11.20.05

Motions - May 29, 2009 Trustee Council Meeting

Agenda Item 2, Agenda and May 13, 2009 Meeting Notes

I move we approve the May 29, 2009 agenda as presented.

I move we approve the May 13, 2009 Trustee Council Meeting Notes as presented.

Agenda Item 5, Investment Work Group

I move we approve Resolution 09-09 pertaining to the asset allocation for period June 1, 2009 through May 31, 2010.

Agenda Item 6. Best Small Parcel - DNR

I move that we authorize $45,000 for the purchase of the Best Parcel, strategically located within Safety Cove State Marine Park. This purchase will help restore lost recreational services and provide benefits to a variety of injured resources such as Pacific herring, otters, and other recovering and not recovered species as identified in the benefits report presented today.

Agenda Item 7, English Bay, Reauthorization of Funds – DOI, NPS

I move that we approve the transfer of $341,746 from the Research Investment subaccount of the *Exxon Valdez* Oil Spill Investment Fund administered by the Alaska Department of Revenue to the Department of the Interior for the purpose of restoring the habitat funds originally set aside for the purchase of those lands identified in the Trustee Council's February 14, 1997 resolution and in the purchase agreement between the United States Department of the Interior and the English Bay Corporation dated May 20, 1997.

Agenda Item 8, Sitkalidik Island Due Diligence Request – USFWS

I move that we authorize $212,550 dollars for the US Fish and Wildlife Service to proceed with an appraisal and other activities necessary for the Trustee Council to consider the purchase of a conservation easement on Sitkalidik Island, owned by Old Harbor Native Corporation.

deferred

Agenda Item 9, Lingering Oil Proposal 090841

I move that we approve funding Miles Project 090841, CYP1A1 Gene Expression Verification Study – Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill for FY 2009 in the amount of $75,540 including G&A of $13,236, FY 2010 in the amount of $116,959 including

G&A of $10,527, and FY 2011 in the amount of $13,236 including G&A of $1,192 for a grand total amount of $205,735.

Agenda

DRAFT 5/15/09

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, AK 99501-2340 • 907 278 8012 • fax 907 276 7178

AGENDA
EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
May 29, 2009, 9:00 a.m. – 12:00 p.m.
Anchorage, Alaska

Trustee Council Members:

RICHARD SVOBODNY
Acting Attorney General
Alaska Department of Law

LARRY HARTIG
Commissioner
Alaska Department of
Environmental Conservation

DENBY S. LLOYD
Commissioner
Alaska Department of Fish and Game

CRAIG O'CONNOR
Special Counsel
National Oceanic & Atmospheric
Administration
U.S. Department of Commerce

KIM ELTON
Senior Advisor to the Secretary for
Alaska Affairs
Office of the Secretary
U.S. Department of the Interior

JOE MEADE
Forest Supervisor
Forest Service
U.S. Department of Agriculture

Meeting in Anchorage, Trustee Council Office 441 West 5th Avenue, Suite 500
Teleconference number: 800.315.6338. Code: 8205
Federal Chair: _____

1. Call to Order – 9:00 a.m.

DRAFT 5/15/09

2.	Consent Agenda - Approval of Agenda* - Approval of Meeting Notes* May 13, 2009	
3.	Public Advisory Committee comments	Stacy Studebaker PAC Chair
4.	Public comment – 10:10 a.m. (3 minutes per person)	
5.	Investment Work Group* - Introduction - Presentation	 Craig Tillery, Department of Law Gary Bader and Bob Michell Department of Revenue
6.	Best Small Parcel*	Carol Fries Department of Natural Resources
7.	English Bay*	Dede Bohn, U.S. Geological Survey
8.	Sitkalidik Island Briefing* - Presentation Chokwak II* - Carol Fries	Carol Fries Roy Jones, Old Harbor Native Corp.
9.	Lingering Oil proposal: CYP1A1 Gene Expression Verification Study – Re-evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill*	Dede Bohn
10.	Tentative Executive Session	

Adjourn – 12:00 p.m.

* Indicates action items

May 13, 2009
Meeting Notes

DRAFT 5/19/09

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, AK 99501-2340 • 907 278 8012 • fax 907 276 7178

TRUSTEE COUNCIL MEETING NOTES

Anchorage, Alaska

May 13, 2009

Chaired by: Larry Hartig
Trustee Council Member

Trustee Council Members Present:

Steve Zemke, USFS *	Craig Tillery, ADOL ***
Kim Elton, US DOI	Tom Brookover, ADF&G****
Craig O'Connor, NOAA **	•Larry Hartig, ADEC

- • Chair
- * Steve Zemke alternate for Joe Meade
- ** Craig O'Connor alternate for James Balsiger
- *** Craig Tillery alternate for Richard Svobodny
- **** Tom Brookover alternate for Denby Lloyd

The teleconference convened at 10:00 a.m., May 13, 2009 in Anchorage at the EVOS Conference Room.

1. Approval of the Agenda

APPROVED MOTION: Motion to approve the May 13, 2009 agenda as presented

Motion by O'Connor, second by Tillery

2. Approval of March 9, 2009 meeting notes

APPROVED MOTION: Motion to approve the May 13, 2009 meeting notes as presented

Motion by Zemke, second by Tillery

Public comment opened at 10:03 a.m.

No public comments were offered.

3. Amendment to Project 070836-A

APPROVED MOTION: Motion to approve the Boufadel Project 070836-A, Factors Responsible for Limiting the Degradation Rate of *Exxon Valdez* Oil in Prince William Sound Beaches in the amount of $437,497; this amount includes G&A ($36,124)

Motion by O'Connor, second by Tillery

4. Adjourn

APPROVED MOTION: Motion to adjourn

Motion by O'Connor, second by Tillery

Off the record 10:30 a.m.

Investment

DRAFT 5/22/09

RESOLUTION 09-09 OF THE *EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL PERTAINING TO THE ASSET ALLOCATION FOR PERIOD JUNE 1, 2009-MAY 31, 2010

The *Exxon Valdez* Oil Spill Trustee Council (the "Council") is responsible for the management and investment of the *Exxon Valdez* Oil Spill Joint Trust Fund (the "Joint Trust Fund"). The Joint Trust Fund is used by the governments for purposes of restoring, replacing, enhancing, rehabilitating or acquiring the equivalent of natural resources and services lost or injured as a result of the oil spill.

Public Law 106-113 allows investment of the Joint Trust Funds (EVOS Research Investment, EVOS Habitat Investment, EVOS Koniag Investment) outside the Untied States Treasury but limits investments to "income-producing asset classes, including debt obligations, equity securities, and other instruments or securities that have been determined by unanimous vote of the Council to have a high degree of reliability and security."

The investment objective for the joint Trust Funds, as described in the Investment Policies adopted by the Trustee Council on February 29, 2000, is to provide adequate liquidity for ongoing restoration purposes and preserve the inflation-adjusted value of the principal, while realizing competitive, total rates of return. In order to meet this investment objective, the Trustee Council unanimously agreed on this date that Joint Trust Fund monies shall be invested outside the Federal Court Registry under the authority of Public Law 106-113. The Council has reviewed the capital market returns and risk assumptions developed by the Alaska Department of Revenue, Division of Treasury's, Callan Associates (dated April 2009).

THEREFORE, BE IT RESOLVED THAT the Council adopts the following asset allocation.

ASSET ALLOCATION

Equities Broad Market	38% +/- 7%
Equities International	18% +/- 5%
Fixed Income – Domestic	44% +/- 7%

AND FURTHER THAT the Council further recognizes that the asset allocation adopted today has a median expected return of 7.77% with a standard deviation of 9.31%.

Approved by the Council at its meeting of May 29, 2009 held in Anchorage, Alaska, as affirmed by our signatures affixed below.

JOE L. MEADE
Forest Supervisor
Forest Service Alaska Region
U.S. Department of Agriculture

RICHARD SVOBODNY
Acting Attorney General
Alaska Department of Law

KIM ELTON
Senior Advisor to the Secretary
for Alaska Affairs
U.S. Department of the Interior

CRAIG O'CONNOR
Special Counsel
National Oceanic & Atmospheric Administration
U.S. Department of Commerce

DENBY S. LLOYD
Commissioner
Alaska Department of Fish and Game

LARRY HARTIG
Commissioner
Alaska Department of Environmental Conservation

Exxon Valdez Oil Spill Trustee Council

Investment Presentation

May 29, 2009

State of Alaska
SUMMARY OF PERFORMANCE
RATES OF RETURN
PERIODS ENDING April 30, 2009

STATE STREET.

EVOS INVESTMENT REPORT

	MKT VAL $(T)	Month	QTR	1 Year	3 Years	5 Years
AY02 - EVOS RESEARCH INVESTMENT	83,405	6.86	5.13	-22.80	-4.86	1.08
EVOSINFI - EVOS INVESTMENT FUND INDEX		*7.29*	*5.69*	*-23.79*	*-4.96*	*1.03*
AY2H - EVOS HABITAT INVESTMENT FUND	29,843	6.61	4.99	-23.20	-5.01	1.00
EVOSINFI - EVOS INVESTMENT FUND INDEX		*7.29*	*5.69*	*-23.79*	*-4.96*	*1.03*
AY2J - EVOS KONIAG INVESTMENT FUND	35,751	6.61	4.99	-23.34	-5.07	0.95
EVOSINFI - EVOS INVESTMENT FUND INDEX		*7.29*	*5.69*	*-23.79*	*-4.96*	*1.03*
AY00A43 - EVOS BROAD MARKET FIXED INCO	53,735	0.88	2.34	2.74	5.29	4.58
XSL - BC AGGREGATE		*0.48*	*1.49*	*3.84*	*6.01*	*4.78*
AY00A45 - EVOS SOA INT'L EQUITY POOL	23,512	10.03	3.90	-37.33	-10.39	1.23
XCB - MSCI EAFE (NET)		*12.80*	*7.65*	*-42.76*	*-12.34*	*0.66*
AY00A42 - EVOS SHORT TERM POOL	1	0.32	0.55	-5.93	1.06	1.78
XI1 - 91 DAY T-BILL		*0.03*	*0.09*	*1.13*	*3.51*	*3.20*
AY00A46 - EVOS RUSSELL 3000 INDEX	71,751	10.49	7.62	-34.72	-10.78	-2.16
XF3 - RUSSELL 3000		*10.52*	*7.61*	*-34.95*	*-10.94*	*-2.25*

2009 Capital Market Expectations

Return and Risk

Callan's Long-Term Capital Market Projections

Asset Class	Index	Projected Returns			Standard Deviation (Risk)	Projected Yield	2008 Projections	
		Arithmetic	Geometric	Real			Return	Risk
Equities								
Broad Domestic Equity	Russell 3000	10.35%	9.48%	6.71%	16.40	2.10	9.00%	16.90
Large Cap	S&P 500	9.95%	9.22%	6.45%	15.25	2.20	8.85%	16.40
Small/Mid Cap	Russell 2500	11.95%	10.04%	7.27%	22.60	1.20	9.85%	22.70
International Equity	MSCI EAFE	10.60%	9.25%	6.48%	19.30	2.00	9.00%	19.20
Emerging Markets Equity	MSCI EMF	13.00%	10.12%	7.35%	27.00	0.00	9.60%	31.20
Fixed Income								
Domestic Fixed	LB Aggregate	5.25%	5.24%	2.47%	5.00	5.25	5.25%	4.50
High Yield	CSFB High Yield	7.45%	7.02%	4.25%	11.70	7.45	7.00%	11.50
Other								
Real Estate	Callan Real Estate	8.55%	7.61%	4.84%	16.10	6.00	7.60%	16.50
Private Equity	VE Post Venture Cap	17.25%	11.56%	8.79%	37.00	0.00	12.00%	34.00
Absolute Return	Callan Hedge FoF	7.20%	6.93%	4.16%	10.00	0.00	6.50%	9.70
Cash Equivalents	90-Day T-Bill	3.00%	3.03%	0.26%	0.80	3.50	3.00%	0.80
Inflation	CPI-U	2.75%	2.77%		1.40		2.75%	1.40

Source: Callan Associates Inc.

2009 Capital Market Expectations

Correlation Coefficient Matrix

Key to Constructing Efficient Portfolios

	Broad	Large Cap	Small/Mid Cap	Inter-national Equity	Emerging Markets Equity	Domestic Fixed	High Yield	Real Estate	Private Equity	Absolute Return	Cash Equiv-alents
Broad	1.00	0.98	0.94	0.68	0.79	0.15	0.58	0.54	0.92	0.56	-0.12
Large Cap	0.98	1.00	0.90	0.68	0.79	0.17	0.60	0.54	0.91	0.56	-0.10
Small/Mid Cap	0.94	0.90	1.00	0.64	0.74	0.07	0.53	0.51	0.87	0.51	-0.15
International Equity	0.68	0.68	0.64	1.00	0.75	0.14	0.43	0.51	0.85	0.60	-0.20
Emerging Markets Equity	0.79	0.79	0.74	0.75	1.00	0.05	0.51	0.53	0.85	0.53	-0.15
Domestic Fixed	0.15	0.17	0.07	0.14	0.05	1.00	0.25	0.15	-0.02	0.41	0.30
High Yield	0.58	0.60	0.53	0.43	0.51	0.25	1.00	0.43	0.53	0.41	0.07
Real Estate	0.54	0.54	0.51	0.51	0.53	0.15	0.43	1.00	0.55	0.43	-0.06
Private Equity	0.92	0.91	0.87	0.85	0.85	-0.02	0.53	0.55	1.00	0.54	-0.10
Absolute Return	0.56	0.56	0.51	0.60	0.53	0.41	0.41	0.43	0.54	1.00	0.15
Cash Equivalents	-0.12	-0.10	-0.15	-0.20	-0.15	0.30	0.07	-0.06	-0.10	0.15	1.00

Source: Callan Associates Inc.

Mean-Variance Optimization Analysis

Asset Mix Alternatives

Asset Classes	1	2	3	5 Real Allocation 4	5	6	Current Target 7	2008 Risk Equivalent 8	9	10	11
Equity - Broad Market	**25%**	**32%**	**34%**	**38%**	**39%**	**50%**	**47%**	**34%**	**53%**	**59%**	**53%**
Equity - International	**12%**	**11%**	**15%**	**18%**	**21%**	**17%**	**20%**	**34%**	**20%**	**21%**	**34%**
Bonds - Aggregate	**63%**	**57%**	**51%**	**44%**	**40%**	**33%**	**33%**	**32%**	**27%**	**20%**	**13%**
Totals	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Projected Return	7.00%	7.25%	7.50%	7.77%	8.00%	8.25%	8.26%	8.33%	8.50%	8.75%	9.00%
Projected Risk	6.99%	7.65%	8.35%	9.31%	9.94%	10.80%	10.81%	11.32%	11.70%	12.67%	13.71%
1 Yr. Probability of Loss	15.6%	16.6%	17.8%	19.3%	20.2%	21.2%	21.3%	22.2%	22.3%	23.0%	24.4%
5 Yr. Probability of Loss	1.6%	2.0%	2.7%	3.6%	4.2%	5.1%	5.1%	5.8%	6.3%	7.1%	8.1%
10 Yr. Probability of Loss	0.1%	0.2%	0.3%	0.5%	0.6%	0.9%	0.9%	1.3%	1.2%	1.8%	2.4%

Investment Considerations

- Preserve the inflation-adjusted value of invested capital on endowment funds. - Exxon Valdez Oil Spill Trustee Council (EVOS) Investment Policy, Page X-14. EVOS has adopted a five percent spending rule.

- Callan provides capital market projections that are calibrated on an inflation projection of 2.75%. Therefore, EVOS should target 7.75% to be consistent with its investment policy.

- Revenue staff performed a stochastic mean-variance optimization process to minimize expected standard deviation while achieving 7.75% goal.

- The following asset allocation is expected to achieve a 7.77% return over the next 10 years with standard deviation of 9.31%:
  - 38% Broad Market Equities (Index: Russell 3000)
  - 18% International Equity (Index: MSCI EAFE)
  - 44% Domestic Bonds (Index: Barclays Aggregate)

Best Small Parcel

Best Parcel

In your packet you will find a benefits report for the Best Parcel. This parcel is a small in-holding strategically located within Safety Cove State Marine Park located in Day Harbor just to the east of Resurrection Bay. The parcel provides important habitat for a variety of species injured by the Exxon Valdez Oil spill including two species that are not yet recovered, Pacific Herring and Pigeon Guillemots. In addition resources that are recovering such as sea otters and harlequin ducks also utilize the habitat in this area. The parcel provides the best access to Safety Cove marine-park and provides important recreational services benefits in addition to the benefits that accrue to the injured resources listed in the benefits report. The appraised value of the parcel is $45,000 and the value is supported by very recent sales in the immediate area indicating a relatively strong market for recreational property. The owner is in a position such that a sale is likely should the state be unable to purchase the parcel. Should the Council authorize this acquisition, the Department of Natural Resources Division of Parks will manage the parcel as a natural zone consistent with EVOS restoration goals and objectives.

Questions

English Bay – The National Park Service will soon be ready to close on the final phase of the English Bay acquisition package authorized by the Council in 1997. Dede Bohn from DOI will present a request for a transfer of funds to allow the Park Service to complete this transaction.

Sitkalidik Island

As you know, Old Harbor corporation contacted the Trustee Council in 2008 to discuss the sale of a conservation easement on Sitkalidik Island. In your packet you will find a benefits report prepared by the USFWS that summarizes the restoration benefits of Sitkalidik Island, the potential threats to the habitat and resource values of the island, the current status of discussions with Old Harbor representatives and an estimate of due diligence costs required to complete the purchase of a conservation easement as proposed by Old Harbor.

