



Environment and Natural Resources Trust Fund

M.L. 2011 Work Plan Cover Page

Date of Status Update: 08/02/2011
Date of Next Status Update: 04/15/2011
Date of Work Plan Approval:
Project Completion Date:

LCCMR Lead Staff:
TBD

Is this an amendment request?: No

Project Title: Species of Concern; Investigations

Project Manager: Carrol Henderson
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Location:

Counties Impacted: Statewide
Ecological Section Impacted Statewide

Total ENRTF Project Budget:	ENRTF Appropriation	\$500,000
	Amount Spent:	\$0
	Balance:	\$500,000

Legal Citation: M.L. 2011, Chp. xx, Sec. xx, Subd.

Appropriation Language:

\$500,000 the first year is from the trust fund to the commissioner of natural resources for investigating species of concern.

Attachments - M.L. 2011 work Plan Main Document, M.L. 2011 Attachment A: Budget Detail, Acquisition/Restoration List (if applicable), Map (if applicable), Other (if applicable).

M.L. 2011 Work Plan Main Document: Acquisition/Restoration List (if applicable): Other 1:
 0811-2-001-proposal-LCCMR Loon and Peli
M.L. 2011 Attachment A: Budget Detail: Map (if applicable): Other 2:
 0811-2-001-budget-LCCMR Loon and Pelic



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I. PROJECT TITLE: Subd. 3p. “Species of Concern: Investigations.

This workplan consists of two parts. **Part A** includes investigations on Minnesota Common Loons and American White Pelicans and details follow here. **Part B** (see page 9) is for a grant to establish baseline information on statewide bird distribution and reproductive status relating to species of concern. Details for the workplan relating to that grant will be submitted at a later date as work is not scheduled to begin until summer of 2012.

Part A. Investigations on Species of Concern: Minnesota Common Loons and American White Pelicans. \$250,000

II. PROJECT SUMMARY:

Four activities are proposed over the next three years to assess the potential impact of the Gulf oil spill on Common Loons and American White Pelicans. The activities proposed will provide scientifically valid data documenting possible effects on these species. Most loons from Minnesota winter along the Gulf coast from Alabama and the Florida panhandle southward along the western coast of Florida to the Florida Keys. They use near-shore areas that are generally less than 150 feet deep, but they can dive as deeply as 220 feet in search of fish. Areas from Orange Beach, Alabama, through Pensacola, Florida, had problems with oil washing ashore. Most loons hatched in Minnesota in the summers of 2008 and 2009 would have been in the Gulf when the oil spill occurred, and young pelicans hatched in 2009 would have also been present in the Gulf when the oil spill occurred. Subadult loons do not return to Minnesota until the beginning of their third year, and they typically do not begin breeding until their fifth year. Young American white pelicans do not return to Minnesota until spring of their second year.

In the spirit of the scientific method, this research will not proceed with any preconceived conclusions that detrimental effects have occurred. Additional population analysis and necropsy studies by the DNR Nongame Wildlife Program will provide supplemental data and results for this study.

The goals of the activities in this proposal will be 1) to determine if population levels of loons and pelicans experience statistically significant declines in 2011 and 2012 that could be attributable to the oil spill and 2) if other impacts like chemical contamination of tissues, eggs, or blood of those species has occurred due to petroleum or oil dispersants. These pollutants could potentially affect the behavior, migratory abilities, reproductive success, or longevity of the affected species.

III. PROJECT STATUS UPDATES:

Project Status as of April 15, 2012:

Project Status as of September 15, 2012

Project Status as of April 15, 2013.

Project Status as of September 15, 2013



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IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Migration Patterns, Wintering Distribution, and Blood and Tissue Analysis of Common Loons that Breed in Minnesota. Budget: \$ 89,000. *note: an additional \$47,000 of RIM Critical Habitat Matching funds will be provided for additional work on the satellite telemetry and geolocator work on loons in order to accomplish all of the deliverables that are proposed. Total budget for this activity is \$136,000.

