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GEM PROPOSAL SUMMARY PAGE

Project Title:	Lingering Oil: Pathways of Exposure and Population Status (ABL)
Project Period:	FY04 - FY 06
Proposer(s):	Stanley Rice (Habitat Program Manager), Jeff W. Short, Mandy Lindeberg NOAA/NMFS Auke Bay Laboratory
Study Location:	Prince William Sound
Abstract:	Lingering oil from the *Exxon Valdez* oil spill remains throughout Western Prince William Sound and appears to have chronic effects on sea otter and sea duck populations in these areas. Studies conducted in 2001-02 have documented the extent of oiling throughout the sound, and as of this writing, we have determined that oil is bioavailable to predators. Bioavailability defines potential for exposure, but is not equal to exposure or significance. In 2003 and 2004, we are determining the significance of lingering oil by quantifying the probability of oil encounters in areas where sea otters and sea ducks have not recovered. Prey and passive samplers collected in 2003 will be analyzed in 2004, and will be supplemented with additional samples in 2004 to meet the needs of the on-going tagging studies of otters and ducks by USGS. With the mechanism of exposure from lower intertidal oil deposits determined, the research theme will move toward the goal of determining the extent and probability of oil exposure in three restricted areas: Herring Bay, Lower Passage, and Bay of Isles. Information gained in this project could aid in the decision process regarding future mitigation, litigation, or clean-up actions.
Funding:	EVOS Funding Requested: FY 04 $ 60 K FY 05 $ 61 K FY 06 $ 29.1K TOTAL: 150.1 K
	Non-EVOS funds used: FY 04 $ 50K FY 05 $ 50K FY 06 $ 50K TOTAL: $ 150 K
Date:	June 13, 2003

INTRODUCTION

From the late 1990's to present, the finding of oil persistence and evidence of continued exposure and impacts to sea otters and sea ducks are the most surprising and best documented of the long term impacts of the *Exxon Valdez* oil spill (Ballachy et. al., 2001a and b; Bodkin et. al., 2002; Brodersen et. al., 1999; Carls et. al., 2001; Esler et. al., 2000). The results were unanticipated and have sparked some levels of controversy. Acute toxicity was expected in the early days of the spill, but the lingering oil and effects 12 years after the spill were never anticipated. In 2001, rigorous field surveys documented the extent and intensity of the lingering oil throughout the western part of Prince William Sound, thus giving strong support to the growing evidence of continued exposure to sea otters and sea ducks, and providing a chemical basis for the positive biomarker findings (Short et. al., 2002). These results suggest that the poor recovery of the top-level predators in some areas of the sound is constrained by continued oil exposure. In particular, some of the heaviest oiled areas in 1989 continue to have a significant incidence of oil, including subsurface oil that is relatively low in the intertidal zone and in the biologically productive zone. The species continuing to show impacts share one thing in common; they live, forage, or spawn in the intertidal zone, where stranded oil continues to have some persistence. Hence there is a match between oil persistence and life history traits.

There is an obvious correlation between oil presence and low-level predator effects, but the case for cause-effect can be better defined using persistence and bioavailability studies linked with biological studies measuring effects. The quantities of lingering oil found in some locations during summer 2001 were surprising, especially the predominance in the lower intertidal, which is closer to the biological zones where the predators sometimes feed. This stimulated the bioavailability study in 2002, and the positive results from bioavailability indicate that linkage between predators and lingering oil should be studied more extensively. Since the direct observation of feeding otters or ducks on an oil patch are very unlikely, proving linkage will be challenging and will require more of an indirect probabilistic approach. While there may be otters or ducks in the vicinity of an oil patch, each individual has preferred diets and feeding habits. As the patches of oil get smaller with time, the oil encounters will likely be infrequent, and only a fraction of the population in the area will encounter the oil, thus requiring rigorous sampling designs to capture the significance.

There are two basic strategies that could be used in linkage studies, direct observation and indirect (or probabilistic) approach. Both approaches have advantages and disadvantages, and this study contains elements of both strategies.