Roy Jones representing Old Harbor will give a presentation on Sitkalidik Island.

In addition, following the presentation, Gary Wheeler, Manager of the Kodiak Island National Wildlife Refuge is available to answer questions relating to the resource values and proposed management of the parcel and Nancy Walsh, Chief of the Fish and Wildlife Service Realty Section is available to answer questions related to current discussions with Old Harbor, anticipated due diligence efforts and timing of those efforts should the council have any questions.

DRAFT 5/28/09

RESOLUTION 09-XX OF THE *EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL REGARDING SMALL PARCEL KAP 3005

We, the undersigned, duly authorized members of the *Exxon Valdez* Oil Spill Trustee Council ("Trustee Council"), do hereby certify that, in accordance with the Memorandum of Agreement and Consent Decree entered as settlement of United States of America v. State of Alaska, No. A91-081 Civil, U.S. District Court for the District of Alaska, and after public meetings, unanimous agreement has been reached to expend funds received in settlement of State of Alaska v Exxon Corporation, et al., No. A91-083 CIV, and United States of America v. Exxon Corporation, et al., No 91-082 CIV, U.S. District Court for the District of Alaska, for necessary natural resource damage assessment and restoration activities, as described in Resolution 07-04 of the *Exxon Valdez* Oil Spill Trustee Council regarding Chokwak II Small parcel, KAP 3001.

This resolution re-authorizes the distribution of funding for the purchase of the above referenced property totaling $160,000, to be distributed to the State of Alaska according to the following schedule:

Department of Natural Resources	$160,000
TOTAL APPROVED FOR DISTRIBUTION	$160,000

The Council further finds as follows:

1. An appraisal of the parcel completed by the Department of Natural Resources and approved by the Bureau of Indian Affairs of the United States Department of the Interior determined that the fair market value of the parcel is $160,000.

2. As set forth in Resolution 07-04 and attachments, this parcel, if acquired, has attributes which will restore, replace, enhance and rehabilitate injured natural resources and the services provided by those natural resources, including important

habitat for several species of fish and wildlife for which significant injury resulting from the spill has been documented. Acquisition of this small parcel will assure protection of approximately 160 acres located on the north shore of Kiliuda Bay on the east side of Kodiak Island. The parcel includes Anadromous Stream #250-20-100 4 0, valuable riparian and intertidal habitat, as well as access to the adjacent state-owned uplands acquired through a land exchange between the State and Old Harbor Native Corporation. The parcel is important to the sport fishing and tourism industries, both of which were impacted by the *Exxon Valdez* oil spill.

3. Existing laws and regulations, including but not limited to the Alaska Forest Practices Act, the Alaska Anadromous Fish Protection Act, the Clean Water Act, the Alaska Coastal Management Act, the Bald Eagle Protection Act and the Marine Mammal Protection Act, are intended, under normal circumstances, to protect resources from serious adverse effects from activities on the lands. However, restoration, replacement and enhancement of resources injured by the *Exxon Valdez* oil spill present a unique situation. Without passing judgment on the adequacy or inadequacy of existing law and regulations to protect resources, scientists and other resource specialists agree that, in their best professional judgment, protection of habitat in the spill area to levels above and beyond that provided by existing laws and regulations will have a beneficial effect on recovery of injured resources and lost or diminished services provided by these resources.

4. There has been widespread public support within Alaska as well as on a national basis, for the acquisition of lands.

5. The purchase of this parcel is an appropriate means to restore a portion of the injured resources and services in the oil spill area. Acquisition of this parcel is consistent with the Final Restoration Plan.

THEREFORE, we resolve to provide funds for the State of Alaska to acquire all

the seller's rights and interests in small parcel KAP 3001 as recommended by the Executive Director of the Trustee Council ("Executive Director"), and pursuant to the following conditions:

(a) the amount of funds (hereinafter referred to as the "Purchase Price") to be provided by the Trustee Council to the State of Alaska shall be forty five thousand dollars ($160,000) for small parcel KAP 3001;

(b) authorization for funding for any acquisition described in the foregoing paragraph shall terminate if a purchase agreement is not executed by December 30, 2010;

(c) filing by the United States Department of Justice and the Alaska Department of Law of a notice, as required by the Third Amended Order for Deposit and Transfer of Settlement Proceeds, of the proposed expenditure with the United States District Court for the District of Alaska and with the Investment Fund established by the Trustee Council within the Alaska Department of Revenue, Division of the Treasury ("Investment Fund"), and transfer of the necessary monies from the Investment Fund to the State of Alaska Department of Natural Resources;

(d) a title search satisfactory to the State of Alaska and the United States is completed, and the seller is willing and able to convey fee simple title by warranty deed;

(e) no timber harvesting, road development or any alteration of the land will be initiated on the land without the express agreement of the State of Alaska and the United States prior to purchase of this parcel;

(f) a hazardous materials survey satisfactory to the State of Alaska and United States is completed;

(g) compliance with the National Environmental Policy Act; and

(h) a conservation easement on parcel KAP 3001 shall be conveyed to the United States which must be satisfactory in form and substance to the United States and the State of Alaska Department of Law.

It is the intent of the Trustee Council that the above-referenced conservation easement will provide that any facilities or other development on the foregoing small parcel shall be of limited impact and in keeping with the goals of restoration, that there shall be no commercial use except as may be consistent with applicable state or federal law and the goals of restoration to prespill conditions of any natural resource injured, lost, or destroyed as a result of the EVOS, and the services provided by that resource or replacement or substitution for the injured, lost or destroyed resources and affected services, as described in the Memorandum of Agreement and Consent Decree between the United States and the State of Alaska entered August 28, 1991 and the Restoration Plan as approved by the Trustee Council.

By unanimous consent, following execution of the purchase agreement between the seller and the State of Alaska and written notice from the Executive Director that the terms and conditions set forth herein and in the purchase agreement have been satisfied, we request the Alaska Department of Law and the Assistant Attorney General of the Environment and Natural Resources Division of the United States Department of Justice to take such steps as may be necessary for withdrawal of the Purchase Price for the above-referenced parcel from the appropriate account designated by the Executive Director.

Such amount represents the only amount due under this resolution to the sellers by the State of Alaska to be funded from the joint settlement funds, and no additional amounts or interest are herein authorized to be paid to the sellers from such joint funds.

Approved by the Council at its meeting of May 29, 2009, held in Anchorage, Alaska, as affirmed by our signatures affixed below.

JOE L. MEADE
Forest Supervisor
Forest Service Alaska Region
U.S. Department of Agriculture

RICHARD SVOBODNY
Acting Attorney General
State of Alaska

KIM ELTON
Senior Advisor to the Secretary
for Alaska Affairs

U.S. Department of Interior
U.S. Department of Commerce

CRAIG R. O'CONNOR
Special Counsel
National Oceanic &
Atmospheric
Administration

DENBY S. LLOYD
Commissioner
Alaska Department of Fish and Game

LARRY HARTIG
Commissioner
Alaska Department of
Environmental
Conservation

KEN 3005, Best Parcel

Owner:	Douglas Best
Physical Location:	The parcel is an in-holding in Safety Cove State Marine Park located in Day Harbor near Seward, AK
Acreage:	2.05 acres
Brief Description:	ASLS 78-119, Plat 80-22 in Section 26, T2S, R1E, SM.
Agency Sponsor:	Alaska Department of Natural Resources
Appraised Value:	$45,000

Parcel Description. The property is located at the head of Safety Cove on the western side of Day Harbor near Seward, Alaska. The parcel encompasses 2.05 acres within Alaska State Land Survey 78-119 and is the only private property within the 960-acre Safety Cove State Marine Park. The property is located north of a three-acre fresh water lake located above the gravel storm berm at the head of the cove. Behind this parcel the land rises steeply and is surrounded by large rocky cliffs and mountains. The parcel provides excellent and strategic access to Safety Cove State Marine Park and contains the only usable beach in the marine park boundaries. The parcel provides 227 feet of beach frontage on Safety cove and an additional 200 feet of freshwater lake frontage.

The parcel is heavily timbered with Sitka Spruce, hemlock and alder. The under story is a mix of salmon berry, blueberry, devils club and moss. The shoreline and intertidal is gravel and cobble. The parcel is currently undeveloped with few signs of human use.

Linkage to Restoration:
Restoration Benefits.
Restoration benefits will accrue to recreation. Acquisition will secure and enhance access to Safety Cove State Marine Park and remove the threat of conflicting use in perpetuity. Additionally, a variety of injured resources utilize the habitat provided by this parcel and are regularly found in the area. Sea otters utilize the intertidal habitat and river otters move between the ocean and the lake using trails worn between the two water bodies. Mussel colonies are found in the intertidal and provide food for Harlequin ducks commonly found in the area. The head of Day Harbor is identified as a waterfowl concentration area. Loons utilize the fresh water lake adjacent to this parcel and it is thought that the old growth Sitka spruce found on the parcel provide marbled murrelet habitat. The area immediately off shore is identified as a Pacific herring spawning area in the Cook Inlet ESI atlases. In addition, the rocky cliffs surrounding Safety Cove are important mountain goat habitat with the goats giving birth in the spring at lower elevations.

Table 1: Injured Resources and Services – Summary of anticipated benefits.

Not Recovering	Recovery Unknown	Recovering	Services
Pacific Herring	Marbled murrelets	Intertidal communities	Recreation
Pigeon Guillemot	Subtidal Communities	Mussels	Commercial fishing
		Sediments	Passive use
		Sea Otters	
		Harlequin Ducks	

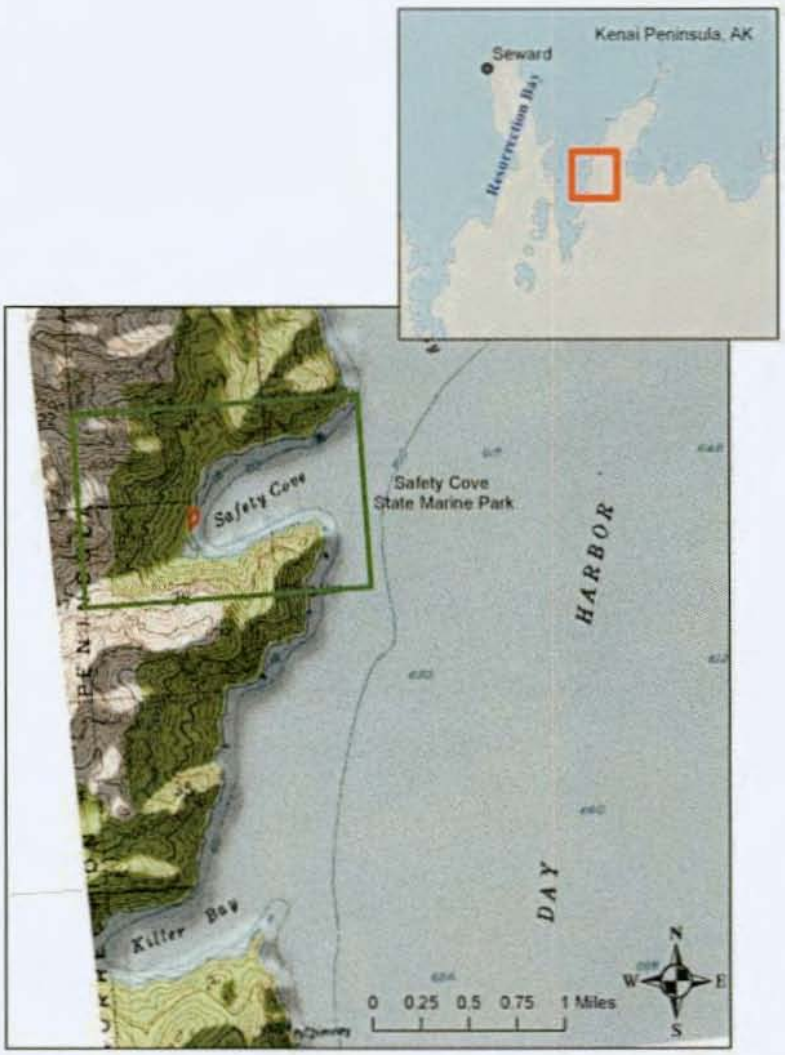
Potential Threats.
The owner is very interested in selling this parcel. He would prefer that the parcel become part of Safety Cove Marine Park however, he is not in a position to donate the parcel and a sale to a third party is highly likely should the State be unable to purchase the parcel. All comparables for this appraisal were 2006 (1) or 2007 (5) sales in Day Harbor indicating that demand is relatively strong for recreational parcels in this immediate area.

Conversion of this property to a lodge or recreational cabin site would severely impact the public's ability to access Safety Cove Marine Park leading to potential user conflicts over time. Development on this parcel has the potential to negatively affect the intertidal and nearshore habitat as well as the heavily forested uplands.

Proposed Management.
This parcel was identified in the Management Plan for State Marine Parks as an in-holding that may impact recreation values of the park should it be developed. The Safety Cove State Marine Park plan recommends purchase if the owners are willing sellers. Justification for purchase was based on the need to prevent conflicts between the public and in-holders should development occur. The management plan recommends management of the marine park as a natural zone with minimal development, which is consistent with EVOS restoration goals and objectives.

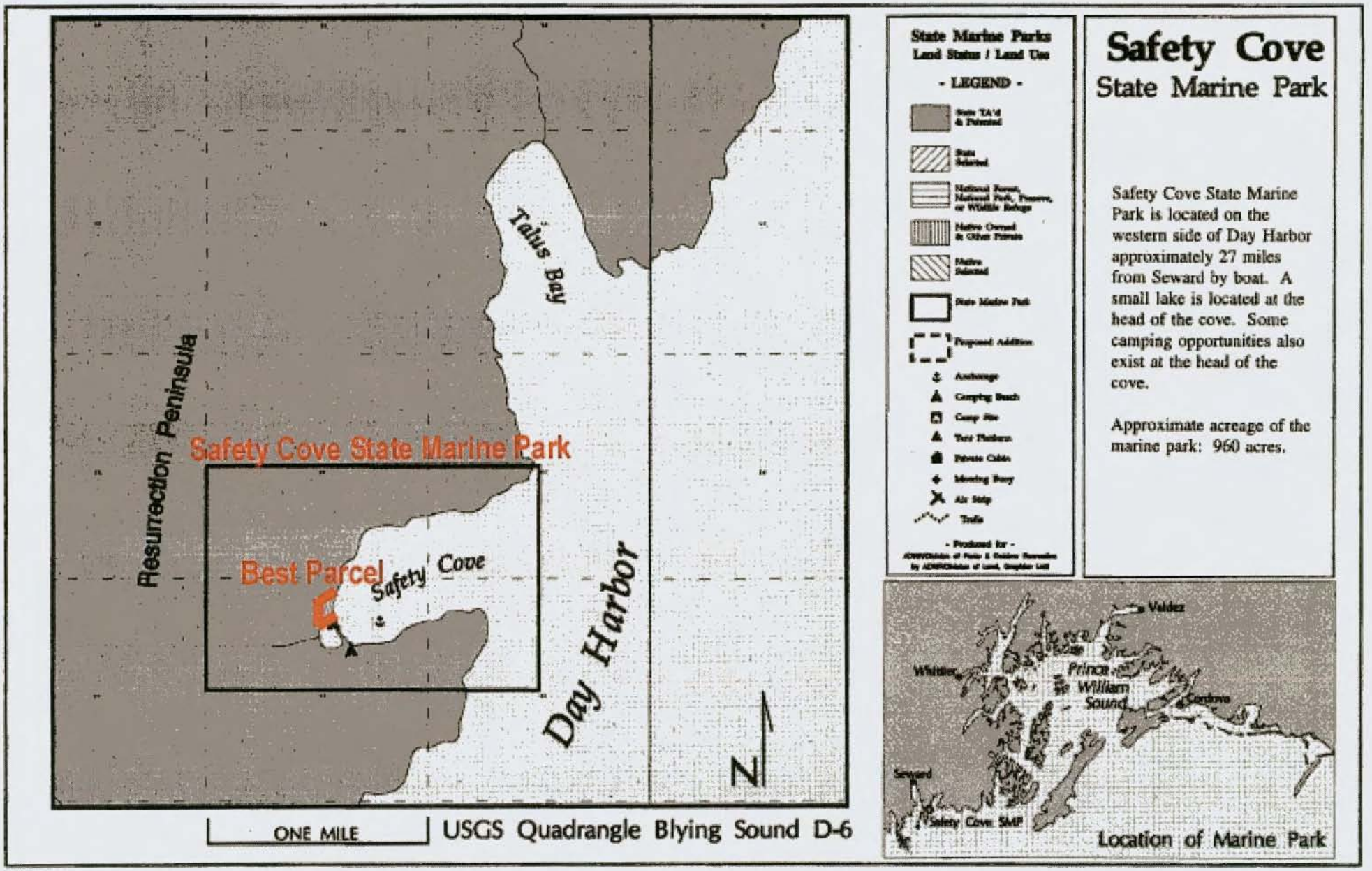
This parcel will be managed by the Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation, consistent with the management intent for Safety Cove State Marine Park and for the purposes of protecting resources and services injured by the *Exxon Valdez* Oil Spill.

Appraised Value. $45,000



Best Parcel, Safety Cove State Marine Park
Kenai Peninsula, Alaska

The Best Parcel (red outline) is located within Safety Cover State Marine Park (green outline).


Resurrection Peninsula
Safety Cove State Marine Park
Best Parcel
Safety Cove
Talus Bay
Day Harbor
N
ONE MILE
USGS Quadrangle Blying Sound D-6
State Marine Parks
Land Status / Land Use
- LEGEND -
Safety Cove
State Marine Park
Safety Cove State Marine Park is located on the western side of Day Harbor approximately 27 miles from Seward by boat. A small lake is located at the head of the cove. Some camping opportunities also exist at the head of the cove.
Approximate acreage of the marine park: 960 acres.
Valdez
Whittier
Prince William Sound
Cordova
Seward
Safety Cove SMP
Location of Marine Park

DRAFT 5/20/09

RESOLUTION 09-06 OF THE *EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL REGARDING SMALL PARCEL KEN 3005

We, the undersigned, duly authorized members of the *Exxon Valdez* Oil Spill Trustee Council ("Trustee Council"), after review and consideration of relevant information regarding restoration of resources injured by the *Exxon Valdez* Oil Spill ("EVOS") find as follows:

1. The owner of small parcel KEN 3005 has indicated an interest in selling said parcel.

2. An appraisal of the parcel approved by the state review appraiser determined that the fair market value of the parcel is $45,000.

3. As set forth in Attachment A, if acquired, this small parcel has attributes which will restore, replace, enhance and rehabilitate injured natural resources and the services provided by those natural resources, including important habitat for several species of fish and wildlife for which significant injury resulting from the spill has been documented. Acquisition of this parcel will protect approximately 227 linear feet of shoreline and an additional 200 feet of freshwater lake frontage. The parcel also provides important access to Safety Cove State Marine Park.

4. Existing laws and regulations, including but not limited to the Alaska Forest Practices Act, the Alaska Anadromous Fish Protection Act, the Clean Water Act, the Alaska Coastal Management Act, the Bald Eagle Protection Act and the Marine Mammal Protection Act, are intended, under normal circumstances, to protect resources from serious adverse effects from activities on the lands. However, restoration, replacement and enhancement of resources injured by the *Exxon Valdez* oil spill ("EVOS") present a unique situation. Without passing judgment on the adequacy or inadequacy of existing law and regulations to protect resources, scientists and other resource specialists agree that, in their best professional judgment, protection of habitat in the spill area to levels above and beyond that provided by existing laws and regulations will have a beneficial effect on recovery of injured resources and lost or diminished services provided by these resources.

5. There has been widespread public support within Alaska as well as on a national basis, for the acquisition of lands.

6. The purchase of small parcels is an appropriate means to restore a portion of the injured resources and services in the oil spill area.

7. The purchase of this parcel is an appropriate means to restore a portion of the injured resources and services in the oil spill area. Acquisition of this parcel is consistent with the Final Restoration Plan.

THEREFORE, we resolve to provide funds for the State of Alaska to purchase all the seller's rights and interests in small parcel KEN 3005 as recommended by the Executive Director of the Trustee Council ("Executive Director"), and pursuant to the following conditions:

(a) the amount of funds (hereinafter referred to as the "Purchase Price") to be provided by the Trustee Council to the State of Alaska shall be forty five thousand dollars ($45,000) for small parcel KEN 3005;

(b) authorization for funding for any acquisition described in the foregoing paragraph shall terminate if a purchase agreement is not executed by June 30, 2010;

(c) filing by the United States Department of Justice and the Alaska Department of Law of a notice, as required by the Third Amended Order for Deposit and Transfer of Settlement Proceeds, of the proposed expenditure with the United States District Court for the District of Alaska and with the Investment Fund established by the Trustee Council within the Alaska Department of Revenue, Division of the Treasury ("Investment Fund"), and transfer of the necessary monies from the Investment Fund to the State of Alaska Department of Natural Resources;

(d) a title search satisfactory to the State of Alaska and the United States is completed, and the seller is willing and able to convey fee simple title by warranty deed;

(e) no timber harvesting, road development or any alteration of the land will be initiated on the land without the express agreement of the State of Alaska and the United States prior to purchase of this parcel;

(f) a hazardous materials survey satisfactory to the State of Alaska and United States is completed;

(g) compliance with the National Environmental Policy Act; and

(h) a conservation easement on parcel KEN 3005 shall be conveyed to the United States which must be satisfactory in form and substance to the United States and the State of Alaska Department of Law.

It is the intent of the Trustee Council that the above-referenced conservation easement will provide that any facilities or other development on the foregoing small parcel shall be of limited impact and in keeping with the goals of restoration, that there shall be no commercial use except as may be consistent with applicable state or federal law and the goals of restoration to prespill conditions of any natural resource injured, lost, or destroyed as a result of the EVOS, and the services provided by that resource or replacement or substitution for the injured, lost or destroyed resources and affected services, as described in the Memorandum of Agreement and Consent Decree between the United States and the State of Alaska entered August 28, 1991 and the Restoration Plan as approved by the Trustee Council.

By unanimous consent, following execution of the purchase agreement between the seller and the State of Alaska and written notice from the Executive Director that the terms and conditions set forth herein and in the purchase agreement have been satisfied, we request the Alaska Department of Law and the Assistant Attorney General of the Environment and Natural Resources Division of the United States Department of Justice to take such steps as may be necessary for withdrawal of the Purchase Price for the above-referenced parcel from the appropriate account designated by the Executive Director.

Such amount represents the only amount due under this resolution to the sellers by the State of Alaska to be funded from the joint settlement funds, and no additional amounts or interest are herein authorized to be paid to the sellers from such joint funds.

Approved by the Council at its meeting of May 29, 2009, held in Anchorage, Alaska, as affirmed by our signatures affixed below.

JOE L. MEADE
Forest Supervisor
Forest Service Alaska Region
U.S. Department of Agriculture

RICHARD SVOBODNY
Acting Attorney General
State of Alaska

KIM ELTON
Senior Advisor to the Secretary
for Alaska Affairs
U.S. Department of Interior
U.S. Department of Commerce

CRAIG R. O'CONNOR
Special Counsel
National Oceanic & Atmospheric Administration

DENBY S. LLOYD
Commissioner
Alaska Department of Fish and Game

LARRY HARTIG
Commissioner
Alaska Department of Environmental Conservation

Attachment A - Restoration Benefits Report and Map

English Bay

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, AK 99501-2340 • 907 278 8012 • fax 907 276 7178

MEMORANDUM

TO: Trustee Council, Liaisons and Counsel

FROM: Elise Hsieh
Interim Executive Director

DATE: May 18, 2009

SUBJECT: Restoration of funds intended for purchase of English Bay Corporation lands by the Department of the Interior pursuant to 1997 Trustee Council resolution

Background:

At its February 14, 1997 meeting, the Trustee Council voted to expend $14,100,000 for the purchase of 32,470 acres of land within the Kenai Fjords National Park and islands within the Alaska Maritime National Wildlife Refuge adjacent to the Park, the surface estate of which had been conveyed or was to be conveyed to the English Bay Corporation under the Alaska Native Claims Settlement Act (ANCSA). The resolution confirming this vote states that the purchase price was adjustable up or down in accordance with the actual acreage ultimately conveyed to the Corporation (at a rate of $418.6433 per acre).

On May 20, 1997, the United States Department of the Interior, pursuant to the Trustee Council's February 14, 1997 resolution, signed a purchase agreement to acquire 32,537 acres of land from the English Bay Corporation for a total price of $15,371,420.22. Of this amount, $1,243,346 was to be paid by the United States from another source, namely the restitution funds obtained pursuant to the settlement of the United States' criminal case against Exxon Corp.; the remaining $14,128,074.22 was to be paid from the civil settlement monies administered by the Trustee Council.

On September 3, 1997, the EVOSTC Executive Director Molly McCammon, notified the United States Department of Justice and the Alaska Department of that all of the terms and conditions in the Trustee Council's 1997 resolution had been satisfied. She requested they

seek from the federal district court a disbursement of funds from the Court Registry Investment System (where the monies were invested at that time) in the amount of $14,128,074.22. That amount was disbursed to the United States Department of the Interior under an order dated September 5, 1997 and deposited in the Natural Resource Damage Assessment and Restoration Fund (NRDA-R Fund). This Fund is administered by the Office of the Secretary.

As conveyance of the ANCSA lands to the English Bay Corporation proceeded, monies were provided from the NRDA-R Fund to the National Park Service (NPS) to carry out the purchase agreement in staged closings. At this point in time, NPS has acquired 31,531.79 acres in two previous closings. The third and final closing (on some 843 acres) will immediately follow the conveyance of English Bay's final ANCSA selections in this transaction, expected in July or August of this year. The costs for this third closing are anticipated at $398,000, including land cost, title insurance, and the performance of due diligence. There are already $56,254 in available funds designated for this purchase from the Restitution Funds held by the Federal Government. The remaining amount, needed from the funds approved in 1997 by the Council, is $341,746.

Due to a change of NRDA-R Fund staff and a misunderstanding in 2002-2003 about the character of inactive English Bay balances residing in the NRDA-R Fund, the monies remaining at that time for use in carrying out the purchase agreement with the English Bay Corporation were used instead to fund a portion of Phase I of the Trustee Council's FY03 Work Plan. A January 9, 2003 report to the Trustee Council's Executive Director indicating that $1,239,036 was "available" from the NRDA-R Fund had mistakenly included in that figure (in addition to lapsed and returned funds and interest earned) $414,430 in funds that were intended for the United States' remaining obligations under the purchase agreement with the English Bay Corporation. That $414,430 instead became part of the $1,055,700 in existing funds that was used to fund the federal portion of Phase I of the FY '03 Work Plan. Because that $414,430 should have come instead from the Investment Fund, the Department of the Interior seeks to have those monies restored to its NRDA-R Fund in order to complete the final phase of the English Bay acquisition.

Recommendation: Approve the transfer of $341,746 from the Research Investment subaccount of the *Exxon Valdez* Oil Spill Investment Fund, administered by the Alaska Department of Revenue, to the Department of the Interior for the purpose of restoring the habitat funds originally set aside for the purchase of those lands identified in the Trustee Council's February 14, 1997 resolution and in the purchase agreement between the United States Department of the Interior and the English Bay Corporation dated May 20, 1997.

DRAFT 5/20/09

RESOLUTION 09-07 OF THE *EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL REGARDING RESTORATION OF FUNDS INTENDED FOR PURCHASE OF ENGLISH BAY CORPORATION LANDS BY U.S. DEPARTMENT OF THE INTERIOR PURSUANT TO THE 1997 TRUSTEE COUNCIL RESOLUTION

We, the undersigned, duly authorized members of the *Exxon Valdez* Oil Spill Trustee Council do hereby certify that, in accordance with the Memorandum of Agreement and Consent Decree entered as settlement of United States of America v. State of Alaska, No. A91-081 Civil, U.S. District Court for the District of Alaska, and after public meetings, unanimous agreement has been reached to expend funds received in settlement of State of Alaska v. Exxon Corporation, et al., No. A91-083 CIV, and United States of America v. Exxon Corporation, et al., No. A91-082 CIV, U.S. District Court for the District of Alaska, for necessary Natural Resource Damage Assessment and Restoration activities for fiscal year 2009, as described in Attachment A.

This Resolution authorizes the transfer of $341,746 from the Research Investment subaccount of the *Exxon Valdez* Oil Spill Investment Fund, administered by the Alaska Department of Revenue, to the Department of the Interior for the purpose of restoring the habitat funds originally set aside for the purchase of those lands identified in the Trustee Council's February 14, 1997 resolution and in the purchase agreement between the United States Department of the Interior and the English Bay Corporation dated May 20, 1997.

Department of the Interior, National Park Service	$341,746
TOTAL APPROVED FOR DISTRIBUTION	**$341,746**

By unanimous consent, we hereby request the Alaska Department of Law and the Assistant Attorney General of the Environmental and Natural Resources Division of the United States Department of Justice to take such steps as may be necessary to make funds available in the amount of $341,746 from the appropriate account as designated by the Executive Director.

Approved by the Council at its meeting of May 29, 2009, held in Anchorage, Alaska, as affirmed by our signatures affixed below.

JOE L. MEADE
Forest Supervisor
Forest Service Alaska Region
U.S. Department of Agriculture

RICHARD SVOBODNY
Acting Attorney General
State of Alaska

KIM ELTON
Senior Advisor to the Secretary
for Alaska Affairs
U.S. Department of Interior

CRAIG R. O'CONNOR
Special Counsel
National Oceanic & Atmospheric
Administration
U.S. Department of Commerce

DENBY S. LLOYD
Commissioner
Alaska Department of Fish and Game

LARRY HARTIG
Commissioner
Alaska Department of Environmental
Conservation

Attachment A: Memo Dated May 18, 2009, to EVOS Trustee Council, Liaisons, and Counsel from Elise Hsieh, EVOS Executive Director

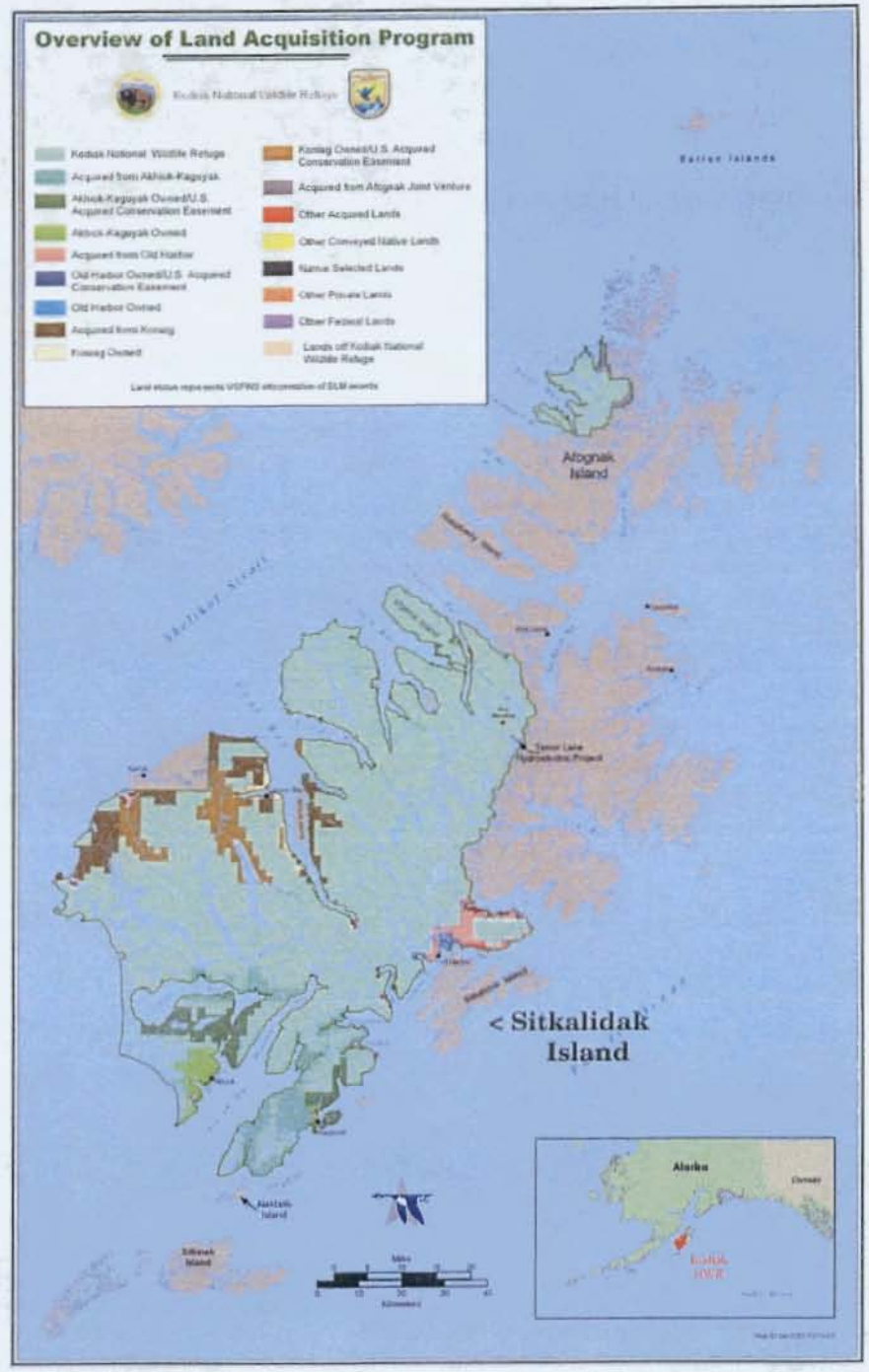
Sitkalidik Island

Sitkalidak Island Habitat Conservation Project

Overview

- Location of Sitkalidak Island in the Kodiak Archipelago
- Map of Sitkalidak Island (adjacent to the KNWR and AMNWR)
- Resources and Services
- Link to Injury
- Unique Opportunity to Conserve 87,000 acres of Fish and Wildlife Habitat
- Unparalleled Large Parcel
- Of Cultural Importance
- People of Alutiiq Village of Old Harbor

The Kodiak Archipelago



Sitkalidak Island totals 87,391 acres or 136.5 square miles; is separated from Kodiak Island by narrow Sitkalidak Strait; located astride the richest known marine habitat in the Gulf of Alaska

Links to Injured Resources and Services

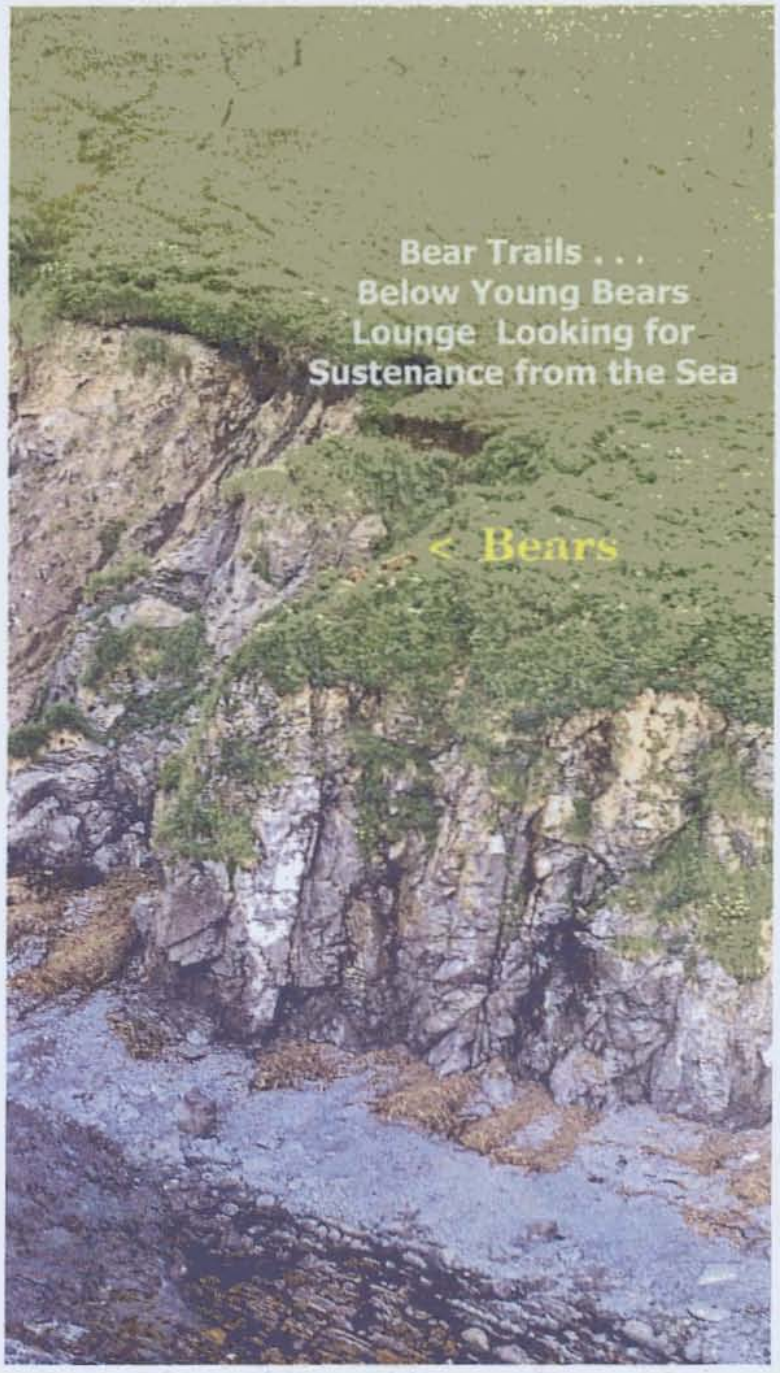
- Fifteen (15) of the species and human services injured by the Exxon Valdez oil spill that are not recovering, recovering, or recovery unknown occur on or are affected by Sitkalidak Island or its nearshore waters.

- Species already recovered live there too in pristine habitat providing a 'natural biological bank' against future crises or oil spills, including bald eagle, common murre, river otter, sea otter, pink and sockeye salmon

Uniquely abundant benthic organisms and plankton collecting on the east side of Kodiak Island occur in densities that attract predators of all kinds, from insects to whales, to bears . . . the whole food chain

Island is especially rich in the following:

- Cultural resources
- Sea birds
- Intertidal/subtidal biota
- Herring
- Rockfish
- Clams
- Harbor seals
- Subsistence
- Wilderness (Passive Use)



Sea Bird Abundance

Ornithologists have long studied Kodiak's seabirds. There are 350,000 colonial nesters and 1.5 million overwintering birds;

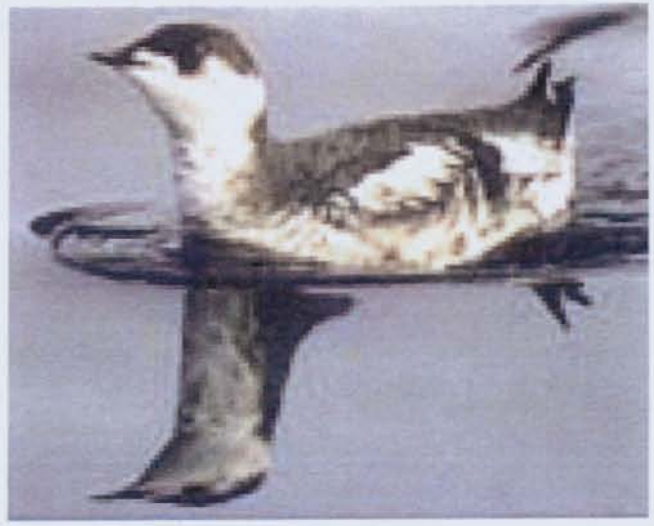
Sitkalidak Island's shallow protected bays host large flocks of birds because of high concentrations of forage fish ;

The largest flock of common murres ever recorded was in the east arm of Sitkalidak Strait

Sitkalidak Island has one of Kodiak Island's highest densities of harlequin ducks

Cathedral Island in Sitkalidak Strait has Kodiak's largest puffin colony

(an indicator of forage food abundance)



Intertidal Subtidal Biotic Richness

- With nearly 100 miles of irregular coastline located adjacent to the Albatross Bank in the Gulf of Alaska, Sitkalidak Island and its narrow straits acts as an ideal 'food trap,' funneling, collecting and storing biotic organisms in numerous bays, inlets and lagoons.
- Gulf of Alaska and Pacific Ocean currents provide a continual flow of marine life to the island.

Sitkalidak Island is an Alaskan Native Cultural Heritage Treasure

- The island's ecosystem that attracts a full spectrum of natural predators plus a mild climate and favorable topography drew Alaska's largest aboriginal population which created the Ocean Bay Culture.
- The Smithsonian Institute and the Alutiiq Museum have documented 75 village sites on the island dating from back 7,500 years. The Sugpiak eskimo people who settled Prince William Sound derive from Sitkalidak Island.

Seal Oil Lamp

Alutiiq Masks of the Kodiak Archipelago

Herring, Rockfish, Clams

- Pacific herring around Sitkalidak Island are among the highest spawning populations in the Kodiak Archipelago (ADFG)
- Rockfish abound in Sitkalidak Island's rocky structures and kelp beds that provide ideal habitat for this species.
- Sitkalidak Island supports two of Kodiak Archipelago's eleven mapped clam beaches

Russian Colonization & America's Whale Fishery Center on Sitkalidak Island

Refuge Rock

Site of artillery shelling of Alutiiq women and children sheltered on this escarpment for their safety in August 1784.

Port Hobron

One of the last Whaling Stations on American soil.

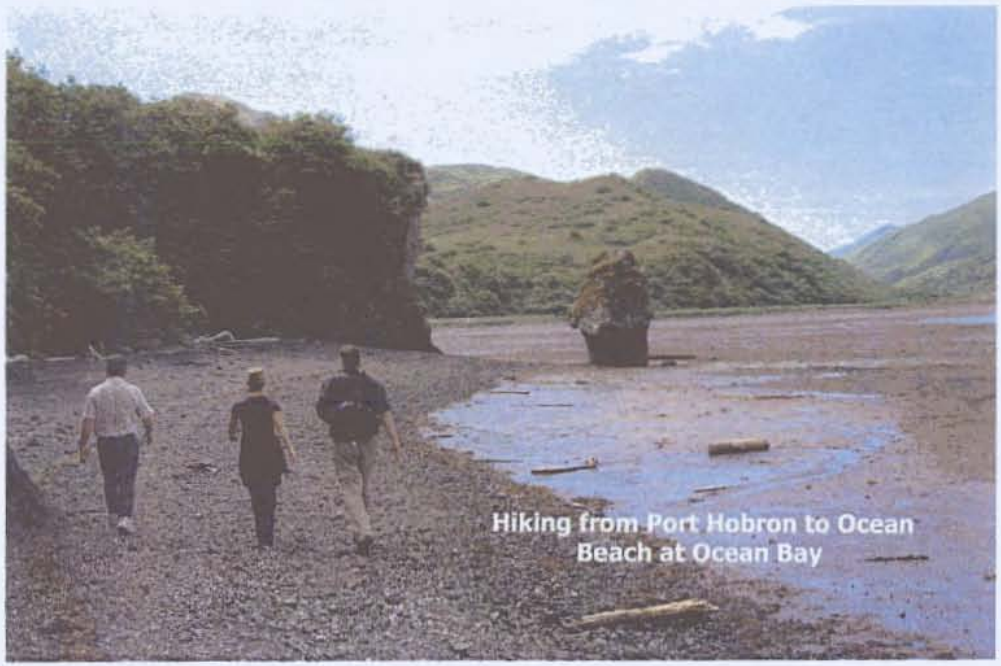
Harbor Seals

- There are several harbor seal haulouts around Sitkalidak Island including Cape Barnabas, Seal Bay, and Table Island. The typical haulout size ranges from 12 to 120 seals "making the area extraordinary" (K. Wynn, NMFS)
- One NMFS survey found 288 harbor seals on nearby Puffin Island (attesting to the biological richness of the area waters).

Subsistence

- The Alutiiq village of Old Harbor has a heavy and historic reliance upon subsistence. Much of that subsistence harvesting takes place on Sitkalidak Island or in its nearshore waters.
- Household subsistence intake of usable weight per capita was 491.1 pounds before the oil spill.
- Every household in Old Harbor uses at least one subsistence resource: each household uses on average 20.1 resources.

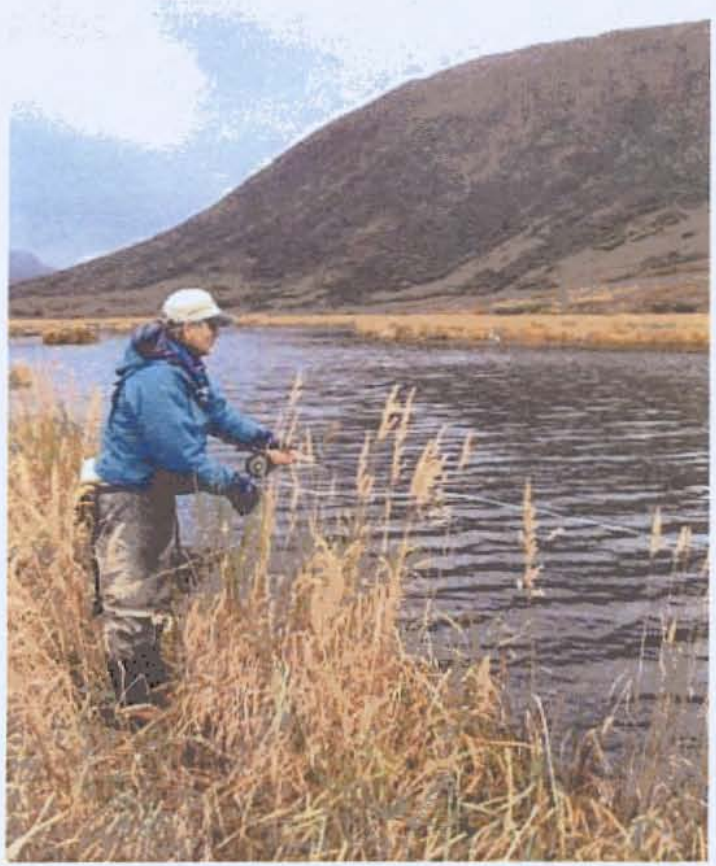
View of Sitkalidak Island from Old Harbor



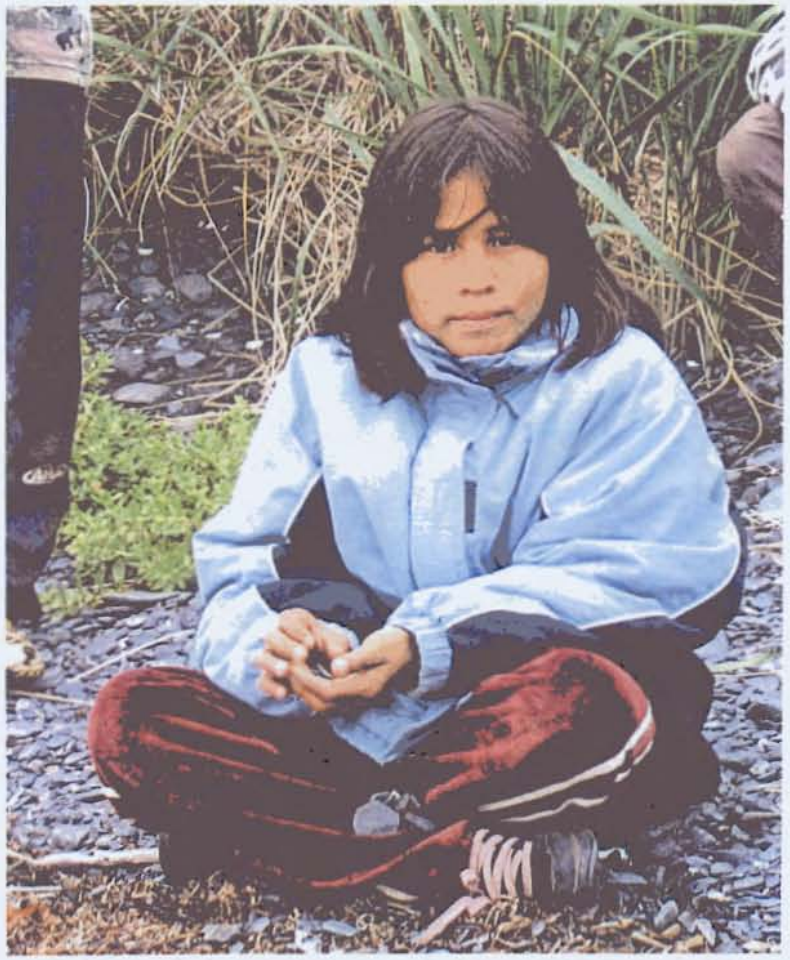
Hiking from Port Hobron to Ocean Beach at Ocean Bay

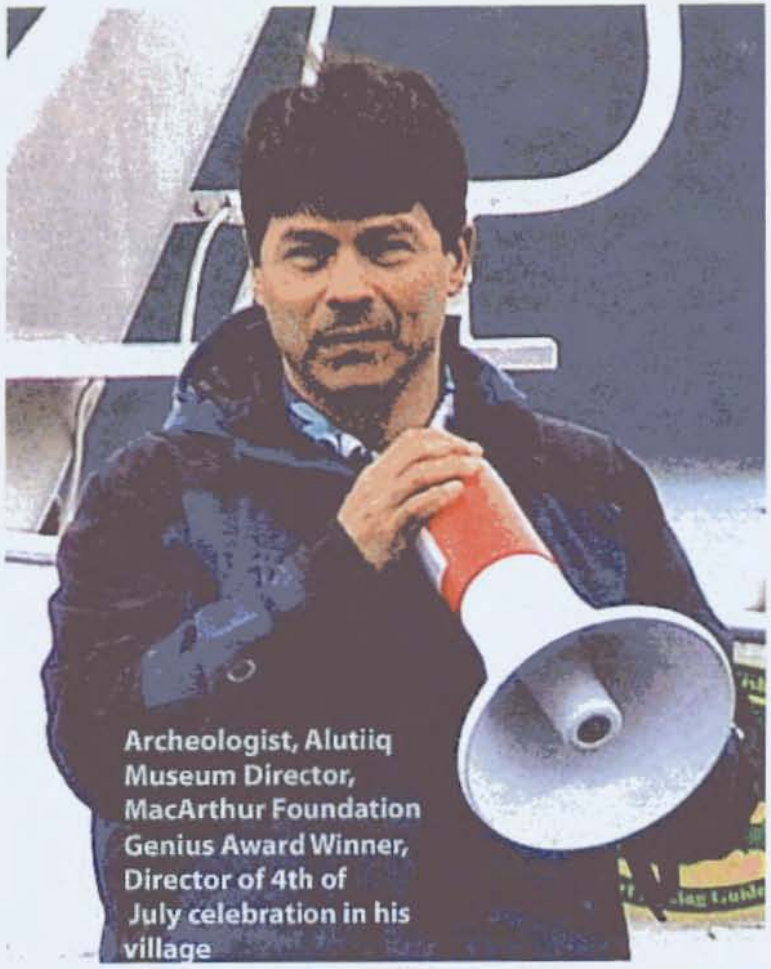
Recreation/Tourism:

Sport Fishing, Hiking, Hunting, Camping, Birding, Cultural Interpretation, Canoeing, Kayaking