Description: Geolocators on leg bands of at least 24 common loons will record their daily locations and diving depths for a year. The geolocators will require recapture of the loons and followup field work in 2012 to download the data collected on those loons. At least 12 loons fitted with satellite transmitters will be tracked to detail movement in real time for at least one year including migratory pathways and wintering destinations. This study will provide support for summary and analysis of that work, include analysis of blood samples collected on loons captured to assess presence of petroleum and dispersant residues related to the oil spill, and cover follow-up field studies and loon captures in 2012. The blood samples will be compared with loon blood collected by the USGS in Minnesota prior to the oil spill. Tissue samples will also be collected from loons that are fitted with satellite transmitters to analyze tissues for petroleum and dispersant residues. Investigator: USGS (Kevin Kenow)

Summary Budget Information for Activity 1:

**ENRTF Budget: \$ 89,000
Amount Spent: \$ 0
Balance: \$ 89,000**

Activity Completion Date:

Outcome	Completion Date	Budget
1. Monitor satellite and geolocator data on movements and survival of all loons marked with satellite transmitters and geolocators.	June 30, 2013	\$ 15,000
2. Upload satellite data for web access of loon tracking and movements and satellite subscription service.	December 1, 2011	\$ 20,000
3. Provide blood and samples from 20 loons captured so the samples can be analyzed for petroleum and dispersant contaminants. Compare blood data with data from collected from loons by the USGS in 2010.	Sept. 1, 2012	\$ 10,000
4. Capture an additional 15 loons in 2012 to outfit them with geolocators and recapture loons fitted with geolocators in 2011 with geolocator tags in 2012 to download data.	June 30, 2013	\$ 25,000
5. Recapture loons fitted with geolocators in 2012 in 2013 to download movement and diving depth data.	October 1, 2013	\$ 12,000
5. Produce final report of all studies	December 31, 2013	\$ 7,000



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Activity Status as of April 15, 2012:

Activity Status as of September 15, 2012:

Activity Status as of April 15, 2013:

Activity Status as of September 15, 2013:

Final Report Summary:

**ACTIVITY 2: Activity 2: Statewide 2011/2012 American White Pelican Survey Analysis.
Budget: \$ 60,000**

Description: Analysis of survey results for 16 known American white pelican nesting sites and data from an additional 12 locations that have significant numbers of summering pelicans that could become nesting sites in 2011. Ensure that survey protocol used is similar to that used in 2004 and 2010 so that results can be compared with survey results from those years. Follow up with additional field surveys in 2012 to validate trend information. Investigators: U of MN. Dr. Francesca Cuthbert & Linda Wires.

Summary Budget Information for Activity 2:

**ENRTF Budget: \$ 60,000
Amount Spent: \$ 0
Balance: \$ 60,000**

Activity Completion Date:

Outcome	Completion Date	Budget
1. Analysis of statewide aerial and ground surveys of American White Pelicans in 2011 and submission of final report comparing counts with those of 2004 and 2010.	December 31, 2012	\$ 30,000
2. Followup white pelican surveys in 2012 to look for population trends, and preparation of final report.	December 31, 2013	\$30,000

Activity Status as of April 15, 2012:

Activity Status as of September 15, 2012:

Activity Status as of April 15, 2013:

Activity Status as of September 15, 2013:

Final Report Summary:



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ACTIVITY 3: Description: American White Pelican Egg, Blood, and Bill Knob Analysis.

This activity will include providing 60 eggs laid by American White Pelicans in 2011 at three different Minnesota nesting colonies (20 per site) for analysis of petroleum and dispersant residues by the University of Connecticut. Additional deliverables will include analysis of blood samples from pelican chicks at three colonies, analysis of shed bill knobs from pelicans to look for petroleum and dispersant residues, and preparation of a final report on the findings of the egg, blood, and bill knob analyses.

