PHOTOGRAPHIC AND ACOUSTIC MONITORING OF KILLER WHALES IN PRINCE WILLIAM SOUND AND KENAI FJORDS, ALASKA (Submitted under BAA #52ABNF100031)

Project Number: 02012

Restoration Category: Monitoring, Research

Proposer: North Gulf Oceanic Society

Lead Trustee Agency: NOAA

Duration: 1 year

Cost : $32,879

FY 2002

Geographic Area: Prince William Sound/Kenai Fjords, Alaska

Injured Resource/Service: Killer Whales

ABSTRACT

This project closes out the monitoring of the damaged AB resident pod and the potentially endangered AT1 transient population as well monitoring of other Prince William Sound/Kenai Fjords killer whales. Monitoring has occurred on a yearly basis since 1984. Analysis of FY 2001 data will be completed as well as additional modeling of the resident killer whale population and AB pod and publication of those results. Remote hydrophone data will be collected through December 2001 and data from all years summarized and assessed. Distribution of killer whales in Kenai Fjords over the course of this monitoring study will be examined using GIS techniques. A final examination of resident killer whale prey will be made using samples collected from 1997-2001. A final report will be submitted.

INTRODUCTION

This project is a closeout of the reduced annual killer whale monitoring program. Killer whales were monitored under EVOS Trustee Council funding in 1989, 1990, and 1991 (damage assessment) and in 1993 and 1995 (restoration monitoring). A reduced annual monitoring program was initiated in 1996. Analysis in this project will build on results of the comprehensive killer whale investigation initiated in FY95 and continued in FY96, FY97, and FY98. In FY99 and FY00 the monitoring program was augmented with matching funding to continue aspects of genetic and contaminant analysis and we expect this to be the case in 2002.

On March 31, 1989 AB pod was observed in oil sheens and six of the 36 pod members were missing. A total of 14 whales were lost from resident AB pod in the two years following the *Exxon Valdez* oil spill and there was no recruitment into the pod during those years. Since that time the social structure within AB pod has shown signs of deterioration. Maternal groups have traveled independently or with other pods, and pod members have not consistently traveled with closest relatives. Although 4 calves were recruited during the period 1992-1994, there were 5 additional mortalities in 1994. There has been a net increase of three individuals since 1995. In 2000 there was one recruited calf and no new mortalities, the pod currently contains 25 individuals. The rate of mortality observed in this pod after the oil spill far exceeds that recorded for other resident pods observed in Prince William Sound over the past 13 years or for 19 pods in British Columbia over the past 20 years. A reduced mortality rate is essential for the recovery of this pod.

Nine whales from the transient AT1 group have not been observed since 1989. Two additional AT1 whales have not been sighted for seven years. Another member of this group stranded and died on a beach near Cordova, Alaska in July 2000. From genetic and photographic data from beached whales, three of these twelve missing AT1 group whales are known to be dead. Although transient killer whale social structure is not fully understood, we are confident that the other missing AT1 whales also are dead. Statistical analysis backs up this supposition and strongly suggests that they have either died or permanently emigrated from the area. Since there is no record of these whales in adjacent regions and they appear to have a limited range, it is most likely that the missing AT1 whales are dead.

Seventeen years of systematic data collected under public and private funding have been placed in a specially designed GIS database currently housed at the U.S. Fish and Wildlife Service, Marine Mammals Management Division, Anchorage, Alaska and at Alaska Pacific University, Anchorage, Alaska under the management of collaborator, Dr. David Scheel The database contains 763 records of encounters with killer whales in and near Prince William Sound and Kenai Fjords, Alaska. Among these

are 557 encounters with resident whales and 206 encounters with transient-type whales. Analyses have determined large-scale differences in spatial distribution patterns between resident and transient whales over time (Sheel et al. 2001). Changes in transient whale distributions have been examined in relation to changes harbor seal populations.

There is worldwide concern that specific PCB and dioxin congeners may have negative effects on reproduction in mammals. The recovery of killer whales in Prince William Sound and the long-term health of the population is dependent on unimpeded reproductive processes. Recently there is concern over contaminant levels and their relationship to the recent decline of southern resident killer whales in Puget Sound. During this study we have measured contaminant levels in both resident and transient killer whales, and found much higher levels in the transient population. Contaminants apparently passed from mother to offspring via lactation and levels follow consistent patterns within genealogies (Ylitalo et al in press). Samples were obtained from individually identified living whales that can be re-identified and re-sampled to assess future changes in levels. The ability to sample and potentially resample specific known individuals and their known kin is a unique aspect of this project. Results of contaminant analysis (Ylitalo et al in press) raise concern that contaminants in transient whales could negatively impact reproduction and or reduce immune response leading to mortalities. There has been no successful reproduction in the AT1 group since 1984. All chemical analysis of tissue and assistance in the interpretation of results has been provided by the NMFS/NOAA Environmental Contaminant Laboratory, Seattle, Washington under a cooperative agreement with N.G.O.S.