The direct observation of linkage would be the preferred approach, if it worked. This approach has higher probabilities in the early years following a spill, and less probability of success as the encounter rate declines. In this approach, otters and sea ducks would be sampled for elevated p450 enzyme induction, radio tagged, and followed for a portion of the year to determine their home range and primary feeding areas. Then the specific feeding habitat would be sampled to determine if the prey and habitat still contain oil, or not. This approach would have had a higher probability of success in earlier years, but as the lingering oil diminishes with time, and P450

levels return toward base levels, there will be lower chances of finding specific predators with elevated P450 feeding in specific oiled locations. What we do not know is how many exposures, or how often, does it take to diminish the survivals of otters or sea ducks, or to sustain an elevated P450. Will one contaminated feeding per week, or per month sustain the biomarker effects? If the exposures are from rare encounters, will the limited visual observations catch the animal at the appropriate site? Can we sample enough predators, and enough habitats? This approach will be attempted by sampling the habitat and prey, based on observations from USGS on otters and Harlequin ducks that have been sampled for P450 and radio tagged.

The indirect or probabilistic approach has a higher probability of success in later years. We can determine how much oil remains within a specific feeding range, including prey, but we may never actually observe an animal feeding at specific oiled patch. That is the "weak link" in this approach. In this approach, we would determine the amount of lingering oil remaining within a certain range and sample the intertidal zone down to the "zero" tide level, where oil and prey are known to exist. The random approach utilized in the original 2001 shoreline survey would be modified, but the approach would be similar. The numbers of sample sites within three areas, ranging from Herring bay (heavily oiled, no otters) to Lower Passage and Bay of Isles where some oil and predators are present. By combining the direct and indirect studies, we can determine how many days specific otters or Harlequin ducks spent in a restricted area that contains an estimated amount of oil in their feeding habitats.

I. NEED FOR THE PROJECT

A. Statement of Problem

The 2001 shoreline survey revealed that a significant amount of oil still remains on beaches in Prince William Sound and certain bays have persistent patches of oil. This study determined that more oil remained than previously thought, and that much of the liquid oil was present lower in the intertidal zone than expected (Short et. al 2002). The design of the project was focused on quantitative assessment of oil in the upper half of the intertidal zone, and was not designed to assess how much oil remained in the lower intertidal, a biologically productive zone that ended up having the most oil. The estimates of remaining oil are conservative underestimates. Remaining oil may not be bioavailable, and the studies in 2002 focused on determining if oil at oil patch sites was available to prey items, and available to surface oil collectors. (Surface passive oil collectors are surrogates for prey items). The preliminary studies in 2002 determined that oil was bioavailable at many of these sites, but we still do not know the magnitude and significance of this. The studies in 2003 will complete many of the chemical analyses of samples from 2002, and will integrate radio tagged predator studies that determine habitat use with contaminant studies that determine bioavailability and exposure. By combining the two parts (contaminants and predators use), we hope to determine the significance of remaining oil to the predators, their constrained population recovery, and continuing biomarkers effects. This coordinated work will assess the "radio-tagged areas" used by some predators, but it will not give an estimate of the contaminants bioavailable for the larger range area of Herring Bay, Lower Passage, and Bay of Isles. Hence, it continues to establish the linkage and connection, but does not define the extent

of the contamination relative to the populations still affected in that limited range. Hence the probabilistic approach has not been fully exploited, only the feasibility has been assessed

B. Relevance to GEM Program Goals and Scientific Priorities

This proposal will establish estimates of oiled shoreline in three areas where sea otters and sea ducks have not recovered from the *Exxon Valdez* oil spill. Individuals observed foraging and captured in contaminated areas can be linked to chronic exposure data. This study will help determine if chronic oil is part of the problem constraining recovery of otters and sea ducks, or not. The pathways of chronic exposure will build into an impressive body of evidence: individuals habitually foraging and resting in close proximity to known subsurface intertidal oil patches, oil collecting in their fur or feathers, feeding on contaminated prey, and/or having elevated levels of P450. Full recovery from the spill will have occurred when contaminated foraging habitat and chronic exposure to top-level predators has fallen below detection levels at these "worst case bays".

II. PROJECT DESIGN

A. Objectives by fiscal years

1. Complete chemical analyses of passive samplers and prey items collected in summer 03 from specific foraging sites of radio tagged otters and ducks**. (FY 04)**

2. Interpret this data, and combine with USGS biological data for manuscripts on the potential mechanisms for these species to be exposed to remaining oil. **(FY 04)**

3. Using information from the 2001 shoreline survey database, and random sampling to the zero tide level in 2003, estimate the volume of oil remaining in a restricted area where both sea otters and harlequin ducks are still showing symptoms of oil exposure. (Hole digging in **03**, but chemical analyses in **04**; statistical estimates in **04**. (The hole digging in 03 is in progress, and will supplement the 2001 survey in these restricted and heavily impacted bays by 5 fold).