Summary Budget Information for Activity 3:

**ENRTF Budget: \$ 35,000
Amount Spent: \$ 0
Balance: \$ 35,000**

Activity Completion Date:

Outcome	Completion Date	Budget
1. Provide 60 pelican eggs (20 each from 3 colonies) so they can be analyzed by the U of Connecticut for petroleum and dispersant residues. (2011 and 2012)	June 30, 2012	\$ 10,000
2. Analysis by NDSU of blood samples from 30 pelicans at 3 colonies including comparison of blood samples with blood plasma collected in 2008, 2009, and 2010 to check for presence of oil and dispersant contaminants.	June 30, 2012	\$ 10,000
3. Providing shed bill knobs (rhynotheca) and collection data from 30 pelicans so the keratin in the knobs can be analyzed by the U of Connecticut for petroleum and dispersant residues.	Sept. 1, 2012	\$ 10,000
4. Prepare final report on results of egg, blood, and bill knob analysis	June 30, 2013	\$ 5,000

Activity Status as of April 15, 2012:

Activity Status as of September 15, 2012:

Activity Status as of April 15, 2013:

Activity Status as of September 15, 2013:

Final Report Summary:

ACTIVITY 4: Analysis of loon and pelican blood, tissue, egg, and bill knobs to determine if petroleum (PAH) and dispersant (Corexit) contaminants are present in Minnesota loons and pelicans. This analysis will be carried out by the Center for Environmental Sciences and Engineering at the University of Connecticut.



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Description: Samples of blood and tissues from dead loons found in Minnesota will be forwarded to UConn after necropsy by the Wisconsin DNR, and egg and bill knob samples collected by project contractors from NDSU will be forwarded to this laboratory for standardized analysis for petroleum (PAH) and dispersant (Corexit) contaminants in Minnesota loons and white pelicans. Investigator: Dr. Christopher Perkins.

Summary Budget Information for Activity 4:

ENRTF Budget: \$ 66,000
Amount Spent: \$ 0
Balance: \$ 66,000

Activity Completion Date:

Outcome	Completion Date	Budget
1. Analysis of up to 55 white pelican eggs for petroleum and dispersant contaminants. (60 samples with two analyses per sample=110 analyses @ \$150 per analysis)	June 30, 2012	\$ 16,500
2. Analysis of up to 35 shed rhinotheca bill knobs from white pelicans for petroleum and dispersant residues. (Up to 30 samples with two analyses per sample@\$150 per analysis)	October 1, 2012	\$ 10,500
3. Analysis of fatty tissue samples and blood samples from up to 65 dead loons for petroleum and dispersant contaminants. (Up to 130 samples with two analyses per sample=230 analyses @ \$150 per analysis)	December 1, 2012	\$ 39,000
4. Submit final report on results of loon and pelican analyses	June 30, 2013	

Activity Status as of April 15, 2012:

Activity Status as of September 15, 2012:

Activity Status as of April 15, 2013:

Activity Status as of September 15, 2013:

Final Report Summary:

V. DISSEMINATION:

Description: Results of this project will be disseminated through the DNR web site and through news releases, interviews with local media, and in stories in the Minnesota Volunteer.

Status as of April 15, 2012:

Status as of September 15, 2012:

Status as of April 15, 2013:



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Status as of September 15, 2013:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget:

Budget Category-PT contracts	\$ Amount	Explanation
US Geological Survey. Loon telemetry, geolocators, and tissue analysis	\$ 89,000 (ENRTF) + \$47,000 DNR	Satellite telemetry, geolocator telemetry, and blood and tissue analysis of Minnesota Common Loons to investigate migration patterns and contamination levels of petroleum and dispersant levels in loons.
Univ. of Minnesota Dept. of Fisheries, Wildlife and Conservation Biology	\$60,000	Statewide surveys and population trend analysis of American White Pelicans including 28 sites.
North Dakota State Univ. Dept of Biological Sciences.	\$35,000	Collection and analysis of contamination levels in blood and tissues of American White Pelicans from three major colonies in Minnesota. Also provide samples for analysis at UConn.
Univ. of Connecticut, Center for Environmental Sciences and Engineering	\$66,000	Analysis of loon blood and tissues from loons found dead in Minnesota and analysis of white pelican eggs and bill knobs for presence of petroleum and dispersant contaminants.
TOTAL ENRTF BUDGET:	\$ 250,000 + \$47,000 DNR funds	

Explanation of Use of Classified Staff: No DNR staff will be paid from this appropriation. Project management will be carried out by Carrol Henderson and Richard Baker in the Department of Natural Resources with funding from the DNR provided as match ENRTF dollars.

