, time and resources are contributed by participating projects to Youth Area Watch.

At this point, the YAW project is in the midst of a metamorphosis. With the trustee council transitioning to the greatly reduced work level of the GEM program, YAW must transition also if it is to remain vital and current. There is a significant degree of uncertainty within the research community as to what exactly the GEM program will look like. In the current climate, we must remain flexible and agile so as to most advantageously position ourselves to participate in long term research and monitoring projects. While we maintain our working understanding with the three previously mentioned projects, (Pristane/mussel analysis, Project Number 01195, Harbor seal management and biological sampling, Project Number 01244F and Comprehensive Killer Whale Investigation in Prince William Sound, Project Number 01012A), we expect that changes in the working protocol will probably occur. We also fully expect to forge new, long-term partnerships as the GEM program settles into a more steady state.
During this time of funding reductions, student contributions to research projects will become more and more important. The past six years have allowed us to demonstrate that students can cost effectively and reliably collect scientific data for existing projects. As we

move toward a program of low cost, high yield monitoring, it is time for our previous work to bear fruit. The many relationships we have built within the research community will serve us well in the next chapter of the Youth Area Watch program.

As funding for the Youth Area Watch project comes from increasingly non-trustee sources, and the pool of Trustee Council projects diminishes, the project will transition to include some non-Trustee Council funded projects. This shift will be necessary in order to meet the goals of the original project proposal and provide a long-term role for middle and high school students in research and restoration projects.

Objectives and Activities

Objective 1: Youth Area Watch students will interact with research project principal investigators, gaining a greater understanding of the affects of the oil spill on the ecosystem.

- Activity 1: Principal investigators commit to working with students directly at least once during the project year.[1]
- Activity 2: Students work beside principal investigators during field work.
- Activity 3: Students independently conduct activities set out by the principal investigators.
- Activity 4: Students draw conclusions from their independent work to be reported at the annual Science Review.
- Activity 5: Students work with Community Involvement (/052) local facilitators and community members to increase awareness of restoration activities and the status of the ecosystem.

Objective 2: Project coordinators identify all research and data collection activities to be conducted by students at all sites participating in Youth Area Watch.

- Activity 1: Project coordinators meet with the principal investigators or delegate project research personnel either by phone or in person to set student activity parameters.
- Activity 2: Activity protocol forwarded by the principal investigator or delegate, including sample and data forwarding process, to project coordinators.

[1] It is expected that additional contact occur throughout the project year, though not necessarily in person. Research project PIs receive updates and samples according to the protocol set out for students.

Activity 3: Project coordinators finalize project activities for site teacher and students.

Objective 3: Project coordinators update memoranda of agreement with the Valdez School District, Cordova School District, and Kenai Peninsula Borough School District for participation in Youth Area Watch.

Activity 1: Project coordinators contact each school district to evaluate the current agreement and make any necessary changes.

Activity 2: Site teachers are identified by each school district for the participating communities.

Objective 4: Site teachers receive Youth Area Watch project orientation.

Activity 1: Project coordinators develop an orientation and training session plan in consultation with research project principal investigators.

Activity 2: Project coordinators set a date in the early part of October to conduct orientation. Site teachers are contacted to determine the most appropriate dates.

Activity 3: Project coordinators perform site teacher orientation and training.

Objective 5: Project coordinators conduct school orientations on Youth Area Watch.

Activity 1: Project coordinator travels to each participating school site prior to beginning the project year.

Activity 2: Project coordinators present Youth Area Watch to community science classes. Students that have participated in prior years will be asked to assist.

Activity 3: Students will be informed of the process to apply and participate in Youth Area Watch '02.

Objective 6: Students are selected to participate in Youth Area Watch.

Activity 1: Project coordinator distributes student applications to project sites. All village council/tribal offices (Chenega Bay, Seward, Tatitlek, Valdez, Seldovia, Port Graham, Nanwalek) will receive application forms, as well as the Valdez, Cordova and Kenai Peninsula Borough School Districts for their respective community sites.

Activity 2: Project coordinators convene a committee to review student applications for Youth Area Watch participation. The committee is comprised of Chugach School District staff and may be assisted by participating school district staff and community facilitators (/052).

Activity 3: The review committee examines applications and selects students based on science interests, academic achievement, maturity and site teacher recommendation.

Objective 7: Project coordinators conduct site teacher training on project activity protocol.

Activity 1: Project coordinators set a date in early October for site teacher protocol training and coordination

Activity 2: Project coordinators request the attendance of research project principal investigators at the site teacher orientation.

Activity 3: Project coordinators facilitate a protocol training session to ensure that correct information and research practices are followed by students during the project year.

Objective 8: Project coordinators complete the student project orientation and training. All participating students from the community sites collectively meet at the Seward SeaLife Center for the Youth Area Watch introduction and preliminary activity participation.

Activity 1: Project coordinators work with SeaLife Center staff to determine appropriate dates for orientation.

Activity 2: The project coordinators invite research project principal investigators to participate in the student orientation.

Activity 3: The Youth Area Watch principal investigator coordinates travel arrangements for student participation in the orientation.

Activity 4: In cooperation with the research project principal investigator(s), project coordinators conduct the student orientation to Youth Area Watch goals, responsibilities and activities. Students learn about the ecosystems, and identify ways in which project activities fit into the biotic cycle.

Objective 9: Students conduct oceanographic data collection in their local communities. Site teachers oversee these activities.

Activity 1: Students take twice monthly water temperature and salinity readings at their local site.

Activity 2: A weather station is installed at each site under the supervision of the site teacher. Students measure the wind speed and direction, air temperature and barometric pressure.

Activity 3: Data is collected at each site and transmitted to the project coordinator periodically.

Activity 4: Data is posted on the Youth Area Watch web page by the project coordinators

Objective 10: Students assist local hunters/technicians collecting harbor seal biological samples.

Activity 1: Project coordinators work with principal investigators to coordinate harbor seal biosampling trainings for students and local hunters.

Activity 2: Students analyze an available sample to become acquainted with what is taken and what to look for in a sample. Students collect various parts of the seal for analyzing, which include: skin, blubber, teeth, stomach, skull, liver, heart and kidney. Additionally, measurements and weight are taken for each animal.

Activity 3: Students at local sites participate in taking samples from harvested seals.

Activity 4: Students assist the hunter/technician in preparing the sample for shipment to the harbor seal management principal investigator.

Objective 11: Each community site conducts a local research/restoration project.

Activity 1: The site teachers and project coordinator work with participating students to identify a local research/restoration project.

Activity 2: During the winter months of November through January, students develop a plan for their local restoration project. This is completed with the appropriate assistance and coordination of community facilitators.

Activity 3: Site teachers work with project PIs where appropriate to develop protocol for student participation.

Activity 4: Students conduct local project activities according to protocol

and timelines set out by site teachers.

Activity 5: Students provide data/samples to project PIs according to protocol.

Objective 12: Students maintain a Youth Area Watch web site.

Activity 1: Students become Internet proficient and learn to update their web site with current YAW information.[1]

Activity 2: Students analyze data collected from the research projects, both past and current.

Activity 3: Using the established reporting format, the data is posted on the web site.

Activity 4: Students update data on research activities as necessary.

Objective 13: Students at each site collect blue mussels for pristane/mussel analysis.

Activity 1: Students tag and identify mussel bed characteristics during fall and winter months at their local sites.

Activity 2: Students note predator/prey activity at the identified mussel bed sites monthly.

Activity 3: Students collect mussels according to principal investigator request during the spring months. Sites are selected by the principal investigator and noted in project reporting.

Activity 4: Students label and cold storage mussels for transport to the Auke Bay laboratory in Juneau.

Activity 5: Students send mussels to project coordinators once an adequate collection has accumulated for transport to Auke Bay Labs.

Activity 6: Students count mussels in the beds according to set protocol.

Activity 7: Students compile site data for transmission to the project coordinator.

Activity 8: Students travel to the Auke Bay laboratory to participate in the analysis of data.

[1] While many students will be familiar with the Internet, some communities recently linked will need training. Additionally, previous Youth Area Watch participants may be proficient at updating the web site, yet new students will need assistance.

Objective 14: Project coordinators facilitate project follow-up training for site teachers in the spring.

Activity 1: Project coordinators set a date convenient for site teachers to conduct a spring follow-up session.

Activity 2: Project coordinators invite principal investigators of participating projects to assist in the follow-up session.

Activity 3: Project coordinators facilitate a follow-up session for site teachers to share information and identify strategies for improving student activities.

Objective 15: Students participate in killer whale identification project.

Activity 1: Principal investigators train students in killer whale identification methods. Students are also informed of project scope and goals.

Activity 2: Students participate in a day cruise with principal investigators to track and identify killer whales in and around Resurrection Bay including: hydrophonic monitoring of whales, photographic recording of individual animals, and darting to obtain blubber and skin samples.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

The Chugach School District serves as the administrative agency for Youth Area Watch through their contract with the Department of Fish and Game. The school district has shown that it is an effective link to the students and communities impacted by the oil spill. As the administrative entity, the Chugach School District will maintain memoranda of agreement with the Valdez School District, Cordova School District and Kenai Peninsula Borough School District as the school districts that serve the identified communities.

The Chugach School District continues to work with the Chugachmiut and Chugach Regional Resources Commission to coordinate and exchange community information with regard to regional restoration activities. As the coordinating agency for community involvement, Chugach Regional Resources Commission works with the youth through the local facilitators so that students may participate in research and restoration activities.

Since the inception of the project, significant contributions have been made and are identified in the budget. Contractors have provided discounted services, as in the case of vessel hiring. Expensive equipment used in project activities are offered by coordinating agencies. Cooperating agencies provide technical assistance, student supervision and support for project activities. The Chugach School District relies heavily on the

commitment and participation of cooperating school districts involved in the project. Site teachers dedicate their time to the goals of Youth Area Watch, serving as an in-kind contribution.

In keeping with its commitment to secure additional support for Youth Area Watch activities, Chugach School District has sought and received two significant grants that offset the cost of the project. A three-year ($1,450,000) M.A.T.E. grant allows the District to couple real life activities with education, focusing on how these experiences will be applied in adulthood; a particular objective of the grant is directed at science opportunities in response to Youth Area Watch. The second grant is a three-year ($510,000) 21-Century grant from the Department of Education that provides funds for real life after-school activities for students. In addition, the district will continue to commit general funds to the project and will seek out alternative funding sources as the program transitions away from Trustee Council support. The success of the project activities motivates the Chugach School District to commit additional funding through diversified means so that the youth are equipped to continue their restoration and ecological management activities as an integral component of their education.

As Trustee Council responsibility for restoration activities decreases due to the decline of settlement funds, the project coordinators continue to pursue opportunities where Youth Area Watch project activities can transition to a more stable position. Toward this end, the school district maintains cooperative relationships with entities engaged in ecological management and restorative projects, independent of Trustee Council funding. Particularly with respect to local restoration projects where other agencies, organizations and private groups are involved, the Youth Area Watch project scope is expanding so that a smooth shift of focus can occur. By building and maintaining these cooperative working relationships, resource exchanges can be enhanced to augment other district resources.

SCHEDULE

A. Measurable Project Tasks for FY 02 (October 1, 2001 - September 30, 2002)

July 1 - August 1, 2001:	Confirm research & data collection activities
August 15 - 31, 2001:	Site teacher orientation
September 1 - 18, 2001:	School site orientations
September 15 - 30, 2001:	Students selected for participation
October 1 - 31, 2001:	Site teacher training on protocol
October 1 - 31, 2001:	Student orientation and training
November 1 - 7, 2001:	Sites prepare weather stations
November 1 - July 30, 2002:	Students participate in research activities
November 1 - May 31, 2002:	Students maintain web site
March 1, 2002:	Project Coordinator sends data to PIs
May 1 - 15, 2002:	Site teacher follow-up training
June 1, 2002:	Project Coordinator sends data to PIs
June 1, 2002:	Students complete project reports for FY 01

Ongoing Activities:

February 02 - August 02:	Student bi-monthly collection of mussels
October 01 - September 02:	Student mussel bed monitoring
October 01 - September 02:	Student weather station monitoring (daily)
October 01 - September 02:	Students collect harbor seal samples with local hunters
October 01 - September 02:	Students conduct local project activities
October 01 - September 02:	Students assist in documenting local TEK
October 01 - September 02:	PIs interact and exchange information with students

B. Project Milestones and Endpoints

October 17, 2001:	Students selected for participation
October 30, 2001:	Protocol training complete
November 1, 2001:	Students conduct project activities
March 1, 2002:	Data/samples to PIs
June 1, 2002:	Data/samples to PIs and reports complete
October 17, 2002:	Students selected for participation
October 30, 2002:	Protocol training complete
November 1, 2002:	Students conduct project activities
March 1, 2003:	Data/samples to PIs
June 1, 2003:	Data/samples to PIs and reports complete

C. Completion Date

Objectives identified in the project design will continue to serve as guidelines for community involvement within the civil settlement throughout the life of the restoration effort. It is expected that the Youth Area Watch project will continue beyond the seven years of Trustee Council Funding.

PUBLICATIONS AND REPORTS

Youth Area Watch was featured in "The Science Teacher," "Living on Earth" and "Alaska Magazine." Copies of these articles have been forwarded to the Restoration Office. In addition, the project has been featured on NPR. The project will also be featured during state-wide broadcasts on the Alaska Rural Communication System during programs on standards in education.

The Youth Area Watch Web site www.micronet.net/users/~yaw continues to be an important venue for students to both receive and distribute information. Each project that students work with has a student generated page of explanation and photographs. There is also space for students reports on their own local restoration projects as well as meteorological and oceanographic data. The site is utilized by students during training at the beginning of the year as they attempt to learn about each of the projects with which they will participate work over the course of the year. FY '02 will be the second year that all of the community schools involved in the project are online. This connectivity has been a strong benefit in allowing the project coordinator to communicate directly and regularly with students at each school. This increase in communication and coordination enables more flexible and responsive action by project coordinators and school site participants.

PROFESSIONAL CONFERENCES

Throughout the year, Chugach School District administrative staff showcase Youth Area Watch. This year, the project will be highlighted to the Oxford Coalition at Harvard University and to members of the Gates Coalition at their annual meeting. Youth Area Watch will also be a feature in the Principal Investigator's keynote speech to the National Quality School Conference in Los Angeles California.

NORMAL AGENCY MANAGEMENT

This section is not applicable.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

Youth Area Watch relies on the participation of Trustee Council funded projects to maintain coordination with restoration efforts. Through the commitment of principal investigators, youth conduct research activities with and for participating projects. Students work independently, as well as beside researchers during the project year. Costs

are shared between projects to allow for increased research vessel time and one-on-one interaction between students and the researchers.

Various people contribute the necessary technical assistance and resources. Local community facilitators from Community Involvement (/052) work with students and serve as chaperones for project activities. School districts provide teacher time and facility space for activities.

A variety of funding sources and project contributions ensure the success of the project. The Chugach School District commits over $142,000 in FY '02 to the project. These funds come in the form of administrative time, certified teacher time, travel expenses and housing for students. Other school districts contribute $58,300 in teacher time and $21,420 in facility resources. Communities and school districts contribute $11,600 in lodging. Equipment in-kind contributions total $6,200. Participating principal investigators from research projects contribute $8,520 worth of their time.

PROPOSED PRINCIPAL INVESTIGATOR

Richard DeLorenzo
Chugach School District
9312 Vanguard Drive, Suite 100
Anchorage, AK 99507
Office: (907) 522-7400
Fax: (907) 522-3399

PRINCIPAL INVESTIGATOR

Richard DeLorenzo is the superintendent of the Chugach School District. He maintains administrative authority over all day-to-day functions of the district's activities. Mr. DeLorenzo has extensive experience administering grants, adhering to project objectives and managing budgets. Mr. DeLorenzo will be directly responsible for budget expenditures, negotiating contracts and working with the participating school districts to ensure effective project management.

OTHER KEY PERSONNEL

Project Coordinator: Randy Fleharty is a certified secondary teacher with Bachelor of Science degree in physics. Mr. Fleharty's responsibilities include:

1. working with principal investigators of research projects to ensure proper protocol.
2. coordinating student selection process.
3. coordinating all orientation and training sessions with site teachers and staff.
4. ensuring that site teachers and students have proper supplies.
5. completing site visits.
6. monitoring project activity of students.
7. providing support to site teachers.
8. coordinating principal investigator-student interaction through research.
9. transmitting data to principal investigators.
10. completing necessary project reports and/or materials for publication.
11. continuing to seek additional funding sources for project activities beyond the life of the Trustee Council.

LITERATURE CITED

Allen, W.H. "Biocultural Restoration of a Tropical Forest." Bioscience. 38(3): 156-161, 1988.

Block, Mindy. "Pine Barrens - Upland Associations." Notes, 1997.

Pinkerton, E. Cooperative Management of Local Fisheries: New Directions for Improved Management and Community Development. Vancouver: University of British Columbia Press, 1989.

Rogers-Martinez. "The Sinky One Intertribal Park Project." Restoration & Management Notes, 1992.

2002 EXXON VALDEZ TRUS COUNCIL PROJECT BUDGET

October 1, 2001 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002						
Personnel		$0.0						
Travel		$0.0						
Contractual		$90.0						
Commodities		$0.0						
Equipment		$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	$0.0	$90.0	Estimated					
General Administration		$6.3	FY 2003					
Project Total	$0.0	$96.3	$80.0					
Full-time Equivalents (FTE)		1.0						
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

FY02

Prepared:

Project Number: 02210
Project Title: Youth Area Watch
Name: Chugach School District
Agency: ADF&G

FORM 3A
TRUSTEE
AGENCY
SUMMARY

2002 EXXON VALDEZ TRUS COUNCIL PROJECT BUDGET

October 1, 2001 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002						
Personnel	$52.0	$50.0						
Travel	$25.0	$20.0						
Contractual	$5.0	$5.0						
Commodities	$3.0	$3.0						
Equipment	$0.0	$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	$85.0	$78.0				Estimated FY 2003		
Indirect	$15.0	$12.0						
Project Total	$100.0	$90.0				$80.0		
Full-time Equivalents (FTE)	1.0	1.0						
	Dollar amounts are shown in thousands of dollars.							
Other Resources	$277.5	$248.0				$221.0		

Comments:

Personnel - The project coordinator is responsible for the duties of monitoring and facilitating the project activities at all sites.

Travel - Students travel by both charter (especially when conducting field work, such as mussel collection with the scientist). Student travel to Anchorage for the Science Review is a project contribution. Only transport expenses are requested through the budget.

Contractual - The hiring of boats at a rate of $1,000 per day (5 days) will occur in conjunction with research on surf scoters and kittiwakes.

Commodities - Each major classroom site is allocated $333 for project supplies. Supplies from previous years will be used as well.

Indirect - School district administrative costs are calculated at 15%. This accounts for the direct oversight of fiscal reporting and associated support at the administrative offices in Anchorage. In addition, these costs offset the expenses that sites incure including telephone, fax, postage and other general support.

Other resources - Teacher time ($52,100); participating PIs ($7,940); Youth Area Watch PI ($13,025); Facility space ($22,340); equipment ($6,200); travel, facilities, lodging and additional adminstrative support ($146,385).

FY02

Project Number: 02210
Project Title: Youth Area Watch
Name: Chugach School District

FORM 4A
Non-Trustee
SUMMARY

Prepared: 4/01

2002 EXXON VALDEZ TRUS COUNCIL PROJECT BUDGET

October 1, 2001 - September 30, 2002

Personnel Costs:				Months	Monthly		Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FY 2001
	Project Coordinator	The coordinator facilitates training for both site teachers and participating students; coordinates youth interaction with research PIs; schedules project travel; works with local sites to develop community restoration projects; works with local facilitators and site teachers to ensure the exchange of information; monitors the completion of project activities; solicits additional funding for project enhancement.		12.0	4.20		50.4
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
		Subtotal		12.0	4.2	0.0	
						Personnel Total	$50.4

Travel Costs:		Ticket	Round	Total	Daily	Proposed
	Description	Price	Trips	Days	Per Diem	FY 2001
	Charter and /or commerical trips for students to training/research.	0.5	28			14.0
	Project coordinator from Anchorage to Cordova.	0.3	2			0.6
	Project coordinator from Anchorage to Nanwalek.	0.2	2			0.4
	Project coordinator from Anchorage to Port Graham.	0.2	2			0.4
	Project coordinator from Anchorage to Seward.	0.1	3			0.3
	Project coordinator from Anchorage to Tatitlek.	1.0	2			2.0
	Project coordinator from Anchorage to Valdez.	0.2	2			0.4
	Research PI travel to training sites.	0.5	4			2.0
						0.0
						0.0
						0.0
					Travel Total	$20.1

FY02

Project Number: 02210
Project Title: Youth Area Watch
Name: Chugach School District

FORM 4B
Personnel
& Travel
DETAIL

Prepared: 4/01

Contractual Costs:	Proposed FY 2001
Description	
The hiring of boats at a rate of $1,000 per day (5 days) will occur in conjunction with research on killer whales and kittiwakes.	5.0
Contractual Total	$5.0

Commodities Costs:	Proposed FY 2001
Description	
Supplies for each classroom site are necessary. This will replace consumable commodities used during the project year. Commodities include chemicals, sampling containers (beakers, plastic bags), water resistent note pads and office supplies associated with the project. Each major classroom site (8) will require $375 for supplies, totaling $3,000.	3.0
Commodities Total	$3.0

FY02

Project Number: 02210
Project Title: Youth Area Watch
Name: Chugach School District

FORM 4B
Contractual & Commodities DETAIL

Prepared: 4/01

New Equipment Purchases: Description	Number of Units	Unit Price	Proposed FY 2001
			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 Equipment Total**	$0.0

Existing Equipment Usage: Description	Number of Units
Weather stations have been purchased in previous years. They will continue to be used in FY 02.	5
Computers and peripherals are used at each site to synthesize and post information on the Youth Area Watch web site.	8
Video equipment is used to document activities for future review and use.	1
A GPS unit is used during various project activities.	1

FY02

Project Number: 02210
Project Title: Youth Area Watch
Name: Chugach School District

FORM 4B
Equipment
DETAIL

Prepared: 4/01

COMMUNITY-BASED HARBOR SEAL MANAGEMENT AND BIOLOGICAL SAMPLING

Project Number:	02245
Restoration Category:	General Restoration
Proposer:	Alaska Native Harbor Seal Commission
Lead Trustee Agency:	Alaska Department of Fish and Game
Cooperating Agencies:	
Alaska SeaLife Center:	No
Duration:	4th year; four-year project
Cost FY 96:	
Cost FY 97:	
Cost FY 98:	
Cost FY 99:	$70,700
Cost FY 00:	$56,500
Cost FY 01:	$40,000
Cost FY 02:	$26,800
Geographic Area:	Prince William Sound, Cook Inlet, Kodiak, Alaska Peninsula
Injured Resource/Service:	Harbor seals; subsistence

ABSTRACT

This project will close out, work supported through previous harbor seal restoration projects (\244, 99245, 00245 and 01245). A biological sample collection program, implemented in FY96 and expanded in FY97, in Prince William Sound, lower Cook Inlet, Kodiak Island, and the Alaska Peninsula will continue. Village-based technicians are selected by the Alaska Native Harbor Seal Commission (ANHSC) and trained by the Alaska Department of Fish and Game to collect samples from subsistence harvested harbor seals. The samples are transported to Anchorage or Kodiak for further subsampling and distribution to participating scientists for analysis and the University of Alaska Museum for archival. The ANHSC will produce and distribute a newsletter with summaries of the biological sampling program.