In FY97 we initiated a remote hydrophone and acoustic monitoring as a long-term assessment tool. Initial analysis and separation of pods has been completed and an initial publication has been submitted. (Yurk et al. in review). Currently we are operating a single hydrophone in Resurrection Bay powered by solar and wind power and using microwave transmission technology. It is currently operational and is effectively documenting presence and absence of killer whales during the fall, winter and early spring months.

We are still compiling our catalogue of acoustic dialects for resident pods. In 2000 we obtained needed recordings of AJ, AD05 and AD16 pods. The dialect of the AT1 transient group have been established and also related to behavior. (Saulitis et al in review) The dialect catalogue is used to document the presence of specific killer whale pods and groups recorded from the remote hydrophone. The long-term goal of this aspect of the project is to determine the extent of winter use by killer whales of these inshore waters and provide an additional, innovative, cost effective tool for monitoring killer whales year round. A hydrophone in Resurrection Bay has the added benefit of providing a continuous live feed to the Alaska Sea Life Center and throughout Seward via FM link for the education of visitors and residents. In winter 2000-2001 acoustic monitoring indicated whales were present on an intermittent basis in late fall/early winter and also in late winter in Resurrection Bay. It appears AB pod and AJ pod were present on a routine basis in late winter/early spring.

NEED FOR THE PROJECT

A. Statement of Problem

The AB pod of killer whales was injured by the EVOS. Although it had shown signs of recovery from 1991 to 1993, mortalities in 1994/95 reduced the number of surviving AB pod whales to 22. Since 1995 there has been a net gain of three individuals, however, it will not be clear whether recovery will be dependent on reduced mortality rate (Matkin et al 2000). At least 12 of the original 22 members of AT1 group of transient killer whales have apparently died since 1989 and there has been no recruitment within the group. Recovery for this group seems doubtful at this time and a petition to list them as an endangered population is in preparation. This project will continue to monitor the status of AB pod and the AT1 group.

Sightability of killer whales in Prince William Sound has changed since the spill; particularly resident whales have been more frequently encountered in the Kenai Fjords region. Transient whales are seen less frequently in all areas than prior to the spill.

Initial mortalities within AB pod following the spill have apparently led to additional mortalities due to loss of key individuals. Deterioration of AB pod social structure has led to a situation where one subpod now travels separately most of the time (the AB25 subpod travels with AJ pod). The project will provide long-term insight into effects of changes in killer whale social structure due to unnatural mortalities. A detailed population model for resident killer whales is under construction.

Despite considerable effort, re-sightings of the AT1 group have declined and fewer individuals are seen when members of this transient group are located. We are confident that 12 of the original 22 members of this group are dead, or have emigrated to other regions; although the later possibility is very unlikely. None of the AT1 whales have been sighted or identified in southeastern Alaska despite healthy pinniped populations and frequent transient sightings in that region.

Although the rate of encounter with members of the AT1 transient group has declined, there has been no detectable increase in the sightings of other transient groups, suggesting that other transients are not increasing their use of the Sound as use of the region as AT1 group declines. Whether this overall decline in the encounters with transient (marine mammal eating) killer whales is related to oil spill effects or ecosystem changes is not clear, but we suspect a combination of the two factors. It is likely that the severe decline in harbor seals and Steller sea lions are important factors in the decline of transients in the region.

MtDNA and nuclear DNA analysis has demonstrated the genetic uniqueness of the AT1 group from residents as well as from other transients. If the AT1 population does not have other components in western Alaska, the loss of the AT1 group could represent a serious overall loss of genetic diversity.

Some environmental contaminants such as PCBs and DDTs have been linked to reproductive dysfunction in mammals and immune system dysfunction. We have discovered very high levels of these contaminants in the transient (marine mammal eating) killer whales, including the non-reproducing AT1 group. When compared to other cetacean populations, these levels appear to be in a range that could result in reproductive dysfunction and reduced immune response or other effects that might impede recovery of this group.