Explanation of Capital Expenditures Greater Than \$3,500: N/A

Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation: None.

Number of Full-time Equivalent (FTE) estimated to be funded through contracts with this ENRTF appropriation: 3.0 (NDSU, Univ. of MN, and USGS combined)

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state			
		\$	
State			



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RIM Matching funds (521)	\$ 47,000		Loon geolocator/satellite work
Nongame match for project management-staff time	\$ 20,000	\$	Project management
Analysis of MN dead loons	\$ 3,000		Necropsy studies of dead loons
TOTAL OTHER FUNDS:	\$ 70,000	\$	

VII. PROJECT STRATEGY:

A. Project Partners

This will be a collaborative effort involving the DNR Nongame Wildlife Program (Division of Ecological and Water Resources), University of Minnesota Department of Ecology and Behavioral Biology, US Geological Survey, North Dakota State University Department of Biology and the Center for Environmental Sciences and Engineering at the University of Connecticut. This unique team brings together Minnesota's best experts on common loons and American white pelicans to evaluate the possible impact of the Gulf oil spill on Minnesota's loons and pelicans.

Richard Baker is in charge of DNR Nongame Research and has administered the Minnesota Loon Monitoring Program (MLMP) since its inception in 1994. He collaborated in developing the original randomly-based statistical design of the loon survey for 100 lakes in six survey regions. Baker will continue to carry out the collection of data for the Minnesota Loon Monitoring Program in 2011, 2012, and 2013. He will collaborate with Dr. Johnson on the statistical analysis of the Minnesota Loon Monitoring Program data so that data can be compared with data collected prior to the Gulf oil spill. Baker's salary coded this project will serve as in-kind match.

Kevin Kenow is a wildlife researcher in the US Geological Survey researcher who is currently carrying out a botulism study of common loons using geolocators and internal satellite transmitters to monitor migratory movements, survival, and wintering locales for Midwestern loons. He has been involved with loon research for over ten years. This study will enable Kenow to apply the knowledge and experience he has gathered in the USGS botulism study to the proposed loon study in Minnesota. Kenow will carry out all capture of loons, equip them with geolocators and satellite transmitters, monitor subsequent movements of loons equipped with satellite transmitters, and recapture loons in 2012 to download geolocator data.

Drs. Francesca Cuthbert and Linda Wires from the University of Minnesota Department of Fisheries, Wildlife and Conservation Biology have extensive experience with research on colonial waterbirds have planned and carried out statewide American white pelican surveys in Minnesota in 2004 and 2009.

Dr. Mark Clark, Wendy Reed, and Jeff DiMatteo are from Department of Biological Sciences at North Dakota State University. DiMatteo is a doctoral candidate who is currently studying pelican ecology in Minnesota. He has banded over 19,000 pelicans in Minnesota during the past ten years and is familiar with all of the state's pelican colonies. DiMatteo will submit pelican eggs, blood, and bill knob samples for analysis. These samples will be collected from three colonies in Minnesota.

Dr. Christopher R. Perkins is the Project Director and Co-laboratory Director of the Center for Environmental Sciences and Engineering at the University of Connecticut. The state-of-the-art equipment and technology utilized by this research center has allowed this facility to be at the forefront of assessment of biological impacts of the Gulf oil spill related to contamination by both



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petroleum and dispersant residues in wildlife. This lab has the capability for assessment of PAH levels reflecting petroleum contamination and Corexit levels reflecting presence of oil dispersants that were used in the Gulf of Mexico.

Carrol L. Henderson has been the DNR Nongame Wildlife Program supervisor since it was founded in 1977. He has coordinated statewide efforts for nongame wildlife program administration, trumpeter swan restoration, river otter restoration, lakescaping demonstration site projects, Project WILD, and the Digital Photography Bridge to Nature teacher workshops. He has partnered with the Raptor Center, the University of Minnesota, and The Nature Conservancy on peregrine falcon restoration. He has experience as project manager in administering over \$1,250,000 in Environment and Natural Resources Trust Fund projects over the past 12 years. Henderson will serve as the project manager for this project. His salary coded to administer this project will serve as in-kind match.