INTRODUCTION

The goal of this project (which continues the work of #\244) 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. Additional workshops took place under Project 97244, Project 98244, and Project 99245.

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 Project 96244 was to test the practicality and effectiveness of a community-based harbor seal biological sampling program, designed and administered cooperatively between the Alaska Native Harbor Seal Commission, the Alaska Department of Fish and Game, and the University of Alaska. 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. This program continued in FY 98, FY 99, and FY 00, with a planned expansion of the program to the Alaska Peninsula (two Perryville hunters were trained in October 1999) and to one more village on Kodiak (one Ouzinkie hunter was trained in February 2000).

As of mid April 2001, samples from approximately 300 animals had been collected for researchers. Table 1 shows the number and sex of harbor seals biosampled in each fiscal year. Table 2 shows the number of tissue types distributed in each fiscal year. The total number of a specific tissue sample or part collected may not equal the total of animals biosampled. In certain circumstances, one or more types of samples may not be collected from the animal. Table 3 reports how the samples have been distributed. Table 4 shows the community origin of the samples from the oil spill region, as of September 1999. From October 1999 to mid April 2000, samples were collected in Chenega Bay, Cordova, Tatitlek, Valdez, Nanwalek, Port Graham, Akhiok, Old Harbor, Ouzinkie, and Perryville. A more complete number of samples collected during FY01 will be provided in the annual report.

Finally, this project supports other restoration projects conducted in FY 00 and proposed for FY 01 and beyond, such as Harbor Seals: Monitoring and Field Research (\064), Harbor Seals: Health and Diet (\341), Harbor Seal Metabolism/Stable Isotopes (\371), Harbor Seal Diet: Lipid Metabolism and Health (\441),the Community Involvement and Traditional Knowledge Project (\052), and the Youth Area Watch (\210). The project also contributes to the Trustee Council's recovery objectives for subsistence by facilitating involvement of subsistence users in the restoration process.

The ANHSC and the National Marine Fisheries Service have signed a Co-Management Agreement for harbor seals. As established in the agreement's Action Plan, biosampling is a high priority research area.

Table 1. Summary of the number of harbor seals biosampled by fiscal year

		NUMBER of HARBOR SEALS BIOSAMPLED			
		Total	Male	Female	Unknown Sex
FY96	Oct 95 - Sept 96	27	18	8	1
FY97	Oct 96 - Sept 97	54	23	24	7
FY98	Oct 97 - Sept 98	40	18	21	1
FY99	Oct 98 - Sept 99	61	37	22	2
FY00*	Oct 99 - mid April 00*	67*			

*NOTE: The total for FY00 is estimated to reach between 80-90 by the end of Sept 00.

Table 2. Summary of the number of each tissue type collected.

	NUMBER COLLECTED IN			
TISSUE TYPE	FY96	FY97	FY98	FY99
Head	27	53	20	60
Whiskers	27	53	40	57
Stomach	26	54	35	59
Blubber	26	45	34	50
Skin / Muscle	27	54	40	60
Heart / Liver / Kidney	27	46	36	52
Female Reproductive Tract	1	17	8	17

Table 3. Distribution of Subsistence Harbor Seal Samples Collected under EVOS Restoration Projects 244 and 245 (as of 9/30/99)

Tissue	# Samples	Contact	Disposition, status, and analysis
Stomachs	174	L. Jemison, ADF&G	Sent to UBC for prey identification
Teeth	160	R. Small, ADF&G	Extracted at UAF Museum; age & growth history to be determined by NMFS
Whiskers	177	D. Schell, UAF	Used in stable isotopes analyses (EVOS # 97170)
Brain and collagen[1]	157	A. Hirons, UAF	Used in stable isotopes analyses (EVOS # 97170)
Blubber	155	B. Fadely, et al., UAF & M. Castellini, UAF	Blubber composition studies completed and continuing (EVOS Proj. 95117)
		K. Frost, ADF&G	Sent to Dalhousie University for fatty acid analysis (EVOS Proj. 95064)
Skin/muscle	181	R. Westlake, NMFS	Sent to NMFS La Jolla for genetic analysis
Reproductive tracts	43	K. Pitcher, ADF&G & H. Harmon, UAF	Stored for future reproductive analysis
Skulls	160	G. Jarrell, UAF	UAF Museum staff is cleaning skulls for archive and morphometric examination
Archived tissue heart liver kidney blubber skeletal muscle	161	A. Runck, UAF	Tissues subsampled and archived in -70C freezer at UAF Museum; available for future analyses.

[1] Collagen from ligaments or tendons; also using muscle, blubber, skin, heart, liver, and kidney

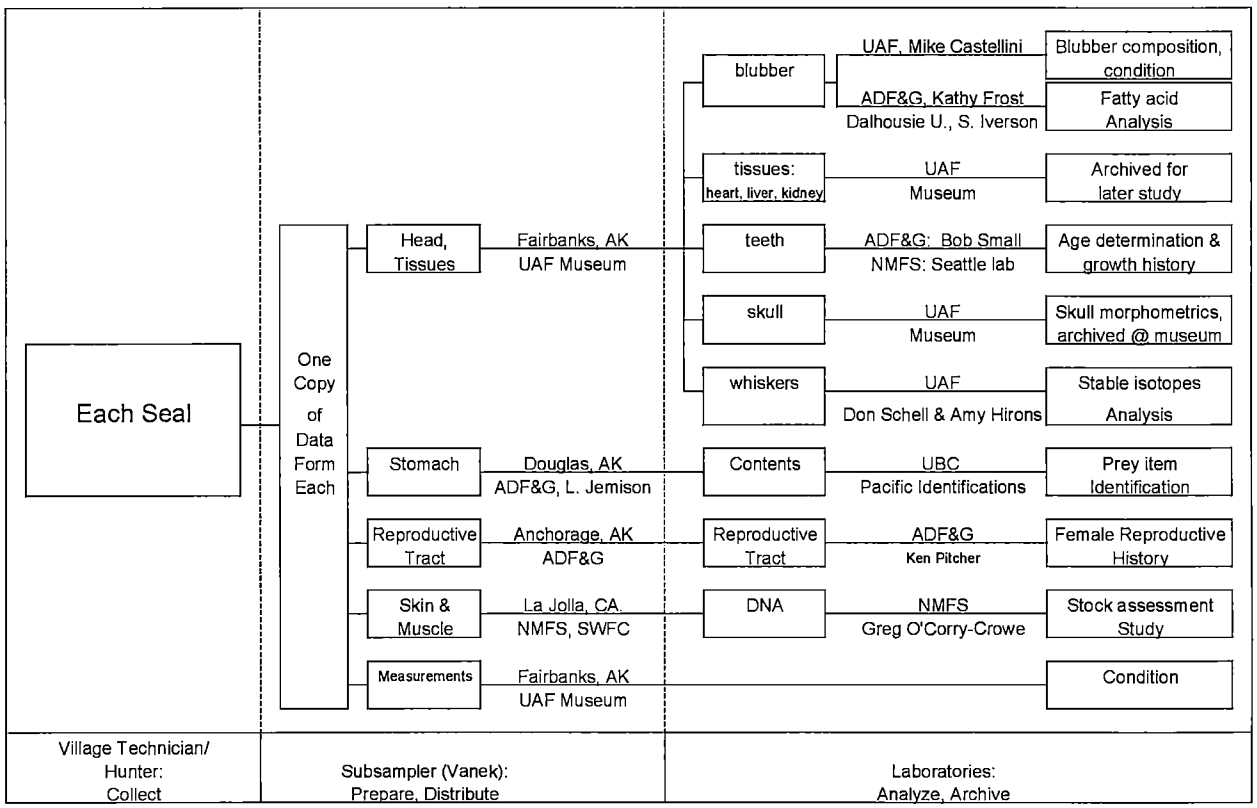

Figure 1. Sample Distribution and Chain of Responsibility (As of 9/99)

Table 4. Summary of Harbor Seal Biosamples Collected (9/30/99)*

Community	Number of Seals Sampled	
	Full Set of Samples	Partial Set of Samples
Chenega Bay	4	3
Nuciiq	2	0
Cordova	30	4
Tatitlek	64	37
Valdez	15	0
Nanwalek	6	1
Port Graham	0	0
Seldovia	2	3
Afognak Island	1	1
Akhiok	5	0
Old Harbor	1	1
Port Lions	1	1
GRAND TOTAL	131	51

FULL SET= Head, whiskers, stomach, muscle, skin, blubber, liver, heart, kidney, female repro tract
PARTIAL SET = A portion of the above list.
*NOTE: From Oct 99 - mid April 00, 67 animals were sampled in Chenega Bay, Cordova, Tatitlek, Valdez, Nanwalek, Port Graham, Akhiok, Old Harbor, Ouzinkie, and Perryville

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. Several other restoration projects are examining the potential causes of the harbor seal population decline and lack of recovery, including mortality caused by humans. The need exists to continue 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 is 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. This project implements the recommendations of the workshops by continuing a biological sampling program and helping to support the activities of the Alaska Native Harbor Seal Commission.

The FY 96, FY 97, FY 98, FY 99, and FY 00 Restoration 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 02. 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 invaluable source of fresh specimens exists in Alaska, where coastal Alaska Natives still legally use marine mammals for subsistence or handicraft purposes. This project has developed a successful community-based bio-sampling program. This program has succeeded because:

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

2. Samples are easily collected, stored and shipped; they are subsequently sub-sampled by ADF&G staff; are analyzed in due time; and results are 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 includes the Prince William Sound communities of Cordova, Chenega Bay, Valdez, and Tatitlek; the lower Cook Inlet communities of Seldovia, Port Graham, and Nanwalek; the Kodiak Island communities of Akhiok, Old Harbor, Ouzinkie, and Port Lions (expansion to Ouzinkie in FY00); and the Alaska Peninsula communities of Chignik Lake and Perryville (planned expansion in FY 00) (Table 4).

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. The primary continuing goal is to support the involvement of the Alaska Native Harbor Seal Commission in the biosampling program. As part of the continuing biological sampling effort, the ANHSC selects technicians (most of whom will be subsistence harbor seal hunters) in participating communities. New technicians will be trained by ADF&G staff to collect biological samples. Subsistence hunters will supply the samples and will be trained through hands-on instruction and the use of an instructional video (produced in FY 96), as needed. Also, participants in the Youth Area Watch Project in Prince William Sound and lower Cook Inlet(\210) and the more recently formed Kodiak Island Youth Area Watch(\052A) will be included in project activities, including community technician training sessions. The ANHSC will produce a newsletter with summaries of the biosampling efforts. (The October 1999 newsletter was distributed to over 1,000 individuals and organizations.) Although project funds are no longer available to help support a workshop, it is anticipated that the biosampling program and results will be reviewed at ANHSC meetings.

As of April 2001, two training sessions funded through this project in FY01 had taken place in Kodiak, Port Graham, Cordova, and Anchorage. About 10 new hunters and 20 students attended these sessions. Through other funding, training has also taken place in Yakutat, Alaska. A biosampling training session will take place in conjunction with the ANHSC meeting in Kodiak in April 2001 where hunters from Angoon, Kodiak, the Aleutians: Sand Point, Akutan, Twin Hills and Dillingham will be trained and certified. Additional demonstrations are planned for Youth Spirit Camps in the spring and summer of 2001.

PROJECT DESIGN

A. Objectives

The primary premise upon which this project is based is that restoration of harbor seal populations is facilitated by involving subsistence users in research and management activities. 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, Old Harbor, Ouzinkie, Port Lions, Chignik Lake, and Perryville. Specific sub-objectives include:

    a. Train local technicians and hunters in biological sample collection procedures
    b. 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 13 communities: Tatitlek, Chenega Bay, Valdez, Cordova, Seldovia, Port Graham, Nanwalek, Akhiok, Old Harbor, Ouzinkie, Port Lions, Chignik Lake, and Perryville. Provide these samples to researchers for analysis and archival.

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, heads, muscle, kidney, liver, heart, female reproductive tracts, and stomachs (see Table 3 and Figure 1).
c. Store samples in a community freezer and periodically ship samples to Anchorage or Kodiak for further processing and distribution for analysis
d. Develop and maintain a procedure for tracking disposition of samples and results of analyses
e. Maintain a database of biosamples

3. In collaboration with the Alaska Native Harbor Seal Commission, communicate information about research and results of harbor seal studies to hunters and scientists on a regular basis.

a. Produce an informational newsletter describing results of harbor seals studies, ongoing harbor seal research, and community involvement
b. Maintain a database of biosamples and research
c. Discuss biosampling program and results at periodic meetings of the ANHSC (these meeting are funded through other programs)

4. Collaboratively produce recommendations for subsistence users of harbor seals that 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 meetings of the ANHSC.

5. Evaluate the program's effectiveness and explore options for a long-term funding plan for the biological sampling program

6. Coordinate with the Youth Area Watch Programs in Prince William Sound and lower Cook Inlet (/210) and on Kodiak Island (/052A) to involve participants in that program in biological sampling and workshops and to support a yearlong curriculum based on information gathered through the biosampling program.

B. Methods

Objectives 1, 2, & 6: Biological Sampling Program

For Objectives 1, 2, and 6, the Biological Sampling Program, the following procedures will be used:

1. *Trainings*

As part of Project 96244 (and revised as part of 97244 and 98244), 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 99 under 99245, Vanek assumed full responsibility to apply these materials and revise them 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. 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.

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.

2. *Training Materials*

Manual: This was produced in FY 96 (Project 96244). It includes step-by-step diagrams and a visual guide. It is waterproof and is included in the sampling kit. Labor is involved in laying out, laminating, and binding each new manual for newly-trained local assistants.

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, the training video, and artificial props.

Video. In FY 96 (Project 96244), 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.

Resource Notebook. In FY00, a resource notebook was developed to provide additional information for hunters, technicians, and students to use as reference material at home and during the trainings.

3. *Sample collection*

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 Vanek or Riedel when supplies are low or freezer is nearly full, and load and ship coolers with samples to Anchorage, Cordova, 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 a total of 70 animals for estimating project costs. Other funding is secured for up to an additional 20.

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 technicians and hunters to record information about harvest location and date, animals' sex, evidence of tags or markers, and standard measures of weight, length, girth, and blubber thickness. Technicians are trained to collect the whole head; vibrissae; stomach (after tying off both ends); female reproductive tract; and samples of liver, heart, kidney, blubber, muscle, and skin. 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.

Researchers utilizing samples in their work were contacted late June 2000 and asked to submit information to the EVOS Trustee Council Office outlining the type and number of tissues they would like collected to be used in their work in FY01 or to be archived for possible future use. Table 5 is a summary of the information supplied.

Table 5. Summary of requests and information from researchers on sample collection in FY01

Researcher	Agency	Tissue Type	Number	Notes
Derek Campbell	NMFS Southwest	skin &	75-100	
Greg O'Corry-Crowe	Fisheries Center	muscle		
Mike Castellini	U of Alaska-Fairbanks	blubber	nns*	
Don Schell	U of Alaska-Fairbanks	muscle	nns*	
Kathy Frost	ADF&G	blubber	nns*	
Sara Iverson	Dalhousie U			
Jennifer Burns	U of Alaska-Anchorage	specific skeletal	18	specific age class
		muscles		
Joe Cook	U of Alaska Museum	heads	150	tissues used by
Gordan Jarrell		whiskers	from south	researchers
		heart	central &	world-wide
		liver	western	(see letter for list)
		kidney	Alaska	
Bob Small	ADF&G	stomachs	?as many	exact info delayed -
Lauri Jemison		teeth	as possible	numbers based
Kelley Hastings		repro tracts	" "	on recent past
		liver	?5 - 10	communication
		kidney	?5 - 10	
		blubber	?5 - 10	

*nns = no number specified In past, these researchers have utilized as many as collected

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 at the time samples are taken by

technician-hunters in the field, or by non-hunting technicians in the community, or by youth from the Youth Area Watch projects. The dataform and samples from one animal are placed in one animal specimen bag for village-based storage. Technicians have a kit that includes supplies adequate for sampling of 8 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 their own ziploc bag. Each is identified on the outside with a marker and has a specimen label enclosed with the same information that uniquely identifies the animal in the field (this system uses the technician's name, village, harvest date and sequential number of animal sampled and is also recorded on the dataform). All the individual sample bags from one animal are placed in one large garbage bag along with its data form. The specimen bag and the data form are placed in a freezer without sub-sampling, the technician contacts Vicki Vanek or Monica Riedel when a full shipment has accumulated, and then sends the samples to Kodiak or Anchorage.

Step 2. Vicki Vanek receives samples in Anchorage and stores them at ADF&G or receives them in Kodiak and stores them at the Fisheries Technology Center. Periodic sub-sampling efforts occur as depicted in Figure. 1. At this time, each animal is assigned a unique number tied to the University of Alaska Museum Archive numbering system, in order that all researchers may easily identify other tissue samples from this animal with other researchers or those archived at the museum. Each tissue sample is identified with this assigned number on the outside of the sample bag, on the label inside, and on the dataform. Subsamples from each seal are repackaged into individual bags and labeled. They are kept frozen and shipped to the appropriate laboratory (see Fig. 1).

4. *Data collection*

Data are recorded on write-in-the-rain forms designed for standardization of data with other harvest-sampling programs. Presently, copies of the original forms have been supplied along with the subsample to researchers on paper only. A future goal is the development of an electronic version of this form, as recommended during the EVOS scientific review committee's review of project \244. All of the data recorded on the forms in the field is entered and kept in a EXCEL database along with other tracking information. Sample label and freezer log forms have been developed to assure adequate sample tracking. In the field, technicians uniquely identify each animal. At the time of processing, each animal receives a unique number that is tied to the UAF Museum Archive numbering system. The number is assigned before any subsampling occurs so all parts are linked to the appropriate animal and can be easily tracked.

5. *Sample analysis*

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. In Project 99245, an agreement form was developed which participating researchers will sign to agree to return the results of their analysis for inclusion in databases and to acknowledge the assistance of the ANHSC.

6. *Data management and reporting*

Biological data collected from this program have been managed and maintained in a data base using Microsoft Excel software that is easily translated or integrated with software used by other agencies and organizations. This database has been centrally maintained by ADF&G and a

summary of the samples collected and analyzed were 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.

In Project 00245 and continuing in Project 01245, steps are being taken to enhance this database, as recommended by the EVOS scientific review committee. These include:

a. Enhance UAF Museum database for back-up tracking, to include information on the biosampled seals, such as the names of researchers who received samples and identification of the sample with this program (see below).
b. Development of an electronic data form (see above). This will facilitate communication of information and incorporation of sample data into databases
c. Development of a form that summarizes research investigators, contact numbers, projects, and publications for samples from a particular animal
d. Development of a biannual biosample status report. Presently there is no automatic system in place for researchers to return the results of their analyses or to update other participants on their activities and progress. This will be an electronic form to be submitted every six months by each researcher who receives biosamples from this project.

UAF Museum Database update.
The following information was supplied by Gordan Jarrell, the Mammal Collection Manager of the University of Alaska Museum.

An effort to develop database structures at the University of Alaska Museum (UAM) that will relate projects that provide specimens, such as the Alaska Native Harbor Seal Commission's Biosampling Program, to projects that use specimens has been substantially upgraded prior to implementation. UAM has developed a shared data model with the Museum of Vertebrate Zoology at the University of California at Berkeley. Their model, now including the "projects layer," has been implemented in Oracle on a new Sun server at UAM. (Berkeley's website incorporating this new model is up and running at http//elib.cs.berkeley.edu/mvz/) We are in the process of moving Mammal Collection data into the new structure and we expect to complete the task this fall or early winter. This data model was central to a successful proposal to the National Science Foundation to form an "Arctic Archival Observatory" (AAO) at UAM. Funding from NSF includes support for a full-time programmer/analyst to bring all the Museum's scientific collections into the system over next three years. This recruitment was successful and will be filled beginning on 5 September.

The Museum's database upgrading began in October 1998. This evolved into changing to a new cutting edge data management system developed and coordinated with the University of California at Berkeley's museum database. Various unforeseen steps in the building of a new information structure and developing the various layers concept have delayed the actual startup. The museum is in the final stage of getting all screens and interfaces working. They are starting the data import from the current system. The Harbor seal projects are the first sets of data to be transferred over into this new system. This new system is expected to be running and allowing access from the Web by December 2000.

7. *Youth Area Watch programs*

Participants will attend biosampling trainings and be trained as technicians. Support will be given to the Youth Area Watch programs in developing a curriculum that incorporates biosample collection and study results. This will initially include developing a limited set of classroom lessons that illustrate the application of length, weight, sex, location, timing, and stomach content data.

Summary: Proposed responsibilities of each cooperating group for Objectives 1 and 2:

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

1. Compile protocols, develop data forms and sampling kits, and incorporate instructions for their use into a training program (this was completed in Project 96244; appropriate revisions will take place in Project 00245); make appropriate revisions to the instruction manual.
2. Communicate with researchers
3. Help answer biosamplers' questions
4. Train new community assistants when replacements are necessary;
5. Receive samples from village-based technicians, process samples, and ship samples to participating researchers for analysis
6. Maintain the in-house database of biological data and work with the UAF Museum in development of a database there
7. Collate the results of the sample analysis into a readily understandable newsletter.
8. Write a brief summary of the project for inclusion in the interim and final reports for the Trustee Council
9. Provide technical support for Youth Area Watch school curriculums
10. Develop and maintain electronic exchange of information with researchers, including providing data forms to researchers and researchers' subsample status and results (from biannual reports) for annual reports and reports prepared by the ANHSC.

The Alaska Native Harbor Seal Commission will:

1. Identify and subcontract with 13 community technicians
2. Purchase sampling kits and distribute kits and other supplies to village-based technicians
3. Facilitate production of manual and resource notebook
4. Set up air freight accounts for shipping samples and facilitate shipping from communities to Kodiak or Anchorage
5. Receive samples from Prince William Sound biosamplers, in Cordova and prepare for shipping to Anchorage for subsampling and distribution.
6. Communicate study findings through a newsletter and at its periodic meetings

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

Communication of study findings, development of recommendations for hunters, project evaluation, and development of a long-term funding plan, are part of a collaborative effort met in part through a contract with the ANHSC, which will do the following:

1. Communicate with communities involved in the biological sampling project to review data and any recommendations developed by the ANHSC. These communications may be through

phone discussions or take place during community visits connected with biosampling training or other ANHSC business
2. Write a newsletter which provides overviews of findings from harbor seal research and ANHSC activities.
3. Participate in the Trustee Council restoration workshop and contribute to Trustee Council's annual and final reports

The Division of Subsistence will provide technical assistance to the Commission as needed. The goals of these objectives are also addressed through the development and maintenance of databases, as discussed above.