4. Determine the potential and probability of oil exposure to chronic oil by placing surface sampling devices in a coverage that would provide estimates for three areas: Herring Bay, Lower passage, and Bay of Isles Deployment in summer **04**; chemical and statistical analyses in **05**.

5. Determine the potential for chronic exposure to oil by placing surface sampling devices at observed habitual resting and feeding locations of sea otters and harlequin ducks. This aspect was initiated in summer **03**, and will have a second round of sampling in **04** because there will be more radio tagged data, including dive depth data coming from the otter studies. Devices deployed in **04** will supplement those studies. Design to be determined at the fall inter-project workshop on lingering oil (Nov. 03) deployment in **04**,

chemical analyses in **05.**

6. Analyze additional prey items for hydrocarbons from very specific feeding patches of sea otter and harlequin ducks with high P450 values; samples collected in **04**, analyzed in **05**. .

7. Present detailed information at a workshop in Nov 03, and Nov 04, when results from contaminant and biological studies are combined; adjust sampling scope and locations based on the most up-to-date findings and priorities. (**FY 04, 05**)

8. Synthesize the mechanisms, including those unexpected, by April **04**. Synthesize the probabilities of continuing exposure by April **05**.

9. Final report June **05**

B,C. Procedural and Scientific Methods including Data and Statistical Analysis

Contamination of specific foraging areas
Sea otters and harlequin ducks are mobile predators, which present a problem for random sampling designs. There is a good chance the randomly selected shorelines for surveying lingering oil will not correlate with foraging predators. To overcome this shortfall, we will directly survey those beach segments where habitual observations of foraging have been made. The specifics of the design will evolve after USGS researchers are well into their winter observations and preliminary results can be reviewed prior to implementation in the spring.

Potential for chronic exposure to sea otters and sea ducks
Oil in the water may be one pathway by which sea otters and harlequin ducks are receiving chronic exposures. Oil from disturbance events (storms, tidal action, or foraging) may be introduced into an individual's fur or feathers. Preening to remove this oil requires additional energy, less time for feeding, and possible ingestion of the oil. Sampling fur and feathers for residual oil is not an established procedure for acute or chronic exposures. Instead, we will use passive sampling devices (PSDs) at the sea surface where foraging and resting activities have been observed. These devices will act as surrogates for fur and feathers. If our PSDs detect oil then it is more than likely that sea otters and harlequin ducks in these areas have also been exposed to oil.

Twenty-five PSDs will be deployed within each area (Herring Bay, Lower Passage, and Bay of Isles) and specifically where sea otters and harlequin ducks have been observed resting and foraging. Locations will be prioritized by shoreline oiling history, numbers of individuals observed and/or individuals with elevated P450 values (January workshop). The monitoring devices will sample surface waters 10 m offshore for a 30-day period.

Hydrocarbon analyses
To determine the source and weathering condition of remaining oil, 10 sediment samples from

pits with visible subsurface oil will be collected. To confirm contamination in prey and supplement elevated P450 data in sea otters and harlequin ducks, approximately 30 prey samples will be collected and analyzed for polycylic aromatic hydrocarbon (PAH) from heavily oiled and/or observed foraging areas. Subtidal clams will be collected from 10 sites via scuba and analyzed for PAHs. This will address sea otters that habitually feed on clams in the subtidal zone (~10 - 20m). All samples will be analyzed by GC-MS (summarized in Short et al. 1996) to determine whether PAH composition matches weathered *Exxon Valdez* oil. A weathering index (Short and Heintz 1997) will be determined for each sample.

Estimated volume of oil remaining within a specific area
The 2001 survey provided estimates of oiled shoreline and the volume of oil remaining throughout the spill area. The northern Knight Island area remains heavily oiled and sea otter and harlequin duck populations have not recovered from this region. This area represents the "worst case" in recovery from the spill and begs for a contamination estimate just for these regions. The 2001 survey data is structured so that these specific regions can be defined and oil estimates recalculated. This would be a statistical exercise only and would not require fieldwork.