B. Project Impact and Long-term Strategy:

The 2011 field season provided the opportunity for collection of pelican eggs, blood, and tissue samples as well as the capture and outfitting of loons with geolocator tags, satellite transmitters, collection of loon blood, and a statewide survey of white pelicans. All of this preliminary work has made possible the variety of analyses and assessments that will be accomplished with the ENRTF appropriations provided for this study. The 2012 field season will provide the opportunity for capture of an additional 15 loons to outfit them with geolocators and recapture of loons to download geolocator data and taking of additional blood samples and any necessary follow-up surveys in 2012. Loons outfitted with geolocators in 2012 will be recaptured in the summer of 2013 to download their migratory movements and diving data. Another statewide pelican survey will be accomplished in 2012 to supplement the survey in 2011.

Collection and analysis of loon carcasses will be carried out throughout 2011 and 2012, and the MLMP data statistical analysis will be completed after the 2013 field season as an ongoing project of the DNR Nongame Wildlife Program. That work will complement the work that is to be carried out with the ENRTF activities.

The need for long term investment in monitoring of common loon and American white pelican populations will depend on the outcome of the studies described above. We should have some indication of how the study is going after the 2011 and 2012 field seasons. No additional commitment is sought at this time.

C. Spending History:

Funding Source	M.L. FY 2011
ENRTF	\$250,000
RIM-CH Matching Fund	47,000

VIII. ACQUISITION/RESTORATION LIST: N/A

IX. MAP(S): Maps of sites with marked loons and sampling sites for white pelicans will be incorporated as part of regular project updates.



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X. RESEARCH ADDENDUM: The egg, blood, and tissue samples involved in this study will be tested for presence of two primary contaminants associated with the Gulf oil spill:

***PAH:** Polycyclic aromatic hydrocarbons (PAHs), also known as poly-aromatic hydrocarbons or polynuclear aromatic hydrocarbons, are potent pollutants from petroleum that consist of fused aromatic rings and do not contain heteroatoms or carry substituents. As a pollutant, they are of concern because some compounds have been identified as carcinogenic, mutagenic, and teratogenic. Natural crude oil contains significant amounts of PAHs, arising from chemical conversion of natural product molecules to aromatic hydrocarbons.

COREXIT: Corexit is a product line of solvents primarily used as a dispersant for breaking up oil slicks. Corexit was the most-used dispersant in the Deepwater Horizon oil spill in the Gulf of Mexico, with COREXIT 9527 having been replaced by COREXIT 9500 after the former was deemed too toxic. Oil that would normally rise to the surface of the water is broken up by the dispersant into small globules that can then remain suspended in the water.

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted not later than April 15, 2012, September 15, 2012, April 15, 2013, September 15, 2013, and April 15, 2014. A final report and associated products will be submitted between June 30 and August 1, 2013 as requested by the LCCMR.

PART B. Species of Concern: Investigations. Grant to establish baseline information on statewide bird distribution and reproductive status relating to species of concern. \$250,000. (This funding will not be utilized until FY '13 so a detailed amendment for use of these funds will be provided at a later date regarding this grant.)

II. PROJECT SUMMARY:

III. PROJECT STATUS UPDATES:

Project Status as of *(Insert Date of First Status Update Report):*

Project Status as of *(Insert Date of Second Status Update Report):*

Project Status as of *(Insert Date of Third Status Update Report):*

Project Status as of *(Insert Date of Fourth Status Update Report):*

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1:

Description:

Summary Budget Information for Activity 1:

ENRTF Budget: \$



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**Amount Spent: \$ 0
Balance: \$**

Activity Completion Date:

Outcome	Completion Date	Budget
1. <i>specific, measureable outcome #1</i>		\$
2. <i>specific, measureable outcome #2</i>		\$
3. <i>specific, measureable outcome #3</i>		\$

(add or remove rows to Outcome table as needed)

Activity Status as of *(Insert Date of First Update Report):*

Activity Status as of *(Insert Date of Second Update Report):*

Activity Status as of *(Insert Date of Third Update Report):*

Activity Status as of *(Insert Date of Fourth Update Report):*

Final Report Summary:

Repeat for Activity 2, Activity3, etc. as necessary.

V. DISSEMINATION:

Description:

Status as of *(Insert Date of First Update Report):*

Status as of *(Insert Date of Second Update Report):*

Status as of *(Insert Date of Third Update Report):*

Status as of *(Insert Date of Fourth Update Report):*

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget:

Budget Category	\$ Amount	Explanation
Personnel:	\$	
Professional/Technical Contracts:	\$	
Service Contracts	\$	
Equipment/Tools/Supplies:	\$	
Capital Equipment over \$3,500:	\$	
Fee Title Acquisition:	\$	



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Easement Acquisition:	\$	
Professional Services for Acq:	\$	
Printing:	\$	
Travel Expenses in MN:	\$	
Other:	\$	
TOTAL ENRTF BUDGET:	\$	

Add or remove rows as needed

Explanation of Use of Classified Staff:

Explanation of Capital Expenditures Greater Than \$3,500:

Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation:

Number of Full-time Equivalent (FTE) estimated to be funded through contracts with this ENRTF appropriation:

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state			
	\$	\$	
State			
	\$	\$	
TOTAL OTHER FUNDS:	\$	\$	

Add or remove rows as needed

VII. PROJECT STRATEGY:

A. Project Partners:

B. Project Impact and Long-term Strategy:

C. Spending History:

Funding Source	M.L. 2005 or FY 2006-07	M.L. 2007 or FY 2008	M.L. 2008 or FY 2009	M.L. 2009 or FY 2010	M.L. 2010 or FY 2011

(add or remove rows and columns as needed)

VIII. ACQUISITION/RESTORATION LIST:

IX. MAP(S):

X. RESEARCH ADDENDUM:



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XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted not later than _____, _____, and _____. A final report and associated products will be submitted between June 30 and August 1, 2013 as requested by the LCCMR.

Attachment A: Budget Detail for M.L. 2011 (FY 2012-13) Environment and Natural Resources Trust Fund Projects

Project Title: *Fill in your project title as it appeared in the appropriation language*

Legal Citation: *Fill in your project's legal citation from the appropriation language*

Project Manager: *Fill in your name*

M.L. 2011 (FY 2012-13) ENRTF Appropriation: \$ *Fill in your appropriation amount*

Project Length and Completion Date: *Fill in the expected date of project completion*

Date of Update: *Fill in the date of report submission*

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Balance	Activity 2 Budget	Amount Spent	Balance	Activity 3 Budget	Amount Spent	Balance	Activity 4 Budget	Amount Spent	Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	<i>Loon telemetry & tissue analysis</i>			<i>Statewide pelican survey analysis</i>			<i>Pelican egg and tissue studies</i>			<i>Analysis of loon & for PAH & samples</i>	<i>pelican Corexit</i>			
Professional/Technical Contracts														
US Geological Survey. Loon telemetry, geolocator studies, and blood and tissue analysis. Web info on loon tracking.	89,000	0	89,000										89,000	89,000
University of Minnesota. Department of Fisheries, Wildlife, and Conservation Biology. Analysis and summary of white pelican surveys and population trends from statewide surveys related to surveys in 2004 and 2011				60,000	0	60,000							60,000	60,000
North Dakota State University, Department of Biological Sciences. Analysis and evaluation of pelican eggs, blood, and tissue samples for petroleum and dispersant contamination from three different colonies.							35,000	0	35,000				35,000	35,000
University of Connecticut, Center for Environmental Sciences and Engineering. Chemical analysis for PAH and Corexit contamination in eggs, blood, and tissue samples of Minnesota loons and pelicans from project contractors										66,000	0	66,000	66,000	66,000
COLUMN TOTAL	\$89,000	\$0	\$89,000	\$60,000	\$0	\$60,000	\$35,000	\$0	\$35,000	\$66,000	\$0	\$66,000	\$250,000	\$250,000