B. Rationale/Link to Restoration

A final analysis of data from killer whale population monitoring will detail the status of AB pod and the AT1 transient group. The status of AB pod is considered non-recovering at this time, the group numbered 25 whales and one subpod (AB25) traveled with primarily with AJ pod. It numbered 36 whales before the spill and was a unified pod. The recent slow growth in the pod suggests a recovery may finally be under way. Using the additional data from a population model will be completed that will compare AB pod with other resident killer whale pods through 2001.

An annual killer whale behavioral database of spanning 17 years now exists in a GIS format. It is accompanied by a photographic database that includes identifications of all individuals from each frame of film for every encounter logged in the GIS system. This will facilitate development of potential critical habitats for killer whales, particular in the Kenai Fjords region where data of this type has been collected in recent years.

Continued development of acoustic monitoring and a dialect directory has provided a cost-effective year- round extension of the monitoring program. We will continue to work cooperatively with the Alaska Sea Life Center, Kenai Fjords National Park, and See More Wildlife Systems in this endeavor. The signal is broadcast 24 hours a day on local FM in Seward. Our program directly involves residents and visitors in the process of monitoring and restoration through connection with Alaska Sea Life Center and Kenai Fjords tour and charter boat industry.

C. Location

This project is part of an ongoing killer whale research in Prince William Sound and the Kenai Fjords region, Alaska. The project involves the village of Chenega, Port San Juan Hatchery, the Alaska Sea Life Center, Kenai Fjords National Park, and other residents and visitors to the region. It operates cooperatively with the Kenai Fjords and Prince William Sound tourboat industry.

COMMUNITY INVOLVEMENT AND TRADITIONAL ECOLOGICAL KNOWLEDGE

There is great public concern and interest for killer whales in Prince William Sound and in Kenai Fjords. The rapidly expanding tourboat industry depends on a healthy killer whale population to attract and satisfy visitors and residents. We have been closely involved with tourboat and recreational operators and residents by exchanging sighting information on a daily basis and providing a catalogue of individual whales to enhance enjoyment of whale observation. We have provided and continue to provide workshops detailing whale biology. We are involved in the Youth Area Watch program, taking young students out to participate in our research. Recent publication of an updated identification catalogue that includes details of our research results and viewing guidelines has further sparked interest in these whales. Killer whales now draw thousands of visitors to the region each year.

We continue to collect observations and stories from native residents and others that will provide background for interpretation of our findings and place the work in a historical and cultural perspective. Some of these legends and stories are used to place

our research in a broader context in our recent publication: “Killer Whales of Southern Alaska” (Matkin et al 1999).

PROJECT DESIGN

A. Objectives

1. Summarize and analyze all resident killer whale population data collected under EVOS funding for inclusion in final report.

2. Final development and publication of population model for resident killer whales

3. Conduct additional analysis on GIS data investigating important killer whale habitat in the Kenai Fjords region; summarize and include in final report.

4. Analyze data collected on killer whale prey since 1997 and update feeding habits analysis and interpretation for resident killer whales.

5. Continued analysis of calls and separation of pod dialects necessary for final interpretation of remote hydrophone data.

6. Summarize all data collected from remote hydrophone project, analyze and interpret results. Evaluate success and potential of this aspect of the monitoring project.

7. Examine status of transient killer whales in the region and changes in encounter rates with these whales and include in final report.

8. Submission of final report.

B. Methods

.

The final report for the killer whale monitoring program will include a summary of field effort, and summary of the pods and individuals encountered and a status report on AB pod and the AT1 group. Changes within AB pod will be examined with consideration for the age and sex structure of the pod and maternal groups within the pod and related to the population model that will be finalized. Trends in transient killer whale sighting rates and demographics will also be examined and evaluated. Analysis of GIS data for the Kenai Fjords region will be used to assess importance of specific areas as killer whale habitat. Copies of killer whale encounter data and vessel logs will be made available to the EVOS Trustee Council and/or lead agency and this data will be archived in the GIS database for potential future analysis. Frame by frame identification data will also be made available on disk. Copies of the GIS program and data base will be available by request to NGOS.