Refining contamination estimate within a specific area
The 2001 shoreline effort was directed at the upper intertidal, whereas most of the oil was found on the lower intertidal surveyed area. The 2001 estimates potentially underestimate the prevalence of contaminated shoreline for the biologically important forage/predators. Therefore, a more refined oiled shoreline survey is necessary. The design will be loosely based on the 2001 SCAT sampling design but with a few alterations as dictated by the findings from that survey. The scope of the survey will be reduced to the three worst-case areas, Herring Bay, Lower Passage and Bay of Isles, sampled as separate strata. An equal random sampling effort will be given to moderately and heavily oiled shorelines (1 strata). Sampling will extend down to the minus 0.5m tide level (when possible), which will allow for detection of oil well into the biological zone and foraging habitat.

Similarly to the 2001 SCAT survey, the beach segments will be partitioned into rectangular blocks by a number of equal-width alongshore columns and 1.0 m tidal elevation intervals ranging from +2.5 m to -0.5 m (tide permitting). The maximum beach segment length, 100 m, will be divided into 5 columns, each 20 m wide, resulting in 15 blocks and 30 random pits. The number of pits and size of blocks may be modified based on a review of 2001 survey data. Shorter beach segments will be divided into fewer columns and blocks. Two 0.25 m2 quadrants will then be randomly placed within each block and a test pit excavated within each to a depth of 0.5 m or until boulders or bedrock are encountered. Oiled surface and subsurface area and its variance for any sampled segment will be estimated from these random quadrants, using standard SRS formulas as per 2001 shoreline survey. Gravimetric samples will be collected from each beach segment, representative of the oil classifications found on that beach, as to obtain a volumetric estimate of the oil. To enhance our biological information, major changes in substrate types (bedrock, boulder, cobble, pebble, granule, peat) and biological zones (algal cover, mussel beds, eelgrass and kelp beds) will be documented along vertical transects within our sampling grid. This baseline survey will have a cost effective and statistically proven design which can be

repeated in outlying years to determine when PWS is clean.

D. Description of Study Area

Sampling Locations:

1. Herring Bay: impacted bay; "worst case" site for recovering otters and sea ducks; acute exposures.
2. Lower Passage: impacted pass; marginal numbers of recovering otters and sea ducks; chronic exposures. This area will span from Passage Pt. to the southern tip of Ingot island.
3. Bay of Isles: impacted bay; marginal numbers of recovering otters and sea ducks; chronic exposures.

E. Coordination and Collaboration with Other Efforts

The overall project is a joint effort with NOAA-ABL and USGS-BRD based on their expertise and Trustee funded research in the past. ABL personnel will conduct studies on oiled shoreline survey as described in this DPD. USGS-BRD personnel will be responsible for directing and conducting sea otter and sea duck studies.

III. SCHEDULE

A. Measurable Milestones

November 2003	Mini inter-project workshop on linger oil; progress, future design
January 2004:	Public presentation of bioavailability of oil to otters/ducks
March 2004	Synthesis on the exposure mechanisms of lingering oil to ducks, otters
April 2004	complete chemical analyses of samples from summer
June 2004	complete estimates of remaining volume of oil in HB, BOI, and LP
Summer 2004	deploy, retrieve sampling devices for HB, BOI, and LP
November 2004	Mini inter-project workshop on linger oil; progress, future design
Winter 2004	complete chemical analyses on prey, samplers from summer 2004
January 05	Attend Annual Workshop
February 2005	complete a synthesis on probability of oil exposure in HB, BOI, LP
June 2005:	Complete Final Report.

B. Measurable Project Tasks

FY03: Four cruises will be carried out during the large spring tides of April, May, June, and July. This will maximize our ability to sample in the biological zone. All chemical analyses will be initiated in FY03.

FY04: Complete chemical analyses from summer 03 collections
Draft manuscripts from those collections
Complete field work; deployment, retrievals in summer 04

FY 05: Complete chemical analyses from summer 04 collections
Complete manuscripts from those collections
Complete final report.

IV. RESPONSIVENESS TO KEY TRUSTEE COUNCIL STRATEGIES

A. Community Involvement and Traditional Ecological Knowledge (TEK)

Charters to support the research will be solicited from the spill impacted area. Further, some labor support for some of the field operations may be solicited from the Native villages. Briefings to stake holders will be given as deemed needed or requested.

B. Resource Management Applications

V. PUBLICATIONS AND REPORTS

We will provide a final report to the Trustees office by June 2005.

Expected publication titles:

1. Mechanisms and potential of oiled habitats to expose sea otters and ducks
2. Significance of oiled habitat and prey as a probable cause of chronic impacts to sea otters and harlequin ducks.
3.. Estimate of EVO remaining in non-otter/otter zones of Northern Knight Island, PWS.
4. Probability of encountering oil in prey or passive use of HB, BOI, and LP
5. Synthesis: long term oiling of lower intertidal habitats: to clean or not to clean

VI. PROFESSIONAL CONFERENCES

The EVOS Trustee meetings will be attended by the principal investigators. One additional technical workshop to specifically review progress and future designs will be attended by the three the principal investigators.

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PROPOSED PRINCIPAL INVESTIGATORS

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PRINCIPAL INVESTIGATORS

Stanley D. Rice
GM-14 Physiologist

Received BA (1966) and MA (1968) in Biology from Chico State University, and PhD (1971) in Comparative Physiology from Kent State University. Employed at Auke Bay Fisheries Laboratory since 1971 as a research physiologist, task leader and Habitat Program Manager since 1986. Rice has researched oil effects problems since 1971, and has published over 115 papers, including over 75 on oil effects. Studies have ranged from field to lab tests, behavioral to physiological to biochemical studies, from salmonids to invertebrates to larvae to meiofauna. Rice has conducted and managed soft funded projects since 1974, including the Auke Bay Laboratory *Exxon Valdez* damage assessment studies since 1989. Activities since the oil spill have included leadership and management of up to 10 damage assessment projects, field work in PWS, direct research effort in some studies. Quality assurance of all studies, particularly the biological impacts research has been the continuing focus through the restoration years. Principal

investigator in subtidal sediment studies, pink salmon effects studies, and in the SCAT surveys of 2001. In addition, Rice has lead the effort on use of PSDs by the Auke Bay Lab.

Jeffrey W. Short
Research Chemist

Education: M.S. (Physical Chemistry). 1989- Present: Established and managed the hydrocarbon analysis facility at ABL to analyze hydrocarbon samples generated by the *Exxon Valdez* NRDA effort. Responsible for quality control and data interpretation of all data hydrocarbon data produced by ABL labs. Principle investigator of several EVOS projects through the damage assessment and restoration years, paarticularly those studies involved in tracking oil (subtidal sediments), tracking the Hydrocarbon Data Base, several specific projects (Pristane; Coal as a background source), and most importanly, principal investigator of the large shoreline assessment project (SCAT) in FY 2001. Many publications.

Mandy R. Lindeberg
Fisheries Research Biologist

B.S. Marine Biology. 1990- present: Mandy has been involved in *Exxon Valdez* oil spill research for the last 11 years. Her research includes studies on intertidal invertebrates and seaweeds, mussel populations, and a co-principal investigator of spot shrimp populations in Prince William Sound. She was the field chief of the intensive PWS oiled shoreline survey during 2001 and lingering oil bioavailability in 2002. Her responsibilities include quality control of field and laboratory sample processing, data analysis, graphics, and proposal/report preparation.

OTHER KEY PERSONNEL

Chemists Marie Larsen, Larry Holland, Josefina Lunasin will participate in the chemical analyses of the samples.

BUDGET JUSTIFICAITON

Long term persistence of oil needs to be tracked, and the significance of that persistence needs to be understood. Future litigation and decisions about cleaning (or management implications) will be based on the persistence and continuing effects. This study, along with USGS biological studies on sea otters and harlequin ducks are critical to that understanding. The public and various stake holders will be placing a high priority on this information.

DATA MANAGEMENT AND QA/QC STATEMENT

Auke Bay Laboratory data management and QA/QC have evolved since the onset of the EVOS and have always been a high priority. The following references, also found in the methods section of this proposal, document analytical QA/QC methods for samples analyzed by GC-MS (summarized in Short et al. 1996; Short and Heintz 1997). This study will also follow protocols for maintaining a Chain of Custody and updating metadata as needed for EVTHD and PWSoil databases.

GEM PROPOSAL SIGNATURE FORM

THIS FORM MUST BE SIGNED BY THE PROPOSED PRINCIPAL INVESTIGATOR AND SUBMITTED ALONG WITH THE PROPOSAL. If the proposal has more than one investigator, this form must be signed by at least one of the investigators, and that investigator will ensure that Trustee Council requirements are followed. Proposals will not be reviewed until this signed form is received by the Trustee Council Office.

By submission of this proposal, I agree to abide by the Trustee Council=s data policy (*Trustee Council/GEM Data Policy**, adopted July 9, 2002) and reporting requirements *(Procedures for the Preparation and Distribution of Reports***, adopted July 9, 2002).