The Alutiiq People of Old Harbor

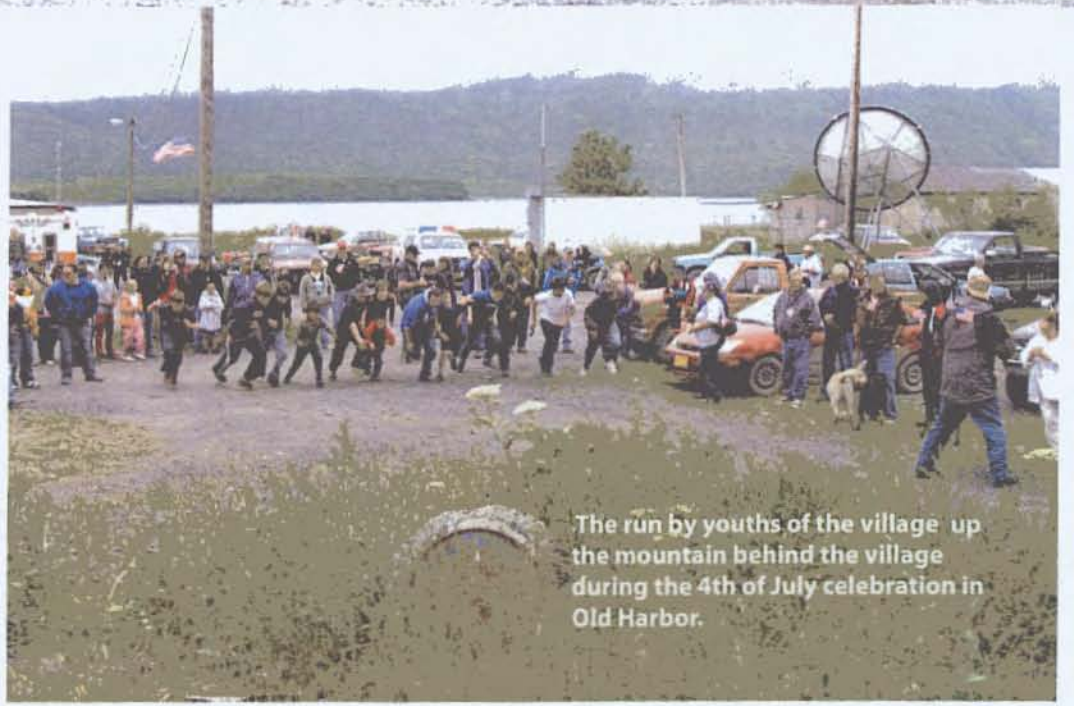




Archeologist, Alutiiq Museum Director, MacArthur Foundation Genius Award Winner, Director of 4th of July celebration in his village

Old Harbor Alutiiq Dancers during Fourth of July Celebration in Village

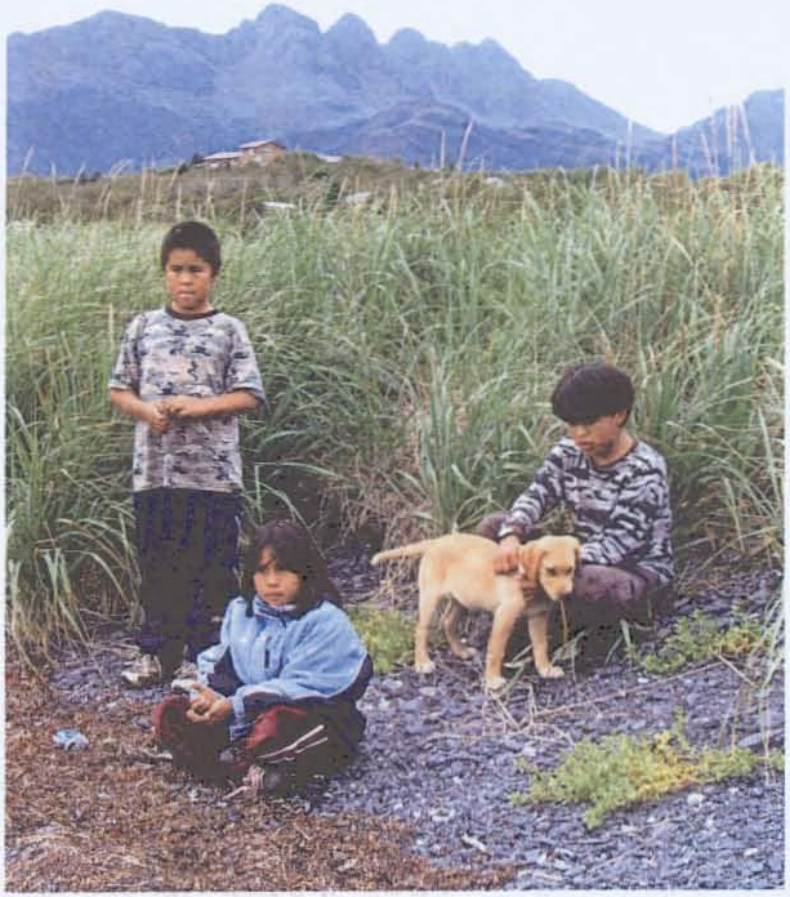
Annual run by Old Harbor youths up the mountain behind the Village on 4th of July



The run by youths of the village up the mountain behind the village during the 4th of July celebration in Old Harbor.

All Who Wish to Box Do So on Fourth of July Celebration Day in Old Harbor

The Future Leaders of the Village



People of Old Harbor


Fox Lagoon

Sitkalidik Island – Old Harbor Native Corporation

Parcel Name	Sitkalidak Island
Parcel Owner	Old Harbor Native Corporation
Physical Location	Sitkalidak Island, Alaska
Acreage	approximately 73,454 acres
Legal Description	Parcel under consideration includes the surface estate of Sitkalidik Island with the exception of native allotments.
Sponsoring Agency	U.S. Fish and Wildlife Service Contact: Danielle Jerry, Chief, Division of Realty and Natural Resources Phone: (907) 786-3335

Description of Parcel:

Sitkalidak Island (Sitkalidak), the third largest island in the Kodiak Archipelago, is surrounded by numerous small islands, rocks, spires, and islets. A majority of Sitkalidak's 73,454 acres are mountainous, with some meadows, wetlands, beaches, and almost 100 miles of pristine shoreline. Sixteen streams support anadromous fish including annual returns of tens of thousands of salmon. Sitkalidak is recognized as a world-class cultural treasure with human use dating back more than 7,500 years. It is from this cultural oasis that the majority of the aboriginal people of the EVOS region descend. It is estimated that there were 75 separate village sites on Sitkalidak which supported the largest aboriginal population in what is today Alaska compared to any similarly sized area in Alaska. Sitkalidak also contains the seamount called "Refuge Rock" or *Awa'uq* in Alutiiq which means 'to be numb.' This promontory islet was the scene of an historic massacre of Alutiiq Natives, mostly women and children, in 1784 by cannon and musket-bearing Russian forces commanded by Gregory Shelikof. This brutal act was aimed at subjugating all Alutiiq people in the region.

Currently, the people of Old Harbor and their guests utilize Sitkalidak Island for subsistence hunting, fishing, and gathering. The village of Old Harbor is recognized as a community with a heavy historic and current reliance upon subsistence resources and much of that subsistence harvesting activity occurs on Sitkalidak Island or in its nearshore waters. Several lodges in Old Harbor take their sport hunting and fishing clients to the Island to hunt and fish, and big game guides operating on the Island provide opportunities for their clients to take bear and deer.

The island is also a place of special cultural meaning and sustenance given that (1) the ancestors from the Ocean Bay culture forward have made use of the resources of the island for cultural purposes and that (2) it is the site of Refuge Rock, the scene of a tragic episode in the history of the Alutiiq people in the area. It is anticipated that over time, cultural tour guiding could become a popular addition on the island to the more conventional ecotourism.

Ranching, recreation, and development of hunting and fishing lodges are potential threats to the natural ecosystem of Sitkalidak. Increasing economic hardship could pressure the Board of Directors of the Old Harbor Native Corporation to sell Sitkalidak in small or large parcels. Prior to the late 1970's there was an active cattle ranch on Sitkalidak. The caretaker aggressively eliminated many of the brown bears he encountered which kept the bear population at a low level. Cattle and bison, which are currently ranched on Kodiak, have the potential to greatly diminish the forage available to deer and brown bear, and their trails could lead to substantial soil erosion. Possibly the greatest potential threat would be remote recreational parcels on which one or more cabins could be built. Owners would be expected to occupy these facilities seasonally and engage in hunting and fishing activities. Another potential use is the development of hunting and fishing lodges. In any case, increased pressures would be placed on the wildlife and fisheries resources of the area which would compete with the subsistence lifestyle of Old Harbor residents. Also, the presence of humans or domestic animals on Sitkalidak could discourage use by disturbance sensitive species such as harbor seals and sea birds, and could degrade water quality and spawning gravels used by thousands of salmon.

Background:

In 1995, the United States purchased approximately 28,069 acres of land from Old Harbor Native Corporation. These lands became part of the Alaska Maritime and Kodiak National Wildlife Refuges. In the 1995 Agreement between OHNC and the United States, OHNC expressed their intent to preserve Sitkalidak Island's productive and biologically diverse ecosystem through conveying a conservation easement to an appropriate entity. In 2008 OHNC renewed discussions with the Service in an attempt to restart the process leading to protection of their lands on the Island. On January 13, 2009, OHNC sent a letter and briefing package to the Regional Director asking the Service if it is willing to serve as the sponsoring agency on the EVOS Parcel Nomination form to be presented to the Trustee Council. On January 15, 2009, the Regional Director signed a letter of support indicating that the Service would agree to serve as the sponsoring agency for this potential easement.

Resource Values/Linkages to Restoration:

Fifteen of the species and human services injured by the oil spill, status of which have been determined by the Trustee Council to be either "not recovering," "recovering," or "recovery unknown" occur on or are affected by Sitkalidak Island or its nearshore waters. This includes both of the EVOS injured species identified as "Not Recovering" - Pacific herring and pigeon guillemot. This includes three of the five species identified as "Recovery Unknown" – Kittlitz's murrelet, marbled murrelet, and subtidal communities. And this includes ten of fourteen species or human services identified as "Recovering" – clams, intertidal communities, mussels, sea otters, harlequin duck, Barrows Goldeneye, commercial fishing, recreation, passive uses, and subsistence. Sitkalidak is linked to the following additional species identified as "Recovered" but that will be at risk should another catastrophic spill occur – bald eagles, common murres, pink salmon, sockeye salmon, harbor seal, common loon, and cormorant.

Sitkalidak Island is recognized in the scientific literature as unique and ecologically significant because of its location on the east side of the Kodiak Archipelago adjacent to the upwelling currents from the Gulf of Alaska. Sitkalidak's asymmetrical shape is ideal for trapping plankton and a funneling effect on prey species in the marine food chain. Sitkalidak's irregular shape characterized by jutting capes and deeply indented shallow bays, and the presence of Sitkalidak Strait, provide optimum fish and wildlife habitat and make it part of a uniquely productive maritime ecosystem in the Gulf of Alaska.

The habitats/sites/species on Sitkalidak are integrally connected to other habitats in the greater Kodiak Archipelago, Barren Islands, Alaska Peninsula, Cook Inlet, and beyond since all the fish and wildlife species in the area freely migrate back and forth to feed and breed within this greater ecosystem. Consequently, loss of habitat and wildlife populations on Sitkalidak is also a loss to the Northern Gulf of Alaska ecosystem.

Sitkalidak and its surrounding waters are located in a highly productive region in the northern Gulf of Alaska benefiting from upwelling currents its asymmetrical shape. Among the resources found in exceptional quality and quantity include Pacific herring, intertidal and subtidal communities, pigeon guillemot, harlequin ducks, rockfish and harbor seals. Sitkalidak has one of the highest densities of harlequin ducks in the Kodiak Archipelago, over 10 birds per kilometer of shoreline, and over twice the density of Uyak and Uganik Bays on the west side of Kodiak. The density of cormorants, a fish eating seabird, near Sitkalidak is also nearly twice that of Uyak and Uganik Bays. Sitkalidak also has one of the highest populations of spawning herring in the Kodiak Archipelago, and it provides excellent habitat for brown bear and deer. Observations of brown bear numbers on Sitkalidak by Alaska Department of Fish and Game personnel indicate that densities are among the highest reported in the Kodiak Archipelago. Preliminary data from a 2008 radio telemetry study show that adult female bears on Sitkalidak have very small home ranges. This appears to indicate that food resources are varied and plentiful, they are able to satisfy all their needs on Sitkalidak, and most are using specific drainages or ridges. Data from 2002-06 indicate an average annual harvest of 18 bears and 150 deer.

All of the fish and wildlife resources and sites on Sitkalidak are present in a pristine natural condition, and all are vulnerable to disturbance or habitat loss. Cultural sites are subject to looting. Currently these lands and resources are protected only by private, Native corporation ownership. Additionally, there is one small privately owned parcel at the former whaling station and at the McCord ranch at Port Hobron, several allotments in private ownership, and several allotments owned by OHNC. Should the land be subdivided and sold, attractive parcels would likely be located in prime coastal habitats. Lands could be degraded by overuse, and the area's fish and wildlife species harmed if a parcel is developed with a lodge beyond an appropriate carrying capacity for the island and/or by the distribution of home sites to shareholders, or the subdivision of the island for development purposes. While it is not pleasant to contemplate such scenarios, they reflect reality since they have occurred elsewhere on Kodiak. It appears that the OHNC acting alone will be less effective in protecting these lands and their natural and cultural

resources than if such protection were achieved through cooperative efforts, including the perpetual protection under state and federal laws brought to bear through restrictive covenants in a conservation easement.
Acquisition of a conservation easement on Sitkalidak Island will allow for perpetual stewardship and protection of injured resources and/or services on the Island. Included in the conservation easement would be the binding commitment to conserve the natural and cultural resources of the island. Expertise of the Service and the State of Alaska would likely be brought to bear in managing the fish and wildlife resources of the Island. Such coordination and cooperation would help ensure that the resources of the Island are healthy and sustainable. Ensuring that such a large, biologically productive and important block of habitat is protected and wisely managed over the long term will help ensure that species injured by the EVOS continue to recover and remain healthy.

The conservation of Sitkalidak Island would reinforce historic conservation practices toward land, water, and other natural resources in this highly productive ecosystem. The conservation of the fish and wildlife resources of the Island would protect subsistence opportunities that would reinforce the continuation of intergenerational practices that form the basis of cultural survival of the Alutiiq people for over 7,500 years. The value of a conserved ecosystem with this degree of biological abundance, diversity, and productivity will provide a natural resource based infrastructure to help sustain a local economy. This local economy will include commercial fisheries, local sport hunting and fishing guides, and local lodges. The American public will benefit from the improved integrity of the Kodiak and the Alaska Maritime National Wildlife Refuges and the resources that they steward. All of these benefits would represent a legacy of achievement for the EVOS restoration plan and perpetually provide benefits to the public, the economy of the region, and to the resources themselves.

Describe Proposed Management:

The Fish and Wildlife Service, Kodiak National Wildlife Refuge, intends to manage the parcel to conserve the fish and wildlife resources and their habitats in their natural diversity for the benefit of current and future generations including providing the opportunity for continued subsistence uses by local residents.

Current Status of effort:

In the 1995 Agreement for the Sale, Purchase and Donation of Lands and Interests in Lands Between Old Harbor Native Corporation and the United States of America, OHNC expressed their intent to preserve Sitkalidak Island's productive and biologically diverse ecosystem through conveying a conservation easement to an appropriate entity. In 2008 OHNC renewed discussions with the Service in an attempt to restart the process leading to protection of their lands on the Island. The Service has met with representatives of OHNC and their consultants to discuss what might be included in a conservation easement on the parcel.

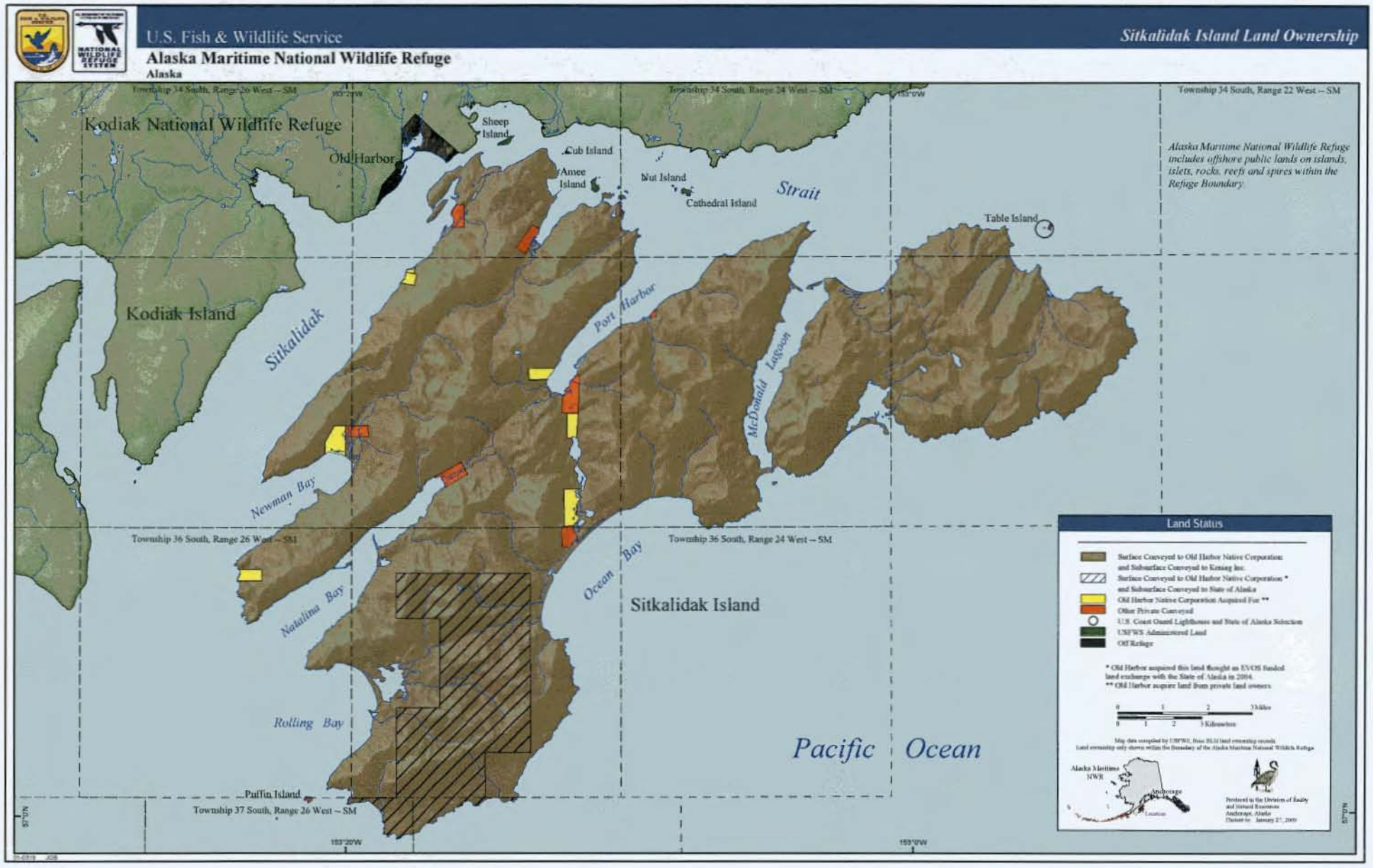
Requested Action:
The USFWS requests funding and authorization to proceed with an appraisal, preliminary discussions with the landowner and other necessary due diligence activities in the amount of $212,550 to conduct due diligence activities included in the proposed budget.

Proposed Budget

Appraisal	$50,000
Title Insurance	$50,000
Closing fees	$70,000
USFWS due diligence Costs including a Level 1 Environmental Site Assessment and site inspection.	$25,000
Sub Total:	$195,000
G&A	$17,550
Total	**$212,550**

Total Funds requested: $212,550

Attachments:
- Site map of the subject parcel.
- Draft Resolution


U.S. Fish & Wildlife Service
Alaska Maritime National Wildlife Refuge
Alaska
Sitkalidak Island Land Ownership
Township 34 South, Range 26 West – SM
Township 34 South, Range 24 West – SM
Township 34 South, Range 22 West – SM
Kodiak National Wildlife Refuge
Old Harbor
Sheep Island
Cub Island
Amee Island
Nut Island
Cathedral Island
Strait
Table Island
Alaska Maritime National Wildlife Refuge includes offshore public lands on islands, islets, rocks, reefs and spires within the Refuge Boundary.
Kodiak Island
Sitkalidak
Port Harbor
McDonald Lagoon
Newman Bay
Township 36 South, Range 26 West – SM
Township 36 South, Range 24 West – SM
Ocean Bay
Natalima Bay
Sitkalidak Island
Rolling Bay
Pacific Ocean
Puffin Island
Township 37 South, Range 26 West – SM
57°0'N
153°20'W
153°0'W
Land Status
Surface Conveyed to Old Harbor Native Corporation and Subsurface Conveyed to Koniag Inc.
Surface Conveyed to Old Harbor Native Corporation * and Subsurface Conveyed to State of Alaska
Old Harbor Native Corporation Acquired Fee **
Other Private Conveyed
U.S. Coast Guard Lighthouse and State of Alaska Selection
USFWS Administered Land
Old Refuge
* Old Harbor acquired this land through an EVOS funded land exchange with the State of Alaska in 2004.
** Old Harbor acquire land from private land owners.
0 1 2 3 Miles
0 1 2 3 Kilometers
Alaska Maritime NWR
Anchorage
Produced in the Division of Realty and Natural Resources Anchorage, Alaska Dated to: January 27, 2010

DRAFT 5/20/09

RESOLUTION 09-08 OF THE *EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL REGARDING SITKALIDIK ISLAND HABITAT PROTECTION

We, the undersigned, duly authorized members of the *Exxon Valdez* Oil Spill Trustee Council do hereby certify that, in accordance with the Memorandum of Agreement and Consent Decree entered as settlement of United States of America v. State of Alaska, No. A91-081 Civil, U.S. District Court for the District of Alaska, and after public meetings, unanimous agreement has been reached to expend funds received in settlement of State of Alaska v. Exxon Corporation, et al., No. A91-083 CIV, and United States of America v. Exxon Corporation, et al., No. A91-082 CIV, U.S. District Court for the District of Alaska, for necessary Natural Resource Damage Assessment and Restoration activities for fiscal year 2009, as described in Attachment A.

This resolution authorizes the distribution of $212,550 of FY 09 funding for due diligence expenses consistent with Trustee Council requirements in support of Sitkalidik Island Habitat Protection Efforts, as described in Attachment A, to be distributed according to the following schedule:

Department of the Interior, US Fish and Wildlife Service	$212,550
TOTAL APPROVED FOR DISTRIBUTION	**$212,550**

Authorization of the approved funding shall run from June 1, 2009 to September 30, 2010.

By unanimous consent, we hereby request the Alaska Department of Law and the Assistant Attorney General of the Environmental and Natural Resources Division of the United States Department of Justice to take such steps as may be necessary to make funds available in the amount of $212,550 from the appropriate account as designated by the Executive Director.

Approved by the Council at its meeting of May 29, 2009, held in Anchorage, Alaska, as affirmed by our signatures affixed below:

JOE L. MEADE
Forest Supervisor
Forest Service Alaska Region
U.S. Department of Agriculture

RICHARD SVOBODNY
Acting Attorney General
State of Alaska

KIM ELTON
Senior Advisor to the Secretary
for Alaska Affairs
U.S. Department of Interior

CRAIG R. O'CONNOR
Special Counsel
National Oceanic & Atmospheric
Administration
U.S. Department of Commerce

DENBY S. LLOYD
Commissioner
Alaska Department of Fish and Game

LARRY HARTIG
Commissioner
Alaska Department of
Environmental Conservation

Attachment A – Restoration Benefits Report and Map

DRAFT 5/22/09

RESOLUTION 09-05 OF THE *EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL REGARDING CYP1A1 GENE EXPRESSION VERIFICATION STUDY – RE-EVALUATION OF SEA OTTER SAMPLES FROM THE *EXXON VALDEZ* OIL SPILL

We, the undersigned, duly authorized members of the *Exxon Valdez* Oil Spill Trustee Council do hereby certify that, in accordance with the Memorandum of Agreement and Consent Decree entered as settlement of United States of America v. State of Alaska, No. A91-081 Civil, U.S. District Court for the District of Alaska, and after public meetings, unanimous agreement has been reached to expend funds received in settlement of State of Alaska v. Exxon Corporation, et al., No. A91-083 CIV, and United States of America v. Exxon Corporation, et al., No. A91-082 CIV, U.S. District Court for the District of Alaska, for necessary natural resource damage assessment and restoration activities in the amount of $205,735 for fiscal years 2009, 2010, and 2011, as described in Attachment A. The monies are to be distributed according to the following schedule:

	FY2009	FY2010	FY2011	Project Total
U.S. Geological Survey	$75,540	$116,959	$13,236	$205,735
TOTAL TO UNITED STATES OF AMERICA	$75,540	$116,959	$13,236	$205,735
TOTAL APPROVED	$75,540	$116,959	$13,236	$205,735

Funds shall be spent in accordance with Attachment A.

By unanimous consent, we hereby request the Alaska Department of Law and the Assistant Attorney General of the Environmental and Natural Resources Division of the United States Department of Justice to take such steps as may be necessary to make available funds for Miles Project 090841, CYP1A1 Gene Expression Verification Study – Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill from the appropriate account designated by the Executive Director.

Approved by the Council at its meeting of May 29, 2009 held in Anchorage, Alaska as affirmed by our signatures affixed below.

JOE L. MEADE
Forest Supervisor
Forest Service Alaska Region
U.S. Department of Agriculture

RICHARD SVOBODNY
Acting Attorney General
Alaska Department of Law

KIM ELTON
Senior Advisor to the Secretary
for Alaska Affairs
U.S. Department of the Interior

CRAIG R. O'CONNOR
Special Counsel
National Oceanic & Atmospheric
Administration
U.S. Department of Commerce

DENBY S. LLOYD
Commissioner
Alaska Department of Fish and Game

LARRY HARTIG
Commissioner
Alaska Department of Environmental
Conservation

Attachment A: Funding Distribution

FY09- FY11 Proposal
PROPOSAL SUMMARY PAGE

Project Title: CYP1A1 Gene Expression Verification Study – Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill

Project Period: 1 June 2009 – June 30, 2011

Primary Investigator(s): A. Keith Miles and Liz Bowen, USGS Western Ecological Research Center (WERC), Brenda Ballachey, USGS Alaska Science Center, Michael Johnson, University of California Davis, Robin Keister USGS WERC, James Bodkin USGS Alaska Science Center, Jeff Stott, UC Davis

Study Location: Western Prince William Sound

Abstract: Sea otter populations in western PWS were injured as a result of the *Exxon Valdez* oil spill, with evidence for both immediate acute mortality and longer term injury from chronic exposure to oil spilled in 1989. The EVOS Trustee Council funded over a decade of studies to identify progress toward recovery of the sea otter populations, particularly in the northern Knight Island Archipelago. These projects have addressed population demographics including abundance, habitat use, and survival rates, together with biological sampling to monitor body condition using blood parameters, liver pathology, and a CYP1A biomarker to determine oil exposure. Although population abundance data indicate some level of recovery in Prince William Sound overall, recovery remained incomplete as of 2006. Recently, a 2002 report (Snyder et al.) of the CYP1A biomarker assessments of sea otter exposure to oil has been questioned, making it necessary to reevaluate this method for assessing exposure. In this study, we propose to re-test the exposure of sea otters to lingering oil by applying our recent discoveries of sea otter specific genetic primers to measure gene expression on the archived samples from these projects. Our initial studies of mink experimentally exposed to oil identified genes that were significantly altered in expression (Bowen et al. 2007). These genes play a role in immuno-modulation, inflammation, cyto-protection, tumor suppression, reproduction, cellular stress-response, metal metabolism, xenobiotic metabolizing enzymes, antioxidant enzymes, and cell-cell adhesion. We have successfully sequenced 13 genes from sea otters that were expressed in mink experimentally exposed to oil, as well as 2 additional genes that aid interpretation of stress levels in animals exposed to xenobiotics that include aromatic hydrocarbons. In phase one of the project, we will analyze the gene expression of a suite of genes from archived Peripheral Blood Mononuclear Cells (PBMC) and liver samples collected from individual sea otters in 2003-2006. If these PBMC samples produce meaningful analytic results, the project will proceed with phase two, to analyze the gene expression in PBMC samples from 1996 through 2002. This study will allow us to verify our past understanding of oil exposure of sea otters in PWS, assess the current status of recovery, and provide a reliable method for assessing recovery in the future.

Estimated Budget:
EVOS Funding Requested *(must include 9% GA)*

FY09	FY10	FY11	FY12	Total
$75,539.20	$115,959.20	$13,236.10	0	$205,734.40

Non-EVOS Funds to be used:

FY10	FY11	FY12	FY13	Total

FY09- FY11 Proposal
PROPOSAL SUMMARY PAGE

Project Title: CYP1A1 Gene Expression Verification Study – Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill

Project Period: 1 June 2009 – June 30, 2011

Primary Investigator(s): A. Keith Miles and Liz Bowen, USGS Western Ecological Research Center (WERC), Brenda Ballachey, USGS Alaska Science Center, Michael Johnson, University of California Davis, Robin Keister USGS WERC, James Bodkin USGS Alaska Science Center, Jeff Stott, UC Davis

Study Location: Western Prince William Sound

Abstract: Sea otter populations in western PWS were injured as a result of the *Exxon Valdez* oil spill, with evidence for both immediate acute mortality and longer term injury from chronic exposure to oil spilled in 1989. The EVOS Trustee Council funded over a decade of studies to identify progress toward recovery of the sea otter populations, particularly in the northern Knight Island Archipelago. These projects have addressed population demographics including abundance, habitat use, and survival rates, together with biological sampling to monitor body condition using blood parameters, liver pathology, and a CYP1A biomarker to determine oil exposure. Although population abundance data indicate some level of recovery in Prince William Sound overall, recovery remained incomplete as of 2006. Recently, a 2002 report (Snyder et al.) of the CYP1A biomarker assessments of sea otter exposure to oil has been questioned, making it necessary to reevaluate this method for assessing exposure. In this study, we propose to re-test the exposure of sea otters to lingering oil by applying our recent discoveries of sea otter specific genetic primers to measure gene expression on the archived samples from these projects. Our initial studies of mink experimentally exposed to oil identified genes that were significantly altered in expression (Bowen et al. 2007). These genes play a role in immuno-modulation, inflammation, cyto-protection, tumor suppression, reproduction, cellular stress-response, metal metabolism, xenobiotic metabolizing enzymes, antioxidant enzymes, and cell-cell adhesion. We have successfully sequenced 13 genes from sea otters that were expressed in mink experimentally exposed to oil, as well as 2 additional genes that aid interpretation of stress levels in animals exposed to xenobiotics that include aromatic hydrocarbons. In phase one of the project, we will analyze the gene expression of a suite of genes from archived Peripheral Blood Mononuclear Cells (PBMC) and liver samples collected from individual sea otters in 2003-2006. If these PBMC samples produce meaningful analytic results, the project will proceed with phase two, to analyze the gene expression in PBMC samples from 1996 through 2002. This study will allow us to verify our past understanding of oil exposure of sea otters in PWS, assess the current status of recovery, and provide a reliable method for assessing recovery in the future.

Estimated Budget:
EVOS Funding Requested *(must include 9% GA)*

FY09	FY10	FY11	FY12	Total
$75,539.20	$115,959.20	$13,236.10	0	$205,734.40

Non-EVOS Funds to be used:

FY10	FY11	FY12	FY13	Total

DRAFT 5/20/09

Resolution 09-05 - Attachment A
Funding Distribution
FY 09 Work Plan
Project Approved on May 29, 2009

Project #	PI	Project Title	FY 09 Funded (includes G&A)	FY 10 Approved	FY 11 Approved	PJ 090100 PJ Mgmt Approved*	PJ 090100 PJ Mgmt G&A*	Project Total Approved by Resolution 09-05
090841	Miles	CYP1A1 Gene Expression Verification Study - Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill	$75,540	$116,959	$13,236			
		DOI - USGS	$75,540	$116,959	$13,236	$0	$0	
		Total to the United States of America	$75,540	$116,959	$13,236	$0	$0	
		Total Approved Resolution 09-05				**$0**	**$0**	**$205,735**

*FY 09 Project management funds were declined by the USGS

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 Data Policy*, adopted March 17, 2008) and reporting requirements (Procedures for the Preparation and Distribution of Reports**, adopted June 27, 2007).

PROJECT TITLE:	**CYP1A1 Gene Expression Verification Study – Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill**
Printed Name of PI	**A. Keith Miles**
Email:	**keith_miles@usgs.gov**
Mailing Address	**USGS Davis Field Station 1 Shields Ave, UC Davis**
City, State, Zip	**Davis, CA 95616-5224**
Phone:	**530-752-5365**
Signature of PI:	_____ Date: _____
Printed Name of PI	**Liz Bowen**
Email:	**lbowen@usgs.gov**
Mailing Address	**USGS Davis Field Station 1 Shields Ave, UC Davis**
City, State, Zip	**Davis, CA 95616-5224**
Phone:	**530-752-5365**
Signature of PI:	_____ Date: _____
Printed Name of PI	**Brenda Ballachey**
Email:	**bballachey@usgs.gov**
Mailing Address	**USGS Alaska Science Center 4210 University Dr.**
City, State, Zip	**Anchorage, AK 99508-4626**
Phone:	
Signature of PI:	_____ Date: _____

* www.evostc.state.ak.us/Policies/data.cfm
** www.evostc.state.ak.us/Policies/reporting.cfm

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 Data Policy*, adopted March 17, 2008) and reporting requirements (Procedures for the Preparation and Distribution of Reports**, adopted June 27, 2007).

PROJECT TITLE:	**CYP1A1 Gene Expression Verification Study – Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill**
Printed Name of PI	**A. Keith Miles**
Email:	**keith_miles@usgs.gov**
Mailing Address	**USGS Davis Field Station 1 Shields Ave, UC Davis**
City, State, Zip	**Davis, CA 95616-5224**
Phone:	**530-752-5365**
Signature of PI:	Date: 30 April 2009
Printed Name of PI	**Liz Bowen**
Email:	**lbowen@usgs.gov**
Mailing Address	**USGS Davis Field Station 1 Shields Ave, UC Davis**
City, State, Zip	**Davis, CA 95616-5224**
Phone:	**530-752-5365**
Signature of PI:	Date:
Printed Name of PI	**Brenda Ballachey**
Email:	**bballachey@usgs.gov**
Mailing Address	**USGS Alaska Science Center 4210 University Dr.**
City, State, Zip	**Anchorage, AK 99508-4626**
Phone:	
Signature of PI:	Date:

* www.evostc.state.ak.us/Policies/data.cfm
** www.evostc.state.ak.us/Policies/reporting.cfm

PROJECT PLAN

CYP1A1 Gene Expression Verification Study – Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill

A. Keith Miles and Liz Bowen, USGS Western Ecological Research Center, Brenda Ballachey, USGS Alaska Science Center, Michael Johnson, University of California Davis, Robin Keister USGS Western Ecological Research Center, James Bodkin USGS Alaska Science Center, Jeff Stott, University of California Davis

I. NEED FOR THE PROJECT

A. Statement of Problem

The *Exxon Valdez* Oil Spill (EVOS) Trustee Council has funded multiple studies to determine long term injury to sea otters from the 1989 *Exxon Valdez* oil spill in Prince William Sound, Alaska. One such study was entitled 'CYP1A1 Gene Expression in Sea Otters (*Enhydra lutris*): a Quantitative Reverse Transcriptase - Polymerase Chain Reaction to Measure CYP1A mRNA in Peripheral Blood Mononuclear Cells (Snyder, 2002). The Snyder report concluded that sea otters from areas that were heavily impacted by oil in 1989 had a higher biochemical signature than those from an unoiled reference area. In 2008 when we examined the cytochrome (CYP) P450 CYP1A1 sequences identified by Snyder et al, we did not find alignment with mammalian CYP1A1 sequences found in Genbank[1]. Further, a recent published study questioned the reproducibility of the findings associated with this report (Hook et al. 2008). We propose to re-examine the archived samples used in the Snyder study using a novel suite of genes (including CYP1A1) we have identified in sea otters to verify exposure in sea otters to oil lingering from the spill. These genes were expressed in mink exposed to crude oil in an experimental laboratory study (Bowen et al. 2007). The archived samples are splits of those that were analyzed in the Snyder study, and came from sea otters that were sampled in Prince William Sound between 1996 and 2006 under a series of EVOS restoration projects by Bodkin and Ballachey (including projects 99025, 030585, 040423, 040620 and 050775).

The Snyder report also stated that analysis of the expression of CYP1A1 in peripheral blood mononuclear cells (PBMC) by RT-PCR represented a sensitive method for evaluating potential exposure to environmental contaminants. However, several studies question the effectiveness of using peripheral blood for the detection of expression of CYP genes (Furukawa et al. 2004, Finnström et al. 2001), and that analysis of CYP1A genes alone without other bioindicators can

[1] GenBank is the National Institute of Health genetic sequence database, an annotated collection of all publicly available DNA sequences. Each GenBank entry includes a concise description of the sequence, the scientific name and taxonomy of the source organism, and a table of features that identifies coding regions and other sites of biological significance, such as transcription units and sites of mutations or modifications. Bibliographic references are included with a link to the Medline unique identifier for all published sequences.

produce spurious conclusions (Wirgin et al. 1996). Apparently, the efficacy of the CYP1A1 gene can be ephemeral in blood and reliability is variable, depending on the species (S. Teh, Toxicological Pathologist, University of California, Davis, personal communication). Liver is the preferred tissue for less variable results but understandably can be problematic to obtain. Based on experimental evidence (Bowen et al. 2007), we now recommend analysis of a suite of genes that indicate exposure and injury directly related to hydrocarbons (including the aryl hydrocarbon gene or AhR).

The primary investigators of the current proposal published a study of expression of a suite of immunologic functional genes in American mink exposed to Bunker C fuel oil (Bowen et al. 2007; Schwartz et al. 2004a,b). The genetic primers that we identified for the mink aligned closely with those for sea otters as confirmed in examination of primers in GenBank. Subsequently we have discovered and identified sea otter-specific primers of the targeted genes. We have also taken advantage of advancements in technology of human medicine by application of Paxgene® blood tubes, which immediately stabilize and preserve mRNA without an urgent need for freezing. Further, the ease of extraction, amplification, replication, and measure of the targeted genes using Real-time Polymerase Chain Reaction (RT PCR) have greatly improved over the last decade.

B. Relevance to 1994 Restoration Plan Goals and Scientific Priorities

The sea otter population in western Prince William Sound has not reached the recovery goal set by the Trustees in the 1994 Restoration Plan. The most recent recovery objective for sea otters states that the otters will have recovered when the population in oiled areas returns to prespill levels and distribution, and when biochemical indicators of hydrocarbon exposure in otters in the oiled areas are similar to those in otters in unoiled areas (*Exxon Valdez* Oil Spill Trustee Council, 2006). This project proposes to use gene expression to re-evaluate the samples taken to determine exposure to oil from sea otters in Prince William Sound from 1996 through 2006, using the archived sea otter samples that had previously been tested for the CYP1A1 biochemical indicator. The results of this project, along with the results of the other aspects of the sea otter research projects, are necessary to re-assess the recovery of sea otters as defined in the 1994 Plan.

II. PROJECT DESIGN

A. Objectives

The overall goal of this project is to determine if there is biochemical evidence in sea otters for exposure to oil following the 1989 oil spill. In Phase One of the proposed study, we will analyze gene expression of a suite of genes in archived, matched samples of PBMC and liver from individual sea otters collected from 2003 through 2006. If defendable results are obtained particularly from the older PBMC samples, then Phase Two of this proposal is to investigate gene expression in PBMC samples from 1996 through 2002. The specific objectives of this project are to determine:

1. whether mRNA can be successfully extracted from PBMC samples.
2. whether gene expression in PBMC samples correlates well with that in liver tissue (the latter expected to be more dependable).
3. whether expression of targeted genes in samples of otters from Knight (oiled area) differs from those from Montague Island (unoiled area).
4. The relationship of gene expression in 2006 and 2007 blood samples collected using Paxgene tubes to archived PBMC and liver samples.

B. Procedural and Scientific Methods

There are more than 639 PBMC and 84 liver samples still available in the archives of samples collected by Bodkin and Ballachey from sea otters in Prince William Sound between 1996 and 2006. An approximate count (i.e., sample identification numbers are diverse and will require verification) indicated that these samples represent tissues from approximately 260 sea otters captured between 1996 and 2006, and that for many otters, there are multiple (2 – 4) PBMC samples collected from the same individual and for some individuals, samples were collected in multiple years.

In Phase One of the project we will extract mRNA from 84 paired liver and PBMC samples for a total of 168 samples collected from 2003 - 2006. Peripheral blood mononuclear cells were isolated in the field from heparinized whole blood by density gradient centrifugation, following procedures outlined by the Snyder testing laboratory at Purdue University, and then the isolated cells were cryopreserved. We are relatively confident that the liver samples, which were cryopreserved immediately after collection, will produce good results. However, any variation in the field handling procedures, particularly of PBMC samples, could cause variability in results or difficulty in analysis. We will experiment with different techniques until we are satisfied with the reliability of the results obtained from the PBMC samples. Because we have replicate PBMC samples from a number of sea otters, we can conduct such methodological experiments without losing samples for the contaminant analysis.

If our results of mRNA quantification from PBMC blood from Phase 1 are successful, we then recommend determining minimal sample size required to achieve statistically acceptable variance. We project that approximately 20 samples per year per oiled and reference site would suffice from 1996 to 2002 (8 years, 320 samples total).

Our initial studies on mink identified genes that were significantly altered in expression by exposure to oil. These genes play a role in immuno-modulation, inflammation, cyto-protection, tumor suppression, reproduction, cellular stress-response, metal metabolism, xenobiotic metabolizing enzymes, antioxidant enzymes, and cell-cell adhesion. We have successfully sequenced 13 genes from sea otters that were the same as those expressed in mink experimentally exposed to oil (Bowen et al. 2007), as well as 2 additional genes that aid interpretation of stress levels in animals exposed to xenobiotics that include aromatic hydrocarbons found in crude oil. These genes include: aryl hydrocarbon receptor (AhR), CYP1A1, heat shock protein-70, Interleukin 2, Interleukin 5, Interleukin 10, Interleukin 18, Cox-2, complement cytolysis inhibitor, HDCMB21P (tumor formation), thyroid hormone receptor,

DRB (bacterial), S9, metallothionein, Mx-1 (viral), and cold shock protein (CIRBP). Descriptions of the function of these genes are provided in Table 1. The S9 is an endogenous reference gene (also called a housekeeping gene) used to normalize for varying quantities of RNA characteristic of individual organisms.

Table 1. Differential expression of genes (of interest in the proposed study) between oil-fed and control mink deduced by quantitative PCR (Bowen et al. 2007). Standard t-tests were performed and statistical significance ($P \leq 0.05$) indicated by *. Arrows indicate direction of expression difference between mink groups. Additional genes of interest are indicated by +.

Genes of interest	P value Spleen	P value CPT	Oiled mink	Gene function
Aryl hydrocarbon receptor	0.17	0.19	↓	Responds to classes of environmental toxicants including polycyclic aromatic hydrocarbons, polyhalogenated hydrocarbons, dibenzofurans, and dioxin (Oesch-Bartlomowicz et al. 2005)
Heat shock protein 70	0.02*	0.10	↑	Produced in response to thermal or other stress (Tsan and Gao, 2004)
Interleukin-2	0.04*	0.16	↑	Proinflammatory cytokine (Goldsby et al. 2003)
Interleukin-18	0.002*	0.29	↓	Proinflammatory cytokine (Goldsby et al. 2003)
Interleukin-10	0.02*	0.34	↓	Anti-inflammatory cytokine (Goldsby et al. 2003)
Cox 2	0.31	0.047*	↓	Cyclooxygenase-2 catalyzes the production of prostaglandins which are responsible for promoting inflammation (Goldsby et al. 2003)
S9	housekeeping gene			18S ribosomal subunit
Metallothionein		0.21	↑	modulate the bioavailability of physiological cations and the toxicity of heavy metals and modulate immune functions (Andrews 2000)
Complement cyt inhibitor	0.05*	0.25	↓	Protects against cell death (Jenne and Tschopp 1989)
HDCMB21P	0.07	0.13	↓	(Translationally controlled tumor protein) implicated in cell growth, cell cycle progression, malignant transformation and in the protection of cells against various stress conditions and apoptosis (Bommer and Thiele, 2004)
DRB	0.45	0.27	=	Binding of pathogens/initiation of immune response (Goldsby et al. 2003, Bowen et al. 2006)
Thyroid hormone receptor	0.16	0.01*	↓	hormone-activated transcription factors bind DNA in the absence of hormone, usually leading to transcriptional repression (Tsai and O'Malley, 1994)
CIRBP	0.33	0.44	↑	Cold-shock protein (Nishiyama et al. 1997); responds to cold temperature stress
Interleukin-5	+	+	+	Up-regulated in response to parasites (Maizels and Balic 2004)
Mx-1	+	+	+	Responds to viral infection. (Tumpey et al. 2007)

C. Data Analysis and Statistical Methods

RNA from PBMC and liver will be isolated according to manufacturer's standard protocols (silica-based microspin technology). The extracted RNA will be treated with 10 U/µl of RNase

free DNase I (DNase, Amersham Pharmacia Biotech Inc, Piscataway, NJ) to remove contaminating gDNA at 37°C for 20 min followed by heat inactivation at 95°C for 5 min and chilling on ice. Extracted RNA will be stored at -80°C until processing and analysis.

A standard cDNA synthesis will be performed on 2 μg of RNA template from each sample. Reaction conditions will include 4 units reverse transcriptase (Omniscript®, Qiagen, Valencia, CA), 1 μM random hexamers, 0.5 mM each dNTP, and 10 units RNase inhibitor, in RT buffer (Qiagen, Valencia, CA). Reactions will be incubated for 60 minutes at 37°C, followed by an enzyme inactivation step of 5 minutes at 93°C and stored at –20°C until further analysis.

Quantitative RT-PCR: Real-time PCR systems for sea otter S9 and target genes will be run in separate wells. cDNA will be examined using an intercalating fluorescent dye PCR (Bowen et al. 2006). Each reaction will contain 500ng DNA in 25μl volumes with 20pmol SSP, Tris-Cl, KCl, $(NH_4)_2SO_4$, 2.5mM $MgCl_2$ (pH 8.7), dNTPs, HotStar Taq DNA Polymerase (Quantitect SYBR Green PCR Master Mix, Qiagen, Valencia, CA), and 0.5 units uracil-N-glycosylase (Roche, Indianapolis, IN). Amplifications will be performed in an ABI 7300 RT PCR System (Applied Biosystems, California) under the following conditions: two minutes at 50°C, followed by 15 minutes at 95°C, and 35 cycles of 94°C for 30 seconds, 58°C for 30 seconds, and 72°C for 30 seconds, with a final extension step of 72°C for 10 minutes. Reaction specificity will be monitored by melting curve analysis using a final data acquisition phase of 60 cycles of 65°C for 30 seconds and verified by direct sequencing of randomly selected amplicons (Bowen et al. 2007). Final quantitation will be done using the comparative C_T method and is reported as relative transcription. All samples are performed in duplicate on the ABI 7300 RT PCR System.

Gene expression will be analyzed by relative quantitation, using the comparative C_T (cycle threshold) method, due to its ease and speed for set-up and analysis; values are expressed relative to a calibrator (weakest signal of the normalized values). First, the C_T for the target amplicon and the C_T for the endogenous control (S9) will be determined for each sample. Differences in the C_T for the target and the C_T for the endogenous control, called ΔC_T, will be calculated to normalize for the differences in the RNA extractions and the efficiency of the RT step. The ΔC_T for each experimental sample will be subtracted from the ΔC_T of the calibrator resulting in a $\Delta\Delta C_T$ value. Finally, the amount of target, normalized to the endogenous control and relative to the calibrator, will be calculated by $2^{-\Delta\Delta CT}$. Thus, all experimental samples will be expressed as a n-fold difference relative to the calibrator.

For the comparative C_T method ($\Delta\Delta C_T$ method) to be valid, the amplification efficiencies of the target and the endogenous control must be approximately equal. To determine the amplification efficiencies of S9 and the other gene of interest (GOI), six dilutions of cDNA preparations (run in triplicate) will be amplified to establish standard curves. Differences of the slopes between standard curves obtained from S9 and the GOI will be plotted against the dilution of input total RNA and the regression line calculated.

Statistical analysis: Statistical analysis of the data will be performed in NCSS (Number Cruncher Statistical System, Kaysville, UT), and Primer E (Primer v6, Plymouth UK). Population differences in gene expression will be examined using Discriminant Function Analysis whereas behavior of genes within specific individuals will be examined using Cluster

Analysis fit to Multi-Dimensional Scaling. Differences between GOI transcriptions will be analyzed with the GLM ANOVA test at the $p < 0.05$ level of significance.

D. Description of Study Area

This project will evaluate archived samples collected from sea otters in western Prince William Sound.

E. Coordination and Collaboration with Other Efforts

The proposed work builds directly on previous EVOS projects investigating the impact of the oil spill on sea otters in western Prince William Sound. Previous projects include numbers 99025, 030585, 040423, 040620, and 050775.

III. SCHEDULE

A. Project Milestones

Phase 1. Analyze archived PBMC and liver samples collected from sea otters in western Prince William Sound, 2003 – 2006. Sample analyses to be completed by Sept. 30, 2009 and interpretation by Dec. 31, 2009.

Phase 2. Analyze archived PBMC samples collected from sea otters in western Prince William Sound, 1996 through 2002. Sample analyses to be completed by Sept. 30, 2010 and interpretation by Dec. 31, 2010.

B. Measurable Project Tasks

FY09, 3rd quarter (April 1, 2009 – June 30, 2009)
Obtain project funding. Obtain archived samples from Purdue laboratory. Begin sample analyses for Phase 1 of the project.

FY09, 4th quarter (July 1, 2009 – Sept. 30, 2009)
Complete sample analyses, Phase 1, and begin interpretation of results.

FY10, 1st quarter (Oct. 1, 2009 - Dec. 31, 2009)
Complete preliminary interpretation of lab results.

FY10, 2nd quarter (Jan. 1, 2010 – March 31, 2010)
As appropriate, pending results of Phase 1, initiate sample analyses for Phase 2.

FY10, 3rd quarter (April 1, 2010 – June 30, 2010)

Continue sample analyses, Phase 2.

FY10, 4th quarter (July 1, 2010 – Sept. 30, 2010)
Complete sample analyses, Phase 2, and begin interpretation of results.

FY11, 1st quarter (Oct. 1, 2010 – Dec. 31, 2010)
Complete interpretation of results for both Phase 1 and 2.
Provide draft Final Report for submission Dec. 31, 2010.

FY11, 2nd quarter (Jan. 1, 2011 – March 31, 2011)
EVOS conducts peer review of draft Final Report

FY11, 3rd quarter (April 1, 2011 – June 30, 2011)
Respond to peer review comments and prepare Final Report.
Prepare manuscript for publication.

IV. RESPONSIVENESS TO KEY TRUSTEE COUNCIL STRATEGIES

A. Community Involvement and Traditional Ecological Knowledge (TEK)

Results of this work will be made available for communities in the oilspill area as well as the general public.

B. Resource Management Applications

Results of the proposed work will provide managers with additional information to make decisions regarding the progress toward recovery of sea otter populations in the oiled area of western Prince William Sound. Results will also facilitate understanding of the effects of exposure to lingering oil and any possible relationship to the delayed recovery rate of the sea otter population at northern Knight Island.

V. PUBLICATIONS AND REPORTS

An annual progress report will be submitted to the Trustee Council on 1 September 2009, 2010, and 2011. A draft final report will be submitted by Dec. 31, 2010. A manuscript reporting the findings of this project will be prepared by June 30, 2011.

VI. REFERENCES

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VII. RESUME OF PROPOSED PRINCIPAL INVESTIGATOR

A. Keith Miles
USGS Western Ecological Research Center
Davis Field Station, 1 Shields Avenue
University of California, Davis 95616
Phone 530-752-5365; Fax 530-752-9680
Keith_miles@usgs.gov

Current Assignment: Supervisory Research Wildlife Biologist - USGS; Faculty, Graduate Group in Ecology; Associate in the California Agricultural Experiment Station, Wildlife, Fisheries, and Conservation Biology, University of California, Davis (UCD).

Education: Ph.D., Oregon State University, June 1987, Wildlife Ecology; M.S., Oregon State University, August 1976, Wildlife Biology; B.S., Howard University, June 1972, Zoology.

Current Research: Team lead of 5 biologists, 4 graduate researchers, and 14 technicians that specialize in field-oriented investigative approaches to contaminants problems and general problems of conservation of wildlife species. The goals of my research are to determine consequences of accumulation of contaminants in species of concern and their prey, and discriminate the effects caused by contaminants from those induced by other causes. I conduct studies on the effects of contaminants on community structure and the potential for accumulation of these contaminants among specific guilds of migratory aquatic birds, marine mammals, and their prey. **Collaborative UCD Studies:** Dr. Jeff Stott, Dr. Liz Bowen: Environmental signatures and gene expression patterns in sea otters; Dr. Barry Wilson: Cytochrome P-4501A induction and hydrocarbon exposure.

Current Awarded Studies:

Aquatic Bird Use of Recreated Wetlands, Salton Sea, California: Benefits and Risks. State of California, Bureau of Reclamation 2007 – 2010; Effects of mercury (Hg) on waterbirds and habitat at San Francisco Bay. State of California, CALFED 2005 – 2009; Understanding the dynamics of mercury in eared grebes, Great Salt Lake, Utah. U.S. Fish & Wildlife Service, 2006 – 2009; Snowy Plovers at Point Reyes National Seashore: Unraveling the Mystery of Mercury, U.S. Park Service. 2006 - 2009.

Relevant (recent) Journal Articles:

Miles AK, Ricca MA, Anthony RG, Estes JA. *in press*. Organochlorine Contaminants in Fishes from Coastal Waters West of Amukta Pass, Aleutian Islands, Alaska. Environmental Toxicology and Chemistry.

Miles AK, Flint PL, Trust KA, Ricca MA, Spring SE, Arrieta DE, Hollmen T, Wilson BA. 2007. Polycyclic Aromatic Hydrocarbon Exposure in Steller's Eiders and Harlequin Ducks, Eastern Aleutian Islands, Alaska. Environmental Toxicology and Chemistry. 26(12):2694-2703.

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VIII. BUDGET JUSTIFICATION - $205,734

Justification for each item in the attached budget is as follows:

FY09, FY10, and FY11 (close-out)

Personnel

FY09--$44,962; funding for 3 PI's and a lab biologist to obtain, inventory, prepare lab samples for Phase I, as well as to refine techniques and examine results.
FY10--$61,492; funding for 3 PI's and a lab biologist to obtain, inventory, prepare lab samples for Phase II, as well as to refine techniques and examine results.
FY11--$8743; Close-out: funding for two PI's to prepare and complete Final Report, make presentation at the Alaska Marine Science Symposium, and write a Journal article

Travel

FY09--$1500; funding for project meeting to review results of Phase I
FY10--$2710; funding for project meeting to review results of Phase II
FY11--$2400; funding for Miles and Bowen to attend and present at the Alaska Marine Science Symposium in January 2011

Contractual

FY09-- $0
FY10--$0
FY11--$0

Commodities

FY09—168 samples @ $130/sample = $21,840; RT PCR calibration estimated at $500, miscellaneous lab supplies @ $500
FY10—320 samples @ $130/sample = $41,600; RT PCR calibration estimated at $1000, miscellaneous lab supplies @ $500
FY11—manuscript preparation and page costs, $1000

Equipment

FY09---$0
FY10---$0
FY11---$0

The equipment for this project is being contributed by the USGS laboratory at UC Davis.

IX. DATA MANAGEMENT

A. Study Design

This study will produce data on archived sea otter samples (blood cells and liver) collected in oiled and unoiled areas of western Prince William Sound from 1996 - 2006. Samples will be analyzed using Real Time Polymerase Chain Reaction (PCR) techniques to obtain data on expression of a panel of genes that indicate (1) exposure of the individual otters to xenobiotics that include aromatic hydrocarbons found in crude oil and (2) stress or injury that may be related to that exposure. Because the study is conducted on archived tissue samples, there is no field work component. The primary objective is to compare gene expression in sea otters from the oiled and unoiled areas, and to assess changes over time (1996 - 2006), as an evaluation of the status of recovery of sea otters in oiled areas. As of 2006, sea otters in heavily oiled areas of western Prince William Sound had not recovered from losses incurred in 1989, during the oil spill. The data generated will be directly related to data previously collected on sea otters in western Prince William Sound, as part of EVOSTC studies (including Projects 99025, 030585, 04023, 040620 and 050775). The variables that will allow linkage of the data to be generated in this study with data from the other studies are (1) sea otter number, which is a unique ID assigned to each otter at the time of capture, and used in subsequent years if an otter is captured more than once, and (2) the capture date. Data from previous studies includes information on capture location, otter age and sex, morphometric data, hematology and serum chemistry data, and, for a subset of the otters, data on movements, dive patterns, and survival; these data sets were described in previous proposals, and reside at the USGS-Alaska Science, Anchorage, Alaska.

In the present study, we will use Real Time PCR methods to generate a Threshold Cycle (C_T), for each of 15 genes of interest in the sea otters (see Table 1) that includes one endogenous reference gene (also called a housekeeping gene), which is used to normalize for varying quantities of RNA characteristic of individual organisms. Real Time PCR is widely used for measurement of gene expression (see Bowen et al. 2007), and advances in methodology over the last decade should allow more efficient and accurate measurement of the genes of interest, provide information on the health status of individual sea otters, and provide a greater understanding of factors constraining recovery of the population.

B. Criteria/Acceptable Data Quality

Sample preparation and Real Time PCR methodology are described in detail in the study design. To assure quality control, all samples are run in duplicate on the ABI 7300 Real Time PCR System. Samples of any duplicate runs greater than 1 C_T value difference are prepared again for Real Time PCR analysis; if the anomaly persists, the sample is eliminated from further consideration or data analyses. The ABI 7300 Real Time PCR System has an internal standard, calibration efficiency test that is executed prior to each run of subject samples to assure accuracy of results.

C. Metadata

a. Metalite Metadata information:
Identification_Information:
Citation:
Citation_Information:
Originator: USGS, A. Keith Miles, Liz Bowen, and Brenda Ballachey
Publication_Date: 20111212
Title: CYP1A1 Gene Expression Verification Study – Re-Evaluation of Sea Otter Samples from the *Exxon Valdez* Oil Spill
Geospatial_Data_Presentation_Form: N/A
Publication_Information:
Publication_Place: Anchorage, Alaska, United States
Publisher: USGS
Description:
Abstract: Sea otter populations in western PWS were injured as a result of the *Exxon Valdez* oil spill, with evidence for both immediate acute mortality and longer term injury from chronic exposure to oil spilled in 1989. The EVOS Trustee Council funded over a decade of studies to identify progress toward recovery of the sea otter populations, particularly in the northern Knight Island Archipelago. These projects have addressed population demographics including abundance, habitat use, and survival rates, together with biological sampling to monitor body condition using blood parameters, liver pathology, and a CYP1A biomarker to determine oil exposure. Although population abundance data indicate some level of recovery in Prince William Sound overall, recovery remained incomplete as of 2006. Recently, the viability of the CYP1A biomarker assessments of sea otter exposure to oil have been questioned, making it necessary to reevaluate this method for assessing exposure. In this study, we propose to re-test the exposure of sea otters to lingering oil by applying our recent discoveries of sea otter specific genetic primers to measure gene expression on the archived samples from these projects. Our initial studies of mink experimentally exposed to oil identified genes that were significantly altered in expression (Bowen et al 2007). These genes play a role in immuno-modulation, inflammation, cyto-protection, tumor suppression, reproduction, cellular stress-response, metal metabolism, xenobiotic metabolizing enzymes, antioxidant enzymes, and cell-cell adhesion. We have successfully sequenced 13 genes from sea otters that were expressed in mink experimentally exposed to oil, as well as 2 additional genes that aid interpretation of stress levels in animals exposed to xenobiotics that include aromatic hydrocarbons. In phase one of the project, we will analyze the gene expression of a suite of genes from archived Peripheral Blood Mononuclear Cells (PBMC) and liver samples collected from individual sea otters in 2003-2006. If these PBMC samples produce meaningful analytic results, the project will proceed with phase two, to analyze the gene expression in PBMC samples from 1996 through 2002. This study will allow us to verify our past understanding of oil exposure of sea otters in PWS, assess the current status of recovery, and provide a reliable method for assessing recovery in the future.

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 19960601
Ending_Date: 20060515
Currentness_Reference: ground condition

Status:
Progress: Planned
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -147.200
East_Bounding_Coordinate: -147.983
North_Bounding_Coordinate: 60.750
South_Bounding_Coordinate: 60.150
Keywords:
Theme:
Theme_Keyword_Thesaurus:
Theme_Keyword: sea otters, recovery, oil exposure
Place:
Place_Keyword_Thesaurus:
Place_Keyword: Prince William Sound
Temporal:
Temporal_Keyword_Thesaurus:
Temporal_Keyword: not required
Access_Constraints: None
Use_Constraints: None
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Point
Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Brenda Ballachey
Contact_Organization: USGS Alaska Science Center
Contact_Address:
Address_Type: Mailing and Physical Address
Address:
Alaska Science Center
4210 University Drive
City: Anchorage
State_or_Province: Alaska
Postal_Code: 99508
Country: United States
Contact_Voice_Telephone: 907.786.7000
Contact_Facsimile_Telephone: 907.786.7150
Contact_Electronic_Mail_Address: bballachey@usgs.gov
Distribution_Liability:
Metadata_Reference_Information:
Metadata_Date: 20090430
Metadata_Contact:
Contact_Information:

Contact_Person_Primary:
Contact_Person: Brenda Ballachey
Contact_Organization: USGS Alaska Science Center
Contact_Address:
Address_Type: Mailing and Physical Address
Address:
Alaska Science Center
4210 University Drive
City: Anchorage
State_or_Province: Alaska
Postal_Code: 99508
Country: United States
Contact_Voice_Telephone: 907.786.7000
Contact_Facsimile_Telephone: 907.786.7150
Contact_Electronic_Mail_Address: bballachey@usgs.gov
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998

b. Dataset category:
Laboratory results: RT PCR data, cycle of threshold (C_T) for each of 15 genes of interest, plus for an endogenous reference gene.

D. Algorithms
None of our data require conversion algorithms.

E. Sample Collection, Handling, Custody, Storage
Samples were collected from sea otters captured from 1996-2006, processed and frozen in LN_2 the field, and shipped in LN_2 to Purdue University in Indiana (lab of Dr. P. Snyder) where they have been maintained in frozen storage at -80°C since their arrival. Samples will be shipped (in LN_2 transfer dewars) to the laboratory of Dr. Keith Miles at University of California, Davis, California, where they will be maintained in frozen storage at -80°C until used in analyses.

F. Analytical Instrumentation
Amplifications of cDNA (from mRNA isolated from PBMC and liver samples) will be performed in an ABI 7300 Real Time PCR System (Applied Biosystems, California).

G. Data Reduction and Reporting
Off the shelf statistical software (e.g. SAS, SYSTAT, NCSS, Primer E) will be used for descriptive statistics and between areas (oil exposed vs. non-exposed) comparisons.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Budget Category:	Proposed FY 09	Proposed FY 10	Proposed FY 11	Proposed FY 12	TOTAL PROPOSED
Personnel	$44,962.0	$61,492.0	$8,743.2	$0.0	$115,197.2
Travel	$1,500.0	$2,710.0	$2,400.0	$0.0	$6,610.0
Contractual	$0.0	$0.0	$0.0	$0.0	$0.0
Commodities	$22,840.0	$43,100.0	$1,000.0	$0.0	$66,940.0
Equipment	$0.0	$0.0	$0.0	$0.0	$0.0
SUBTOTAL	$69,302.0	$107,302.0	$12,143.2	$0.0	$188,747.2
General Administration (9% of subtotal)	$6,237.2	$9,657.2	$1,092.9	$0.0	$16,987.2
PROJECT TOTAL	$75,539.2	$116,959.2	$13,236.1	$0.0	$205,734.4
Other Resources (Cost Share Funds)	$0.0	$0.0	$0.0	$0.0	$0.0

COMMENTS: Salaries are being contributed for participation in the project by: Keith Miles, Jim Bodkin, M. Johnson, and J.Stott. The equipment for this project is being contributed by the USGS laboratory at UC Davis.

Prepared April 27, 2009

FY09 - 11

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles
Agency: USGS

FORM 3A
TRUSTEE AGENCY SUMMARY

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Project Title	Step	Budgeted	Costs	Overtime	Sum
K. Miles	PI		0.5	9744.0		4,872.0
L. Bowen	co-PI		1.0	7100.0		7,100.0
Keister	Lab biologist		4.0	5580.0		22,320.0
Ballachey	co-PI		1.1	9700.0		10,670.0
Bodkin, collaborator, in-kind						0.0
Johnson, collaborator, in-kind						0.0
Stott, collaborator, in-kind						0.0
						0.0
Miles, additional salary contributed						0.0
						0.0
						0.0
						0.0
	Subtotal		6.6	32124.0	0.0	
					Personnel Total	########

Travel Costs: Description	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
					0.0
project meeting of PI's	600.0	2	5	60.0	1,500.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$1,500.0

FY09

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B
PERSONNEL & TRAVEL DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Contractual Costs: Description		Contract Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	$0.0

Commodities Costs: Description	Commodities Sum
PCT & RT primers + RNA isolation + RT & Q PCR PCR reactions + DNA sequencing	
168 samples @ $130.00/sample = $21,840 All runs are duplicated on RT PCR System	21,840.0
Equipment maintenance (RT PCR calibrating)	500.0
Miscellaneous lab supplies	500.0
Commodities Total	#########

FY09

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B CONTRACTUAL & COMMODITIES DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

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

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY09

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B EQUIPMENT DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Personnel Costs:		GS/Range/ Step	Months Budgeted	Monthly Costs	Overtime	Personnel Sum
Name	Project Title					
						0.0
K. Miles	PI		0.5	9744.0		4,872.0
L. Bowen	co-PI		1.5	7100.0		10,650.0
Keister	Lab biologist		6.5	5580.0		36,270.0
Ballachey	co-PI		1.0	9700.0		9,700.0
Johnson, collaborator, in-kind						0.0
Stott, collaborator, in-kind						0.0
Bodkin, collaborator, in-kind						0.0
						0.0
Miles, additional salary contributed						0.0
						0.0
						0.0
	Subtotal	[illegible]	9.5	32124.0	0.0	[illegible]
					Personnel Total	#########

Travel Costs: Description	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
					0.0
project meeting of PI's	800.0	2	5	222.0	2,710.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$2,710.0

FY10

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B PERSONNEL & TRAVEL DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Contractual Costs: Description		Contract Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	$0.0

Commodities Costs: Description	Commodities Sum
PCT & RT primers + RNA isolation + RT & Q PCR PCR reactions + DNA sequencing	
320 samples @ $130.00/sample = $41,600 All runs are duplicated on RT PCR System	41,600.0
Equipment maintenance (RT PCR calibrating)	1,000.0
lab supplies	500.0
Commodities Total	#########

FY10

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B CONTRACTUAL & COMMODITIES DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

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

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY10

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B
EQUIPMENT
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Project Title	Step	Budgeted	Costs	Overtime	Sum
						0.0
K. Miles	PI		0.3	9744.0		2,923.2
L. Bowen	co-PI					0.0
Keister	Lab biologist					0.0
Ballachey	co-PI		0.6	9700.0		5,820.0
						0.0
Miles, additional salary contributed						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		0.9	19444.0	0.0	
					Personnel Total	$8,743.2

Travel Costs: Description	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
					0.0
presentation at Alaska Marine Sciences Symposium					0.0
travel for Miles and Bowen	700.0	2	4	250.0	2,400.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$2,400.0

FY11

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B
PERSONNEL & TRAVEL DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Contractual Costs: Description		Contract Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	$0.0

Commodities Costs: Description	Commodities Sum
manuscript preparation	1,000.0
Commodities Total	$1,000.0

FY11

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B CONTRACTUAL & COMMODITIES DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

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

Existing Equipment Usage: Descriptior	Number of Units	Inventory Agency

FY11

Project Title: Gene Expression Verification Study
Lead PI: Keith Miles

FORM 3B EQUIPMENT DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Project Title	Step	Budgeted	Costs	Overtime	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
	Subtotal		0.0	0.0	0.0	
					Personnel Total	$0.0

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
					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

FY12

FORM 3B
PERSONNEL &
TRAVEL DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

Contractual Costs: Description		Contract Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	$0.0

Commodities Costs: Description	Commodities Sum
Commodities Total	$0.0

FY12

FORM 3B CONTRACTUAL & COMMODITIES DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11

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

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY12

FORM 3B EQUIPMENT DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 09- FY 11