Ages have been estimated for resident killer whales in Prince William Sound/Kenai Fjords and initial population modeling inititiated. We will continue to examine whether the Alaskan pods conform to the B.C. model (i.e. were indicative of population increasing at its intrinsic rate). The expected number of births each year will be estimated:

$$\text{Births} = Nf(x) \bullet FEC(x)$$

Where Nf(x) represents the number of females of age x and FEC(x) the age-specific fecundity rate as given in equation 26 of Olesiuk et al. 1990 (but updated to include data to the late 1990s). The expected number of juvenile, female and male deaths each year will be estimated as:

$$\text{Juvenile Deaths} = N(x) \bullet MR(x)$$

$$\text{Adult Female Deaths} = Nf(x) \bullet MRf(x)$$

$$\text{Adult Male Deaths} = Nm(x) \bullet MRm(x)$$

Where N(x), Nf(x) and Nm(x) represent the number of juveniles of either sex, adult females and adult males aged x in that year, MR(x) is the age-specific mortality rates of juveniles aged less than 15 of both sex as per Table 9 in Olesiuk et al (1990) but updated to included data to the late 1990s, and MRf(x) and MRm(x) represent the age-specific mortality rates of females and males aged 15 or greater as per Table s 11 and 12 respectively in Olesiuk et al (1990) again updated for data to the late 1990s.

We will compare the observed and expected number of deaths, and to dampen year-to-year fluctuations due to stochastic events (births and deaths are integers, where predicted values are real numbers), we will also calculate 3-year running means of the ratio of observed to expected values.

Since there were far more deaths in AB-pod than expected in 1989-90 following EVOS, we will continue to examine the effects of these losses. In order to estimate the lost production from females lost at the time of the spill, we will project their production in the years following their disappearance.

$$\boldsymbol{N}t+1 = \boldsymbol{M} \bullet \boldsymbol{N}t$$

Where $\boldsymbol{N}t$ is a vector giving the number of animals by age and $\boldsymbol{M}$ the Leslie projection matrix giving the age-specific fecundity and survival rates.

Analysis using the GIS database will include examination of the distribution of killer whales in the Kenai Fjords over the past six years (including 2001) area using methods similar to those developed for Prince William Sound (Scheel et al 2001). The region will be divided into cells of similar effort based on natural geography and other

considerations. Comparisons of killer whale use per unit of search effort will be statistically compared and differences interpreted. As possible specific killer whale behaviors also will be related to area. The possible importance of specific areas within Kenai Fjords will be discussed based on the results of our analysis.

Pod specific dialects for resident killer whales have been determined from recordings made by several researchers in the Prince William Sound area and in Southeast Alaska during the spring and summer months of the years 1984 to 2000. Construction of a catalogue of pod specific dialects for all pods, including those infrequently encountered is an ongoing process and dependent on recordings that will be made during the FY02 field season. Specific calls from Prince William Sound transient (AT1 group) killer whales also have been catalogued (Saulitis 1993, Saulitis in review.). A total of 8456 calls have been screened and digitized using a Kay Elemetrics Real Time Sound Spectrum Analyzer, Model 5500. Samples from this screening process were digitized using the Canary acoustic spectrum analysis software (The Cornell Bioacoustics Workstation). Calls from different killer whale pods and transient groups are being categorized method developed by Dr. John Ford in British Columbia, Canada. This process involves arbitrary acoustical identification paired with a visual and statistical comparison of sound spectra.

Continued assessment of repertoires of Prince William Sound killer whales will occur in 2001/02 and this information used to evaluate all calls obtained by remote hydrophone monitoring. A publication detailing the linkage of dialect and genetic data has been journal submitted and is in review (Jurk et al, in review). The recordings from the remote hydrophone obtained through December 2001 will be used in analysis presented in the final report.

Samples collected from the sites of resident killer whale predation over the past five years will be examined and prey species determined. This analysis will used to update the predation database and will be detailed in the final report.

PC (Windows) compatible computers owned by NGOS will be used to analyze field data. The GIS system at Alaska Pacific University (Dr. David Scheel) and U.F.W.S, Marine Mammal Management Division in Anchorage (Doug Burn) and VAX data system at the Pacific Biological Station, Nanaimo also will be used for data storage and analysis.

C. Contracts and Other Agency Assistance

The entire project will be completed under the auspices of the North Gulf Oceanic Society(NGOS) under federal research permits held by NGOS and issued under the Marine Mammal Protection Act. NGOS will provide a technician to enter data collected in 2002 into the GIS database housed at Alaska Pacific University and U.S.F.W.S. in Anchorage using the a preexisting menu interface. Harold Yurk at the University of British Columbia will conduct acoustic analysis and interpretation. Peter Olesiuk of the Alaska Department of Fish and Game will assist in population dynamics analysis and

population modeling. David Scheel of Alaska Pacific University will provide GIS analysis and interpretation.

SCHEDULE

A. Measurable Project Tasks for FY2002

January 2002: Summarize monitoring fieldwork for 2001.