PROJECT TITLE: _____

Printed Name of PI: _____

Signature of PI: _____ Date _____

Printed Name of co-PI: _____

Signature of co-PI: _____ Date _____

Printed Name of co-PI: _____

Signature of co-PI: _____ Date _____

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
DETAILED BUDGET FORM FY 04 - FY 06

Budget Category:	Proposed FY 04	Proposed FY 05	Proposed FY 06		TOTAL PROPOSED	
Personnel	$6.0	$6.2	$3.3		$15.5	
Travel	$12.0	$10.8	$3.4		$26.2	
Contractual	$27.0	$28.0	$10.0		$65.0	
Commodities	$10.0	$11.0	$10.0		$31.0	
Equipment	$0.0	$0.0	$0.0		$0.0	
Subtotal	$55.0	$56.0	$26.7		$137.7	
General Administration (9% of Subtotal)	$5.0	$5.0	$2.4		$12.4	
Project Total	$60.0	$61.0	$29.1		$150.1	

Cost-share Funds:
Supervision and participation by Jeep Rice and Jeff Short contributed. The contributions of FTP labor exceeds the soft funding from EVOS. This budget is being submitted at a higher cost than predicted in the FY03 DPD because more chemical analyses are needed than originally projected. These are needed to support decisions on litigation and mitagation and are contested by Exxon. It was estimated at 15K but is now being submitted at 49.6K. As stated in the proposal, some additional chemical analyses and extended monitoring are needed in FY04 due to unexpected primary analyses.

FY 04-06

Date Prepared: June 12,2003

Project Number: 040620
Project Title: Lingering Oil: Pathways of Exposure and Population Status
Agency: NOAA - Auke Bay Laboratory

FORM 3A
TRUSTEE
AGENCY
SUMMARY

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
DETAILED BUDGET FORM FY 04 - FY 06

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Description	Step	Budgeted	Costs	Overtime	Sum
						0.0
Jeep Rice	Habitat Program Manager	GS-14				0.0
Mandy Lindeberg	Fisheries Res. Biologist	GS-11	1.0	6.0		6.0
Jacek Maselko	Risheries Res. Biologist	GS-11		6.0		0.0
Jeff Short	Research Chemist	GS-13				0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		1.0	12.0	0.0	
					Personnel Total	$6.0

Travel Costs:		Ticket	Round	Total	Daily	Travel
Description		Price	Trips	Days	Per Diem	Sum
						0.0
Spring LDPE Deployment	JNU-CDV RT	0.5	3	2	0.3	2.1
Spring LDPE Pickup	JNU-CDV RT	0.5	3	2	0.3	2.1
						0.0
						0.0
EVOS Workshop - Jan. 2004	JNU-ANC	0.6	2	10	0.3	4.2
						0.0
Technical Workshop - Lingering Oil	JNU-ANC	0.6	3	6	0.3	3.6
						0.0
						0.0
						0.0
						0.0
					Travel Total	$12.0

FY 04

Project Number: 040620
Project Title: Lingering Oil: Pathways of Exposure and Populatioin Status
Agency: NOAA - Auke Bay Laboratory

FORM 3B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 04 - FY 06

Contractual Costs:			Contract Sum
Description			
Vessel Charter			
Spring Deployment PWS	5 days	1.3 K per day	6.5
Spring Pickup PWS	5 days	1.3 K per day	6.5
Temporary labor (NOAA) -			
Analytical (LDPE, GC)	in support of analyses and sampling		14.0
If a component of the project will be performed under contract, the 4A and 4B forms are required.		**Contractual Total**	$27.0

Commodities Costs:	Commodity Sum
Description	
Analytical - chemicals and glassware (LDPE, GC)	10.0
Commodities Total	$10.0

FY 04

Project Number: 040620
Project Title: Lingering Oil: Pathways of Exposure and Population Status
Agency: NOAA - Auke Bay Laboratory

FORM 3B
Contractual
&
Commoditie

New Equipment Purchases:		Number of Units	Unit Price	Equipment Sum
Description				
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
			New Equipment Total	$0.0

Existing Equipment Usage:	Number of Units	Inventory Agency
Description		
NOAA - Auke Bay Laboratory		
Computers/software		
HPLC		
GCMS		

FY 04

Project Number: 040620
Project Title: Lingering Oil: Pathways of Exposure and Population Status
Agency: NOAA - Auke Bay Laboratory