Annual and final reports: the Division of Subsistence and the ANHSC will jointly prepare annual and final reports for the project.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

A. In prior study years, 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 Project 01245. Tasks for the ANHSC under this contract will include:

1. Purchase sampling kits and distribute kits and other supplies to village-based technicians
2. Set up air freight accounts for shipping samples
3. Identify and subcontract with local community technicians
4. Prepare brief (letter format) quarterly reports on its activities as related to this project.
5. Attend the Trustee Council Restoration Workshop and contribute to Trustee Council's annual and final reports

Through subcontracts with the ANHSC, community technicians in 13 communities (Cordova, Tatitlek, Chenega Bay, Valdez, Seldovia, Port Graham, Nanwalek, Akhiok, Old Harbor, Ouzinkie, Port Lions, Chignik Lake and Perryville) will do the following:

1. Attend one day training session (if newly hired in FY 01)
2. Collect samples (stomach contents, female reproductive organs, liver, heart, kidney, claws, head)
3. Record data on harvest locations, sex, evidence of tags or markers, length, and girth
4. Label and freeze samples, notify Vicki Vanek or the ANHSC when freezers are full, and load and ship coolers with samples to Kodiak or Anchorage

Contract A: Budget

Personnel	Executive Director	0
	Program Assistant for 6.5 months @ ¼ time	0
Travel	Executive Director travel	0
Operational costs: phone & mailing		0
Insurance		0
Sampling and freezer supplies, shipping		0

Subcontract, village-based technicians	2,900
15% indirect program cost	400
Total	$3,300

Other funding from NMFS was secured for Monica Riedel's time in June 2000. Her availability may be slightly reduced at times due to new obligations.

Subcontract: Village-based Technicians

Training honorarium: $100/day for two new technicians for one day each:		0
Compensation for taking biological samples of seals		2,900
	Total	2,900

Note: it is anticipated that samples will be taken from a total of 65 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 x 3 hours x 65 seals = $2,900.

SCHEDULE

A. Measurable Project Tasks for FY 01

Start-up to October 15, 2001:	Update contract with the Alaska Native Harbor Seal Commission; hire technicians
October to December 2001:	Hold training sessions for biological sampling for new community technicians and students
October to September 2001:	Biological sample collection
November to September 2001:	Process samples
March/April 2002:	Produce and distribute newsletter (Alaska Native Harbor Seal Commission)
April 15, 2002	Annual report
September 2002:	Evaluate fifth year of program

B. Project Milestones and Endpoints (includes \244)

1. Development of sampling program: October/November 1995
2. Production and distribution of Instructional video: March 1996
3. Workshops to train local hunters and technicians in collection procedures: October/November 1995
4. Workshop in conjunction with meeting of Alaska Native Harbor Seal Commission: March 1996
5. Produce and distribute first proceedings report: April 1996
6. Maximize coordination with other programs: ongoing
7. Ship samples to appropriate laboratories for subsequent analysis: ongoing
8. Advise villages and scientists of analytical results when available: ongoing
9. Conduct interviews with hunters to collect traditional knowledge: ongoing
10. Second workshop in conjunction with Commission meeting: September 1996
11. Produce and distribute second proceedings report: September 1996
12. Train new village technicians and new Youth Area Watch participants: November 1996
13. Hold workshop in conjunction with ANHSC meeting: March 1997
14. Demonstrate updated Traditional Knowledge Database: March 1997
15. Produce and distribute proceeding for 1997 workshop: April 1997
16. Annual report: April 15, 1997
17. Complete map database and report: June 1997
18. Present Biosampling Demonstrations at Youth Spirit Camps June/July 1997
19. Evaluate the program's effectiveness and develop a more long-term funding plan: September 1997 and September 1998
20. Train new Youth Area Watch participants: October 1997
21. Hold workshop in conjunction with ANHSC meeting: March 1998
22. Produce and distribute proceedings for 1998 workshop: April 1998
23. Develop electronic forms for researcher exchange of information and system to transmit forms, assist UAF Museum to add tracking information to computer programs as a backup to main database: ongoing
24. Assist in Youth Area Watch curriculum development: May 1998
25. Present Biosampling Demonstrations at Youth Spirit Camps July 1998
26. Final report, \244: September 30, 1998

27. Train new community technicians and new Youth Area Watch participants: October/November 1998
28. Hold workshop in conjunction with ANHSC meeting: March 1999
29. Produce and distribute proceedings for 1999 ANHSC meeting: April 1999
30. ANHSC sign Co-Management Agreement with NMFS April 1999
31. Biosampling Demonstration at multi-community Cultural Week May 1999
32. Present community reports May 1999
33. Facilitate sampling collection between hunters and scientists in field June 1999
34. Initiate contract for expanded biosampling program with UAF July 1999
35. Implement expanded biosampling program with UAF Aug 1999
36. Plan and facilitate training workshops Sept 1999
37. Develop Harbor Seal Biosampling Resource Notebook Sept – Oct 1999
38. Facilitate development of Kodiak Youth Area Watch Aug – Dec 1999
39. Produce and distribute newsletter Oct 1999
40. Conduct expanded training workshop for hunters Oct 1999
41. Train Youth Area Watch participants - PWS Nov 1999
42. Train Youth Area Watch participants and hunters - Lower Cook Inlet Dec 1999
43. Conduct audit for FY 98 and FY99 Jan 2000
44. Present poster and biosampling data at EVOS workshop Jan 2000
45. Present poster and biosampling data at Marine Mammal Stranding workshop Feb 2000
46. Train Youth Area Watch and hunters - Kodiak Feb 2000
47. Hold workshop in conjunction with ANHSC meeting April 2000
48. Present community reports May 2000
49. Facilitate sample collection with hunters and scientists in field June 2000
50. Maximize coordination with other programs and Native Organizations: ongoing
51. Collection of biosamples: ongoing
52. Process and ship samples to labs and UA museum for subsequent analysis and archival: ongoing
53. Advise Tribes, communities, and scientists of research results: ongoing
54. Produce and distribute proceedings from April 2000 meeting July 2000
55. Present Biosampling Demonstration to Youth Spirit camp participants July 2000
56. Annual Report 7/30/00
57. Produce and distribute newsletter Sept 2000
58. Facilitate planning for training workshop and Youth Area Watch programs Sept 2000
59. Training workshops for technicians and students Oct – Dec 2000
60. Hold training workshop in conjunction with ANHSC meeting Oct 2000
61. Participate in EVOS GEM workshop Oct 2000
62. Conduct audit for FY00 Nov 2000
63. Collect, process, and ship samples for analysis and archival: ongoing
64. Advise Tribes, communities, and scientists of research results when available: ongoing
65. Continue development of Resource Notebook and high school curriculum: ongoing
66. Hold training workshops Jan - March 2001
67. Hold workshop in conjunction with ANHSC spring meeting April 2001
68. Produce and distribute newsletter March –April 2001
69. Present community reports May 2001
70. Present Biosampling Demonstration to Youth spirit camp participants June –Aug 2001
71. Annual Report 4/15/01
72. Annual Report 4/15/02

73. Final Report 9/30/03

C. Completion Date

This project should continue as long as the Marine Mammal Ecosystem Research package is underway. It is anticipated that work on several marine mammal restoration projects will continue into FY 01, including, \341 (Harbor Seals: Health and Diet), \371 (Harbor Seal Metabolism/Stable isotopes), and \441 (Harbor Seal Diet: Lipid Metabolism and Health). Harbor seal research projects in the spill area with other funding are also utilizing samples collected in the Biosampling Project.

PUBLICATIONS AND REPORTS

Annual report	July 30, 2001
Annual report	April 15, 2002
Final report	September 30, 2002

PROFESSIONAL CONFERENCES

No attendance planned for FY 01.

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 will lose a key source of biological information on this species. Trustee Council support of the activities of the Alaska Native Harbor Seal Commission has improved 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 has received a congressional appropriation through the National Marine Fisheries Service to support certain administrative and operational costs, such as office space and travel to certain meetings and conferences. It is seeking funding from NMFS in accordance with provisions of the Marine Mammal Protection Act to support its long-term activities.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

The project provides biological samples from subsistence-taken harbor seals to address potential health and nutritional problems that may be impeding harbor seal recovery, including restoration project numbers \341, \371, and \441. The project provides information to researchers working on harbor seal restoration projects and facilitates their work with Alaska Native hunters.. Participants in the Youth Area Watch projects (\210and \052A) participate in community technician training sessions and attend workshops.

Several programs exist using sample tissues collected from harbor seals in the spill area (see Tables 3 and 5 and Fig. 1). As noted above, every effort is made to coordinate 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 assists with coordinating the harbor seal sampling and testing programs.

Additional funding for the operations of the Alaska Native Harbor Seal Commission has been received from the National Marine Fisheries Service and the U.S. Congress, and additional funding is being sought from these entities as well as the National Science Foundation. Such funding supports 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.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

No additions to project objectives or methods of the detailed project description submitted and approved for Project 00245 are being proposed. Previously, the ANHSC organized a workshop in conjunction with one of its meeting and prepared a proceedings report. This task was eliminated in FY00 in light of reduced funding. We do also not anticipate expanding the project into new communities. It is anticipated that review of project progress will still take place at ANHSC meetings. In FY 01 and 02, Vicki Vanek assumed responsibilities as co-principal investigator (along with Monica Riedel), replacing James Fall. In FY 01 and 02, other funding was secured for Monica Riedel's time and a part time assistant to the Biosampling Program has been added.

ENVIRONMENTAL COMPLIANCE

This project is, a continuation of Project 00245 which was 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

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PERSONNEL

Monica Riedel, an Alaska Native resident of Cordova, is the executive director and chief executive officer of the Alaska Native Harbor Seal Commission. She has held this position for the past 6 years. Ms Riedel is responsible for the ANHSC activities under this project, including identifying and subcontracting with local village technicians, developing subcontracts, and developing the newsletter.

Vicki Vanek is a Wildlife Biologist 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, 97244, and 98244. Dr. Vanek is responsible for overall project performance for the Division. She will assist hunters and community technicians in biosampling, and will train newly hired technicians. Dr. Vanek will also process biosamples. She will also prepare a newsletter, which reports results of the biosampling efforts and will also coordinate preparation of annual and final reports. Four months of funding is being requested for her work on this project.

FY 02 *EXXON VALDEZ* TRU: COUNCIL PROJECT BUDGET

October 1, 2001 - ptember 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002						
Personnel		$19.2						
Travel		$1.2						
Contractual		$3.3						
Commodities		$0.0						
Equipment		$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	$0.0	$23.7	Estimated FY 2003					
General Administration		$3.1						
Project Total	$0.0	$26.8						
Full-time Equivalents (FTE)		0.3						
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

FY02

Prepared:4/14/01

Project Number: 02245
Project Title: Community-Based Harbor Seal Management and Biological Sampling
Agency: Alaska Department of Fish and Game

FORM 3A
TRUSTEE
AGENCY
SUMMARY

FY 02 *EXXON VALDEZ* TRU COUNCIL PROJECT BUDGET
October 1, 2001 ptember 30, 2002

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 2002
Vicki Vanek	Wildlife Biologist II	16B	4.0	4.8		19.2
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		4.0	4.8	0.0	
					Personnel Total	$19.2

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 2002
Kodiak - Anchorage	0.3	2	6	0.1	1.2
Restoration Workshop and one training session					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$1.2

FY02

Prepared: 4/13/01

Project Number: 02245
Project Title: Community-Based Harbor Seal Management and Biological Sampling
Agency: Alaska Department of Fish and Game

FORM 3B
Personnel
& Travel
DETAIL

Contractual Costs:	Proposed FY 2002
Description	
4A Linkage	3.3
When a non-trustee organization is used, the form 4A is required. **Contractual Total**	$3.3

Commodities Costs:	Proposed FY 2002
Description	
Commodities Total	$0.0

FY02

Project Number: 02245
Project Title: Community-Based Harbor Seal Management and Biological Sampling
Agency: Alaska Department of Fish and Game

FORM 3B
Contractual & Commodities DETAIL

Prepared:4/13/01

New Equipment Purchases:		Number	Unit	Proposed
	Description	of Units	Price	FY 2002
				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 Equipment Total**	$0.0

Existing Equipment Usage:	Number	Inventory
Description	of Units	Agency

FY02

Project Number: 02245
Project Title: Community-Based Harbor Seal Management and Biological Sampling
Agency: Alaska Department of Fish and Game

FORM 3B
Equipment
DETAIL

Prepared: 4/13/01

FY 02 *EXXON VALDEZ* TRU : COUNCIL PROJECT BUDGET

October 1, 200' ptember 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002
Personnel		$0.0
Travel		$0.0
Contractual		$2.9
Commodities		$0.0
Equipment		$0.0
Subtotal	$0.0	$2.9
Indirect		$0.4
Project Total	$0.0	$3.3
Full-time Equivalents (FTE)		0.0
Other Resources		

LONG RANGE FUNDING REQUIREMENTS

Estimated FY 2003					

Dollar amounts are shown in thousands of dollars.

Comments: indirect = 15% of program costs

FY02

Prepared:4/13/01

Project Number: 02245
Project Title: Community-Based Harbor Seal Management and Biological Sampling
Name: Alaska Native Harbor Seal Commission

FORM 4A
Non-Trustee
SUMMARY

FY 02 *EXXON VALDEZ* TRU **COUNCIL PROJECT BUDGET**

October 1, 2001 ptember 30, 2002

Personnel Costs:			Months	Monthly		Proposed
	Name	Position Description	Budgeted	Costs	Overtime	FY 2002
						0.0
						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	
					Personnel Total	$0.0

Travel Costs:		Ticket	Round	Total	Daily	Proposed
	Description	Price	Trips	Days	Per Diem	FY 2002
						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

FY02

Prepared:4/13/01

Project Number: 02245
Project Title: Community-Based Harbor Seal Management and Bioligical Sampling
Name: Alaska Native Harbor Seal Commission

FORM 4B
Personnel
& Travel
DETAIL

Contractual Costs:	Proposed FY 2002
Description	
For local technicians: 65 seals biosampled @ 3 hrs/seal @ $15/hour	2.9
Contractual Total	$2.9

Commodities Costs:	Proposed FY 2002
Description	
Commodities Total	$0.0

FY02

Prepared:4/13/01

Project Number: 02245
Project Title: Community-Based Harbor Seal Management and Biological Sampling
Name: Alaska Native Harbor Seal Commission

FORM 4B
Contractual & Commodities DETAIL

New Equipment Purchases: Description	Number of Units	Unit Price	Proposed FY 2002
			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 Equipment Total**	$0.0

Existing Equipment Usage: Description	Number of Units	

FY02

Project Number: 02245
Project Title: Community-Based Harbor Seal Management and Biological Sampling
Name: Alaska Native Harbor Seal Commission

FORM 4B
Equipment
DETAIL

Prepared:4/13/01

Kametolook River Coho Salmon Subsistence Project

Project Number:	02247
Restoration Category:	General Restoration
Proposer:	Perryville Village Council
Lead Trustee Agency:	ADF&G
Cooperating Agencies:	NONE
Alaska SeaLife Center:	NO
Duration:	6th year, 6-year project
Cost FY 97	$31.4
Cost FY 98	$14.9
Cost FY 99	$20.8
Cost FY 00	$23.2
Cost FY 01	$22.7
Cost FY 02	$34.0
Geographic Area:	Perryville/ Kametolook River/ Alaska Peninsula
Injured Resources/ Service	Subsistence

ABSTRACT

Subsistence users from the remote South Alaska Peninsula Native Village of Perryville have noted declines in the coho salmon (*Oncorhynchus kisutch*) run in the nearby Kametolook River since the *Exxon Valdez* oil spill (EVOS). The Trustee Council began funding this project in Federal Fiscal Year 1997 with the intent of restoring the coho salmon run to historic levels. This project is a continuation of an evaluative phase of the project funded through the EVOS criminal settlement (Grant Agreement Number 2168588). Although limnological, juvenile, and adult fisheries data were not available or severely limited before the salmon decline, it was determined through the evaluation phase that instream incubation boxes in conjunction with self imposed harvest limits by

subsistence users were the preferred alternatives for restoration this salmon run. In 1997, the Alaska Department of Fish and Game, Habitat and Restoration Division aided the project by providing an Environmental Assessment. In 1997, a Finding of No Significant Impact was signed for NEPA compliance.

Community involvement by the villagers of Perryville is an integral part of restoring the Kametolook River coho as a subsistence resource. Presently, no regulations prohibit fishing in the Kametolook River; however, starting in 1997 the Perryville Village Council voluntarily closed the upper half of the Kametolook River to subsistence salmon fishing in order to not interfere with spawning salmon. In the summer of 1999 and 2000, virtually no one fished in the Kametolook River for salmon. In addition, as part of the community involvement portion of the project the Perryville Village Council has hired local assistants who received training to assist ADF&G with fieldwork including: genetic and pathological sampling, incubation box installation, egg takes and incubation techniques, and year around monitoring of the boxes and environment. Also, an aquarium has been set up in the village school where students actively participate in incubating coho salmon from egg to fry stage and releasing the fry into the Kametolook River. In May 1997, 1998, and 1999, about 125 fry from the school aquarium project annually were released into the Kametolook River. In 2000 the aquarium water pump failed and all the fry were lost. In the fall of 2000, approximately 400 fertilized eggs were placed in the school aquarium however the aquarium tank was cracked sometime during the winter and the fry died.

In 1997, two production type instream incubation boxes were installed in the upper reach of the Kametolook River. These boxes replaced and were in addition to a small test incubation box that has successfully incubated eggs. In 1997, the Kametolook River coho escapement was an estimated 724 salmon, nearly four times the estimated escapement during 1996. The increased escapement is attributed to the self imposed closure of the upper river by the villagers, a commercial fishing closure in marine waters during nearly the entire coho salmon run, and a strong run of coho salmon in general to the Chignik area. In 1997, several attempts to capture ripe coho salmon have generally been unsuccessful; eggs from only seven females (four of which were partially spent) have been deployed in the incubation boxes.

In 1998, in order to increase the egg take, two salmon holding pens were installed near the coho salmon spawning region of the Kametolook and used to make the recovery of ripe salmon more efficient. Sixteen female and 15 male salmon were captured and placed in the holding pens to ripen. Seven males were used to fertilize 11 ripe females and the fertilized eggs were placed in the two incubation boxes in November, 1998. The coho salmon escapement for 1998 was an estimated 148 salmon. The decreased escapement is attributed to a weak run of coho salmon in general to the Chignik area.

In early November 1999, the two salmon holding pens were used again. Nine female and 20 male salmon were captured and placed in the holding pens to ripen. On November 17th, eggs and milt were collected from the ripe salmon in the holding pens. Standard delayed fertilization techniques used and the fertilized eggs were placed into the two egg

incubation boxes. Kidney, ovarian, and genetic samples were also collected. There was an attempt to estimate the Kametolook River coho escapement, however turbid waters made it impossible to determine.

In 2000, 4 female and 8 male coho salmon were captured and placed into the holding pens in early November. On November 16th milt from 7 of these coho were used to fertilize two of the ripe females. The fertilized eggs were placed into the egg boxes. About 200 eggs were held back from the egg boxes and were transported to the Perryville school for use in the school aquarium. Because the kidney pathology sample was complete and only two female salmon were used in the egg take, no ovarian or genetic samples were collected. Additional eggs for the rehabilitation project were desired; however, the escapement was estimated to be extremely low, only 85 total coho salmon in the Kametolook River system.

Due to the continual low escapement of coho salmon into the Kametolook River system, the project will be unable to achieve the goal of restoration of the coho salmon run within two life cycles of the fish. In 2001, we are proposing to expand the project to investigate nearby coho stocks as potential brood sources for rehabilitation of the Kametolook coho run. An expanded project would collect genetic and pathology samples from nearby streams for testing. If after ADF&G genetic and pathology approval, we will propose transporting coho salmon eggs and/or juvenile fish from nearby streams, but outside of the Perryville valley, to aid in restoration of the Kametolook coho run (if fish transport permits allow).

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 ADF&G 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 (PI's, Habitat and Restoration, and Perryville Village Council) that local salmon stock instream incubator boxes are the best method to help restore Kametolook River coho salmon runs. Applications for ADF&G fish transport permits are reviewed annually and a general habitat waterway/waterbody application has been granted for this project. In 1997, an environmental assessment was completed with a Finding of No Significant Impact signed for NEPA compliance. Samples of adult coho salmon will continue to be collected for genetic and pathology data until sufficient numbers are obtained. 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 its 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 that 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 is 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 ADF&G 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 ADF&G 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 ADF&G 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 ADF&G during assessment and implementation phases of the project. In addition, local assistants will monitor the project throughout the year, when ADF&G personnel will not be present. Local assistants through hands-on involvement have been trained by ADF&G 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 allows).

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. Presently, no regulations prohibit fishing in the Kametolook River; however, starting in 1997 and continuing through 2000, the Perryville Village Council voluntarily closed the upper half of the Kametolook River to subsistence salmon fishing in order to not interfere with spawning salmon. A subsistence salmon household survey in Perryville for both the 1999 and 2000 seasons determined that virtually no one fished the Kametolook River for subsistence salmon, because people were concerned about the fish populations.

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. Fish resource permits have allowed the release of these fry into the Kametolook River (1996-2001). In addition, when allowed by the teachers and parents, older school children have accompanied ADF&G personnel to the Kametolook River and nearby lakes to assist with minnow trapping and biological and habitat sampling. This portion of the project has been in operation every winter since

1997, and expected to continue through 2002 and possibly beyond if the school continues to support the program.

PROJECT DESIGN

The primary goals of the project are to increase the coho salmon runs to the Kametolook River and to 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 ADF&G 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 school aquarium Fish Transport Permit that is submitted to ADF&G for review annually). The Environmental Assessment and a Finding of No Significant Impact by the US Fish and Wildlife Service was approved in May of 1997. 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, instream incubators will be employed. (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.) In 1998 and beyond, the use of salmon holding pens will be used to make the recovery of ripe salmon easier. The incubators are expected to operate annually from 1997 through 2002 (or longer if there is a need and funding available). 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 creek and river 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 so far has included installation (August/September 1997) of large capacity streamside incubation boxes, installation and use of the school aquarium, education programs, and biological sampling for pathological and genetic testing. Phase 3 will continue through the end of the project with biological testing (until required amount necessary are obtained for genetic and pathology tests), annual egg takes for the incubation boxes and the school aquarium, continued education and habitat and harvest monitoring. Phase 4 will be implemented in 2001. Due to continual low escapement of coho salmon into the Kametolook River system, an expansion of the project will investigate potential genetic and pathology brood stock concerns for the transport of coho salmon eggs and/or juvenile fish from nearby streams to the Kametolook River. River systems outside of the Perryville valley (other than the Kametolook, Three Star, and Long Beach Rivers) will be investigated and if fish transport permits are granted the transport of eggs and/or juvenile coho salmon will occur.

B. Methods/ May 1996 - September 2000

May 1996 through September 1996/ This phase of the project was funded through the Criminal Settlement/ Project Perryville 96-1.

May 1996- Three ADF&G 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. Perryville guides showed the ADF&G team 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. ADF&G personnel 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, side-channel 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 ADF&G personnel discussed potential education projects such as a classroom salmon aquarium and recirculating egg incubators. (A detailed field trip report is available.)