Nov. 1, 2001 - Jan. 31, 2002: Analysis of photographs from 2001 fieldwork. Input data into GIS system.

January 2002: Acoustic analysis of killer whale calls from previous year.

Oct. 1, 2001- April 30, 2002: Preparation and submission of paper on population dynamics of killer whale pods.

Oct. 1, 2001- March 15, 2002. Analysis and interpretation of GIS data for Kenai Fjords region for inclusion in final report

January 1- April 30 2002: Prepare and submit final report

January 1- April 30 2002. Final analysis and reporting of remote hydrophone data collected through December 2001.

January 2002: Attend EVOS Trustee Council annual workshop

.

B. Project Milestones and Endpoints

The FY2002 killer whale project will provide for final analysis and reporting on photoidentification and acoustic monitoring program initiated in FY1997. Also included will be initial GIS analysis of existing Kenai Fjords region data for resident killer whales and an updated examination of resident killer whale feeding habits.

C. Completion Date

Final report will be submitted by April 30, 2002

PUBLICATIONS AND REPORTS

Matkin, C.O., G.E. Ellis, and E. Saulitis. Population dynamics of resident killer whales in the Prince William Sound/Kenai Fjords region. To be submitted to Marine Mammal Science. ***(Held over from previous year)***

PROFESSIONAL CONFERENCES

Bienniel Conference of the Biology of Marine Mammals, Vancouver, B.C. Canada November 2001 (funded from FY 2001)

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

The monitoring of killer whales and analysis of historic and current data on killer whale behavior is part of an program to investigate killer whale recovery and the interactions of killer whales and harbor seals. It will be integrated with the concurrent harbor seal studies. In FY2002 this project will rely on approximately $11,000 in matching funds from other sources. As a non-profit research institution familiar with private funding sources and cooperative programs, NGOS can work with the Trustee Council cooperation to maximize potential for other funding in the future.

PROPOSED PRINCIPAL INVESTIGATOR:

Craig O. Matkin
North Gulf Oceanic Society
60920 Mary Allen Ave, Homer, Alaska 99603
Phone/Fax (907) 235-6590
comatkin@xyz.net

KEY PERSONNEL

Craig Matkin (M.S. University of Alaska), is the project leader. Matkin will be responsible for supervising the completion of all fieldwork and insuring successful operation of boats and equipment. He will be the operator of the R.V. *Natoa* and supervise directly all work completed from that platform. He will direct data analysis and assemble all material for annual and comprehensive reports and be responsible for completion and submission of these reports. He will represent this project and present the work to the EVOS Trustee Council.

Matkin has studied killer whales in Prince William Sound since 1977. He initiated systematic killer whale photoidentification in Prince William Sound, and is a founding member of NGOS. In 1994 he completed the "The Biology and Management of Killer

Whales in Alaska" for the U.S. Marine Mammal Commission. Other pertinent publications include EVOS killer damage assessment results ("The Status of Killer Whales in Prince William Sound 1984-1992", Craig O. Matkin, G. M. Ellis, M.E. Dahlheim, and J. Zeh in T.R. Loughlin. ed. Marine Mammals and the *Exxon Valdez* and Matkin and C.O., Matkin, D.R., Ellis, G.M. , Saulitis, E. and McSweeney, D. 1997. Movements of resident killer whales in Southeastern Alaska and Prince William Sound, Alaska. Marine Mammal Science, 13(3):469-475. Mr. Matkin also teaches at the University of Alaska, Lower Kenai Penninsula Campus.

Eva L. Saulitis (M.S. University of Alaska) , a director of NGOS, has conducted fieldwork on killer whales in Prince William Sound each season since 1987. She is a principal field biologist for the monitoring segment of this project (photoidentification) and will co-operate the research vessel *Natoa*. She will make ready and maintain all necessary equipment, complete photoidentification work and all logs and data sheets as required. She will provide entry of field data into the GIS system.

Saulitis completed her MS thesis "The Behavior and Vocalizations of the AT Group of Killer Whales in Prince William Sound, Alaska." in 1993. She coauthored the "Biology and Management of Killer Whales in Alaska" for the U.S. Marine Mammal Commission and “Killer Whales” for the EVOS Restoration notebook series and authored Saulitis, E.L., C.O. Matkin, K. Heise, L. Barrett Lennard, and G.M. Ellis. 2000. Foraging strategies of sympatric killer whale (*Orcinus orca*) populations in Prince William Sound, Alaska. Marine Mammal Science16(1):94-109. She has done extensive analysis of killer whale calls and has operated research vessels in Prince William Sound since 1988.