FORM 3B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 04 - FY 06

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Description	Step	Budgeted	Costs	Overtime	Sum
						0.0
Jeep Rice	Habitat Program Manager	GS-14				0.0
Mandy Lindeberg	Fish. Res. Biologist	GS-11	1.0	6.2		6.2
Jacek Maselko	Fish. Res. Biologist	GS-11				0.0
Jeff Short	Analytical Chemist	GS-13				0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		1.0	6.2	0.0	
					Personnel Total	$6.2

Travel Costs:		Ticket	Round	Total	Daily	Travel
Description		Price	Trips	Days	Per Diem	Sum
						0.0
Spring LDPE Deployment JNU-CDV RT		0.5	3	3	0.2	2.1
						0.0
Spring LDPE Pickup JNU-CDV RT		0.5	3	3	0.2	2.1
						0.0
EVOS WORKSHOP Jan 2005	Jnu-Anc	0.6	2	10	0.3	4.2
(Rice/Lindeberg)						0.0
Technical Workshop						0.0
(Rice/Lindeberg/Short)	Jnu-Anc	0.6	3	2	0.3	2.4
						0.0
						0.0
						0.0
					Travel Total	$10.8

FY 05

Project Number: 050620
Project Title: Lingering Oil: Pathways & Population Status
Agency: NOAA-Auke Bay Laboratory

FORM 3B
Personnel & Travel DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 04 - FY 06

Contractual Costs:			Contract Sum
Description			
Vessel Charter			
Spring Deployment PWS 5 days	1.4K/day	5 days	7.0
Spring Pickup PWS	1.4k/day	5 days	7.0
Temp Labor(NOAA)			14.0
Analytical chemistry lab support of analysis and field work			
If a component of the project will be performed under contract, the 4A and 4B forms are required.		**Contractual Total**	$28.0

Commodities Costs:	Commodity Sum
Description	
Analytical supplies: plastic, glassware, chemicals in support of sampling and analyses	11.0
Commodities Total	$11.0

FY 05

Project Number: 050620
Project Title: Lingering Oil: Pathways of Exposure & Population Status
Agency: NOAA- Auke Bay Lab

FORM 3B
Contractual
&
Commoditie

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 04 - FY 06

New Equipment Purchases:	Number of Units	Unit Price	Equipment Sum
Description			
			0.0
NOAA-Auke Bay Lab:			0.0
GCMS, HPLC, Computers and software			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
		New Equipment Total	$0.0

Existing Equipment Usage:	Number of Units	Inventory Agency
Description		

FY 05

Project Number: 040620
Project Title: Lingering Oil:Pathway of Exposure & Population Status
Agency: NOAA-Auke Bay Laboratory

FORM 3B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 04 - FY 06

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Description	Step	Budgeted	Costs	Overtime	Sum
						0.0
Mandy Lindeberg	Fish. Res Biologist		0.5	6.5		3.3
Jacek Maselko	Fish. Res Biologist					0.0
Jeff Short	Analytical Chemist					0.0
Jeep Rice						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		0.5	6.5	0.0	
					Personnel Total	$3.3

Travel Costs:		Ticket	Round	Total	Daily	Travel
Description		Price	Trips	Days	Per Diem	Sum
						0.0
GEM Workshop 2006	JNU-ANC	0.5	2	8	0.3	3.4
Rice, Lindeberg						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
					Travel Total	$3.4

FY 06

Project Number: 060620
Project Title: Lingering Oil :Pathways of Exposure and Population Status
Agency: NOAA-Auke Bay Laboratory

FORM 3B
Personnel
& Travel
DETAIL

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
DETAILED BUDGET FORM FY 04 - FY 06

Contractual Costs:	Contract Sum
Description	
Temporary Labor for Analytical Chemistry Lab support	10.0
Contractual Total	$10.0

Commodities Costs:	Commodity Sum
Description	
Analytical Chemistry Supplies	10.0
Commodities Total	$10.0

FY 06

Project Number:
Project Title:
Agency:

FORM 3B
Contractual
&
Commoditie

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 04 - FY 06

New Equipment Purchases:		Number	Unit	Equipment
Description		of Units	Price	Sum
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
			New Equipment Total	$0.0

Existing Equipment Usage:	Number	Inventory
Description	of Units	Agency

FY 06

Project Number:
Project Title:
Agency:

FORM 3B
Equipment
DETAIL