Project 97247 (October 1996 - September 1997)

October 1996- Three ADF&G 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 drainages, had some stable reaches but about half of the discharge had changed course and currently flows 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.

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. 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 the ADF&G team participated by asking questions and explaining details. ADF&G personnel also demonstrated scale reading techniques and presented representative samples of all species collected from the minnow traps. Plans were developed with the science teacher to install and permit a classroom aquarium incubator for coho salmon eggs. (A detailed field trip report is available.)

November 1996- Two ADF&G 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 continued, and the observed escapement might have been higher than the actual spawning escapement. (A detailed field trip report is available.)

At the high school the ADF&G team assembled the aquarium incubator. When the eggs reach the eyed stage, about 250 eggs from the stream side incubator were transferred to the classroom incubator (January ADF&G field trip). (A detailed field trip report is available.)

January 1997- Two ADF&G team members traveled to Perryville. While waiting in King Salmon for the flight to Perryville they met with the Alaska Peninsula/Becharoff National Wildlife Refuge staff to discuss the Kametolook project and review the draft Environmental Assessment. In Perryville, they 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 the release of any resulting fry back into the Kametolook River. With the assistance of five high school students the team 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. ADF&G personnel also attended a meeting sponsored by the Village Council where they 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- ADF&G 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 for review 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).

June - July, 1997- Received appropriate fish transport permits from ADF&G for harvesting salmon eggs and releasing fry from incubation box and school aquarium for the 1997/98 season. Purchased materials for two incubation boxes and constructed them for

later use. Met with the Chignik Regional Planning Team, Chignik Regional Aquaculture Association and public to development a Western and Perryville Districts coho salmon management plan.

August 1997- Transported incubation boxes to Chignik Bay (ADF&G M/V Resolution) and local Perryville resident transported them to Perryville via fishing boat.

September 1997- Two Perryville personnel were trained (2 weeks) at Pillar Creek Hatchery (Kodiak) in spawning and incubator maintenance techniques. Two ADF&G staff attempted to travel to Perryville to install the two incubation boxes in Kametolook River, sample salmon and trout for age, length and abundance data, however weather prevented them from traveling beyond Chignik Lake. In late September, two Perryville assistants transported two egg boxes and other necessary equipment up Kametolook River to the installation site.

Project 98247 (October 1997 - September 1998)

October - November 1997- The Perryville Village Council voluntarily closed the spawning areas of the Kametolook River to fishing (October 3). One ADF&G personnel traveled to Perryville October 31 through Nov. 6. On this trip ADF&G personnel 1) set up the school aquarium for incubation of coho salmon from egg to fry stages, met with the teachers and this year's upper class members and instructed them on classroom salmon incubation techniques; 2) discussed with the local assistants the placement of thermographs for the fall/winter/spring period of 1997-1998; 3) estimated the total coho salmon escapement to the Kametolook and Three Star Rivers; 4) with help of three local assistants, installed two production type salmon incubation boxes in the Kametolook River; 4) attempted a coho salmon egg take for the incubator boxes and the school aquarium 5) took samples of adult coho salmon for genetic and pathology data. Only two ripe and no spawned out fish were caught and added to one of the egg incubation boxes. Because of the lack of success finding ripe and spawned out salmon, it was decided that four local Perryville assistants would attempt additional egg takes through November. (A detailed trip report is available.)

Local Perryville assistants took 10 additional trips at different stream locations and several sets per day to capture ripe coho for the incubation boxes without much success (total catch: 7 females, 4 of which were partially spent) which were added to the incubation boxes. The problem was not in catching fish, but in catching ripe ones. Samples were taken for pathology and genetic testing from males and females harvested for sampling. They reinstalled and deployed thermographs at designated sites.

December 1997- The assessment team decided to install fish holding pens in 1998 to aid in capturing ripe salmon for egg incubation boxes. Perryville assistants traveled to egg incubation boxes and removed approximately 300-eyed eggs that were put inside the school aquarium. (A detailed trip report is available.)

January - March 1998- Perryville assistants took monthly monitoring trips to Kametolook River to check thermograph sites and egg boxes. Approval to release fry in Kametolook was denied by ADF&G Pathologist due to low number of females harvested; however, approved was granted to release them in local landlocked Sicken and Sandy Lakes in late April or May. The Perryville teacher communicated with ADF&G regarding status of eggs in aquarium. Survival fry from school incubation box will be transported and released in the Kametolook River in late April or May. Two net holding pens were acquired, and prepared for transport to Perryville in May. Present staff attended the State Board of Fisheries meeting and gave staff report regarding the project. They also attended Chignik RPT meeting and provided a project status report. The RPT continued to support project. A fish transport permit request was submitted to ADF&G for review.

Project 99247 (October 1998 - September 1999)

October 1998- Jim McCullough participated in a field trip on 21 through 27 October 1998, to Perryville, Alaska. The purpose of the trip included: 1) to install temporary ripening pens for coho salmon, 2) foot survey of salmon in the Kametolook River, 3) capture and place in holding pens adult coho salmon, 4) clean the instream incubation boxes, 5) clean the school salmon egg incubation aquarium, and 5) collect and down load remote thermographs. (A detailed trip report is available.)

October 23, 1998- Jim McCullough along with the assistance of Jerry Yagie and Bruce Phillips installed holding pens for ripening coho salmon in a side pond of the Kametolook River. The Kametolook River was also surveyed for adult salmon. Approximately 70 coho and 25 sockeye salmon were observed in the main upriver spawning area located about ¼ mile below the incubation boxes. An additional 4 coho salmon were counted in the main stem of the river below the main spawning site and an additional 15 sockeye salmon in Candlefish Slough. The indexed escapement count for the Kametolook River is 148 coho salmon and 40 sockeye salmon. The indexed count for coho is twice the observed count (sockeye estimate not expanded). Although the river was somewhat turbid below the main spawning area, it was also obvious that there were few salmon present.

October 24, 1998- 16 female and 15 male coho salmon were caught and placed in the holding pens to ripen. The instream incubator boxes and water head collector boxes were cleaned and disinfected. The Three Star River was also visited where 5 adult coho salmon were spotted. Jim McCullough met with the new science teacher, Patsy Chapple and discussed report requirements and the permit process for running the school aquarium, and cleaned, disinfected, and filled the aquarium with fresh water and turned the chiller on.

October and November 1998- Jerry Yagie conducted weekly stream surveys of the Kametolook for the presence of coho.

November 1998- Jim McCullough and Melvin Chya participated in a field trip on 9 through 13 November 1998, to Perryville, Alaska. The purpose of the trip included: 1) foot survey of salmon in the Kametolook River, 2) spawn adult coho salmon that were

ripening in holding pens, 3) fertilized and place coho salmon eggs in the Kametolook River incubation boxes, and 4) fertilize and place coho salmon eggs in the school aquarium. Melvin Chya works at the Pillar Creek Hatchery in Kodiak, Alaska. (A detailed trip report is available.)

November 10, 1998- Jim, Melvin and Jerry Yagie checked the Kametolook River incubation boxes to insure they were operating properly for the next days-planned egg take. The holding pens where checked for adult ripening coho salmon and noticed that the adult male salmon had escaped, the female salmon were still captive in their pen. The Kametolook River was surveyed again for adult salmon with approximately 20 coho and 10 sockeye salmon in the main upriver spawning area located about ¼ mile below the incubation boxes observed. None of these salmon appeared fresh and were likely counted during the 23 October salmon survey. The indexed escapement count for the Kametolook River should remain at 148 coho salmon and 40 sockeye salmon, the survey count from 23 October.

November 11, 1998- Jim, Jerry, Melvin, Austin Shangin caught 7 male coho salmon from the Kametolook River and used them to fertilize the 11 ripe female coho salmon from the holding pen. Standard salmon delayed fertilization techniques were used and the fertilized eggs were immediately rinsed and placed in the instream incubators. All but about 300 unfertilized eggs which were held back for the school aquarium, were distributed between the two instream incubator boxes. Fin and kidney samples were collected form each salmon for genetic analysis and disease screening, and ovarian samples were collected from each female salmon for disease screening.

November 12, 1998- Jim and Melvin showed all the Perryville students from kindergarten through the sixth grade how to fertilize salmon eggs. After fertilizing the eggs, they were placed them in the school aquarium where the students will be able to watch their development through the swim up fry stage and their release into the Kametolook River in the spring of 1999.

November 13, 1998- Genetic samples were delivered to U.S. Fish and Wildlife laboratory in Anchorage and kidney and ovarian samples taken to Anchorage Alaska Department of Fish and Game laboratory for testing.

November 1998 - April 1999- Jerry Yagie continued to conduct BI-monthly trips to the instream incubation boxes to check their condition. He provided reports to the ADF&G staff.

January 1999- Jim McCullough attended the State Board of Fisheries meeting and gave a status report of this project.

March 17-19, 1999- Jim McCullough and Lisa Scarbrough attended Chignik RPT and CRRAA meeting and provided project status report of project. A Perryville Subsistence Workgroup was created consisting of representatives from: Perryville, Chignik

commercial fisherman and ADF&G staff members to look into identifying ways (in addition to the incubation boxes) to assist with the recovery of coho salmon in the Kametolook River.

March 23-26, 1999- Jim McCullough and Lisa Scarbrough constructed a project poster for the 1999, 10th annual EVOS conference "Legacy of an Oil Spill 10 Years After *Exxon* Valdez". Attended the conference and presented the poster during the scheduled poster session.

April 9, 1999- Jim McCullough and Lisa Scarbrough participated in a teleconference with the Perryville Subsistence Workgroup. The Kametolook River project was discussed.

April 29 - May 4, 1999- Lisa Scarbrough traveled to Perryville with Jim McCullough to issue subsistence salmon permits and conduct key respondent interviews. The interviews were designed to further investigate the subsistence salmon fishery in Perryville as requested by the Perryville Subsistence Workgroup. Topics discussed in the interviews were directed at trying to learn how each salmon stock contributes toward meeting the salmon needs of Perryville, and alternative subsistence resources available. Life histories were also gathered for several respondents to document stocks used over time, locations of harvests, and ways each species is processed and cooked. Jim McCullough and local assistants attempted to travel to the incubation boxes on the Kametolook River, but heavy wet snow halted the trip. (A detailed trip report is available.)

Project 00247 (October 1999 - September 2000)

September - October 1999- Local Assistant, Jerry Yagie conducted stream surveys, counting coho in upper reaches of Kametolook River. Reports information to ADF&G's Jim McCullough.

October 25, 1999- Teleconference with ADF&G and the Perryville Subsistence Workgroup. The Kametolook Coho Restoration project was discussed.

October 28, 1999- Jim Fall (ADF&G Division of Subsistence) attended the Alaska State Board of Fisheries meeting in Fairbanks and gave a status report of the Perryville Subsistence Workgroup including the Kametolook project.

November 1-5, 1999- Jim McCullough participated in a field trip to Perryville, Alaska. The purpose of the trip included: 1) survey Kametolook River's salmon escapement, 2) set up holding pens for ripening adult coho salmon, 3) captured and placed in holding pens adult coho salmon, 4) cleaned and set up the coho salmon school aquarium project and 5) met with villagers to determine how the 1999 salmon subsistence fishery was proceeding. (A detailed trip report is available.)

November 1-2, 1999- Travel for Jim McCullough from Kodiak to Perryville via Anchorage and King Salmon.

November 3, 1999- Bad weather prevented travel to the Kametolook River spawning area so Jim McCullough spent the day cleaning and setting up the school aquarium and met with the junior and high school teachers to discuss the school aquarium project.

November 4, 1999- Jerry Yagie, Jim McCullough and one high school student, Michael Shangin set up the holding pens in the spring above the Kametolook River incubation boxes. They also surveyed the Kametolook River for the presence of any fish. In the spring of 1999, about 75% of the glacial water that had been flowing into the Long Beach River changed course and began flowing into the Kametolook River. The additional flow nearly doubled the size of the Kametolook River and made extremely poor salmon survey conditions due to turbidity. They observed only 3 coho salmon immediately below the incubation box site, an additional 6 coho salmon in the main stem and 5 coho salmon in clear water tributaries. Jerry noted that in one clear tributary, where they saw only 2 sockeye and one coho salmon, he had observed 20 coho salmon about two weeks earlier. They also saw 10 sockeye salmon in the main stem of the river.

November 5, 1999- Jerry Yagie, Michael Shangin, and Jim McCullough captured 6 female and 16 male coho in the stream reach just below the incubation boxes. They kept and put in the holding pens all 6 females and 13 male coho salmon. They were surprised by this catch because we had only observed 3 salmon the previous day in this area. The glacial melt water made the survey conditions very poor.

During this trip Jim asked several people about the on-going coho salmon subsistence fishery. He was informed that fishing in Sleepy Hollow and Humpback Bay was slow while Anchor Bay and Ivan River fishing was generally good. One person said they had just returned from Chignik Lake with 96 "red" sockeye salmon from the Clark River and that their fishing partners had also taken about 100 fish each for a total of ~300 sockeye salmon. People also noted that the coho run to Ivanof was good with plenty of fish for that village. Jim returned to Kodiak, the evening of November 5.

November 9, 1999- Jerry Yagie and another person caught 3 female and 7 male coho salmon and added these to the holding pens.

November 10, 1999- Jim also presented a paper on the Kametolook project at the annual meetings of the American Fisheries Society in Anchorage.

November 15-19, 1999- Jim McCullough participated in a field trip to Perryville, Alaska. The purpose of the trip included: 1) a coho salmon egg take from the Kametolook River's salmon stock, 2) collecting biological samples from the salmon used in the egg take, 3) winterizing the holding pens and other equipment and 4) placing fertilized eggs in the incubation boxes and in the school aquarium. (A detailed trip report is available.)

November 15-16, 1999- Travel for Jim McCullough from Kodiak to Perryville via Anchorage and King Salmon.

November 17 1999- Jerry Yagie, Austin Shangin, five junior and high school students (Boris Kosbruk, Alec Phillips, Harry (JR) Kosbruk, Ryan O'Domin and Jonathan Kosbruk) and Jim McCullough collected eggs and milt from the coho salmon that had been placed in the holding pens. They also collected kidney, ovarian and genetic samples. Standard delayed fertilization techniques were used and the fertilized eggs were placed in the incubation boxes. About 400 eggs from a singe female and milt from 2 males were held back for the school aquarium. The holding pens and other equipment that was no longer needed was winterized at Jerry Yagie's house.

November 18, 1999- Jim McCullough met with the grade school and high school students that did not participate during the previous days egg take. Again using standard delayed fertilization techniques; the eggs were fertilized and added to the aquarium. Students got to watch the process and a discussion of the care of the eggs and aquarium followed. Jim returned to Anchorage that evening arriving about 8:30 p.m.

November 19, 1999- Jim McCullough dropped off the kidney and ovarian samples at the ADF&G lab and the genetic samples at the US Fish and Wildlife lab in Anchorage. He returned to Kodiak that evening.

November 1999 - May 2000- Jerry Yagie continued to conduct bi-monthly trips to the instream incubation boxes to check their condition. He provided telephone reports to the ADF&G staff.

January 2000- Jim McCullough presented a paper at Annual EVOS Restoration Workshop in Anchorage summarizing the Kametolook project. His presentation emphasized the project's community involvement. The poster created for the EVOS 10th annual conference in 1999 was displayed again at 2000 annual workshop.

April 4, 2000- Jim McCullough participated in a teleconference for the Chignik RPT and CRRAA meeting and provided project status report of the project.

April 2000- Jim McCullough and Lisa Scarbrough (PI's) met via teleconference April 6 to discuss the progress of the project and identify measurable tasks for FFY-2001. Prepared project DPD for 2001 funding.

Project 01247 (October 2000 - September 2001)

September - October 2000- Local assistant, Jerry Yagie conducted stream surveys, counting coho in upper reaches of Kametolook River. Reports information to ADF&G's Jim McCullough.

November 2000- Jim McCullough traveled to Perryville November 1-5 and assisted by local assistants Jerry Yagie and Andrew Shangin surveyed Kametolook River's salmon escapement, set up net holding pens, captured and placed adult coho salmon into holding pens, cleaned and set up the coho salmon school aquarium, and met with the community to determine how the 2000 subsistence salmon fishery was proceeding. (A detailed trip report is available.)

Jim returned to Perryville November 13-18 and harvested eggs and milt from salmon held in the holding pens, added fertilized eggs to the egg boxes and school aquarium, and winterized holding pens and other equipment. Additional ripe salmon were not found and no biological samples were collected due to few salmon available for sampling and kidney sample requirements were satisfied in 1999. (A detailed trip report is available.)

December 2000 - May 2001- Local assistants make monthly trips to incubation boxes to inspect condition of boxes and eggs. ADF&G analyze commercial and subsistence harvest dada for community of Perryville.

March 2001- Jim McCullough met with Chignik Regional Aquaculture Association (CRAA) and Perryville Subsistence work group to discuss project and other potential restoration techniques. March 12-14, 2001 (Anchorage).

April 2001- Jim McCullough attended Kodiak ADF&G staff meeting in part to discuss the project.

April 5, 2001- Teleconference with CRAA consultant, ADF&G pathology, genetics and fish transport permit staff on restoration techniques and requirements for obtaining coho eggs or fry from other river systems and transporting them to Kametolook River.

SCHEDULE

A.1. Measurable Project Tasks remaining for FY 01 (May 2001 - September 2001)

May - September 2001:

-Chignik Regional Planning Team will meet in Chignik. A status report of the Kametolook Project will be given and Perryville Subsistence Workgroup will meet.

-Apply for FRP permits to collect coho salmon pathology and genetic samples from potential brood source streams (Ivanof, Smokey Hollow, and Ivan Rivers) for

future FTP permits for eggs and/or juvenile fish transport from area rivers to the Kametolook River.

-Conduct stream surveys and genetic/pathological work in area river systems for FTP requirements to transport coho eggs and/or juvenile fish to Kametolook River in fall of 2001 and 2002.

-Complete annual report 01247

A.2. Measurable Project Tasks for FY 02 (October 2001 - September 2002)

October 2001:

-Local Perryville assistants will conduct stream surveys for coho salmon in Kametolook River, and report findings to ADF&G.

-Two ADF&G personnel will travel to Perryville to work with PV assistants and conduct stream surveys of Kametolook River, capture adult coho salmon (assisted by 2 or 3 Perryville residents), and will place the salmon in holding pens until they are ripe. In addition, they will start or continue with stream surveys and genetic/ pathological work in local area river systems for FTP requirements to transport coho eggs and/or juvenile fish to Kametolook River and egg boxes.

-Consult with teachers and set up school aquarium and obtain school FTP.

-Perform maintenance of instream incubation system and school aquarium.

November - December 2001:

-Two ADF&G staff travel to Perryville to meet with Perryville personnel and conduct escapement surveys.

-Perform a coho salmon egg take (Kametolook and another nearby river if FTPs allows), fertilize eggs, place in incubation boxes.

-Sample salmon for genetic and pathology tests.

-Meet with school children and community to discuss project.

-Renew school aquarium FTP.

-Meet with Chignik RPT/CRAA and the Perryville SubsistenceWorkgroup to discuss the Kametolook Project.

December 2001 - May 2002:

-Perryville assistants make monthly trips to incubation boxes to inspect condition of boxes and eggs.

-ADF&G analyze subsistence and commercial harvest data.

-Attend EVOS annual restoration workshop. Anchorage.

-Attend Chignik Subsistence Workgroup meeting. Anchorage.

-Attend Board of Fisheries meeting to discuss Kametolook project. Anchorage or Kodiak.

April - May 2002:

-Meeting with assessment team to evaluate the project.

-Write FY 01 annual report.

-Meet with community to review status of project and discuss community involvement activities.

-Purchase and ship to Perryville any necessary equipment needed for project maintenance.
-Perryville assistants monitor boxes for fry release.
-Sanitize boxes after fry leave.
-Students release aquarium fry into Kametolook River.

June - September 2002:
-Regional Planning Team and Perryville Subsistence Workgroup meeting in Chignik Bay to review success of the project and evaluate if need to continue project and look for other sources of funding.
-Write FY-02 annual report and final project report to EVOS Trustee Council.

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 Kametolook River to monitor the environment, the egg boxes, net pens and conduct general stream surveys (counting adult salmon). ADF&G will continue to supervise the project and continue to take trips to assist with the project. As this project continues; however, (up through 2002) Perryville assistants will continue to be better trained and will take on additional responsibility for the project. Some of their duties will include: conducting escapement surveys, netting salmon for holding in pens, harvesting and fertilizing eggs and transporting to egg boxes, taking samples of harvested salmon for genetic and pathology tests, assisting school children with obtaining eyed eggs for the school aquarium project, and releasing fry in the spring. (This is necessary because of budget constraints preventing ADF&G from being present at all critical times of the project.)

Annually, ADF&G 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. ADF&G biologists will determine any significant changes to the coho salmon spawning and rearing habitat of the rivers to determine appropriate stocking levels. ADF&G 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 including Sandy and Sicken Lakes.

In order to rehabilitate the coho salmon run in the Perryville area, education of villagers through a better understanding of the life cycles and conservation of salmon is essential and will continue every year. The ADF&G team will assist with an educational process that focuses on teaching the community through the both the school children and adults. They 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, the ADF&G team will continue to work with the Village Council to assess the project and look at ways the community can

facilitate the success of the project and help increase the number of spawning coho salmon. As mentioned earlier, as of October 1997, Perryville Village Council voluntarily closed the upper half of the Kametolook River to salmon fishing as a way to do their part at helping solve the salmon shortage problem.

In 1999 and 2000, virtually no one from Perryville chose to catch any of their subsistence coho from the Kametolook River to help with the rehabilitation of it's salmon runs. In addition, Chignik commercial fisherman delivered two loads of fresh coho salmon (approximately 600 fish) to Perryville residents in August of 1999 (given mostly to the elders). This delivery was greatly appreciated, and also took some of the pressure off of the Kametolook River. This action was in part due to recommendations made by the Perryville subsistence workgroup which consists of representatives of Perryville subsistence users, Chignik commercial fisherman, and ADF&G staff. The workgroup was created in 1999 and continues to meet (as recommended by the Alaska State Board of Fisheries) in order to assist Perryville with the rehabilitation of their declining coho salmon stocks (in addition to this incubation box project). These actions as well as other options will be evaluated and discussed with the community annually on a regular basis.

At the start of this project in 1997 and through 2000, the ADF&G team expected the stream side incubation boxes, in conjunction with some fishing restraints, and the Perryville subsistence workgroup would provide sufficient coho salmon to rehabilitate the run within two to three coho life cycles. Due to the low escapement of coho salmon into the Kametolook River system, this project will be unable to achieve this goal. In the last five years (1996-2000) the total estimated adult coho escapement has ranged from 85 (2000) to 724 (1997) fish and averaged about 289 salmon. The project's instream incubator boxes were designed to hold eggs from 60 females or use 120 total salmon. Due to the difficulty of capturing ripe female coho salmon and the low escapements we have always used less than 10 females for the annual egg take.

We are requesting an expansion of the project to investigate potential genetic and pathology brood stock sources from nearby river systems. If the scope of the project is broadened, we intend to collect coho salmon samples in the Ivanof, Smokey Hollow, and Ivan Rivers and if budgets allow, also from Humpback and Fishrack systems for pathology and genetic analysis. If fish transport permit applications are approved, we will transport eggs and/or juvenile fish to the Kametolook River to help in restoring this subsistence salmon run.

C. Completion Date

The project will be completed by September 30, 2002 due to the cut off of funding from the EVOS TC. If another funding source can be obtained after that date and the community of Perryville is still interested in participating, it is recommended that the project continue until coho salmon runs have been fully restored to satisfy the needs of Perryville subsistence users.

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 ADF&G with field work and long term monitoring of the project. Three additional Perryville residents have been hired (by the Village Council) to work annually, as needed, to assist ADF&G and the project administrator with building and hauling materials, maintenance of installed egg boxes, site selection and installation of fish holding nets. Local assistants will also help with capturing adult salmon, taking genetic and pathology samples, removing, fertilizing, and seeding eggs into incubation boxes, and releasing fry in spring. 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 four village assistants have been included in the cost of the grant.

Alaska Department of Fish and Game

Several ADF&G personnel have provided technical assistance for the project to date. These people 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: Bill Hauser, Fish Biologist IV for Habitat and Restoration, Anchorage; Joe Sullivan (retired), Fish Biologist III for Habitat and Restoration, Anchorage, Dave Owen (retired), Fish Biologist III, Chignik/Kodiak; George Pappas, Fish Biologist III, Chignik/Kodiak; Wayne Dolezal, Habitat Biologist III for Habitat and Restoration, Anchorage and Pete Velsco (retired), Fish Culturist II for Commercial Fisheries, Nome.

Jim McCullough with ADF&G has several years of varied experience with fisheries enhancement and research projects as well as salmon management in the Alaska Peninsula. Lisa Scarbrough, has been doing subsistence research in the Alaska Peninsula (including Perryville) communities since 1989. Bill Hauser along with Joe Sullivan (retired) have extensive experience in fisheries restoration and enhancement with the department. George Pappas replaced Dave Owen (retired 1999) as Chignik's Area Management Biologist in 1999. Both Dave and George have had several years of experience with fisheries in Alaska. Wayne Dolezal is one of the State's leading habitat experts in Alaska. Pete Velsco (retired 1997) had several years of varied experience with instream and recirculating incubation box projects, particularly in Norton Sound. Labor (with the exception of 0.5 months/year for Lisa Scarbrough) will be provided by ADF&G 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

American Fisheries Society, Anchorage. November 9-11, 1999. Paper of project was presented by Jim McCullough, ADF&G, Kodiak.

NORMAL AGENCY MANAGEMENT

This proposed rehabilitation effort is not part of ADF&G'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 (in State Fiscal Year 1996) and Trustee Council Civil projects 97247, 98247, 99247 and 00247 (in Federal Fiscal Years 1997, 1998, 1999 and 2000).

PRINCIPAL INVESTIGATORS

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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. Co-leader 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 was analyzed to determine opening and closure of the various commercial fisheries as delegated by the Commissioner of ADF&G.

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.

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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 subsistence 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. Since 1993, Lisa has been responsible for assessing Chignik Subsistence salmon permit data.

OTHER KEY PERSONNEL

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FY 02 *EXXON VALDEZ* TRU[illegible] COUNCIL PROJECT BUDGET

October 1, 200[illegible] - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002
Personnel	$2.9	$12.6
Travel	$6.4	$8.3
Contractual	$11.8	$10.1
Commodities	$0.3	$0.2
Equipment	$0.0	$0.2
Subtotal	$21.4	$31.4
General Administration	$1.3	$2.6
Project Total	$22.7	$34.0
Full-time Equivalents (FTE)	0.5	2.5
Other Resources		

LONG RANGE FUNDING REQUIREMENTS					
Estimated FY 2003					
N/A					

Dollar amounts are shown in thousands of dollars.

Comments: An Environmental Assessment for all years of the project was approved in 1997. FY 2002 is the final year and evaluation of the project.

This project was originally funded by Criminal Settlement funds in 1996, and has been funded since 1997 through the EVOS TC. The budget estimate for 2002 for staff time has increased from previous years of the project due to additional time needed for writing both annual and final reports and to develop and monitor the subcontract with Perryville Village Council. In addition, due to continual low escapement of coho in the Kametolook River system, this year the project would like to test other coho runs as potential brood sources and transport coho eggs or juvenile fish from streams outside Kametolook River to aid in restoration of the Kametolook coho run (if FTP permits allow). This will require additional travel, field time and labor from a F&W Technician to assist the PI for genetic and pathological sampling, capturing fry and/ or harvesting eggs and transporting to the Kametolook River. The school aquarium also needs to be replaced (the original glass tank cracked in 2000).

FY02

Prepared: April 10, 2001

Project Number: 02247
Project Title: Kametolook River Coho Salmon Subsistence Restoration
Agency: Alaska Department of Fish and Game

FORM 3A
TRUSTEE
AGENCY
SUMMARY

FY 02 *EXXON VALDEZ* TRU E COUNCIL PROJECT BUDGET
October 1, 200 . eptember 30, 2002

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 2002
						0.0
Lisa Scarbrough	Subsistence Resource Specialist II	16K	2.0	5.7	0.0	11.4
	(logistics/ report writing annual and final)					0.0
						0.0
To be determined	Fish and Wildlife Tech II / Kodiak	9D	0.5	2.4	0.0	1.2
	(assist with genetic sampling/ egg take)					0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		2.5	8.1	0.0	
					Personnel Total	$12.6

Travel Costs:		Ticket	Round	Total	Daily	Proposed
Description		Price	Trips	Days	Per Diem	FY 2002
						0.0
						0.0
*	Kodiak to Anchorage	0.4	5	13	0.1	3.3
	Anchorage to Perryville	0.8	4	18	0.1	5.0
						0.0
						0.0
*	Note when traveling from Kodiak to Perryville it is necessary to					0.0
	overnight in Anchorage coming and going.					0.0
						0.0
						0.0
						0.0
						0.0
					Travel Total	$8.3

FY02

Prepared: April 10, 2001

Project Number: 02247
Project Title: Kametolook River Coho Salmon Subsistence Restoration
Agency: Alaska Department of Fish and Game

FORM 3B
Personnel
& Travel
DETAIL

Contractual Costs:		Proposed
Description		FY 2002
4A Linkage	1) Contract with Native Village of Perryville (Perryville wages/ gasoline/ ATV or boat use/ insurance/ Village Admin. Fee (10%)	9.8
	2) Shipping costs of misc. maintenance supplies/ aquarium to Perryville, via USPS or Peninsula Airways	0.3
When a non-trustee organization is used, the form 4A is required.	**Contractual Total**	$10.1

Commodities Costs:		Proposed
Description		FY 2002
General maintenance supplies for incubation boxes/ egg take equipment/ fish holding pens temperature instruments/ school aquarium/ film development etc.		0.2
	Commodities Total	$0.2

FY02

Project Number: 02247
Project Title: Kametolook River Coho Salmon Subsistence Restoration
Agency: Alaska Department of Fish and Game

FORM 3B
Contractual & Commodities DETAIL

Prepared: April 10, 2001

New Equipment Purchases: Description	Number of Units	Unit Price	Proposed FY 2002
			0.0
			0.0
school aquarium (R)			0.2
			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 Equipment Total**	$0.2

Existing Equipment Usage: Description	Number of Units	Inventory Agency
None		

FY02

Project Number: 02247
Project Title: Kametolook River Coho Salmon Subsistence Restoration
Agency: Alaska Department of Fish and Game

FORM 3B
Equipment
DETAIL

Prepared: April 10, 2001

FY 02 *EXXON VALDEZ* TRU[illegible]E COUNCIL PROJECT BUDGET

October 1, 200[illegible] - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002						
Personnel	$6.2	$5.4						
Travel	$1.2	$0.0						
Contractual	$4.4	$4.7						
Commodities	$0.0	$0.0						
Equipment		$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	$11.8	$10.1	Estimated FY 2003					
Indirect								
Project Total	$11.8	$10.1	$0.0					
Full-time Equivalents (FTE)		0.0						
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

FY02

Prepared: April 10, 2001

Project Number: 02247
Project Title: Kametolook River Coho Salmon Subsistence Restoration
Name: Perryville Village Council/ Peninsula Airways

FORM 4A
Non-Trustee
SUMMARY

FY 02 *EXXON VALDEZ* TRU : COUNCIL PROJECT BUDGET
October 1, 200. September 30, 2002

Personnel Costs:			Months	Monthly		Proposed
	Name	Position Description	Budgeted	Costs	Overtime	FY 2002
	To be determined	Perryville/ Project Facilitator and Assistants				5.4
	Note: Approximately 54 days of work @ about $100.00/ day labor					
						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	
					Personnel Total	$5.4

Travel Costs:		Ticket	Round	Total	Daily	Proposed
	Description	Price	Trips	Days	Per Diem	FY 2002
	none					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

FY02

Prepared: April 10, 2001

Project Number: 02247
Project Title: Kametolook River Coho Salmon Subsistence Restoration
Name: Perryville Village Council/ Peninsula Airways

FORM 4B
Personnel
& Travel
DETAIL

FY 02 *EXXON VALDEZ* TRI E COUNCIL PROJECT BUDGET
October 1, 200 - September 30, 2002

Contractual Costs:	Proposed
Description	FY 2002
Perryville contract:	
Approximately 45 days of ATV or skiff use @ $50.00/ day (wet)	2.3
Perryville Village Administrative fee at 10% of contract (not including insurance costs)	0.8
Insurance for workman's compensation and general liability required of Perryville as contractor of the project by the State of Alaska	1.3
Air freight costs to Peninsula Airways to ship school aquarium and other project supplies to Perryville	0.3
Contractual Total	$4.7

Commodities Costs:	Proposed
Description	FY 2002
None	
Commodities Total	$0.0

FY02

Project Number: 02247
Project Title: Kametolook River Coho Salmon Subsistence Restoration
Name: Perryville Village Council/ Peninsula Airways

FORM 4B
Contractual & Commodities DETAIL

Prepared: April 10, 2001

FY 02 *EXXON VALDEZ* TRU : COUNCIL PROJECT BUDGET
October 1, 200. September 30, 2002

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FY 2002
None			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 Equipment Total**	$0.0

Existing Equipment Usage:	Number	
Description	of Units	
None		

FY02

Project Number: 02247
Project Title: Kametolook River Coho Salmon Subsistence Restoration
Name: Perryville Village Council/ Peninsula Airways

FORM 4B
Equipment
DETAIL

Prepared: April 10, 2001

Sockeye Salmon Stocking at Solf Lake

Project number:	02256b
Restoration Category:	General Restoration
Proposer:	USFS
Lead Trustee Agency:	USFS
Cooperating Agencies:	none
Alaska Sea Life Center:	No
Duration:	7th year, 7-year project
Cost FY 2002:	$20,000
Cost FY 2003:	$4,500
Geographic Area:	Prince William Sound
Injured Resource:	Subsistence/Sockeye Salmon

ABSTRACT

This project is designed to benefit subsistence users of Western Prince William Sound. Solf Lake has been recognized for many years as a site 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 proved unsuccessful. The lake was never stocked and subsequent investigations suggested that it was fishless. There are two phases to this project: Phase 1, which began in FY96, has verified the ability of Solf Lake to support a sustainable population of sockeye salmon. Phase 2, included stocking the lake with approximately 100,000 sockeye salmon fry, then ensuring access to Solf Lake for returning adult salmon. The stocking program began in 1997 and outlet flow control structures were completed in 1997 and 1998. The reconstruction of the fishway in the eastern channel was completed in the summer of 2000 and returning adult salmon to Solf Lake will be monitored starting in 2001to evaluate the improvements.

INTRODUCTION

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, approximately 40 miles from Chenega Bay.

This proposal is a request for continued support from the Trustee Council to fund the final year of a seven-year project to restore sockeye salmon (*Oncorhynchus, nerka*) runs to Solf Lake. Construction on control structures at the two outlets of Solf Lake are completed and the stocking and rearing of sockeye salmon fry is continuing. Reconstruction of the fishway was completed in the summer of 2000 and monitoring of returning adults will be conducted in 2001.

The funding request in this proposal is for an additional year of monitoring the adult returns to Solf Lake to evaluate the performance of the structural improvements and stocking success. Approval of this proposal will also provide funding for completion of a final report on the Solf Lake Project. The first returns from the first stocking in 1998 are expected in May and June of 2001; at that time the fishway will be evaluated for fish passage effectiveness and spawning habitat utilization by returning fish. An additional year of observations will strengthen the results on the success of the project.

Solf Lake has long been recognized as an opportunity to reestablish a sockeye salmon run in Prince William Sound. 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." Starting in the early 1970's, various attempts have been made to reestablish sockeye salmon in Solf Lake. For two years in this same period, ADF&G personnel transported adult sockeye salmon from Eshamy River to Solf Lake. Unfortunately, necessary stream improvements had not been completed when the offspring from the transplanted fish returned. In 1978, 1980 and 1981, the USFS implemented improvements to the outlet streams. The work consisted of improving the eastern outlet and partially damming the western outlet. The diversion weir was designed to raise the level of the lake to provide adequate water flow for fish passage at the eastern outlet. The improved eastern outlet channel is less than 100 m in length, with an average gradient of 23 percent (Figure 2). Stocking of the lake never occurred after the improvements due to higher priority projects for both the USFS and ADF&G.

ADF&G surveyed Solf Lake in 1985/1986 as part of a lake investigation 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 minnow 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 sampled in 1986. The Pellissier and Somerville (1987) survey also documented that

water was flowing through the western outlet due to an incomplete seal by the diversion weir. Three minor barriers to fish passage were identified in the eastern channel.

ADF&G recommends stocking based on their zooplankton studies and added that the instability of the macrozooplankton community in barren lakes when faced with predation necessitates stocking programs based on a conservative approach. Close evaluation and experimenting with stocking strategies will ameliorate significant impacts to the macrozooplankton community. Major reasons for the disparity of response to stocking barren lakes include; inherent low productivity of these lakes; macro zooplankton abundance, composition, and ability to adapt to predation; stocking density; lake morphology and variability in the indirect effects of predation in individual lakes. Based on limnological information the stocking levels at Solf Lake could be as high as 400,000 fry. While Solf Lake is most likely capable of supporting stocking at this level, it was decided to take a more conservative approach to stocking.

Solf Lake is a clear water lake with a mean depth of 42.5 m and a surface area of approximately 0.61 km^2 (Barto and Nelson, 1982). Based on historical limnological data from the 1980's, stream survey data collected in 1996, and analysis of current limnological data it is reasonable to expect that the lake is capable of supporting a sustainable sockeye population. Based on the available spawning area, it is estimated that Solf Lake could sustain a run of approximately 10,000 sockeye salmon. 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. Consequently, we are recommending stocking at the 100,000 fry level to meet the objective of the stated return and the assumption that there will be a high fry to adult survival.

With the exception of 1986 prior to stocking activity, *Diaptomus* have accounted for more than 50% of the total biomass followed by *Cyclops*, which generally comprises about 30 % of the total. The remainder of the total macrozooplankton (TMZ) consisted primarily of the cladoceran form *Bosmina* and very small numbers of *Daphnia*. The 2000 stocking level of 116,500, 0.42g., sockeye fry did not appear to have a significant influence on (TMZ) and the abundance as indicated by an increase in *Diaptomus* density by 22% and a 4.5% increase in biomass. Results indicate *Bosmina* decline in density by 39% and in biomass by 45% from pre-stocking means. Similarly a decline in *Cyclops* by 57% and 63% respectively were also observed. All of the observations in 2000 fall within the range of pre-stocking observations and are therefore not considered to be significant see Figures 3 and 4.

Fishless lakes are susceptible to overgrazing by large numbers of obligate planktivores, i.e. sockeye fry, resulting in steep declines in macrozooplankton numbers and biomass. Diet selectivity studies for rearing sockeye fry have shown that fry presented with a wide choice of food items tend to select for cladoceran and large calanoid forms. Although sockeye fry do graze on *Cyclops*, it is not actively selected. Thus, in Solf Lake, we would expect the large, red pigmented, and therefore, highly visible *Diaptomus*, to be an indicator species of excessive grazing pressure and a guide to gauge stocking levels. There was no observed significant difference between macrozooplankton biomass and density from pre-stocking and post-stocking means. In April the Project Investigator reviewed the macrozooplankton results from 2000 and determined that current stocking levels are still supported at Solf Lake.

Personnel from the Main Bay Hatchery successfully collected 121,000 green eggs from Coghill brood stock and reared them at their Main Bay facility. Overall, survival of green eggs to released fry was 96.3%. This resulted in the release of 116,500, 0.42 g fry into Solf Lake on June 15, 2000. Of the total number of fry released into Solf Lake all were marked with a thermal otolith mark sequence of 1:1.3,2.2. The expected return from the release of the BY99 Coghill stock sockeye to Solf Lake is expected to be 4,400. Approximately 60% of these should return as four-year-olds in 2003. The remaining 40% may return as five-year-old in 2004.

On June 16 personnel from ADF&G conducted a hydroacoustic survey of Solf Lake; surveying several transects perpendicular to the longitudinal axis of the lake. There were essentially no targets (fish) recorded during the entire survey. In September Forest Service crewmembers fished a floating fyke net overnight near the inlet streams of the lake and captured 27 Dolly Varden but no sockeye.

The reason for the lack of fish targets during the hydroacoustic survey and no sockeye being captured during fyke net sampling remains unknown. The hydroacoustic survey was conducted within a few days of stocking, during this time a barrier net was in place at the diversion weir to prevent any outmigration, and the eastern outlet was closed for construction purposes. Both ADF&G and Forest Service Crews observe several small groups of fry, usually numbering less than 50 swimming around the margins of the lake, however no large groups, at least not enough to account for 116,500 fry were seen exiting the lake or as mortalities. It is possible, that no fry were observed during the hydroacoustic survey due to the gregarious nature of recently stocked fry and the survey being conducted so shortly after the time of stocking. The survey may have missed a few large groups of fish not yet dispersed throughout the lake or fry aggregating very near the shoreline. Additionally fyke netting in the fall may not have captured any sockeye fry, if they emigrated as age-0 smolt, as has been proposed in previous reports. Starting in 2001 stocking procedures will include retention of sockeye fry in temporary holding pens near the lakes inlet streams for two weeks to allow time for fry to acclimate and for observation of possible mortalities.

Cook Inlet Aquaculture Association (CIAA) has documented age-0 sockeye salmon smolts emigrating from their lake stocking programs; from 1990-1995, estimates of age-0 smolt emigrating Chelatna Lake (Susitna River basin) have ranged from less than 1% to 62% of the total outmigration (Fandrei 1995), and in Bear Lake (Seward) age-0 smolt estimates for 1990-1994 have ranged from less than 1%, up to 98% in one year (Hetrick and Prochazka 1998). At this time it is uncertain what the effects of this early emigration will have on ocean survival and consequently the number of returning adults to Solf Lake.

This early outmigration is expected to discontinue as the available zooplankton is reduced and fry growth rates decrease and stabilize, however given the results from the macrozooplankton sampling this situation has not yet occurred. Increasing future stocking levels to decrease growth

rates will have to be discussed with ADF&G and the RPT if returning adult in 2001 indicate low ocean survival rates.

The Regional Forest Service Engineer and the Trustee Council approved the final design for the fishway to be installed in 2000 in the spring of the same year. The constructed fishway varied only slightly from the approved design in location and orientation of the Steep Passes and concrete headwalls. Construction specifications detailed in the final design were adhered to the greatest extent possible. Excavation of the 60-foot trench through bedrock went extremely well, primarily due to the expertise of the Forest Service Blasters and construction crew. Because the integrity of the bedrock was maintained during trench construction and a watertight seal created, a concrete liner was not required. Time did not allow for an as-built survey but will be planned for in 2001 and should be available for inclusion in the final report.

Both the diversion weir at the western outlet and the control structure on the eastern outlet has been successfully completed and are working properly. During the 2000 field season both structures were inspected for serviceability. After a full 3 years of exposure to the rigorous weather of Prince William Sound the structures remain operational showing little sign of wear.

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 use 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 current observations, along with 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 before 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 km^2 (Barto and Nelson, 1982). Analyses 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 provide food for the tables of subsistence users in Western Prince William Sound.

Cost benefit calculation for subsistence resources are difficult to place a monetary value on, given that the nature of these resources are more intrinsic and cultural. This project will provide a subsistence resource to local communities in perpetuity.

If this project were to be evaluated as a commercial enhancement activity the resultant harvest would be approximately 4,500 fish/yr. This would result in an annual harvest of 27,000 lb. of sockeye salmon. Assuming an ex-vessel price of $1.75/lb. and a 2.5 multiplier to adjust for retail value providing an $118,125 /yr. cash benefit. This information is provided purely to demonstrate a cash benefit to substance users, however does not capture the intrinsic and cultural values this project will provide.

C. Location

Solf Lake is located off 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), 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), see figure 1.

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 self-sustaining 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 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

Phase 1. Feasibility phase. The four components to this objective are:

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 existing habitat improvement structures to ensure adequate conditions for adult migration (completed).

Phase 2. Implementation phase. 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 (completed).
2. Stock Solf Lake with sockeye salmon to produce a self-sustaining population that can provide an adequate subsistence harvest (ongoing).
3. Monitor zooplankton and smolt out-migration to ensure appropriate stocking levels (discontinued).

B. Methods

Project 96256 included one season of data collection to determine presence of resident fish and the potential carrying capacity of Solf Lake. Information collected in 2001 will continue to evaluate the success of the stocking program and improvements made at Solf Lake. In FY00 the Trustees elected not to continue funding ADF&G's involvement in the Solf Lake project, consequently subsequent stocking levels will have to be based on previously collected data and adult returns. Their methodologies are presented here to provide background to the information they previously collected in support of the project.

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

Interagency Coordination: 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 started in 1996 and continues through 2001 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 have been determined in coordination with ADF&G and PWSAC using all available data. Fry are currently being 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 as

potential stocks for Solf Lake. At least four years of fry transplants would be required to establish a sockeye salmon run. Recent discussions with PWSAC indicate that there will be no brood stock available in 2001 for Coghill fish. This is a result of the loss of the BY98 Coghill fish at the Main Bay Hatchery facility and therefore no stocking will occur at Solf Lake in 2002. However, eggs will be collected and fry reared for the 2003 stocking.

On the recommendation of the RPT, Eyak fish were selected as the brood stock for the Solf Lake project. At that time, there was concern that the incubation temperatures were too high in Solf Lake for early run Eyak fish. However, an early run stock was chosen to minimize management conflicts. Since that time, PWSAC has updated their Area Management Plan, which includes discontinuing the rearing of all sockeye stocks except Coghill fish at their Main Bay facility. On February 18th, 1999 a letter was sent to the RPT indicating that the Forest Service had no objection to switching the stock to Coghill fish, since these fish are also identified in the PWS/CR Phase 3 Comprehensive Salmon Plan as a suitable stock for Solf Lake. The mid run timing of the Coghill fish may additionally provide a more favorable incubation period than the Eyak stock, increasing the likelihood of a successful project. Discussions with the State Geneticist and the RPT have indicated that since the return at Solf is expected to be small and isolated from other stocks the stock and that the switch presents no concerns.

Monitoring (1998 and beyond): Limnological data was collected to evaluate the affect of the stocking program on the plankton population. This monitoring included 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).

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 weir to estimate the total out-migration. Fish will be sampled to determine age, length and weight characteristics that can be used to evaluate the health of the population. Coded wire tags and thermal otolith marking will be used to monitor the adult population. Hydroacoustic and tow-net surveys were conducted by ADF&G on Solf Lake at approximately 12 transects perpendicular to the longitudinal axis of the lake to enumerate fry abundance. 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.

Part 2. This section recognizes the work that has been needed to provide access to the lake for returning adults. Construction of the fishway at the eastern channel in 2000 is complete however returning fish should be monitored closely to determine the success of the improvements.

Outlet Flow Control Structures (1997 – 1998): The existing improvement structures at the two outlets of the lake were evaluated. It was determined that the old structure, which diverts flow at the impassable western outlet, required extensive reconstruction to provide adequate flow for fish passage at the lakes eastern outlet, this work was completed in 1998. The eastern outlet, that would provide fish access to the lake also required reconstruction of the "irrigation type" control weir, this work was completed in 1997.

Channel Modifications (2000): Solf Lake was visited by ADF&G personnel as part of a PWS lake investigation project in 1985 (Pellissier and Somerville, 1987). Three minor barriers to fish migration were identified in the outlet channel. These barriers were height and velocity barriers that ranged in size from 1.5 to 2.5 meters. The fishway in the eastern outlet was completed in the summer of 2000 and was designed to provide sockeye salmon passage into Solf Lake. The design called for two Alaska Steep Passes one 30 feet, another 40 feet in length, installed at a 22% slope. Each Steep Pass required a concrete head wall and support piers. The upper pass spills into an excavated section of bedrock forming a watertight trench. Additionally, step pools were created by the installation of intermittent notched concrete weirs, to further facilitate fish passage.

C. Cooperating Agencies, Contracts, and Other Agency Assistance

Personnel from the ADF&G Limnology Lab in Soldotna previously conducted the limnological data collection. ADF&G also completed the water chemistry and plankton analysis work. USFS will conduct the habitat surveys, evaluations of the habitat improvement structures, determine available spawning and rearing habitats, evaluate fish populations and construct improvements. 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. ADF&G, Residents of Chenega and the USFS will coordinate and develop a harvest strategy prior to sockeye returning to Solf Lake to prevent possible over escapements.

SCHEDULE

A. Measurable Project Tasks for FY02

January:	Attend Annual Restoration Workshop.
Jan - April:	USFS. Prepare for field season, hire crew.
Jan - April:	USFS. Prepare and submit Annual Report.
April - July:	USFS. Evaluate fishway and monitor returning adult salmon.
October:	USFS. Prepare final report.

B. Project Milestones and Endpoints

Phase 1. The overall objective of this stage of the project was to determine the feasibility of stocking Solf Lake with sockeye salmon. This objective has been completed and mixed-stock fisheries and genetic risk issues are resolved.

Phase 2. This is the actual stocking phase of the project. With the completion of Phase 1 and a favorable recommendation from the RPT stocking began in FY98 through 2001 however for reasons previously stated no stocking will occur in 2002.

Tentative schedule and measurable end points for phase 2:

Oct - Dec. FY01:	Determine appropriate brood stock and potential stocking levels. Coordinate with PWSAC and the PWS RPT for production planning.
FY98 - FY02:	Submit annual reports
FY01 - FY02:	Enumerate adult returns and evaluate fishway.
FY02:	Prepare and submit final report.

C. Completion Date

The project completion date for fieldwork will be at the end of FY2002. This will be the final year of monitoring. The final report will be prepared and submitted by December 15th 2002.

PUBLICATIONS AND REPORTS

Annual reports and an updated DPD will be submitted during each year of the project. A final report will be submitted in FY04.

PROFESSIONAL CONFERENCES

At this time, there are no plans to present this project at professional conferences.

NORMAL AGENCY MANAGEMENT

Given current 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. Shared cost proposals for 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 the project 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 were presented to the RPT outlining, potential size of the stocking program and brood stocks. The information was 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. 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

Dan Gillikin
Glacier Ranger District
P.O. Box 129
Girdwood, AK. 99587
(907) 783-3242

PRINCIPAL INVESTIGATOR

The principal investigator of this project will be Daniel Gillikin, Fisheries Biological Technician; Glacier Ranger District. Dan is the logistics and construction specialist for the fisheries department at Glacier and will coordinate this project for the USFS. Currently Dan holds the position of Fisheries Technician on the Glacier District. Dan has twelve years of experience as a fisheries technician with Private and Federal Agencies in Washington and Alaska. He would work with the project manager and conduct project implementation, environmental compliance, agency coordination, budget management and reporting.

OTHER KEY PERSONNEL

Cliff Fox, U.S. Forest Service Glacier Ranger District Chugach National Forest. Currently holds the position of Resource Staff Officer on the Glacier District. Cliff has 20 years experience in natural resource management with State and Federal Agencies in California, Idaho and Alaska.

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Seitz, J. and R.Miraglia. 1995. Chenega Bay. In: Fall, J.A and C.J. Utermohle, (eds). *An investigation of the sociocultural consequences of outer Continental Shelf development in Alaska; II. Prince William Sound.* MMS 95-011; Technical Report No. 160.

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Figure # 1. Solf Lake Location Map.

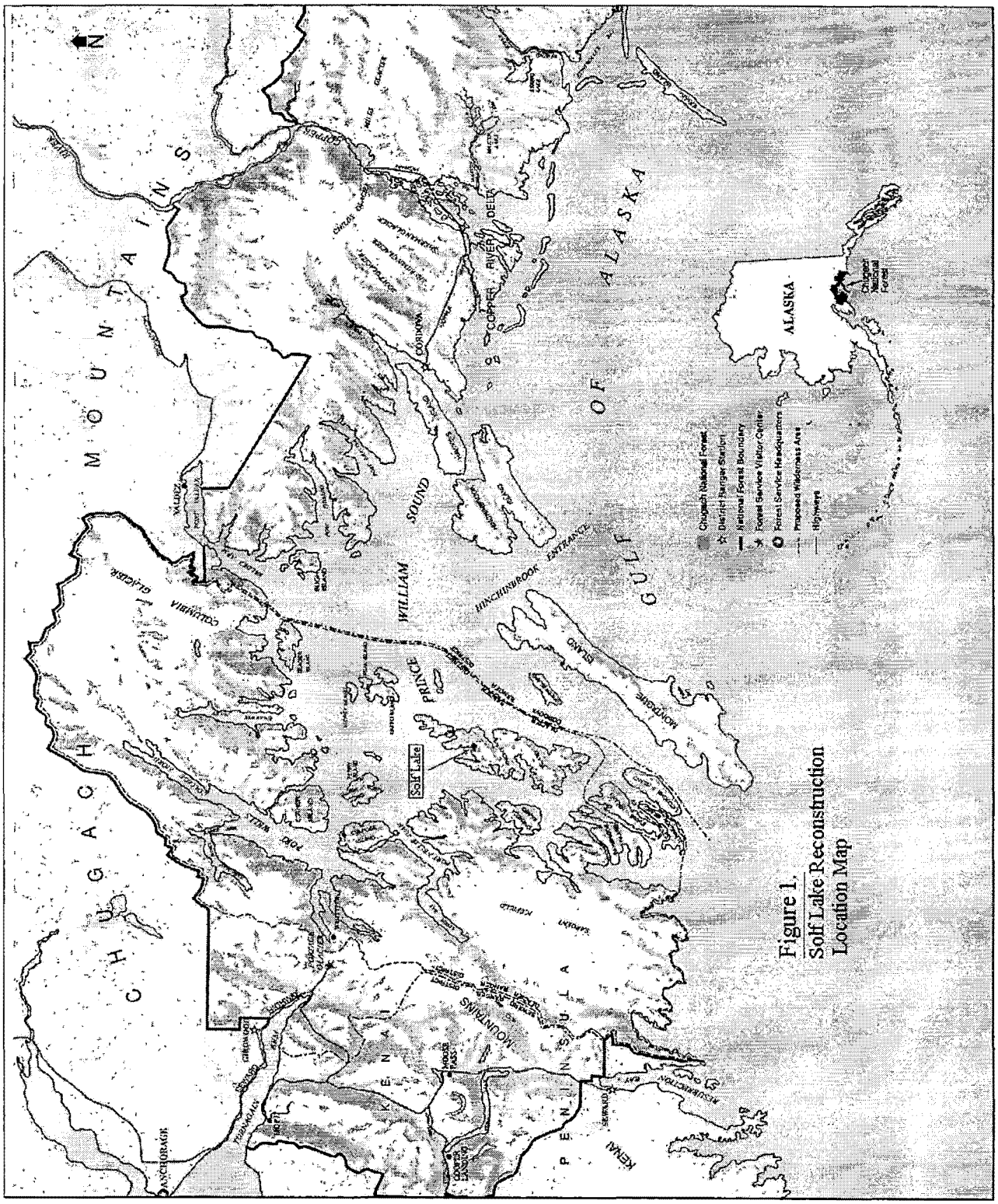


Figure 1.
Solf Lake Reconstruction
Location Map

Figure # 2. Solf Lake Site Plan

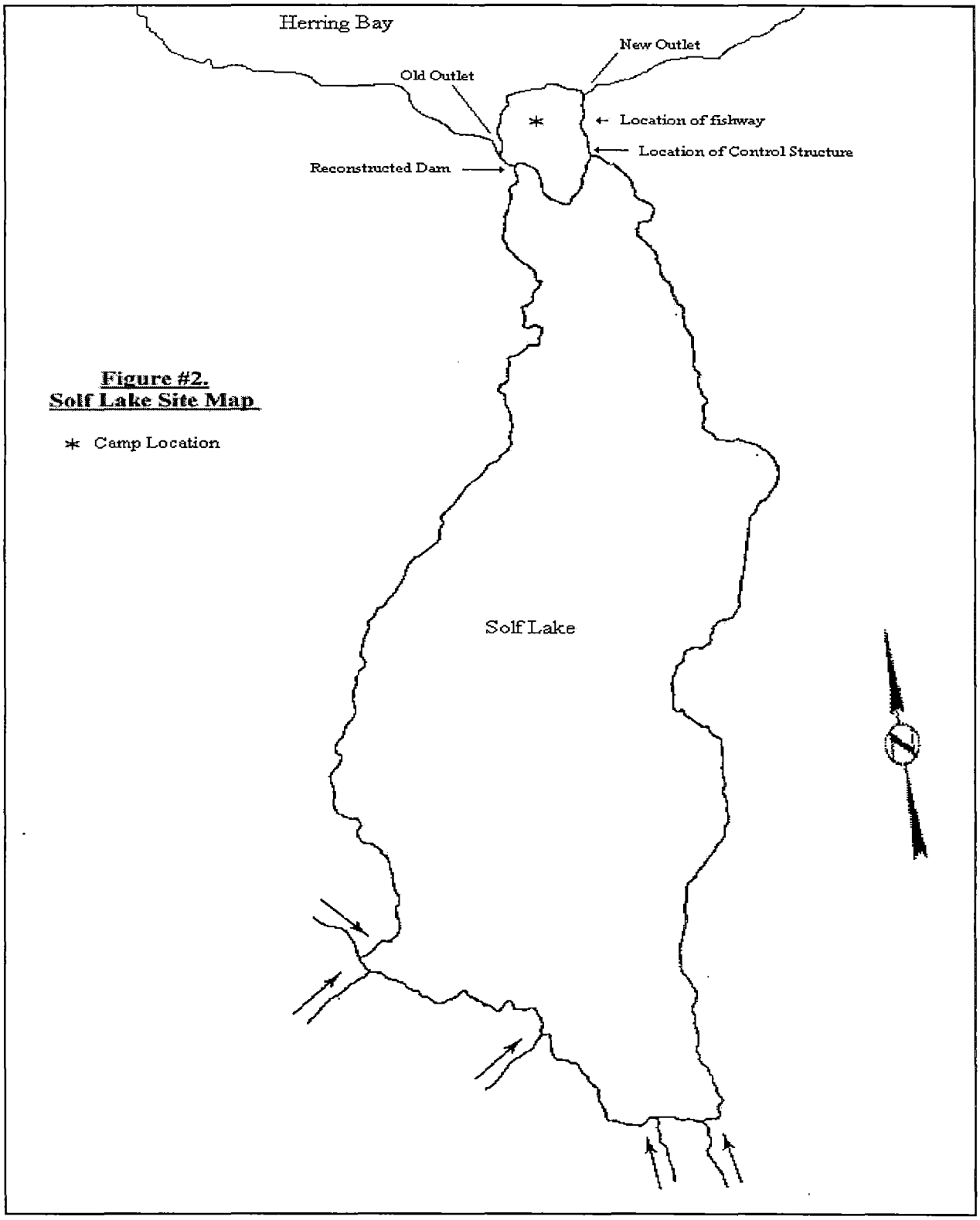


Figure # 3. Macrozooplankton Composition by Density.

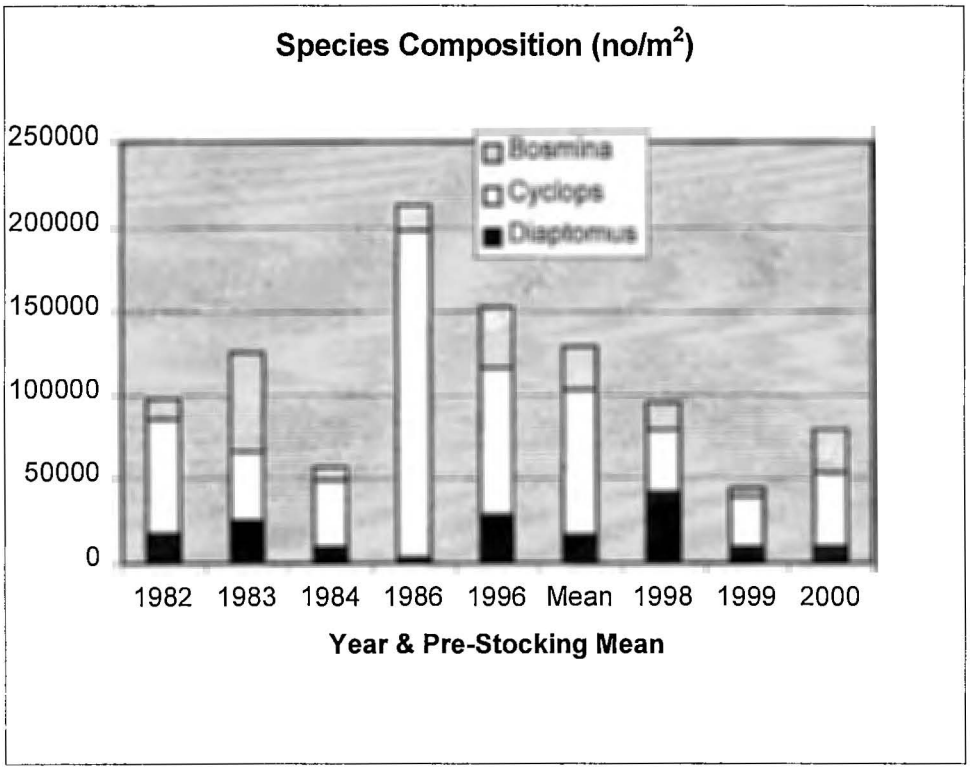
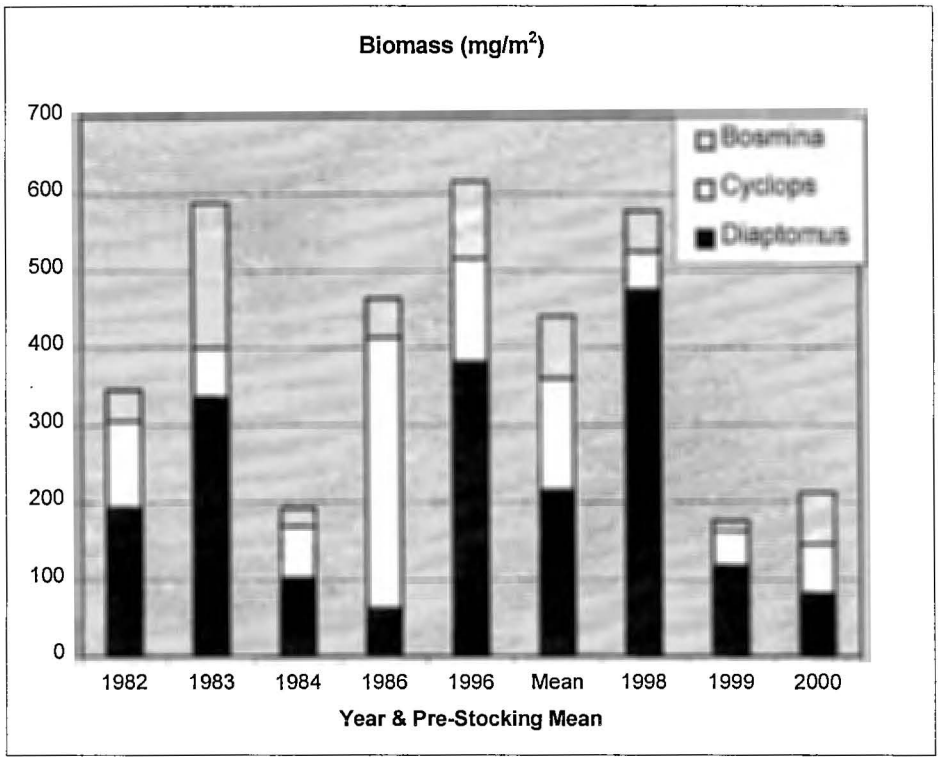


Figure # 4. Macrozooplankton Biomass (mg/m2).



2002 EXXON VALDEZ TRI : COUNCIL PROJECT BUDGET

October 1, 200 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002	PROPOSED FY 2002 TRUSTEE AGENCIES TOTALS					
			ADEC	ADF&G	ADNR	USFS	DOI	NOAA
						$15.5		
Personnel	$14.5	$11.1						
Travel	$0.4	$2.7						
Contractual	$6.6	$4.2						
Commodities	$0.3	$0.0						
Equipment	$0.0	$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	$21.8	$18.0				Estimated FY 2002	FY2003	
General Administration	$2.6	$2.0						
Project Total	$24.4	$20.0					$4.5	
Full-time Equivalents (FTE)	0.0	0.3						
	Dollar amounts are shown in thousands of dollars.							
Other Resources	$0.0	$0.0				$0.0		

Comments:This is a continuation of project 01256B.

FY02

Project Number: 02256b
Project Title: Sockeye salmon stocking: Solf Lfake
Lead Agency: USFS

FORM 2A
MULTI-TRUSTEE AGENCY SUMMARY

Prepared: 4/11/01, keh

2002 EXXON VALDEZ TRI : COUNCIL PROJECT BUDGET

October 1, 200 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002	LONG RANGE FUNDING REQUIREMENTS					
						Estimated FY 2002		
Personnel	$5.3	$0.0						
Travel	$0.4	$0.0						
Contractual	$0.0	$0.0						
Commodities	$0.0	$0.0						
Equipment	$0.0	$0.0						
Subtotal	$5.7	$0.0						
General Administration	$0.8	$0.0						
Project Total	$6.5	$0.0						
Full-time Equivalents (FTE)		0.0						
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

FY02

Prepared:

Project Number: 02256b
Project Title: Sockeye salnom stocking: Solf Lake
Agency: ADF&G

FORM 3A
TRUSTEE
AGENCY
SUMMARY

2002 EXXON VALDEZ TRI : COUNCIL PROJECT BUDGET
October 1, 200[illegible] - September 30, 2002

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 2002
						0.0
						0.0
						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	
					Personnel Total	$0.0

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 2002
					0.0
					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

FY02

Project Number: 02256b
Project Title: Sockeye salmon stocking: Solf Lake
Agency: ADF&G

FORM 3B
Personnel
& Travel
DETAIL

Prepared:

Contractual Costs:	Proposed FY 2002
Description	
When a non-trustee organization is used, the form 4A is required. **Contractual Total**	$0.0

Commodities Costs:	Proposed FY 2002
Description	
Commodities Total	$0.0

FY02

Prepared:

Project Number: 02256b
Project Title: Sockeye salmon stocking: Solf Lake
Agency: ADF&G

FORM 3B
Contractual & Commodities DETAIL

New Equipment Purchases:			
Description	Number of Units	Unit Price	Proposed FY 2002
			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 Equipment Total**	$0.0

Existing Equipment Usage:		
Description	Number of Units	Inventory Agency

FY02

Project Number: 02256b
Project Title: Sockeye salmon stocking: Solf Lake
Agency: ADF&G

FORM 3B
Equipment
DETAIL

Prepared:

2002 EXXON VALDEZ TRI : COUNCIL PROJECT BUDGET

October 1, 200 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002
Personnel	$9.2	$11.1
Travel	$0.0	$2.7
Contractual	$6.6	$4.2
Commodities	$0.3	$0.0
Equipment	$0.0	$0.0
Subtotal	$16.1	$18.0
General Administration	$1.8	$2.0
Project Total	$17.9	$20.0
Full-time Equivalents (FTE)		0.3

LONG RANGE FUNDING REQUIREMENTS

			Estimated FY 2002	FY2003	
				$4.5	

Dollar amounts are shown in thousands of dollars.

Other Resources								

Comments: This covers administrative cost for report preparation and monitoring of adult salmon returns and fishpass effectiveness.

FY02

Prepared:

Project Number: 02256b
Project Title: Sockeye salmon stocking: Solf Lake
Agency: USFS

FORM 3A
TRUSTEE
AGENCY
SUMMARY

2002 EXXON VALDEZ TR E COUNCIL PROJECT BUDGET
October 1, 200[illegible] - September 30, 2002

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 2002
Project Investigator	Fish Biologist	GS-9	0.5	4.2		2.1
Field Crew Supervisor	Fish Technician	GS-9	1.5	4.2		6.3
Seasonal	Fish Technician	GS-5	1.5	1.8		2.7
Seasonal						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		3.5	10.2	0.0	
					Personnel Total	$11.1

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 2002
Charter Flights	0.6	4			2.4
Camp Food			15	0.02	0.3
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$2.7

FY02

Prepared:

Project Number: 02256b
Project Title: Sockeye salmon stocking: Solf Lake
Agency: USFS

FORM 3B
Personnel
& Travel
DETAIL

2002 EXXON VALDEZ TRI : COUNCIL PROJECT BUDGET
October 1, 2001 - September 30, 2002

Contractual Costs:	Proposed FY 2002
Description	
Egg Take, Incubation, Marking and Release. PWSAC Contract at Main Bay	4.2
When a non-trustee organization is used, the form 4A is required. **Contractual Total**	$4.2

Commodities Costs:	Proposed FY 2002
Description	
Commodities Total	$0.0

FY02

Prepared:

Project Number: 02256b
Project Title: Sockeye salmon stocking: Solf Lake
Agency: USFS

FORM 3B
Contractual & Commodities DETAIL

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FY 2002
			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 Equipment Total**	$0.0

Existing Equipment Usage:	Number	Inventory
Description	of Units	Agency
Forest Service Landing Craft	1	USFS

FY02

Project Number: 02256b
Project Title: Sockeye salmon stocking: Solf Lake
Agency: USFS

FORM 3B
Equipment
DETAIL

Prepared:

The Exxon Valdez Trustee Hydrocarbon Database and Interpretation Service

Project Number:	02290
Restoration Category:	Service Project
Proposer:	Bonita D. Nelson and Jeffrey W. Short NMFS, Auke Bay Laboratory ABL Program Manager: Dr. Stan Rice
Lead Trustee Agency:	NOAA
Cooperating Agencies:	None
Alaska SeaLife Center:	No
Duration:	Service Ongoing
Cost FY 02:	35,000
Cost FY 03:	35,000
Geographic Area:	Not Applicable
Injured Resource/Service:	Maintenance of the Trustee hydrocarbon database, archival of environmental samples, interpretative services

ABSTRACT

This project is an on-going service project providing data and sample archiving services for all samples collected for hydrocarbon analysis in support of *Exxon Valdez* Oil Spill Trustee Council projects. These data represent samples collected since the oil spill in 1989 to the present and include environmental and laboratory Response (National Resource Damage Assessment - NRDA) and Restoration data . Additionally, we provide interpretive services for the hydrocarbon analysis, provide public releases of the hydrocarbon and pristane databases and store and maintain the hydrocarbon sample archives.

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 . Additionally, we provide interpretive services for the hydrocarbon analyses. Currently, the database contains results of the hydrocarbon analysis of more than 15,500 samples and collection information from more than 50,000 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. This year we are proposing to continue the this task. The second purpose is to make the results of the hydrocarbon analyses (including pristane analysis) available to principal investigators, resources managers and to the public, including FOIA requests. This service is expected to have activity as long as hydrocarbon data are collected. 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.

The Trustee hydrocarbon 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) . Updating the database and the public release is an on-going program. Samples from pink salmon projects (01454, 01456) , coal/oil seep project (01599) , and SCAT (01543) will be added in FY2002.

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. Recently interpretation has grown to include identification of potential hydrocarbon sources (e.g. coal) for the background hydrocarbon signal in PWS. This is a continuation of project 01290 and previously funded under TS#1, 93090, 94290, 95290, 96290 , 97290, 98290, 99290 and 00290.

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, particularly as more data is added and long term monitoring projects come on line via the GEM management plan.

B. Rationale/Link to Restoration

Archiving of the Trustee hydrocarbon sample data will ensure 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 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. Application of the petroleum weathering model developed under this project (Short and Heintz, 1997) has been used to compare coal samples and Katalla seep with Prince William Sound background samples, and has identified coal as the a biologically non-available source, in contrast to researchers sponsored by EXXON, who have identified the source as Katalla seep oil.

C. Location

While this project resides at the Auke Bay Laboratory, Juneau , Alaska, the service provided serves the entire spill area. The public release of the database is available on the internet.

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 and for syntheses products as needed.

3. Maintain Pristane database for Trustee funded project.

4. Provide public release of the data via CD-Rom and on the internet.

5. Extend the use of the petroleum weathering model by using it as a tool for identifying potential sources of petroleum that contribute to the background signal identified in Constantine Harbor.

6. Implement a long-term archiving plan for the Trustee hydrocarbon database PWSOIL and provide information for FOIA requests.

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. An updated 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 projects including sampling and analytical quality control procedures .The product is updated annually.

The petroleum weathering model developed under this project has been used to reject the hypothesis that the hydrocarbons comprising the background PAH source are derived from the Katalla oil seep. Analysis of sediment and mussel samples collected from locations near the Katalla oil seep as well as coal deposits east of PWS supports the conclusion that PAH derived from coal characterize the background hydrocarbon signal (Short et al., 1999). We will continue to use this information and analyses when necessary to demonstrate the generality of the weathering model with other oil sources and the absence of a similar weathering process in coal.

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.

The pristane database will be maintained in ACCESS software. Information from samples collected under Trustee project 195 will be combined with data from the Trustee hydrocarbon database where applicable to provide a complete data set of pristane related information.

C. Contracts and Other Agency Assistance

No contracts are anticipated

SCHEDULE

A. Measurable Project Tasks for FY02

Samples will be stored and data analyzed throughout 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.

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 FY00 will be available on or about 15 April, 2002 in the form of the annual report .Data are submitted as soon as they are available from the chemistry laboratory.

PROFESSIONAL CONFERENCES

One meeting is required, an annual Quality Assurance Control meeting attended by ABL's Senior Analytical Chemist. The results of an international calibration exercise by participant is reviewed for the integrity and credibility of chemical analyses. This meeting usually occurs in the Washington D.C. area, and is sponsored by National Institute of Standards and Technology (NIST).

NORMAL AGENCY MANAGEMENT

NOAA/NMFS has statutory stewardship for most living marine resources; however, if the oil spill had not occurred, NOAA would not be conducting this project. NOAA/NMFS proposes to make a significant contribution (as stated in the 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 FY01, it is a continuation of the same service. The project has been downsized, as the input volume has decreased somewhat, although interpretation services will probably increase.

PROPOSED PRINCIPAL INVESTIGATOR

Bonita D. Nelson
NMFS Auke Bay Laboratory
11305 Glacier Highway
Juneau, Alaska 99801
907-789-6071
907-789-6094
bonita.nelson@noaa.gov

PRINCIPAL INVESTIGATORS

Bonita D. Nelson

Education:
BS 1979, University of Illinois, Urbana (Ecology, Ethology , Evolution)
MS 1986, University of Alaska-Juneau (Fisheries)

Other Experience:
Database manager of the Trustee hydrocarbon data for 6 years. Responsibilities include: supervision of data entry of sample and analytical data; processing and dissemination of data after interpretation by chemist; database management including data retrieval for production of the public versions of the database. Nelson has designed and managed databases as well as analyzed data for the radio telemetry program at the Auke Bay Laboratory for 15 years.

Jeffrey W. Short

Education:
BS, 1972 University of California, Riverside (Biochemisty & Philosophy)
MS, 1982, University of California, Santa Cruz (Physical Chemistry)

Other Experience:

1989 - Present: Established and managed the hydrocarbon analysis facility at ABL to analyze hydrocarbon samples generated by the *Exxon Valdez* NRDA effort (about 20% of these samples were analyzed at ABL).
1989 - 1992 : Principal Investigator, Exxon Valdez project Air/Water #3; Determination of petroleum hydrocarbons in seawater by direct chemical analysis and through the use of caged mussels deployed along the path of the oil spill.
1991 - 1992 : Principal Investigator, Exxon Valdez project Subtitle #8 ; Development of computer-based statistical methods for global examination of sediment and mussel hydrocarbon data produced for the Exxon Valdez NRDA effort for systematic bias, and for identification of probable sources of hydrocarbons. In addition, this project produced both hard-copy and computer display maps of all the sediment and mussel hydrocarbon data.

LITERATURE CITED

Short, J. W., K.A. Kvenvolden, P.R. Carlson, F. D. Hostettler, R. J. Rosenbauer, & B. A. Wright, 1999. Natural Hydrocarbon Background in Benthic Sediments of Prince Willaim Sound, Alaska: Oil vs Coal. Environ. Sci. Technol. 33:34-42.

Short, J. W., and R. A. Heintz. 1997. Identification of *Exxon Valdez* oil in sediments and tissues from Prince William Sound and the Northwestern Gulf of Alaska based on a PAH weathering model. Environ. Sci. Technol. 31:2375-2384.

FY 02 *EXXON VALDEZ* TRU : COUNCIL PROJECT BUDGET

October 1, 200 eptember 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002	LONG RANGE FUNDING REQUIREMENTS
Personnel		$24.1	
Travel		$2.2	
Contractual		$0.0	
Commodities		$5.1	
Equipment		$0.0	
Subtotal	$0.0	$31.4	Estimated FY 2003
General Administration		$3.6	
Project Total	$0.0	$35.0	$35.0
Full-time Equivalents (FTE)		0.3	
			Dollar amounts are shown in thousands of dollars.
Other Resources			

Comments:

This project is ongoing to support the maintenance of the samples collected for hydrocarbon analyses sorting and archiving of samples and interpretation of chemical data as well as public releases of the data and FOIA requests.

NOAA Contribution: Research Chemist, Jeff Short .5 mo. @9.9 mo, Analytical Chemist, Marie Larsen .5 mo @6.9/mo for a total contribution of 8.5K.

FY02

Prepared:4/1/01

Project Number: 02290
Project Title: Hydrocarbon Database
Agency: NOAA

FORM 3A
TRUSTEE
AGENCY
SUMMARY

FY 02 *EXXON VALDEZ* TRU E COUNCIL PROJECT BUDGET
October 1, 20(eptember 30, 2002

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 2002
Bonita Nelson	Fishery Biologist	11	2.8	6.7		18.8
Jacek Maselko	Fishery Biologist	9	1.0	5.3		5.3
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		3.8	12.0	0.0	
					Personnel Total	$24.1

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 2002
Quality Control meeting for research chemist, Marie Larsen	1.0	1	2	0.2	1.4
EVOS workshop	0.4	1	2	0.2	0.8
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$2.2

FY02

Prepared:4/1/01

Project Number: 02290
Project Title: Hydrocarbon Database
Agency: NOAA

FORM 3B
Personnel
& Travel
DETAIL

Contractual Costs:		Proposed FY 2002
Description		
When a non-trustee organization is used, the form 4A is required.	**Contractual Total**	$0.0

Commodities Costs:		Proposed FY 2002
Description		
Software & supplies		2.7
disposal of samples		2.4
	Commodities Total	$5.1

FY02

Prepared:4/1/01

Project Number: 02290
Project Title: Hydrocarbon Database
Agency: NOAA

FORM 3B
Contractual & Commodities DETAIL

New Equipment Purchases: Description	Number of Units	Unit Price	Proposed FY 2002
			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 Equipment Total**	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
Computers, freezers		

FY02

Prepared:4/1/01

Project Number: 02290
Project Title: Hydrocarbon Database
Agency: NOAA

FORM 3B
Equipment
DETAIL

Sound Ecosystem Assessment (SEA): Printing the Final Report

Project Number:	02320
Restoration Category:	Research
Proposer:	William J. Hauser Alaska Department of Fish and Game
Lead Trustee Agency:	ADF&G
Cooperating Agencies:	
Alaska SeaLife Center:	no
Duration:	October 1, 2001 to September 30, 2002. First year of a one-year project.
Cost FY 00:	$6.2*
Geographic Area:	Prince William Sound
Injured Resource/Service:	Pink salmon and Pacific herring

ABSTRACT:

This proposal will provide funding to print, bind and distribute the Final Report package from the EVOS TC Sound Ecosystem Assessment (SEA) project. The integrated final report is a required document expected to exceed 1000 pages (some with color). This product represents the closeout documentation for SEA specified in the FY99 single integrated DPD. Funding for copying, binding and mailing the Final Report was provided in FY2000, but completion has been delayed and the encumbered funds cannot be spent after 30 June 2001. The FY2000 unused encumbered funds will be allowed to lapse.

* The estimated cost for this project is based on July 1999 planning assumptions; the actual budget request may be adjusted after actual costs are determined.

INTRODUCTION

The Sound Ecosystem Assessment (SEA) program was initiated in April 1994 to evaluate possible environmental suppression of pink salmon and Pacific herring following the oil spill. The goals of SEA were to understand and model numerically the physical and biological processes that influence pink salmon and herring production in Prince William Sound (PWS). In its closeout year, FY99, the major focus of the SEA program was synthesis and report and manuscript preparation. Many project reports and manuscripts have already been extensively reviewed and published. This proposal provides support only to complete the printing and distribution of the Final Report in FY02 according to the specifications in "Procedures for the Preparation & Distribution of Reports" (October 1998).

It had been planned to complete this action during FY 2000 and funding had been allocated to ADF&G for that task; however, completion of the report has been delayed and according to State of Alaska procurement rules, the encumbered funds cannot be spent after 30 June 2001.

NEED FOR THE PROJECT

A. Statement of the Problem

Successful completion of this multidisciplinary investigation requires peer authentication, printing, and distribution of the Final Report. Production of an integrated synthesis volume in a peer-reviewed journal has been funded separately; however, the final production of the Final Report still remains. This task is the responsibility of the Alaska Department of Fish and Game, however, no funds will be available after the FY2000 encumbrance has been allowed to lapse. In addition, assumptions about the size, content, format, and cost of the SEA Final Report have changed (e.g., postage); therefore, these assumptions need to be validated with FY2002 data.

B. Rationale/Link to Restoration

Knowledge gained through work of the SEA program is adding to the understanding of factors that may limit recovery of two injured species, pink salmon and herring. This project supports the publication of information that can be used by the Trustee Council and its member agencies to enhance management of these important commercial fishes, and by other projects studying linkages between forage fishes and higher level consumers, as part of the overall EVOS restoration effort.

C. Location

SEA was designed and implemented in Prince William Sound.

COMMUNITY INVOLVEMENT

The Final Report and the special synthesis volume will be available to people from affected communities, all agencies and to users of pink salmon and herring resources in PWS and elsewhere though the ARLIS Library archival and distribution activities.

PROJECT DESIGN

A. Objectives

Specific project objective is:

- To collate, print, bind and distribute the integrated SEA Final Report as required by the Trustee Council.

B. Methods

The Draft Final Report for the SEA project was to be assembled as part of the 00320Z2 project. After the integrated package of approved SEA Final Reports is approved by the Chief Scientist, it will be received, printed, bound and distributed at ADF&G Habitat and Restoration Division by Celia Rozen.

A total of 88 copies will be prepared including 33 for the required ARLIS distribution and 50 copies for SEA program members, PIs, senior scientists, technicians and students. The 33 copies of the Final Report that are intended for the required ARLIS distribution will be accommodated by this project. The 50 copies for SEA program members are scheduled to be published in Compact Disk (CD) format and have been included in the DPD and budget for the project Number 00320Z2, Sound Ecosystem Assessment (SEA): publishing the integrated Final Reports and a Program Synthesis.

The size, content, format and costs associated with the printing, binding and mailing of the SEA Final Report was estimated two years ago with planning assumptions that included completion by September, 2000. The budget included with this DPD is also based on those same assumptions. The actual size, content, format and costs associated with the printing, binding and mailing of the Final Report may be known before this DPD is reviewed and the budget may be adjusted as the planning assumptions are replaced with real data.

C. Cooperating Agencies, Contracts and Other Agency Assistance

The Final Report will be ready for printing and distribution after all of the components of the Draft Final Report are assembled and submitted for peer-review, pending approval by the Chief Scientist.

SCHEDULE

A. Measurable project tasks for FY00 (October 1, 2001 - September 30, 2002)

October, 2001 – Draft Final Report will have been submitted and peer reviewed.

December, 2001 – Peer-review comments are addressed and Final Report is approved and delivered.

March, 2002 – Final Report is printed, bound and mailed.

B. Project milestones and endpoints

The process detailed in this proposal will be completed when the Final Report package is printed and distributed to the EVOS Trustee Council and its agencies. The actual schedule may be amended if the delivery of the Draft Final Report and the Final Report are not delivered according to the expected schedule.

C. Completion Date

The publication of SEA Final Report closeout documentation is expected to be concluded in FY02.

PUBLICATIONS AND REPORTS

The approved Final Report for the SEA project will be printed, bound and mailed.

PROFESSIONAL CONFERENCES

None.

NORMAL AGENCY MANAGEMENT

N/A

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

Publication tasks will be performed in close coordination with the SEA Lead Scientist, Dr. T. Cooney and the Restoration Office.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

N/A

PROPOSED PRINCIPAL INVESTIGATOR

Bill Hauser will serve as the PI of project 02320.

PRINCIPAL INVESTIGATOR

William J. Hauser
ADF&G – H&R
333 Raspberry Road
Anchorage, AK 99515
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Other Key Personnel

Celia Rozen
333 Raspberry Road
Anchorage, AK 99515
(907)267-2314
fax (907)267-2464
Email celia_rozen@fishgame.state.ak.us

Dr. Bob Spies and EVOS TC Restoration Office
645 G Street, Suite 401
Anchorage, AK 99501
(907)278-8012

FY 02 *EXXON VALDEZ* TR E COUNCIL PROJECT BUDGET

October 1, 200 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002						
Personnel		$0.0						
Travel		$0.0						
Contractual		$5.8						
Commodities		$0.0						
Equipment		$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	$0.0	$5.8	Estimated FY 2003					
General Administration		$0.4						
Project Total	$0.0	$6.2	$0.0					
Full-time Equivalents (FTE)		0.0						
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

Costs shown in this budget are based on July 1999 planning assumptions which are no longer valid (e.g., postal rates have increased); the actual budget request will be adjusted as actual costs are determined
(wjh, 28 March 2001)

FY02

Prepared:
wjh; 28 March 2001

Project Number: 02320
Project Title: Sound Ecosystem Assessment (SEA): Printing the Final Report.
Agency: Alaska Department of Fish and Game

FORM 3A
TRUSTEE
AGENCY
SUMMARY

FY 02 *EXXON VALDEZ* TR E COUNCIL PROJECT BUDGET

October 1, 200[illegible] - September 30, 2002

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 2002
						0.0
						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	
					Personnel Total	$0.0

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 2002
					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

FY02

Prepared:

Project Number: 02320
Project Title: Sound Ecosystem Assessment (SEA): Printing the Final Report.
Agency: Alaska Department of Fish and Game

FORM 3B
Personnel
& Travel
DETAIL

FY 02 *EXXON VALDEZ* TRI E COUNCIL PROJECT BUDGET

October 1, 200 - September 30, 2002

Contractual Costs:				Proposed FY 2002
Description				
Production costs for the SEA Final Report*				
Task	Cost each ($)	Number		
Color Copies	98	33		3.2
Printing & Binding	75	33		2.5
Postage	3	33		0.1
* Based on July 1999 planning assumptions; Budget will be adjusted as actual costs are determined				
When a non-trustee organization is used, the form 4A is required.			**Contractual Total**	$5.8

Commodities Costs:	Proposed FY 2002
Description	
Commodities Total	$0.0

FY02

Project Number: 02320
Project Title: Sound Ecosystem Assessment (SEA): Printing the Final Report.
Agency: Alaska Department of Fish and Game

FORM 3B
Contractual & Commodities DETAIL

Prepared:

FY 02 *EXXON VALDEZ* TR E COUNCIL PROJECT BUDGET
October 1, 200[illegible] - September 30, 2002

New Equipment Purchases: Description	Number of Units	Unit Price	Proposed FY 2002
			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 Equipment Total**	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY02

Project Number: 02320
Project Title: Sound Ecosystem Assessment (SEA): Printing the Final Report.
Agency: Alaska Department of Fish and Game

FORM 3B
Equipment
DETAIL

Prepared:

Sea Otter Monitoring

Project Number:	[redacted] 02333
Restoration Category:	Enhance/Replace Subsistence Resources
Proposer:	Native Village of Eyak
Lead Trustee Agency:	Native Village of Eyak, a Federally Recognized Tribal Government.
Cooperating Agencies:	DOI, ADFG, NMFS, & CRRC.
Duration:	1st year of a five-year project.
Cost FY 02:	$100,000
Cost FY 03:	$100,000
Cost FY 04:	$100,000
Cost FY 05:	$100,000
Cost FY 06:	$100,000

Geographic area: Copper River, Prince William Sound.
Injured Resource/Service Subsistence

Abstract:

The Sea Otters in Orca Inlet have been dying and washing up on the beaches in Orca Inlet. This has happened for the past few years. The problem is getting worse. We know the cause. We need to do some monoriting to find a way to prevent these needless deaths.

The Native Village of Eyak

P.O. Box 1388
Cordova, Alaska 99574-1388
PH (907) 424-7738 * FAX (907) 424-7739

April 13, 2001

Molly McCammon
Executive Director
Exxon Valdez Oil Spill Trustees Council
645 G Street, Suite 401
Anchorage, Alaska 99501-3451

Dear Molly

Enclosed is a restoration proposal to monitor the sea otters in and around the Eyak/Cordova area. In the past few years, during the winter months, many of the sea otters have been washing up on the beaches of Orca Inlet. From January 2000 up to date over 100 sea otters have been picked up between Hartney Bay and Nelson Bay. The cause is very clear. The necropsies show the cause of death to be parasites and bone impacting the stomachs and intestines. These are picked up by the sea otters from feeding at the outfalls from the cannery waste that is pumped into Orca Inlet.

There is a direct tie to the Exxon Valdez Oil Spill. The polleck waste that is the cause of this, comes from a polleck fishery that was started after EVOS funded studies showed there were polleck in harvestable quantities in PWS.

Our Tribe became involved when we were accused of killing sea otters and not picking them up. Now we are being accused of trying to shut down the canneries. We all need to get to the bottom of this problem.

We are requesting technical assistance from EVOS for this proposal.

Sincerely yours

Bob Henrichs
President
Native Village of Eyak
Traditional Council

02340

Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem

Project Number:	02340
Restoration Category:	Monitoring
Proposer:	University of Alaska Fairbanks
Lead Trustee Agency:	ADFG
Cooperating Agencies:	none
Alaska SeaLife Center:	no
Duration:	1 year
Cost FY 02:	$19,309
Geographic Area:	Resurrection Bay/Gulf of Alaska shelf
Injured Resource/Service:	All organisms and services

ABSTRACT

This proposal seeks funds to complete the final report for project number 01340, "Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem". The fourth year of measurements will be completed in September 2001 (or December 2001 if the GAK 1 mooring is to be continued under the GEM program). After completion of the data collection phase of the project we will prepare a final report and a manuscript for publication focussing on freshwater variations on the Gulf of Alaska shelf. This manuscript will synthesize the data collected as part of the EVOS program as well as some of the retrospective efforts included in previous annual reports.

INTRODUCTION

This proposal seeks support to complete analysis on the four years of GAK 1 hydrographic and mooring measurements that have been supported by EVOS since November 1997. These data have maintained the 30-year (1970 – present) time series of conductivity-temperature versus depth (CTD) data collected at hydrographic station GAK1 on the northern Gulf of Alaska shelf. EVOS support for this program began in November 1997 with monthly cruises to station GAK1. These are presently scheduled to continue through September 2001. The monthly data are being supplemented with hourly (or shorter) measurements of temperature and conductivity at six depths using instruments moored at station GAK1. Weingartner (1999, 2000, and 2001) gives a more complete description and analysis of the data collected thus far. However, the principal findings to date are:

1. The anomalous summer 1997 warming (amounting to 1-2°C above normal) was confined to the upper 40 m of the ocean. That warming was mainly a result of anomalously clear skies and low winds during the summer of 1997.
2. The abnormally large El Niño-related winter 1998 warming (~2°C) occurred throughout the entire 250 m depth of the shelf. The return to near normal temperatures beginning last May and continuing through the present is being documented.
3. The abnormally large El Niño-related winter 1998 freshening (amounting to a vertically averaged salinity decrease of 0.15 psu) over the upper 200 m of the shelf. Freshening ceased in May and, below 200 m, was replaced with the saltiest waters ever observed at this location. These high salinity waters are enriched in nutrients and potentially available to phytoplankton in the surface layers.
4. A return to near normal temperatures in the summer after May 1998.
5. The integral time scales for temperature and salinity at GAK1 are about 1 month, which implies that the monthly values (which comprise the historical data set) are not severely aliased.
6. Within-month temperature and salinity variance computed from the moored instruments is no greater than the interannual variability based on the monthly data from the historical record.
7. Variations in freshwater forcing and the baroclinic transport of freshwater are large on seasonal, interannual, and interdecadal time scales. On average freshwater transport increases fivefold between spring and fall. Alaska Coastal Current freshwater transport in spring 1998 (during the 1997-98 El Niño) was twice that of spring 1999.
8. A first order description of seasonal variations in freshwater transport of the Alaska Coastal Current shows that these variations are accounted for by the annual cycles of: 1) coastal discharge and 2) the Ekman onshore transport of relatively fresh surface waters. Their sum accounts for the annual cycle of the baroclinic component of the freshwater transport within the Alaska Coastal Current. This transport primarily occurs within the upper 150m of the water column and within 35 km of the coast.
9. The Alaska Coastal Current could significantly influence the marine ecosystem on the southeast Bering Sea. Our preliminary estimate is that the Alaska Coastal Current contributes about 25% of the Bering Sea freshwater supply. Therefore, improved understanding of

environmental variability of the Gulf of Alaska ecosystem could improve our understanding of changes in the Bering Sea ecosystem.

10. Time series of coastal discharge estimates based on Royer's (1982) method, measured discharge, the leading EOF of precipitable water over the Northeast Pacific Ocean, and coastal salinity data all suggest a decrease in freshwater discharge into the northern Gulf of Alaska from the late 1950s through the mid-1970s. Discharge increased from the mid-70s through the early-80s; coincident with the regime shift of the 1970s and with the Pacific Decadal Oscillation (PDO) (Mantua, 1997; Overland et al., 1999). These findings add to other suggestions of a freshening across the North Pacific Ocean basin since the 1970s (Wong et al., 1999).
11. Monthly anomalies in the PDO index are coherent with Royer's monthly discharge anomalies at periods of 2 - 4 years suggesting a possible relationship to El Niño events.
12. Monthly sea level anomalies at Seward Alaska are significantly correlated with monthly anomalies of vertically integrated (0-200m) salinity and the 0/200db dynamic height. Hence sea level could serve as a proxy for shelf salinity variations here and perhaps elsewhere in the Gulf of Alaska. The Gulf of Alaska watershed and coastal ocean are severely undersampled with respect to precipitation, river discharge, and salinity. Long-term time series of these are lacking and even the future maintenance of existing discharge and weather stations is uncertain. There is a need to develop proxy variables that can be used to reliably estimate runoff and coastal salinity. A goal of this EVOS program is to determine if sea level can serve as a proxy for ocean salinity variations.
13. There is a promising correlation emerging between GAK 1 dynamic height (0/200 db) and the freshwater and mass transport as computed from the cross-shore density field in the Alaska Coastal Current. This suggests that the GAK 1 data could be used as an index for these variations.
14. We continued our investigations into the reasons for the anomalously low-salinity shelf water observed during the winter of 1998 and suggest that this was a consequence of several factors. First, there was above average seasonal (fall and winter) coastal discharge from Alaska. Second, there was also above average discharge from the Pacific Northwest as represented by the discharges from the Fraser River in British Columbia and the Columbia River in Oregon in the preceding summer and early fall. Third, there was anomalously strong seasonal coastal downwelling around the coastal Gulf of Alaska. These factors enhanced one another in several ways. The high runoff diluted inner shelf waters and strengthened the cross-shelf density gradients. These gradients, in conjunction with the strong cyclonic wind stress, enhanced the alongshore extent and strength of the coastal current. The anomalously strong downwelling would also have enhanced trapping of freshwater against the coast and augmented coastal freshening by increasing the onshore transport of low-salinity surface waters. Furthermore, our results suggest that the simultaneous occurrence of all of these anomalies is unusual because 1997-98 was the only year since 1970 in which all of these anomalies coincided.

We propose to complete one remaining objective and then to combine our results into a final report and a manuscript for publication in the peer-reviewed literature.

NEED FOR THE PROJECT

A. Statement of Problem

The GAK1 monthly time series illustrates some of the very large interannual and interdecadal variability of the high latitude North Pacific. The higher sampling rate (hourly) provided by the moored time series, allows detection and quantification of shorter period variations indicative of significant transitions that might be aliased by the monthly sampling. The results are enhancing interpretations of historical data and place the magnitude of previous anomalies in a better statistical framework. Moreover, the time series could serve as a proxy for transport in the Alaska Coastal Current. Variability in the marine environment, as reflected in ocean temperatures and salinities, and, if possible, shelf circulation, need to be quantified to understand the structure of, and changes in, the northern Gulf of Alaska marine ecosystem. The data will also support ongoing efforts to assess the recovery of marine species and services affected by the oil spill. Indeed, several EVOS-supported investigators underscored the need to understand natural climate variability and its influence on the recovery of species injured by the oil spill (Purcell et al., 1999; Piatt and Irons, 1999; Duffy, 1999; Anderson et al., 1999).

B. Rationale/Link to Restoration

The results from this proposal will provide published information to current and future investigators working in the Gulf of Alaska and adjacent waters needing information on environmental variability. This information will assist in:

1. Understanding thermohaline variability on time scales ranging from the tidal to the interdecadal.

2. Interpreting historical data sets for use in retrospective studies.

3. Configuring a cost-effective, long-term monitoring program.

4. Designing process studies necessary to develop ecosystem models for this shelf.

C. Location

The work will be completed at the University of Alaska's Institute of Marine Science in Fairbanks, AK. The results will combined with the existing historical data that are on the Institute of Marine Science webpage: http://www.ims.alaska.edu:8000/gak1/gak.dat. We will put the manuscript on the webpage as a pdf file to make it accessible to the broadest possible community.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

We do not see any overt connection to traditional ecological knowledge. However, the most expedient way to share these data with both the public and scientific communities is via the

internet. Such a link will allow easy access to the data for those working at the community level and with traditional ecological knowledge.

PROJECT DESIGN

A. Objectives

There were two objectives at the heart of this program. The first was to continue the 30-year time series at station GAK1 through a combination of monthly CTD measurements and through yearlong deployments of a mooring containing temperature and conductivity (T/C) recorders. The second was to contribute to the design of a cost-effective monitoring program for the Gulf of Alaska shelf. Our sampling schemes, in conjunction with the GLOBEC data set, complement one another by providing high vertical resolution at monthly time scales and high temporal resolution but at a lower vertical resolution. Our generic goal of ecosystem monitoring is a long-term undertaking requiring multiple and multi-disciplinary efforts, however, our effort constitutes one essential step toward that goal.

B. Methods

Funds are requested to prepare a final report (manuscript for publication in the peer-reviewed literature). Many of our analyses are completed except for working up the final year of data (being collected now) and a remaining objective. That objective is to compare simple atmospheric pressure patterns or indices with long term precipitation and/or stream flow measurements from around the gulf. Pressure patterns over the Northern Hemisphere have been reconstructed back to 1900. However, there is only one virtually continuous streamflow record for the northern Gulf of Alaska since ~1920 and continuous precipitation records date to 1930. Thus quantifying decadal scale variability is hampered by the lack of precipitation and discharge records. If proxies for these variables can be established then a surrogate discharge time series for the gulf can be reconstructed for the past 100 years. I anticipate that pressure patterns favoring northward atmospheric transport into the Gulf of Alaska might be highly correlated with regional runoff and precipitation. If such an index results then it would serve as a proxy for discharge variability dating to the early 1900s. Note that we are not trying to duplicate other indices (such as the PDO) which characterize hemispheric scales but rather to construct a more local (e.g., Gulf of Alaska) index that would be a better predictor of regional precipitation variations. I will use~40 years of monthly atmospheric precipitable water and atmospheric pressure indices obtained from the NCEP/NCAR reanalyzed meteorological fields interpolated onto a 2.5° grid between 65°-35°N and 160°-120°W. The purpose is to construct statistical relationships between atmospheric pressure indices and precipitable water and stream discharge. (Precipitable water data are available from: http://www.cdc.noaa.gov./cdc/data.nmc.reanalysis.html#surface) and streamflow data are obtainable from the USGS website: http://2o-nwisw.er.usgs.gov/nwis-w/AK/. I have used some of these data in a different analysis (Weingartner, 2000). We will also use Royer's Gulf of Alaska discharge time series in this analysis.

SCHEDULE

A. Measurable Project Tasks for FY 02 (October 1, 2001 – March 30, 2003)

September 2001:	Recover GAK 1 mooring and complete monthly CTD surveys.
November–December 2001:	Perform above if companion proposal to continue these measurements as a bridge to GEM is funded.
December - March:	Complete post-calibrations and data processing.
March – July 2002:	Prepare report and manuscript (depending upon final calibration schedule).

B. Project Milestones and Endpoints

The data collected as part of this project will be available to a broad community of users and posted on our website as well as published in the peer-reviewed literature.

C. Completion Date

This project will be completed by March or July 2003.

PUBLICATIONS AND REPORTS

We intend to submit a manuscript to the Journal of Geophysical Research (or comparable journal) at the completion of this project.

PROFESSIONAL CONFERENCES

We have presented some of the previous findings listed in the Introduction at national conferences in conjunction with GLOBEC work. We have also presented posters at the annual EVOS workshop as well as the Ocean Sciences meeting (January 2000, San Antonio) and the Eastern Pacific Ocean Conference (EPOC; September 2000, Sidney, British Columbia). In each case we have melded the GAK 1 results with GLOBEC results where appropriate and have acknowledged the support of EVOS as well as NSF and NOAA. I anticipate doing the same in the future. No funds are sought from EVOS for travel and attendance at national meetings, as I will use GLOBEC funds to cover these costs.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

We have discussed aspects of the GAK1 historical data with several investigators supported by the Trustee Council. Many have expressed interest in these data and know how to access it. Other scientists are aware of these data through papers and meetings, (e.g., the American Geophysical Union which serves primarily the U.S. oceanographic community and the North Pacific Marine Science Organization [PICES] composed of marine scientists from around the Pacific Rim) and, of course, at GLOBEC meetings. Though we have discussed how we would make these data available, we welcome advice from the Trustee Council on additional ways to share these data with other investigators and/or the public.

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

None

PROPOSED PRINCIPAL INVESTIGATOR

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PRINCIPAL INVESTIGATOR

Thomas J. Weingartner

EDUCATION

Ph.D. Physical Oceanography, 1990, North Carolina State University
M.S. Physical Oceanography, 1980, University of Alaska
B.S. Biology, 1974, Cornell University

MEMBERSHIPS

American Geophysical Union; American Meteorological Society

PUBLIC SERVICE

Member, Science Steering Committee, NSF - Arctic System Science-Ocean Atmosphere Ice Interaction (OAII) component
Member, Science Steering Committee, NSF - ARCSS-OAII Shelf-Basin Initiative
Member, Science Steering Committee, NSF - ARCSS-Human Dimensions of the Arctic component
Member, UNOLS - Fleet Improvement Committee

PROFESSIONAL EXPERIENCE

Assistant Professor; Institute of Marine Science, School of Fisheries and Ocean Sciences, U. of Alaska Fairbanks, Alaska; 11/93 - present
Research Associate; Institute of Marine Science, School of Fisheries and Ocean Sciences, U. of Alaska Fairbanks, Alaska; 9/91 - 10/93
Postdoctoral Student; Institute of Marine Science, School of Fisheries and Ocean Sciences, U. of Alaska Fairbanks, Alaska; 7/88 - 8/91
Graduate Research Assistant; Department of Marine, Earth and Atmospheric Sciences, North Carolina State U.; Raleigh, North Carolina; and Department of Marine Science, U. of South Florida; St. Petersburg, Florida; 8/84 - 10/88

PROFESSIONAL INTERESTS

Physical oceanography of the Arctic and North Pacific Ocean and the adjacent shelves, biophysical linkages in oceanography; public education.

PUBLICATIONS

Weingartner, T. J., S. Danielson, Y. Sasaki, V. Pavlov, and M. Kulakov. The Siberian Coastal Current: a wind and buoyancy-forced arctic coastal current. *J. Geophys. Res.*, **104**: 29697 – 29713, 1999.

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Roach, A. T., K. Aagaard, C. H. Pease, S. A. Salo, T. Weingartner, V. Pavlov, and M. Kulakov. 1995. Direct measurements of transport and water properties through Bering Strait. *J. Geophys. Res.,* 100:18443-18458.

Falkner, K. K., R. W. Macdonald, E. C. Carmack, and T. Weingartner. 1994. The potential of Barium as a tracer of arctic water masses. *J. Geophys. Res., Nansen Centennial Volume.*

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Niebauer, H. J., Royer, T. C., and T. J. Weingartner. 1994. Circulation of Prince William Sound, Alaska. *J. Geophys. Res..* 99:14113-14126

Coyle, K. O., G. L. Hunt, M. B. Decker, and T. Weingartner. 1992. The role of tidal currents in concentrating euphausiids taken by seabirds foraging over a shoal near St. George Island, Bering Sea. *Mar. Ecol. Progr. Ser.* 83:1-14.

Musgrave, D. L., T. J. Weingartner, and T. C. Royer. 1992. Circulation and hydrography in the northwest Gulf of Alaska. Deep-Sea Res. 39:1499-1519.

Weingartner, T. J. and R. H. Weisberg. 1991. A description of the annual cycle in sea surface temperature and upper ocean heat in the equatorial Atlantic. *J. Phys. Oceanogr.* 21:83-96.

Weingartner, T. J. and R. H. Weisberg. 1991. On the annual cycle of equatorial upwelling in the central Atlantic Ocean. *J. Phys. Oceanogr.* 21:68-82.

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Weisberg, R. H. and T. J. Weingartner. 1988. Instability waves in the equatorial Atlantic Ocean. *J. Phys. Oceanogr.* 18: 1641-1657.

Weisberg, R. H. and T. J. Weingartner. 1986. On the baroclinic response of the zonal pressure gradient in the equatorial Atlantic Ocean. *J. Geophys. Res.* 91:11717-11725.

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Weingartner, T. J., T. Royer, S. Danielson and S. Okkonen. Freshwater transport and variability within the Alaska Coastal Current, Gulf of Alaska.

Weingartner, T. J., K. Aagaard, D. J. Cavalieri, and Y. Sasaki. Winter baroclinic processes on the northeast Chukchi Sea shelf.

Weingartner, T. J., K. Aagaard, and Y. Sasaki. Circulation in Barrow Canyon and implications on shelf-basin exchange.

OTHER KEY PERSONNEL

Mr. Seth Danielson is the computer programmer who will assist in data processing, analyses, and maintenance of the web page. Both are employees of the Institute of Marine Science.

LITERATURE CITED

Anderson, P. J., J. F. Piatt, J. E. Blackburn, W. R. Bechtol, T. Gotthardt. 1999. Long-term changes in Gulf of Alaska marine forage species 1953-1998, p. 137 abstract only, Legacy of an Oil Spill- 10 Years after *Exxon Valdez,* Anchorage, AK, March 23-26.

Duffy, D. C. 1999. And an oil spill ran through it: lessons from the APEX study of the effects of the *Exxon Valdez* Spill on Alaskan Seabirds and Fish, p. 143 abstract only, Legacy of an Oil Spill- 10 Years after *Exxon Valdez*, Anchorage, AK, March 23-26.

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Mantua, N.J., S. R. Hare, Y. Zhang, J. M. Wallace, and R.C. Francis, 1997. A Pacific interdecadal climate oscillation with impacts on salmon production, *Bull. Am. Met. Soc.,* 78: 1069-1079.

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Weingartner, T. 2000. Toward long-term oceanographic monitoring of the Gulf of Alaska ecosystem, *Exxon Valdez* Oil Spill Restoration Project Annual Report (Restoration Project 98340), Alaska Department of Fish and Game, Habitat and Restoration Division, Anchorage, Alaska.

Weingartner, T. 1999. Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem, *Exxon Valdez* Oil Spill Restoration Project Annual Report (Restoration Project 98340) Alaska Department of Fish and Game, Habitat and Restoration Division, Anchorage, Alaska.

Wong A.P.S., N. L. Bindoff, and J. A Church. 1999. Large-scale freshening of the intermediate waters in the Pacific and Indian Oceans, *Nature, 400*, 440-443.

2002 *EXXON VALDEZ* TI EE COUNCIL PROJECT BUDGET

October 1, 2001 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002
Personnel		$0.0
Travel		$0.0
Contractual		$19.3
Commodities		$0.0
Equipment		$0.0
Subtotal		$19.3
General Administration		$1.4
Project Total		$20.7
Full-time Equivalents (FTE)		0.2
Other Resources		

LONG RANGE FUNDING REQUIREMENTS					
Estimated FY 2003					

Dollar amounts are shown in thousands of dollars.

Comments:

FY02

Prepared:

Project Number: 02340
Project Title:Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem
Agency: Alaska Department of Fish and Game

FORM 3A
TRUSTEE
AGENCY
SUMMARY

2002 *EXXON VALDEZ* TF :E COUNCIL PROJECT BUDGET
October 1, 2001 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002						
Personnel		$12.4						
Travel		$0.5						
Contractual		$2.5						
Commodities		$0.0						
Equipment		$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal		$15.4	Estimated FY 2003					
Indirect		$3.9						
Project Total		$19.3	$14.5					
Full-time Equivalents (FTE)		0.2						
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

The indirect rate is 25% TDC as negotiated by the Exxon Valdez Oil Spill Trustee Council with the University of Alaska.

FY02

Prepared:

Project Number: 02340
Project Title:Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem
Name: Thomas J. Weingartner

FORM 4A
Non-Trustee
SUMMARY

2002 *EXXON VALDEZ* TI EE COUNCIL PROJECT BUDGET
October 1, 2001 - September 30, 2002

Personnel Costs:			Months	Monthly		Proposed
	Name	Position Description	Budgeted	Costs	Overtime	FY 2002
	Weingartner, T.	PI/Associate Professor	1.0	6.8		6.8
	Danielson, S.	Analyst Programmer	1.0	5.6		5.6
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
		Subtotal	2.0	12.4	0.0	
					Personnel Total	$12.4

Travel Costs:		Ticket	Round	Total	Daily	Proposed
	Description	Price	Trips	Days	Per Diem	FY 2002
	Fairbanks to Anchorage	258.0	1	2	121.0	0.5
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
					Travel Total	$0.5

FY02

Prepared:

Project Number: 02340
Project Title:Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem
Name: Thomas J. Weingartner

FORM 4B
Personnel
& Travel
DETAIL

2002 *EXXON VALDEZ* TF EE COUNCIL PROJECT BUDGET
October 1, 2001 - September 30, 2002

Contractual Costs:	Proposed
Description	FY 2002
Page charges	2.5
Contractual Total	$2.5

Commodities Costs:	Proposed
Description	FY 2002
Commodities Total	$0.0

FY02

Prepared:

Project Number: 02340
Project Title:Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem
Name: Thomas J. Weingartner

FORM 4B
Contractual & Commodities DETAIL

2002 *EXXON VALDEZ* TI EE COUNCIL PROJECT BUDGET

October 1, 2001 - September 30, 2002

New Equipment Purchases:	Number of Units	Unit Price	Proposed FY 2002
Description			
			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 Equipment Total**	$0.0

Existing Equipment Usage:	Number of Units	
Description		

FY02

Prepared:

Project Number: 02340
Project Title:Toward Long-Term Oceanographic Monitoring of the Gulf of Alaska Ecosystem
Name: Thomas J. Weingartner

FORM 4B
Equipment
DETAIL

UNIVERSITY OF ALASKA
FAIRBANKS

SFOS Budget Worksheet
Year 1
1 October 2001 -- 30 September 2002

SALARIES AND BENEFITS				
Wages	Months	Hrly. Rate		Total
Weingartner, T.	1.00	$30.58	$5,321	
Danielson, S.	1.00	$21.47	$3,736	
Leave Benefits				
Weingartner, T.			$69	
Danielson, S.			$725	
Staff Benefits				
Weingartner, T.			$1,445	
Danielson, S.			$1,151	
TOTAL SALARIES AND BENEFITS				**$12,447**
TRAVEL				
Domestic				
1 R/T Fairbanks to Anchorage		$258		
Per diem (2 days @ $121/day)		$242		
Total Domestic			$500	
TOTAL TRAVEL				**$500**
SERVICES				
Page charges			$2,500	
TOTAL SERVICES				**$2,500**
TOTAL DIRECT COSTS				**$15,447**
FACILITIES AND ADMINISTRATION	Type= TDC		Rate =	25.0%
			Base =	$15,447
				$3,862
TOTAL FUNDING REQUESTED				**$19,309**
ADFG Overhead	Type=	TDC	Rate=	7.0%
			Base=	19,309
				$1,352
TOTAL REQUESTED TO EVOS				$20,661

02372

Steller Sea Lion Monitoring

Project Number:	02372
Restoration Category:	Enhance/Replace Subsistence Resources
Proposer:	Native Village of Eyak
Lead Trustee Agency:	Native Village of Eyak, a Federally Recognized Tribal Government.
Cooperating Agencies:	DOI, ADFG, NMFS, & CRRC.
Duration:	1st year of a five year project.
Cost FY 02:	$250,000
Cost FY 03:	$250,000
Cost FY 04:	$250,000
Cost FY 05:	$250,000
Cost FY 06:	$250,000
Geographic area:	Copper River, Prince William Sound.
Injured Resource/Service	Subsistence

Abstract:

Steller Sea Lions are on the decline and have been placed on the endangered list by NMFS. If this trend continues, subsistence fishing for salmon, herring and other marine life will be curtailed. Some traditional areas may be closed to all fishing & hunting. We need to monitor the interaction between the Steller Sea Lions and the fishing fleets. The decline of the Sea Lion is effecting the subsistence fishing in our area. This proposal would fund this interaction.

The Native Village of Eyak

P.O. Box 1388
Cordova, Alaska 99574-1388
PH (907) 424-7738 * FAX (907) 424-7739

April 13, 2001

Molly McCammon
Executive Director
Exxon Valdez Oil Spill Trustees Council
645 G Street, Suite 401
Anchorage, Alaska 99501-3451

Dear Molly

Enclosed is a restoration proposal to monitor Western Stellar Sea Lions in the Prince William Sound/Copper River area. As the Western Stellar Sea Lions have been placed on the endangered list by NMFS. The dividing line between the Western and Eastern Steller Sea Lions is Cape Suckling. The eastern boundary of Area E Salmon district is Cape Suckling. It is critical that we find out the reason for their demise. Should the decline in the Sea Lion numbers continue, the subsistence harvest of salmon, herring and other marine life will be curtailed.

We have submitted this proposal in past. ***This problem is becoming more critical now then it has ever been.***

We are requesting technical assistance from EVOS for this proposal.

Sincerely yours

Bob Henrichs
President
Native Village of Eyak
Traditional Council