Harold Jurk Harald is a Phd. candidate at the University of British Columbia and specalizing in cetacean acoustics. He is conducting analysis and interpretation of killer whale acoustic data collected over the past 13 years in Prince William Sound/Kenai Fjords from vessels and from remote hydrophones.

LITERATURE CITED

Matkin, C.O., D. Scheel, G. Ellis, L. Barrett-Lennard, H. Jurk, and E. Saulitis. 2000. Photographic and Acoustic Monitoring of Killer Whales in Prince William Sound and Kenai Fjords, Alaska (Restoration Project 99012), North Gulf Oceanic Society, Homer, Alaska

Matkin, C.O., Ellis, G.M., Saulitis, E.L., Barrett-Lennard, L.G., & Matkin, D. 1999. *Killer Whales of Southern Alaska*. North Gulf Oceanic Society, Homer, Alaska.

Saulitis, E.L., F. H. Fay, C O. Matkin, in review. Acoustical Behavior of the AT1 Transient Killer Whale Population in Prince William Sound and Kenai Fjords, Alaska. Animal Behavior.

Scheel, D., C. Matkin, E. Saulitis. 2001. Distribution of killer whale pods in Prince William Sound, Alaska over a thirteen-year period, 1984-1996. Marine Mammal Science 17(3).

Ylitalo, G.M., C.O. Matkin, J. Buzitis, M. M. Krahn, L. L. Jones, T. Rowles, and J. Stein. in press. Influence of Life-History Parameters on Organochlorine Concentrations in Free-Ranging Killer Whales (*Orcinus orca*) from Prince William Sound, Alaska.. The Science of the Total Environment.

Yurk, H., L. Barrett-Lennard, J.K.B. Ford, And C.O.Matkin. in review. Parallel cultural and genetic lineages in resident killer whales off the coast of Southern Alaska. Animal Behavior.

_____

Proposed Project Manager
Stacy Masters
DOC,NOAA, NMFS, F/AKRX5
P.O. Box 21668
Juneau, Alaska 99802-1668
Phone 907 586-7644

FY 02 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET

October 1, 2001 - September 30, 2002

Budget Category:	Authorized FY 2001	Proposed FY 2002
Personnel		$28,010.0
Travel		$910.0
Contractual		$0.0
Commodities		$970.0
Equipment		$0.0
Subtotal	$0.0	$29,890.0
Indirect		$2,989.0
Project Total	$0.0	$32,879.0
Full-time Equivalents (FTE)		0.6
	Dollar amounts are shown in thousands of dollars.	
Other Resources		$11,000.0

LONG RANGE FUNDING REQUIREMENTS

FY02

Prepared:

Project Number: 00212
Project Title: Killer Whale Monitoring
Name: North Gulf Oceanic Society

FY 02 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2001 - September 30, 2002

Personnel Costs:			Months	Monthly		
	Name	Position Description	Budgeted	Costs	Overtime	
	Craig O. Matkin	P.I.	3.0	4600.0		
	Eva Saulitis	Data technician	0.8	3200.0		
	Harald Jurk	Acoustic Analyst	1.0	3400.0		
	Dave Scheel	GIS Analysis	1.0	4800.0		
	Peter Olesiuk	Population Modeling	0.5	4800.0		
		Office Assistant	0.7	1500.0		
		Subtotal	7.0	22300.0	0.0	
					Personnel Total	

Travel Costs:		Ticket	Round	Total	Daily	
	Description	Price	Trips	Days	Per Diem	
	Homer/Seward/Homer (car travel)	140.0	2			
	Homer/Anchorage/Homer	165.0	2	3	100.0	
					Travel Total	

FY02

Project Number: 00212
Project Title: Killer Whale Monitoring
Name: North Gulf Oceanic Society

Prepared:

Contractual Costs:	
Description	
Contractual Total	

FY 02 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2001 - September 30, 2002

Commodities Costs:	
Description	
Phone Computer Services Shipping	
Commodities Total	

FY02

Project Number: 00212
Project Title: Killer Whale Monitoring
Name: North Gulf Oceanic Society

Prepared:

New Equipment Purchases:	Number of Units	Unit Price	
Description			
Those purchases associated with replacement equipment should be indicated by placement of an R.		**New Equipment Total**	

Existing Equipment Usage:	Number of Units	
Description		

FY 02 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2001 - September 30, 2002

FY02

Prepared:

Project Number:
Project Title:
Name: