ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1-2
PROJECT NR.: 1.0

WORK LOCATION: Walrus Islands State Game Sanctuary

PROJECT DURATION: 1 July 2002 – 31 December 2006

PROJECT REPORTING PERIOD: 1 July 2002 – 30 June 2003

PROJECT TITLE: Walrus Islands Conservation Planning

Project Objectives:

1. Track trends in the number of walrus using Bristol Bay (annually and seasonally) from 2002-2006.
   Job/Activity a: Staff will count walrus hauled out on each beach or estimate their numbers daily from mid-May to mid-August each year.
   Job/Activity b: Staff will collect "ground truth" information to evaluate accuracy of satellite imagery to count walrus during summer 2002.
   Job/Activity c: ADF&G will provide shelter and support for USGS and USFWS research biologists in the collection of skin samples of walrus during summer 2002.
   Job/Activity d: Staff will record all observations of anthropogenic disturbances by visitors, boat traffic, and air traffic.

2. With Federal, State, Native and other groups, develop cooperative conservation efforts from 2002-2006.
   Job/Activity a: Staff will provide data for updating the Bristol Bay Walrus Conservation Plan
   Job/Activity b: Staff will assist in developing and maintaining cooperative management of walrus in Bristol Bay with Federal, State, Native and other groups by June 30, 2006.
   Job/Activity c: Staff will update cooperative management agreement between USFWS and ADF&G by March 2003.

Summary of Project Accomplishments (numbers correspond to project objectives/activities):
NOTE: The following accomplishments refer to one field season of data May 14-August 11, 2002.

1. a. Walrus hauled out on the east-side beaches of Round Island were counted on 90 consecutive days. The high count was of 3371 walrus on May 29, 2002.
   b. Satellite photos were taken successfully on May 17, June 17, July 10, and July 28. Staff collected "ground truth" information to evaluate accuracy satellite images though USFWS has yet to analyze the results.

c. ADF&G provided shelter and support for 2 USGS and 1 USFWS research biologists. The USGS biologist collected approximately 50 skin samples of walrus to help delineate American/Russian populations and to investigate the validity of genetic population estimates.
d. Staff recorded all observations of anthropogenic disturbances by visitors, boat traffic, and air traffic. Nine airplanes flew over the island causing several hundred walrus to abandon the haulout after all but one of these incidents.

NOTE: The following accomplishments refer to interim reporting period of July 1, 2002 through June 30, 2003

2. a. Staff provided data for updating the Bristol Bay Walrus Conservation Plan. A USFWS biologist is currently circulating a draft plan within USFWS for comment before sending it out to partner agencies.
c. Changes to the walrus hunting season were approved by the Alaska Board of Game in March '03. Staff drafted a revised Cooperative Agreement to manage Round Island walrus during this reporting period.

Project Costs: Federal share $46,037.25 + state share $15,345.75 = total cost $ 61,383

Prepared By: Colleen Matt, Lands & Public Services Coordinator

Date: September 8, 2003

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1-2
PROJECT NR.: 1

WORK LOCATION: Walrus Islands State Game Sanctuary

PROJECT DURATION: 1 July 2002 – 31 December 2006

PROJECT REPORTING PERIOD: 1 July 2003 – 30 June 2004

PROJECT TITLE: Walrus Islands Conservation Planning

Project Objectives:

1. Track trends in the number of walrus using Bristol Bay (annually and seasonally) from 2002-2006.
   Job/Activity a: Staff will count walrus hauled out on each beach or estimate their numbers daily from mid-May to mid-August each year.
   Job/Activity b: Staff will collect "ground truth" information to evaluate accuracy of satellite imagery to count walrus during summer 2002.
   Job/Activity c: ADF&G will provide shelter and support for USGS and USFWS research biologists in the collection of skin samples of walrus during summer 2002.
   Job/Activity d: Staff will record all observations of anthropogenic disturbances by visitors, boat traffic, and air traffic.
2. With Federal, State, Native and other groups, develop cooperative conservation efforts from 2002-2006.
   Job/Activity a: Staff will provide data for updating the Bristol Bay Walrus Conservation Plan
   Job/Activity b: Staff will assist in developing and maintaining cooperative management of walrus in Bristol Bay with Federal, State, Native and other groups by June 30, 2006.
   Job/Activity c: Staff will update cooperative management agreement between USFWS and ADF&G by March 2003.

Summary of Project Accomplishments:

NOTE: The following accomplishments refer to one field season of data May 14-August 11, 2003.

1. a. Walrus hauled out on the east-side beaches of Round Island were counted on 98 consecutive days. The high count was 3,487 walruses on August 1, 2003.
   b. Satellite telemetry tags were deployed on seven animals and they were tracked throughout 2003.
   c. ADF&G provided shelter and support for one USGS and one USFWS research biologists in May 2003. The USGS biologist collected 19 skin samples of walruses to help delineate American/Russian populations and to investigate the validity of genetic population estimates.

d. Staff recorded all observations of anthropogenic disturbances by visitors, boat traffic and air traffic. Several commercial boats strayed just inside the 3-mile restricted area around Round Island but no disturbance to walruses was noted. Inadvertent disturbances by sanctuary visitors and staff were minimal.

NOTE: The following accomplishments refer to interim reporting period of July 1, 2003 through June 30, 2004

2. a. Staff provided data for updating the Bristol Bay Walrus Conservation Plan. A USFWS biologist continues to work on the draft and will send to partner agencies after their internal consultation.

b-c. While staff and partner agencies finalized a revised Cooperative Agreement to manage the Round Island walrus hunt, local hunters did not utilize the newly created hunt period in fall of 2003.

Project Costs (includes indirect costs)**:**
Federal share $ 52,432.63 + state share $ 17,477.55 = total cost $ 69,910.18

Prepared By: Colleen Matt, Lands & Public Services Coordinator

Date: August 30, 2004

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1-2
PROJECT NR.: 1

WORK LOCATION: Walrus Islands State Game Sanctuary

PROJECT DURATION: 1 July 2002 – 31 December 2006

PROJECT REPORTING PERIOD: 1 July 2004 – 30 June 2005

PROJECT TITLE: Walrus Islands Conservation Planning

Project Objectives:

1. Track trends in the number of walrus using Bristol Bay (annually and seasonally) from 2002-2006.
   Job/Activity a: Staff will count walrus hauled out on each beach or estimate their numbers daily from mid-May to mid-August each year.
   Job/Activity b: Staff will collect "ground truth" information to evaluate accuracy of satellite imagery to count walrus during summer 2002.
   Job/Activity c: ADF&G will provide shelter and support for USGS and USFWS research biologists in the collection of skin samples of walrus during summer 2002.
   Job/Activity d: Staff will record all observations of anthropogenic disturbances by visitors, boat traffic, and air traffic.
2. With Federal, State, Native and other groups, develop cooperative conservation efforts from 2002-2006.
   Job/Activity a: Staff will provide data for updating the Bristol Bay Walrus Conservation Plan
   Job/Activity b: Staff will assist in developing and maintaining cooperative management of walrus in Bristol Bay with Federal, State, Native and other groups by June 30, 2006.
   Job/Activity c: Staff will update cooperative management agreement between USFWS and ADF&G by March 2003.

Summary of Project Accomplishments:

Objective 1 (Note: Because the data collection period overlaps the reporting period the accomplishments for Objective 1 refer to one field season of data collection from May 4 to August 11, 2004.)

a. Walrus haulout surveys were conducted each day during this period (98 surveys). The high count was 3,500 walruses on May 6, 2004 with a daily mean count of 548.5 walruses.

b. During summer of 2004, Round Island staff observed and recorded satellite transmitter-tagged animals hauled out on the island. The animals had been tagged by USGS and USFWS research biologists in the sea ice west of Round Island prior to the reporting period.

c. ADF&G provided shelter and support for one USFWS technician who assisted with haulout monitoring.

d. Staff observed 38 incidents of anthropogenic disturbances to walruses (by visitors, boat traffic and air traffic) and 2 natural disturbance events. One helicopter entered the sanctuary without authorization resulting in disturbance to 22 walruses and the remainder of the anthropogenic disturbances were minor and resulted from authorized activities. Two natural disturbance events resulted from rock falls and/or sea bird activity.

Objective 2

a. Staff provided data to USFWS management biologists for updating the Bristol Bay Walrus Conservation Plan. The USFWS continues to work on the draft and will send to partner agencies after their internal consultation.
b. Staff and partner agencies finalized a revised Cooperative Agreement to manage the Round Island traditional walrus hunt in 2003. Staff continue meeting and discussing hunt-related issues and other Bristol Bay walrus management issues with partner entities during several annual meetings and as necessary.
c. A Memorandum of Agreement for managing and staffing the summer program at Round Island was updated in 2003.

Project Costs (includes indirect costs)**:**

Stewardship Investment items: None

Total costs: Federal share $44,577.75 + state share $14,859.25 = total cost $59,437

Prepared By: Joe Meehan, Lands & Refuges Program Coordinator

Date: August 31, 2005

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1-2
PROJECT NR.: 1

WORK LOCATION: Walrus Islands State Game Sanctuary

PROJECT DURATION: 1 July 2002 – 31 December 2006

PROJECT REPORTING PERIOD: 1 May 2005 – 30 August 2006

PROJECT TITLE: Walrus Islands Conservation Planning

Project Objectives:

1. Track trends in the number of walrus using Bristol Bay (annually and seasonally) from 2002-2006.
   Job/Activity a: Staff will count walrus hauled out on each beach or estimate their numbers daily from mid-May to mid-August each year.
   Job/Activity b: Staff will collect "ground truth" information to evaluate accuracy of satellite imagery to count walrus during summer 2002.
   Job/Activity c: ADF&G will provide shelter and support for USGS and USFWS research biologists in the collection of skin samples of walrus during summer 2002.
   Job/Activity d: Staff will record all observations of anthropogenic disturbances by visitors, boat traffic, and air traffic.
2. With Federal, State, Native and other groups, develop cooperative conservation efforts from 2002-2006.
   Job/Activity a: Staff will provide data for updating the Bristol Bay Walrus Conservation Plan
   Job/Activity b: Staff will assist in developing and maintaining cooperative management of walrus in Bristol Bay with Federal, State, Native and other groups by June 30, 2006.
   Job/Activity c: Staff will update cooperative management agreement between USFWS and ADF&G by March 2003.

Summary of Project Accomplishments:

Objective 1 (Note: Because the data collection period overlaps the reporting period, the accomplishments for Objective 1 refer to two field seasons of data collection from May 17 to August 13, 2005 and May 2 through August 14, 2006.)

a. Walrus haulout surveys were conducted 80 times in the 2005 season and 95 times during the 2006 season. The high counts were 2,195 walruses on May 19 and 2,716 walruses on May 26 for the 2005 and 2006 seasons, respectively.

b. There were no tagging or marking of animals in the 2005 or 2006 seasons and satellite imagery was not conducted in either season.

c. There were no research efforts by USFWS or USGS staff at Round Island in 2005 or 2006.

d. Staff observed 17 incidents of anthropogenic disturbances to walruses and one natural disturbance event during 2005. During the 2006 season, staff observed 10 anthropogenic disturbances and no natural disturbance events. All observed disturbance incidents were from authorized activities (by visitors, boat traffic and air traffic) and the natural event was likely a result of a thunderstorm. During 2006, two aircraft flew low over the island in separate incidents and it is unknown if any walruses were disturbed.

Objective 2

a. Staff provided walrus survey and disturbance data to USFWS management biologists for updating the Bristol Bay Walrus Conservation Plan. The USFWS continues to work on the draft conservation plan and have recently hired a graduate intern to review current and past survey data to assess the affects environmental conditions have on walrus use of haulouts. These results may influence how the conservation plan is ultimately implemented.
b. Staff and partner agencies finalized a revised Cooperative Agreement to manage the Round Island traditional walrus hunt in 2003. Staff continue meeting and discussing hunt-related issues and other Bristol Bay walrus management issues with partner entities during several annual meetings and as necessary.
c. A Memorandum of Agreement for managing and staffing the summer program at Round Island was updated in 2003. While the USFWS Office of Marine Mammals Management provided assistance with survey methodology, and provided financial assistance to support an ADF&G volunteer program in 2005, they were unable to provide staffing support during the 2005 and 2006 seasons.

Project Costs (includes indirect costs)**:**

Total costs: Federal share $80,795.62 + state share $26,931.88 = total cost $107,727.50

Prepared By: Joe Meehan, Lands & Refuges Program Coordinator

Date: August 30, 2006

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant and Segment Number: T-1-2

Project Number: 1.0

Project Title: Walrus Islands State Game Sanctuary

Project Duration: 1 July 2002 – June 30, 2007

Report Period: 1 July 2006 – 30 June 2007

Report Due Date: September 30, 2007

Partner: Alaska Department of Fish and Game

Project Objectives

OBJECTIVE 1: Track trends in the number of walrus using Bristol Bay (annually and seasonally) from 2002-2006.

JOB/ACTIVITY A: Staff will count walrus hauled out on each beach or estimate their numbers daily from mid-May to mid-August each year.

JOB/ACTIVITY B: Staff will collect "ground truth" information to evaluate accuracy of satellite imagery to count walrus during summer 2002.

JOB/ACTIVITY C: ADF&G will provide shelter and support for US Geological Survey (USGS) and US Fish and Wildlife Service (USFWS) research biologists in the collection of skin samples of walrus during summer 2002.

JOB/ACTIVITY D: Staff will record all observations of anthropogenic disturbances by visitors, boat traffic, and air traffic.

OBJECTIVE 2: With Federal, State, Native and other groups, develop cooperative conservation efforts from 2002-2006.

JOB/ACTIVITY A: Staff will provide data for updating the Bristol Bay Walrus Conservation Plan

JOB/ACTIVITY B: Staff will assist in developing and maintaining cooperative management of walrus in Bristol Bay with Federal, State, Native and other groups by June 30, 2006.

JOB/ACTIVITY C: Staff will update cooperative management agreement between USFWS and ADF&G by March 2003.

Summary of Project Accomplishments for the entire project

OBJECTIVE 1:

JOB/ACTIVITY A: Walrus numbers, behavior, distribution and other environmental conditions were documented on a near-daily basis during summer (early May – mid-August) during the entire project period. Survey techniques were consistent with

established protocols and included comparisons of count techniques (e.g., multiple counts by single observers, multiple counts by multiple observers, and photographic counts). Annual high counts ranged from 2,195 animals in 2005 to 5,245 animals in 2007.

JOB/ACTIVITY B: Satellite photos of Round Island were taken in 2002 (4 photos) and 2003 (5 photos). Sanctuary staff provided "ground truthing" counts and photographs of walruses on the island that were used to develop a technique for estimating numbers of walruses present in the satellite imagery.

In addition, satellite telemetry tags were deployed on seven animals at Round Island in 2003 and these animals were tracked throughout the season. Satellite transmitters were also deployed on 30 walruses in the sea ice west of Round Island in April 2004. During summer of 2004, Round Island staff observed and recorded tagged animals hauled out on the island.

JOB/ACTIVITY C: ADF&G provided shelter and support for two USGS and one USFWS research biologists in 2002 when approximately 50 skin samples of walrus were collected to help delineate American/Russian populations and to investigate the validity of genetic population estimates. Shelter and support were also provided to one USGS and one USFWS research biologists in May 2003 when 19 skin samples of walruses were collected. During the summers 2002 – 2005, ADF&G provided shelter and support for one USFWS technician who assisted with walrus haulout monitoring.

JOB/ACTIVITY D: Staff recorded all observations of anthropogenic disturbances by visitors, boat and traffic, and sanctuary operations including 9 events in 2002 (all aircraft); 38 incidents in 2004 (plus two natural disturbance events involving a rock slide and seabird activity); 17 incidents in 2005 (plus one natural disturbance event); ten incidents in 2006 (plus one natural disturbance event); and 21 incidents in 2007. Evaluating these observations allowed staff to better direct sanctuary operations in an effort to minimize disturbance to walruses.

OBJECTIVE 2:

JOB/ACTIVITY A: All data collected during the project period were provided to the Office of Marine Mammal Management at the USFWS for use in their Bristol Bay Walrus Conservation Plan. These data were used in evaluating survey techniques and relationships between haulout use and environmental factors. A draft conservation plan has been prepared; however, other conservation priorities for Pacific walruses have delayed final plan preparation.

JOB/ACTIVITY B: Staff and partner agencies finalized a revised Cooperative Agreement to manage the Round Island traditional walrus hunt in 2003. Staff continue meeting and discussing hunt-related issues and other Bristol Bay walrus management issues with partner entities during several annual meetings and as necessary. Efforts continued throughout the project period to implement conservation and land protection strategies for the Cape Siniavin haulout in southern Bristol Bay.

JOB/ACTIVITY C: A Memorandum of Agreement for managing and staffing the summer program at Round Island was updated in 2003.

Project Accomplishments during last segment period only (July 1, 2006 – June 30, 2007)

Walrus surveys as described in OBJECTIVE 1, JOB/ACTIVITY A continued during this reporting period as did documentation of anthropogenic disturbances as described in OBJECTIVE 1, JOB/ACTIVITY D. These data were provided to the USFWS for their continuing efforts to manage and conserve Pacific walruses in Bristol Bay and for use in their conservation plan (OBJECTIVE 2, JOB/ACTIVITY A).

Prepared By: Joe Meehan, Lands & Refuges Program Coordinator

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1-10
PROJECT NR.: 1.0

WORK LOCATION: Statewide

PROJECT DURATION: 1 October 2002 – 30 June 2004

PROJECT REPORTING PERIOD: 1 October 2002 – 30 June 2003

PROJECT TITLE: Marine Mammal conservation planning coordination

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Project Objectives:

1. Participate on marine mammal advisory committees and provide information to commissions for use in updates or revisions to marine mammal conservation plans.

Job/Activity a: Serve on advisory committees and the State of Alaska Steller sea lion restoration team to provide information on the biology and ecology of sea lions, to cooperatively revise the National Marine Fisheries Service's Recovery Plan for the Steller Sea Lion.

Job/Activity b: Serve on advisory committees to provide information on the biology and ecology of sea lions and information about marine mammal/fish interactions and coexistence and help the North Pacific Fisheries Management Council Steller sea lion mitigation committee develop revised Reasonable and Prudent Alternative plans to implement fisheries.

Job/Activity c: Serve on the Alaska Beluga Whale Committee and provide information on the biology and ecology of beluga whales, and assist in revision of the Cook Inlet Beluga Whale Conservation Plan and other beluga whale plans that may be developed.

Job/Activity d: Provide information on harbor seal conservation and management issues to various groups and commissions; e.g., Alaska Scientific Review Group, National Marine Fisheries Service, and the Alaska Native Harbor Seal Commission, and contribute to developing a research plan for harbor seals in Alaska.

Job/Activity e: Monitor and provide input into other marine mammal programs, especially those of the National Marine Fisheries Service, Fish and Wildlife Service, University of Alaska, and Alaska SeaLife Center, and assist in the selection and direction of research and monitoring for the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

2. Supervise and coordinate marine mammal staff in development of ADF&G research and contributing to development of state wildlife conservation plans.

Job/Activity a: Supervise four Wildlife Biologist IIIs that lead marine mammal research programs giving guidance on research objectives, methods, and analyses and helping them to develop annual and multi-year research plans for the marine mammal program.

Job/Activity b: Provide information on marine mammal conservation and management issues for ADF&G staff developing the state Comprehensive Wildlife Conservation Plan.

Summary of Project Accomplishments:
Originally, this project was to have ended on June 30, 2003, however it has been extended one year. This report covers accomplishments during the 9-months of the initial project period, Oct. 1, 2003 – June 30, 2003.

1. a. Chaired 3 meetings of the Steller sea lion (SSL) Recovery Team with discussions focused on determining current threats to the recovery of SSLs, and was the lead on revisions to the Recovery Plan. The State of Alaska SSL restoration team did not meet during the reporting period. Participated in numerous teleconferences with members of the Pacific Walrus Conservation Fund as the representative for ADF&G, resulting in a Request for Proposals and subsequent granting of funds for 6 projects after completion of the review process. Participated in the annual meeting of the Eskimo Walrus Committee and discussed development of population assessment techniques and harvest monitoring. Assisted in planning the development of a new Commission for ice seals, and helped organize a working group meeting to be held in July 2003.

1. b. Represented the SSL Recovery Team in discussions on possible interactions between SSLs and fisheries. The North Pacific Fisheries Management Council (NPFMC) RPA committee did not meet during the reporting period, but was reorganized as the NPFMC SSL Mitigation Committee, with meetings planned for the next reporting period.

1. c. Participated in the annual meeting of the Alaska Beluga Whale Committee and discussed recent population assessment results, harvest monitoring, and development of research priorities.

1.d. Met with members of the Alaska Native Harbor Seal Commission, NMFS, and the Alaska SeaLife Center to revise the Alaska Harbor Seal Research Plan (attached) and developed a joint proposal for cooperative research. Discussed status of new scientific information on the population structure of harbor seals at the autumn meeting of the Alaska Scientific Review Group, with a focus towards revising harbor seal stock structure in Alaska.

1. e. Discussed with the USFWS the population status of sea otters in Alaska and a proposed listing under the Endangered Species Act. Synthesized ADF&G marine mammal staff input on research priorities for the North Pacific Research Board (NPRB), and reviewed proposals for both the NPRB and the Gulf Ecosystem Monitoring Program.

2. a. Supervised the four principal marine mammal programs of ADF&G, including the review of research priorities, improvements in administrative support, investigation into acquiring new laboratory facilities, and acquisition of funding. Met with entire ADF&G marine mammal staff to discuss overall research direction and planning, and enhanced integration with Division of Wildlife Conservation.

2. b. Discussed integration of marine mammal conservation and management into the state Comprehensive Wildlife Conservation Plan, including status of current conservation plans for marine mammals.

Project Costs: Federal share $38,996 + state share $12,999 = total cost $ 51,995

Prepared By: Robert J. Small, Principal Investigator, Marine Mammals Coordinator

Date: 18 September 2003

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1-10
PROJECT NR.: 1

WORK LOCATION: Statewide

PROJECT DURATION: 1 July 2003– 30 June 2004

PROJECT REPORTING PERIOD: 1 July 2003–30 June 2004

PROJECT TITLE: Marine Mammal conservation planning coordination

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Project Objectives:

1: Participate on marine mammal advisory committees and provide information to commissions for use in updates or revisions to marine mammal conservation plans.

Job/Activity a: Serve on advisory committees and the State of Alaska Steller sea lion restoration team to provide information on the biology and ecology of sea lions, to cooperatively revise the National Marine Fisheries Service's Recovery Plan for the Steller Sea Lion.

Job/Activity b: Serve on advisory committees to provide information on the biology and ecology of sea lions and information about marine mammal/fish interactions and coexistence and help the North Pacific Fisheries Management Council Steller sea lion mitigation committee develop revised Reasonable and Prudent Alternative plans to implement fisheries.

Job/Activity c: Serve on the Alaska Beluga Whale Committee and provide information on the biology and ecology of beluga whales, and assist in revision of the Cook Inlet Beluga Whale Conservation Plan and other beluga whale plans that may be developed.

Job/Activity d: Provide information on harbor seal conservation and management issues to various groups and commissions; e.g., Alaska Scientific Review Group, National Marine Fisheries Service, and the Alaska Native Harbor Seal Commission, and contribute to developing a research plan for harbor seals in Alaska.

Job/Activity e: Monitor and provide input into other marine mammal programs, especially those of the National Marine Fisheries Service, Fish and Wildlife Service, University of Alaska, and Alaska SeaLife Center, and assist in the selection and direction of research and monitoring for the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

2: Supervise and coordinate marine mammal staff in development of ADF&G research and contributing to development of state wildlife conservation plans.

Job/Activity a: Supervise four Wildlife Biologist IIIs that lead marine mammal research programs giving guidance on research objectives, methods, and analyses and helping them to develop annual and multi-year research plans for the marine mammal program.

Job/Activity b: Provide information on marine mammal conservation and management issues for ADF&G staff developing the state Comprehensive Wildlife Conservation Plan.

Summary of Project Accomplishments

1. a. Chaired 2 meetings of the Steller sea lion (SSL) Recovery Team with discussions focused on determining current threats to the recovery of SSLs, and was the lead on revisions to the Recovery Plan. The State of Alaska SSL restoration team did not meet during the reporting period. Assisted in planning the development of a new Commission for ice seals, and helped organize and participated in the first working group meeting held in July 2003.

1. b. Represented the SSL Recovery Team in discussions on possible interactions between SSLs and fisheries. Attended 3 meetings held by the North Pacific Fisheries Management Council (NPFMC) SSL Mitigation Committee on additional sea lion mitigation measures.

1. c. Participated in the annual meeting of the Alaska Beluga Whale Committee, which included the 3rd Workshop on Science and Traditional Knowledge, and discussed recent population assessment results, harvest monitoring, and development of research priorities.

1.d. Met with members of the Alaska Native Harbor Seal Commission, NMFS, and the Alaska SeaLife Center to revise the Alaska Harbor Seal Research Plan and developed a joint proposal for cooperative research. Discussed the status of new scientific information on the population structure of harbor seals at the autumn meeting of the Alaska Scientific Review Group, with a focus towards revising harbor seal stock structure in Alaska.

1. e. Led the ADF&G response to a proposed rule in the federal register to list the southwest stock of northern sea otters as 'threatened' under the Endangered Species Act. Synthesized ADF&G marine mammal staff input on research priorities for the North Pacific Research Board (NPRB), and reviewed proposals for both the NPRB and the Gulf Ecosystem Monitoring Program.

2. a. Supervised the four principal marine mammal programs of ADF&G, including the review of research priorities, improvements in administrative support, investigation into acquiring new laboratory facilities, and acquisition of funding. Met with entire ADF&G marine mammal staff to discuss overall research direction and planning, and enhanced integration with Division of Wildlife Conservation.

2. b. Chaired the working group on marine mammals in drafting the marine mammal templates for the draft ADF&G Comprehensive Wildlife Conservation Strategy.

Project Costs (includes indirect costs)**:**
Federal share $ 42,751.12 + state share $ 14,250.38 = total cost $ 57,001.50

Prepared By: Robert J. Small

Date: 2 September 2004

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1- 10

PROJECT NR.: 1

WORK LOCATION: Statewide

PROJECT DURATION: 1 July 2004 – 30 June 2005

PROJECT REPORTING PERIOD: 1 July 2004 – 30 June 2005

PROJECT TITLE: Marine Mammal conservation planning coordination

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Project Objectives

Objective 1: Participate on marine mammal advisory committees and provide information to commissions for use in updates or revisions to marine mammal conservation plans.

Job/Activity a: Serve on advisory committees and the chair the Steller sea lion Recovery Team to provide information on the biology and ecology of sea lions and to cooperatively revise the National Marine Fisheries Service's Recovery Plan for the Steller Sea Lion.

Job/Activity b: Serve on advisory committees to provide information on the biology and ecology of sea lions and information about marine mammal/fish interactions and coexistence and help the North Pacific Fisheries Management Council Steller sea lion mitigation committee develop revised Reasonable and Prudent Alternative plans to implement fisheries.

Job/Activity c: Provide information and advise the ADF&G Commissioner's staff on the Marine Mammal Protection Act reauthorization, the declining southwest stock of sea otters, marine mammal observer program, and list of fisheries.

Job/Activity d: Serve on the Alaska Beluga Whale Committee and provide information on the biology and ecology of beluga whales, and assist in revision of the Cook Inlet Beluga Whale Conservation Plan and other beluga whale plans that may be developed.

Job/Activity e: Provide information on harbor seal conservation and management issues to various groups and commissions; e.g., Alaska Scientific Review Group, National Marine Fisheries Service, and the Alaska Native Harbor Seal Commission, and contribute to developing a research plan for harbor seals in Alaska.

Job/Activity f: Monitor and provide input into other marine mammal programs, especially those of the National Marine Fisheries Service, Fish and Wildlife Service, University of Alaska, and Alaska SeaLife Center, and assist in the selection and direction of research and monitoring for the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

Objective 2: Supervise and coordinate marine mammal staff in development of ADF&G research and contributing to development of state wildlife conservation plans.

Job/Activity a: Supervise one Wildlife Biologist IV, two Wildlife Biologist IIIs, and a Biometrician III that lead marine mammal research programs giving guidance on research objectives, methods, and analyses and helping them to develop annual and multi-year research plans for the marine mammal program.

Job/Activity b: Provide information on marine mammal conservation and management issues for ADF&G staff developing the state Comprehensive Wildlife Conservation Plan.

Summary of Project Accomplishments

1. a. Chaired 2 meetings of the Steller Sea Lion (SSL) Recovery Team with discussions focused on determining priority research and management actions needed for the recovery of SSLs, and was the lead on revisions to the Recovery Plan. Assisted in further development of the new Ice Seal Committee, helping identify research and management priorities.

1. b. Represented the SSL Recovery Team in discussions on possible interactions between SSLs and fisheries. Attended 1 meeting held by the North Pacific Fisheries Management Council (NPFMC) SSL Mitigation Committee on additional sea lion mitigation measures.

1. c. Prepared documents for the ADF&G Commissioner's office on priority issues for the State regarding reauthorization of the Marine Mammal Protection Act. Prepared an overview of the ADF&G SSL research program in response to a request by the Governor's office. Also briefed or prepared documents for Commissioner's office staff on issues related to (1) the proposed ESA listing of the southwest stock of northern sea otters, (2) the oil spill from the Selendang Ayu, (3) proposed oil and gas leases, (4) Kensington Mine, and (4) the proposed Kink Arm Crossing.

1. d. Participated in the annual meeting of the Alaska Beluga Whale Committee, and discussed recent population assessment results, harvest monitoring, and development of research priorities, and was also the speaker at the annual banquet associated with the meeting. Prepared the ADF&G comments on the draft Cook Inlet Beluga Whale Conservation Plan.

1. e. Met with members of the Alaska Native Harbor Seal Commission (ANHSC), NMFS, and the Alaska SeaLife Center to revise the Alaska Harbor Seal Research Plan and developed a revised joint proposal for cooperative research. Attended a two-day workshop on the population structure of Alaska harbor seals, followed by discussions outlining a timeline for drafting revised population stocks to be reviewed and approved by NMFS and the ANHSC through the co-management process. Attended the autumn meeting of the Alaska Scientific Review Group, with a focus towards revising harbor seal stock structure in Alaska.

1. f. Attended the 18th meeting of the US-Russia working group on Marine Mammals to discuss conservation and research priorities between the two countries. Reviewed research proposals for the NPRB, NFWF, and the Gulf Ecosystem Monitoring Program, and manuscripts submitted for publication to the Society of Marine Mammalogy.

2. a. Supervised the three principal marine mammal programs of ADF&G, including the review of research priorities, improvements in administrative support, and acquisition of funding. Met with entire ADF&G marine mammal staff to discuss overall research direction and planning, and enhanced integration with Division of Wildlife Conservation.

2. b. Worked with Division of Wildlife Conservation staff to finalize the marine mammal sections of the ADF&G Comprehensive Wildlife Conservation Strategy.

Project Costs (includes indirect cost)

Stewardship Investment items: None

Total costs: Federal share $39,258 + state share $13,086 = total cost $ 52,344

Prepared By: Robert J. Small

Date: 31 August 2005

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1-19
PROJECT NR.: 1

WORK LOCATION: Juneau, Alaska

PROJECT DURATION: 20 September 2005 – 30 June 2006

PROJECT REPORTING PERIOD: 20 September 2005 – 30 June 2006

PROJECT TITLE: Marine Mammal Conservation Planning Coordination

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Project Objectives:

Objective 1: Participate on marine mammal advisory committees and provide information to commissions for use in updates or revisions to marine mammal conservation plans.

Job/Activity a: Serve on advisory committees and chair the Steller sea lion Recovery Team to provide information on the biology and ecology of sea lions and to cooperatively revise the National Marine Fisheries Service's Recovery Plan for the Steller Sea Lion.

Job/Activity b: Serve on advisory committees to provide information on the biology and ecology of sea lions and information about marine mammal/fish interactions and coexistence and help the North Pacific Fisheries Management Council Steller sea lion mitigation committee develop revised Reasonable and Prudent Alternative plans to implement fisheries.

Job/Activity c: Provide information and advise the ADF&G Commissioner's staff on the Marine Mammal Protection Act reauthorization, ESA listed Southwest stock of sea otters, new proposals for state-water fisheries in Steller sea lion critical habitat, marine mammal observer program, and list of fisheries.

Job/Activity d: Serve on the Alaska Beluga Whale Committee and provide information on the biology and ecology of beluga whales, and assist in revision of the Cook Inlet Beluga Whale Conservation Plan and other beluga whale plans that may be developed.

Job/Activity e: Provide information on harbor seal conservation and management issues to various groups and commissions; e.g., Alaska Scientific Review Group, National Marine Fisheries Service, and the Alaska Native Harbor Seal Commission, and contribute to developing a research plan for harbor seals in Alaska.

Job/Activity f: Monitor and provide input into other marine mammal programs, especially those of the National Marine Fisheries Service, Fish and Wildlife Service, University of Alaska, and Alaska SeaLife Center, and assist in the selection and direction of research and monitoring for the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

Objective 2: Supervise and coordinate marine mammal staff in development of ADF&G research and contributing to development of state wildlife conservation plans.

Job/Activity a: Supervise one Wildlife Biologist IV, two Wildlife Biologist IIIs, and a Biometrician III that lead marine mammal research programs giving guidance on research objectives, methods, and analyses and helping them to develop annual and multi-year research plans for the marine mammal program.

Job/Activity b: Provide information on marine mammal conservation and management issues for ADF&G staff developing the state Comprehensive Wildlife Conservation Plan.

Summary of Project Accomplishments for entire project:

1. a. Chaired one meeting of the Steller Sea Lion (SSL) Recovery Team in which the revised draft recovery plan for the eastern and western populations of SSL was completed. Additionally, met with a subgroup of the Team twice to discuss and develop the recovery criteria for the revised plan. Assisted in further development of the new Ice Seal Committee, helping identify research and management priorities in a draft research plan. Attended the first meeting of the Recovery Team for sea otters, and presented an overview of the SSL recovery process. Served on the 'Marine Mammal Expert Group' that provided information needed to assess the current status of marine mammals impacted by the *Exxon Valdez* oil spill.

1. b. Represented the SSL Recovery Team in discussions on possible interactions between SSLs and fisheries. Attended 1 meeting held by the North Pacific Fisheries Management Council (NPFMC) SSL Mitigation Committee, specifically to present and discuss the revised draft recovery plan.

1. c. Prepared documents for the ADF&G Commissioner's office on priority issues for the State regarding reauthorization of the Marine Mammal Protection Act, specifically the 'Zero Mortality Rate Goal". Also briefed or prepared documents for Commissioner's office staff on issues related to (1) right whale critical habitat, (2) the proposed ESA listing of polar bears, (3) the oil spill from the Selendang Ayu, and (4) proposed oil and gas leases.

1. d. Participated in the annual meeting of the Alaska Beluga Whale Committee, and discussed recent population assessment results, harvest monitoring, and development of research priorities. Reviewed and provided comment on new information on the population structure and lack of recovery of the Cook Inlet stock of beluga whales.

1. e. Met with members of the Alaska Native Harbor Seal Commission (ANHSC), NMFS, and the Alaska SeaLife Center to revise the Alaska Harbor Seal Research Plan and developed a revised joint proposal for cooperative research. Attended the annual meeting of the Alaska Scientific Review Group, to review and discuss the status of marine mammals in Alaska.

1. f. Attended the 16th Biennial meeting of the Society for Marine Mammalogy, and made a presentation on the population decline of harbor seals in the Aleutian Islands. Reviewed research proposals for the NPRB, and manuscripts submitted for publication to the Journals Marine Mammal Science and Ecological Applications. No involvement with the Gulf Ecosystem Monitoring Program, because the Program was not developed further during project period.

2. a. Supervised the three program leaders (two Wildlife Biologist IIIs and one Wildlife Physiologist III) of the principal marine mammal programs of ADF&G, and a Biometrician III, which including the review of research priorities, improvements in administrative support, and acquisition of funding.

2. b. No direct involvement with the ADF&G Comprehensive Wildlife Conservation Strategy (CWCS), because it was completed prior to the reporting period. Discussed project ideas and reviewed proposals for marine mammals under the CWCS.

Project Costs:

Total costs: Federal share $41,987.65 + state share $13,995.88 = total cost $ 55,983.53

Prepared By: Robert Small

Date: September 6, 2006

FEDERAL AID
INTERIM PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: **T-1** **Segment Number: 3**
Project Number: **7.10**
Project Title: Marine mammal conservation planning coordination
Project Duration: July 1, 2006 – June 30, 2009
Report Period: 1 July 2006 – 30 June 2007
Report Due Date: September 30, 2007
Partner: Alaska Department of Fish and Game

Project Objectives

OBJECTIVE 1: Participate on marine mammal advisory committees and provide information to commissions for use in updates or revisions to marine mammal conservation plans.

JOB/ACTIVITY A: Serve on advisory committees and the chair the Steller sea lion Recovery Team to provide information on the biology and ecology of sea lions and to cooperatively revise the National Marine Fisheries Service's Recovery Plan for the Steller Sea Lion.

JOB/ACTIVITY B: Serve on advisory committees to provide information on the biology and ecology of sea lions and information about marine mammal/fish interactions and coexistence and help the North Pacific Fisheries Management Council Steller sea lion mitigation committee develop revised Reasonable and Prudent Alternative plans to implement fisheries.

JOB/ACTIVITY C: Provide information and advise the ADF&G Commissioner's staff on the Marine Mammal Protection Act reauthorization, ESA listed Southwest stock of sea otters, new proposals for state-water fisheries in Steller sea lion critical habitat, marine mammal observer program, and list of fisheries.

JOB/ACTIVITY D: Serve on the Alaska Beluga Whale Committee and provide information on the biology and ecology of beluga whales, and assist in revision of the Cook Inlet Beluga Whale Conservation Plan and other beluga whale plans that may be developed.

JOB/ACTIVITY E: Provide information on harbor seal conservation and management issues to various groups and commissions; e.g., Alaska Scientific Review Group, National Marine Fisheries Service, and the Alaska Native Harbor Seal Commission, and contribute to developing a research plan for harbor seals in Alaska.

JOB/ACTIVITY F: Monitor and provide input into other marine mammal programs, especially those of the National Marine Fisheries Service, Fish and Wildlife Service, University of Alaska, and Alaska SeaLife Center, and assist in the selection and direction of research and monitoring for the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

OBJECTIVE 2: Supervise and coordinate marine mammal staff in development of ADF&G research and contributing to development of state wildlife conservation plans.

JOB/ACTIVITY A: Supervise one Wildlife Biologist IV, two Wildlife Biologist IIIs, and a Biometrician III that lead marine mammal research programs giving guidance on research objectives, methods, and analyses and helping them to develop annual and multi-year research plans for the marine mammal program.

JOB/ACTIVITY B: Provide information on marine mammal conservation and management issues for ADF&G staff developing the state Comprehensive Wildlife Conservation Plan.

Summary of Project Accomplishments

Objective 1:

JOB/ACTIVITY A: As Chair of Steller Sea Lion Recovery Team (SSLRT), held several discussions with personnel from the National Marine Fisheries Service (NMFS) regarding revisions of the draft revised Steller Sea Lion Recovery Plan for the eastern and western populations of SSL. NMFS officially disbanded the SSLRT in June 2007.

JOB/ACTIVITY B: No work performed because the North Pacific Fisheries Management Council (NPFMC) SSL Mitigation Committee did not request any information regarding Steller sea lions during the reporting period.

JOB/ACTIVITY C: Prepared documents for and held discussions with ADF&G Commissioner's office staff on the following issues on the proposed ESA listing of polar bears and Cook Inlet beluga whales.

JOB/ACTIVITY D: Reviewed the April 2007 version of the draft conservation plan for Cook Inlet beluga whales and provided comments to Commissioner's office staff and participated in meetings with the NMFS regarding new research proposals on Cook Inlet beluga. Also attended the first International Workshop on beluga whale research and also a meeting of beluga scientists involved with research on belugas across the circumpolar region as part of the International Polar Year.

JOB/ACTIVITY E: Met with members of the Alaska Native Harbor Seal Commission (ANHSC) and members of the ADF&G Commissioner's office to discuss research prioritization for harbor seals and all other pinnipeds in Alaska. Participated in the annual meetings of the Ice Seal Committee and the Eskimo Walrus Committee.

JOB/ACTIVITY F: Served as an invited expert at a workshop held by the U.S. Marine Mammal Commission to develop a monitoring program for Arctic marine mammals. Met with members of the USFWS and the Pacific Walrus Conservation Fund (PWCF) regarding the future direction of the PWCF. Attended a workshop sponsored by the Minerals Management Service to identify research priorities and mitigation measures for marine mammals in the Chukchi Sea related to oil and gas development.

OBJECTIVE 2:

JOB/ACTIVITY A: Supervised the three program leaders (two Wildlife Biologist IIIs and one Wildlife Physiologist III) of the principal marine mammal programs of ADF&G, and

a Biometrician III, which including the review of research priorities, improvements in administrative support, and acquisition of funding.

JOB/ACTIVITY B: No direct involvement with the ADF&G Comprehensive Wildlife Conservation Strategy (CWCS), because it was completed prior to the reporting period. Discussed project ideas and reviewed proposals for marine mammals under the CWCS.

Prepared By: Robert J. Small

Date: 5 September 2007

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-3 **Segment Number:** 1

Project Number: 7.10

Project Title: Marine mammal conservation planning coordination

Project Duration: July 1, 2006 – June 30, 2009

Report Period: July 1, 2007 – June 30, 2008

Report Due Date: September 30, 2008

Partner: Alaska Department of Fish and Game

Project Objectives

OBJECTIVE 1: Participate on marine mammal advisory committees and provide information to commissions for use in updates or revisions to marine mammal conservation plans.

JOB/ACTIVITY 1A: Serve on advisory committees and the chair the Steller sea lion Recovery Team to provide information on the biology and ecology of sea lions and to cooperatively revise the National Marine Fisheries Service's Recovery Plan for the Steller Sea Lion.

JOB/ACTIVITY 1B: Serve on advisory committees to provide information on the biology and ecology of sea lions and information about marine mammal/fish interactions and coexistence and help the North Pacific Fisheries Management Council Stellar sea lion mitigation committee develop revised Reasonable and Prudent Alternative plans to implement fisheries.

JOB/ACTIVITY 1C: Provide information and advise the ADF&G Commissioner's staff on the Marine Mammal Protection Act reauthorization, ESA listed Southwest stock of sea otters, new proposals for state-water fisheries in Stellar sea lion critical habitat, marine mammal observer program, and list of fisheries.

JOB/ACTIVITY 1D: Serve on the Alaska Beluga Whale Committee and provide information on the biology and ecology of beluga whales, and assist in revision of the Cook Inlet Beluga Whale Conservation Plan and other beluga whale plans that may be developed.

JOB/ACTIVITY 1E: Provide information on harbor seal conservation and management issues to various groups and commissions; e.g., Alaska Scientific Review Group, National Marine Fisheries Service, and the Alaska Native Harbor Seal Commission, and contribute to developing a research plan for harbor seals in Alaska.

JOB/ACTIVITY 1F: Monitor and provide input into other marine mammal programs, especially those of the National Marine Fisheries Service, Fish and

Wildlife Service, University of Alaska, and Alaska SeaLife Center, and assist in the selection and direction of research and monitoring for the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

OBJECTIVE 2: Supervise and coordinate marine mammal staff in development of ADF&G research and contributing to development of state wildlife conservation plans.

JOB/ACTIVITY 2A: Supervise one Wildlife Biologist IV, two Wildlife Biologist IIIs, and a Biometrician III that lead marine mammal research programs giving guidance on research objectives, methods, and analyses and helping them to develop annual and multi-year research plans for the marine mammal program.

JOB/ACTIVITY 2B: Provide information on marine mammal conservation and management issues for ADF&G staff developing the state Comprehensive Wildlife Conservation Plan.

Summary of Project Accomplishments:

OBJECTIVE 1:

JOB/ACTIVITY 1A: The Steller Sea Lion Recovery Team (SSLRT) was disbanded in June 2007 by the National Marine Fisheries Service (NMFS) following completion of the draft revised Steller Sea Lion Recovery Plan for the eastern and western populations of SSL by the SSLRT. Thus, no further work was accomplished under this activity.

JOB/ACTIVITY 1B: No work performed under this activity because the North Pacific Fisheries Management Council (NPFMC) SSL Mitigation Committee did not request any information regarding Steller sea lions during the reporting period.

JOB/ACTIVITY 1C: Prepared documents for and held discussions with ADF&G Commissioner's office staff on proposed ESA listings of polar bears and Cook Inlet beluga whales. Additionally, discussions were held regarding summarizing ADF&G information on walruses and the four species of ice seals (ribbon, ringed, bearded, and spotted) following petitions to list those species under the ESA.

JOB/ACTIVITY 1D: Reviewed the 2008 version of the draft conservation plan for Cook Inlet beluga whales and provided comments to Commissioner's office staff and participated in meetings with the NMFS regarding new research proposals on Cook Inlet beluga. Also attended the research prioritization workshop for Cook Inlet beluga whales, and attended the annual Alaska Beluga Whale Committee meeting.

JOB/ACTIVITY 1E: Contributed information towards the revision of the Alaska harbor seal research plan by the Alaska Native Harbor Seal Commission (ANHSC), NMFS, and ADF&G. Briefed the Alaska Scientific Review Group on the harbor seal population decline in the Aleutian Islands.

JOB/ACTIVITY 1F: Participated in two meetings of the sea otter Recovery Team (USFWS) and held discussions with NMFS personnel regarding research

prioritization of marine mammals in Alaska. Contributed as an invited panel member on a review of co-management of marine mammals in Alaska organized by the U.S. Marine Mammal Commission. No activity requested under the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

OBJECTIVE 2:

JOB/ACTIVITY 2A: Supervised the three program leaders (one Wildlife Biologist IV, one Wildlife Biologist III, and one Wildlife Physiologist III) of the principal marine mammal programs of ADF&G, and a Biometrician III, which including the review of research priorities, improvements in administrative support, and acquisition of funding through NMFS, State of Alaska, and SWG.

JOB/ACTIVITY 2B: No direct involvement with the ADF&G Comprehensive Wildlife Conservation Strategy (CWCS), because it was completed prior to the reporting period. Discussed project ideas and reviewed proposals for marine mammals under the CWCS.

Prepared By: Robert J. Small

Date: 29 September 2008

FEDERAL AID
INTERIM PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-3 **Segment Number:** 1

Project Number: 7.10

Project Title: Marine mammal conservation planning coordination

Project Duration: July 1, 2006 – June 30, 2011

Report Period: July 1, 2008 – June 30, 2009

Report Due Date: September 30, 2009

Partner: Alaska Department of Fish and Game

Project Objectives

OBJECTIVE 1: Participate on marine mammal advisory committees and provide information to commissions for use in updates or revisions to marine mammal conservation plans.

JOB/ACTIVITY 1A: Serve on advisory committees and chair the Steller sea lion Recovery Team to provide information on the biology and ecology of sea lions and to cooperatively revise the National Marine Fisheries Service's Recovery Plan for the Steller Sea Lion.

JOB/ACTIVITY 1B: Serve on advisory committees to provide information on the biology and ecology of sea lions and information about marine mammal/fish interactions and coexistence and help the North Pacific Fisheries Management Council Stellar sea lion mitigation committee develop revised Reasonable and Prudent Alternative plans to implement fisheries.

JOB/ACTIVITY 1C: Provide information and advise the ADF&G Commissioner's staff on the Marine Mammal Protection Act reauthorization, ESA listed Southwest stock of sea otters, new proposals for state-water fisheries in Stellar sea lion critical habitat, marine mammal observer program, and list of fisheries.

JOB/ACTIVITY 1D: Serve on the Alaska Beluga Whale Committee and provide information on the biology and ecology of beluga whales, and assist in revision of the Cook Inlet Beluga Whale Conservation Plan and other beluga whale plans that may be developed.

JOB/ACTIVITY 1E: Provide information on harbor seal conservation and management issues to various groups and commissions; e.g., Alaska Scientific Review Group, National Marine Fisheries Service, and the Alaska Native Harbor Seal Commission, and contribute to developing a research plan for harbor seals in Alaska.

JOB/ACTIVITY 1F: Monitor and provide input into other marine mammal programs, especially those of the National Marine Fisheries Service, Fish and Wildlife Service, University of Alaska, and Alaska SeaLife Center, and assist in the selection and direction of research and monitoring for the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

OBJECTIVE 2: Supervise and coordinate marine mammal staff in development of ADF&G research and contributing to development of state wildlife conservation plans.

JOB/ACTIVITY 2A: Supervise one Wildlife Biologist IV, two Wildlife Biologist IIIs, and a Biometrician III that lead marine mammal research programs giving guidance on research objectives, methods, and analyses and helping them to develop annual and multi-year research plans for the marine mammal program.

JOB/ACTIVITY 2B: Provide information on marine mammal conservation and management issues for ADF&G staff developing the state Comprehensive Wildlife Conservation Plan.

Summary of Project Accomplishments:

JOB/ACTIVITY 1A: Serve on advisory committees and chair the Steller sea lion Recovery Team to provide information on the biology and ecology of sea lions and to cooperatively revise the National Marine Fisheries Service's Recovery Plan for the Steller Sea Lion.

The Steller Sea Lion Recovery Team (SSLRT) was disbanded in June 2007 by the National Marine Fisheries Service (NMFS) following completion of the draft revised Steller Sea Lion Recovery Plan for the eastern and western populations of SSL by the SSLRT. Thus, no further work was accomplished under this activity.

JOB/ACTIVITY 1B: Serve on advisory committees to provide information on the biology and ecology of sea lions and information about marine mammal/fish interactions and coexistence and help the North Pacific Fisheries Management Council Stellar sea lion mitigation committee develop revised Reasonable and Prudent Alternative plans to implement fisheries.

No work performed under this activity because the North Pacific Fisheries Management Council (NPFMC) SSL Mitigation Committee did not request any information regarding Steller sea lions during the reporting period.

JOB/ACTIVITY 1C: Provide information and advise the ADF&G Commissioner's staff on the Marine Mammal Protection Act reauthorization, ESA listed Southwest stock of sea otters, new proposals for state-water fisheries in Stellar sea lion critical habitat, marine mammal observer program, and list of fisheries.

Prepared documents for and held discussions with ADF&G Commissioner's office staff on (1) the proposed ESA listing and designation of critical habitat of Cook Inlet beluga whales and (2) petitions to list ice seals and walrus under the ESA.

JOB/ACTIVITY 1D: Serve on the Alaska Beluga Whale Committee and provide information on the biology and ecology of beluga whales, and assist in revision of the Cook Inlet Beluga Whale Conservation Plan and other beluga whale plans that may be developed.

Participated in meetings with the NMFS regarding research priorities for Cook Inlet beluga whales and attended the annual Alaska Beluga Whale Committee meeting.

JOB/ACTIVITY 1E: Provide information on harbor seal conservation and management issues to various groups and commissions; e.g., Alaska Scientific Review Group, National Marine Fisheries Service, and the Alaska Native Harbor Seal Commission, and contribute to developing a research plan for harbor seals in Alaska.

Contributed information towards the revision of the Alaska harbor seal research plan prepared by the Alaska Native Harbor Seal Commission (ANHSC), NMFS, and ADF&G. Completed a publication on the harbor seal population decline in the Aleutian Islands and provided an overview of the primary results to NMFS and the Alaska Scientific Review Group.

JOB/ACTIVITY 1F: Monitor and provide input into other marine mammal programs, especially those of the National Marine Fisheries Service, Fish and Wildlife Service, University of Alaska, and Alaska SeaLife Center, and assist in the selection and direction of research and monitoring for the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

Participated in two meetings of the sea otter Recovery Team (USFWS) and held discussions with NMFS and ADF&G personnel regarding research prioritization of marine mammals in Alaska. No activity requested under the Gulf Ecosystem Monitoring Program in the Gulf of Alaska.

JOB/ACTIVITY 2A: Supervise one Wildlife Biologist IV, two Wildlife Biologist IIIs, and a Biometrician III that lead marine mammal research programs giving guidance on research objectives, methods, and analyses and helping them to develop annual and multi-year research plans for the marine mammal program.

Supervised the three program leaders (one Wildlife Biologist IV, one Wildlife Biologist III, and one Wildlife Physiologist III) of the principal marine mammal programs of ADF&G, and a Biometrician III, which included the review of research priorities, continued improvements in administrative support, and the integration of grant applications for acquisition of funding through NMFS and SWG.

JOB/ACTIVITY 2B: Provide information on marine mammal conservation and management issues for ADF&G staff developing the state Comprehensive Wildlife Conservation Plan.

No direct involvement with the ADF&G Comprehensive Wildlife Conservation Strategy (CWCS), because it was completed prior to the reporting period. Discussed project ideas and reviewed proposals for marine mammals under the Coastal Impact Assistance Program (CIAP) relative to priorities under the CWCS.

Prepared By: Robert J. Small

FEDERAL AID
INTERIM PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-1 **Segment Number:** 3

Project Number: 7.11

Project Title: Developing an ice seal harvest monitoring program

Project Duration: July 1, 2006 – June 30, 2009

Report Period: 1 July 2006 – 30 June 2007

Report Due Date: September 30, 2007

Partner: Alaska Department of Fish and Game

Project Objectives

(a) Determine the best method to collect harvest information for ice seals (ringed, bearded, spotted, ribbon) throughout their range. The method will be flexible to accommodate specific regional and community needs. The method will also be effective, inexpensive and voluntary.

(b) After three years this project will result in a viable harvest monitoring program or significant recommendations for how to develop such a program. The recommendation will consider the interests of subsistence hunters, local and regional representatives, and the co-managers of ice seals: the Ice Seal Committee and the National Marine Fisheries Service.

Summary of Accomplishments

A long-term nonpermanent Fish and Wildlife Technician IV (Mark Nelson) was hired in October 2006. Mark attended the annual Ice Seal Committee meeting, in October, where he met with committee members and introduced his position and project goals. Mark traveled to Barrow, Kotzebue, Togiak, Hooper Bay and Mekoryuk during this reporting period. He met with community representatives to discuss past, current, and future harvest monitoring programs.

North Slope Region: In Barrow, Mark met with the North Slope Borough (NSB) Department of Wildlife Management. The NSB uses annual household surveys to record all species harvested for subsistence. Discussions included how effective household surveys were, and if there were other methods that should be considered. The NSB is satisfied with the household surveys although they have difficulty analyzing the data and preparing the reports in a timely manner.

Northwest Arctic Region: In Kotzebue, Mark met with the Kotzebue IRA where he discussed harvest monitoring with the IRA wildlife management representative and with a Maniilaq representative. The IRA has recently completed a comprehensive harvest survey of Kotzebue, using household survey methods, the report is in preparation. Once this report is released we will be able to see how it is received by the community. The acceptance of the report by the community will likely affect plans to continue this type of survey in the future.

Yukon-Kuskokwim Delta Region: In Hooper Bay, Mark delivered a presentation on harvest monitoring, which included the use of a seal harvest calendar. A community discussion followed revealing that people were interested and would like to participate; therefore we distributed harvest calendars to everyone at the meeting. The calendars allow hunters to record the number of seals harvested each week by species and sex, and the monthly record is designed to be torn out each month and mailed in postage free. Turning in calendar pages makes participants eligible for prizes.

In Mekoryuk, Mark visited with the village administrator and a nonprofit group called NPT. Plans were made for future visits and various methods of harvest monitoring surveys were discussed.

Bristol Bay Region: Mark is working with the Bristol Bay Native Association, ADFG Division of Subsistence and the Alaska Native Harbor Seal Commission to determine the best way to approach harvest monitoring in this region. Adding ice seals to the existing harbor seal/sea lion survey appears to be the preferred method of surveying by all parties involved.

Summary: Most regions are using household surveys for collecting harvest information. Survey time intervals vary based on the availability of money for different species. The preferred method is to combine surveys to do one complete survey of all subsistence species to avoid 'survey burnout,' which happens when different agencies conduct similar surveys in the same timeframe. For example, there could be as many as five agencies or local governments interested in obtaining harvest information.

Although some regions have been successful in conducting household surveys as often as once a year, the difficulty appears to be in analyzing the data and preparing the reports in a timely manner due to the volume of the data, personnel availability, and/or the funding available. We are exploring different survey tools, especially in areas that are not covered by household surveys. The harvest calendar is one tool that has been well received in the communities, however, the return rate has been low; we are attempting different prize strategies to boost returns. Further evaluation of survey methods already in place and exploring and developing other methods will be the main tasks for the second year of the project.

Significant Deviations*:* No significant deviations to date.

Project Leader: Lori Quakenbush / Mark Nelson (ADFG AMMP)

Additional Information: Although ice seal harvest monitoring is a sensitive issue among subsistence hunters the general consensus from village meetings and the Ice Seal Committee is that harvest monitoring is important to hunters. Different regions have different survey tools in place and to avoid 'survey burnout' we are attempting to work with interested organizations to combine surveys and share information.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-3 **Segment Number:** 1

Project Number: 7.11

Project Title: Developing an ice seal harvest monitoring program

Project Duration: July 1, 2006 – June 30, 2009

Report Period: July 1, 2007 – June 30, 2008

Report Due Date: September 30, 2008

Principal Investigator: Mark Nelson, Alaska Department of Fish and Game

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Project Objectives:

OBJECTIVE 1: Develop a harvest-monitoring program that is flexible enough to accommodate different villages and is effective, inexpensive and voluntary. After three years this project will result in a viable harvest monitoring program or significant recommendations for how to develop such a program.

JOB/ACTIVITY 1A. A long-term nonpermanent Fish and Wildlife Technician IV (Mark Nelson) will work with 10 villages to develop monitoring methods that can be expanded to other villages in the future. Those villages are Barrow, Pt. Hope, Kivalina, Kotzebue, Nome, Shishmaref, Gambell or Savoonga, Hooper Bay, Mekoryuk, and Togiak.

Summary of Project Accomplishments:

OBJECTIVE 1: Mark travelled to Kotzebue, Anchorage, Togiak, Juneau, Bethel, and Hooper Bay during FY08 to assist in the development to two ice seal harvest monitoring programs and to attend meetings about ice seal harvest monitoring. The Y-K Delta region has been involved in the least amount of harvest monitoring of any of the five regions, therefore we are making this region a priority. Mark is developing a draft report for the Ice Seal Committee (ISC) that summarizes the results of existing ice seal harvest monitoring programs across the state from 2000 to 2006. The report will provide basic information about seal harvest by region that will show where current harvest monitoring efforts are and where they are needed.

JOB/ACTIVITY 1A: In the Y-K Delta region, Mark working with Jennifer Hooper from the Association of Village Council Presidents (AVCP) was successful in obtaining funds from the ISC to hire local people to conduct harvest surveys in three villages. The first step was to hold an Imarpigmiut Ungungsiit Murillkestiit (IUM) meeting, which consists of a member from each of the 26 coastal tribes in the region. Seal harvest surveys were discussed at the meeting and it was decided that each village should decide for themselves whether or not to participate. So the next step is for Jennifer and Mark is to visit the villages to seek approval to

conduct the surveys. If the surveys are approved, a local surveyor will be hired and trained to conduct the surveys during spring 2009.

In Bristol Bay, Mark travelled to Togiak with Molly Chythlook from Bristol Bay Native Association (BBNA) to meet with the Togiak Traditional Council to talk about adding three seal species to a survey that was already being conducted. The Togiak Traditional council approved the pilot project as did the nearby village of Twin Hills. The ice seal species were added to these surveys and the results should be available by winter 2008. Mark produced a harvest calendar using drawings from local students that was provided to the hunters to help keep track of their harvest by recording how many seals were harvested by species throughout the year. The calendar could then be used during the household survey to make sure accurate numbers get recorded.

Prepared By: Mark Nelson

Date: August 21, 2008

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-3 **Segment Number:** 1

Project Number: 7.11

Project Title: Developing an ice seal harvest monitoring program

Project Duration: July 1, 2006 – June 30, 2010

Report Period: July 1, 2008 – June 30, 2009

Report Due Date: September 30, 2009

Principal Investigator: Mark Nelson, Alaska Department of Fish and Game

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Project Objectives:

OBJECTIVE 1: Develop a harvest-monitoring program that is flexible enough to accommodate different villages and is effective, inexpensive and voluntary. After three years this project will result in a viable harvest monitoring program or significant recommendations for how to develop such a program.

JOB/ACTIVITY 1A: A long-term nonpermanent Fish and Wildlife Technician IV (Mark Nelson) will work with 10 villages to develop monitoring methods that can be expanded to other villages in the future. Those villages may include Barrow, Pt. Hope, Kivalina, Kotzebue, Nome, Shishmaref, Gambell or Savoonga, Hooper Bay, Mekoryuk, and Togiak.

Summary of Project Accomplishments:

OBJECTIVE 1: Mark travelled to Anchorage, Tununak, Quinhagak, Bethel, and Hooper Bay during FY09 to assist in the development of two ice seal harvest monitoring programs and to attend meetings about ice seal harvest monitoring. The Yukon-Kuskokwim (Y-K) Delta region has been least involved in harvest monitoring of any of the five regions, therefore we have made this region a priority. Mark developed a draft report for the Ice Seal Committee (ISC) that summarizes the results of existing ice seal harvest monitoring programs across the state from 2000 to 2006. The report provided basic information about seal harvest by region and shows where current harvest monitoring efforts are and where they are needed.

JOB/ACTIVITY 1A: In the Y-K Delta region, Mark worked with Jennifer Hooper from the Association of Village Council Presidents (AVCP) to hold a meeting of the Imarpigmiut Ungungsiit Murillkestiit (IUM), which consists of a member from each of the 26 coastal tribes in the region. The IUM agreed that harvest monitoring was important, however, the individual communities should decide whether or not to participate in the projects. Jennifer and Mark attended meetings in Hooper Bay, Tununak, and Quinhagak to seek approval to conduct the surveys, all communities agreed to the surveys. Mark then traveled back to the

communities in early winter to train a locally appointed surveyor from each community. The surveyors collected the information and the results will be presented to the communities this fall before distributing or sharing the information.

In Bristol Bay, Mark coordinated with Molly Chythlook from Bristol Bay Native Association (BBNA) to add ice seals to a survey that was already being conducted for harbor seals and sea lions. The Togiak Traditional council approved the pilot project as did the nearby village of Twin Hills. The ice seal species were added to these surveys and the results from 2008 are available. In Togiak 104 of 110 (95%) households were surveyed and in Twin Hills all 20 (100%) households were sampled. Togiak harvested an estimated 71 spotted, 1 bearded, 2 ringed, and no ribbon seals in 2008, Twin Hills harvested 4 spotted seals and no other ice seals during 2008. We will continue to monitor Togiak and Twin Hills in the future to determine if the low number of harvested ice seals in 2008 is stable or fluctuates from year to year.

Prepared By: Mark Nelson

Alaska Department of Fish and Game
State Wildlife Grant
ANNUAL INTERIM PERFORMANCE REPORT

Grant Number: T-1 **Segment Number:** 6
Project Number: 4
Project Title: Cooperative acoustic monitoring of Pacific Right Whales
Project Duration: July 1, 2003 – June 30, 2006
Report Period: July 1, 2004 – June 30, 2005
Report Due Date: September 30, 2005

Objectives (*as submitted in grant project statement*):

1. Construct and deploy two High-frequency Acoustic Recording Packages (HARPs) to acquire information on population abundance and trend, important habitats, and spatial and temporal geographic distribution of the North Pacific Right Whale; project will include data on other cetaceans, including humpback, fin, and killer whales.
2. Increase the spatial extent of the current acoustic monitoring program across the historical summer range of the right whale with two new HARPs.
3. Analyze data and conduct analyses of seasonality.

Summary of Accomplishments *(Describe accomplishments related to the work that was proposed to be done during this same period in the Project Description and work schedule)**:***
The following accomplishments are related to Objectives 1 and 2.

1. One ADF&F funded HARP that had been deployed at mooring site M2 during April 2004 was successfully recovered using the NOAA Ship *Miller Freeman* in September 2004. This instrument recorded acoustic data continuously at 80 kHz between April 2004 and July 2004. These data are currently being processed to detect and classify whale calls.
2. Two ADF&G funded HARPs were deployed at mooring sites M2 and M4 during September 2004 using the NOAA Ship *Miller Freeman.* These two HARPs were successfully recovered in April-May 2005, aboard the *Miller Freeman*. These instruments were programmed to continuously record acoustic data at 32 kHz.
3. One ADF&G funded HARP was deployed at site M2, in April 2005 and plans are to recover this instrument during October 2005 using the *Miller Freeman.*

The following accomplishment is related to Objective 3.

4. Data downloaded from the recovered HARPs are being processed by graduate student Lisa Munger for her doctoral dissertation. Processing techniques include using Matlab-based software (*Triton* and *Neptune*, Wiggins 2003[1]) to manually browse spectrograms for marine mammal calls, and using automated call detection software

[1] Wiggins, S. 2003. Autonomous Acoustic Recording Packages (ARPs) for Long-Term Monitoring of Whale Sounds. Marine Technical Science Journal, 37: 13-22.

(*Ishmael*, Mellinger 2001[2]) to specifically screen for right whale and fin whale calls. A manuscript is being prepared on right whale seasonality.

Significant Deviations *(if any, and explain the reasons for these)*:

1. Only one ADF&G funded HARP was deployed in April 2005, rather than two, owing to instrument problems. We plan to deploy two ADF&G funded HARPs during the October 2005 *Miller Freeman* trip.

Actual Costs during this Report Period *(personnel plus all operating expense totals)*:

Federal (from ADF&G):	Partner (nonfederal share):
$88,215.34	$29,405.11

Project Leader *(or Report Contact Person)*: J Hildebrand

Additional Information: *(Not required. Add any additional detail, if desired, related to the progress of the project)*:

1. In April-May 2004, three NOAA-funded autonomous Acoustic Recording Packages (ARPs) were deployed along the Bering Sea shelf break between Dutch Harbor and the Pribilof Islands
2. One of the shelf-break ARPs was trawled off the seafloor in June 2004 by a fishing vessel and recovered by SIO. We redeployed this ARP in August 2004.
3. Data were downloaded from the recovered ARPs, and are being processed by graduate student Lisa Munger.

[2] Mellinger, D.K. 2001. *Ishmael 1.0 User's Guide*. NOAA Technical Report OAR-PMEL-120, Seattle, WA. 26 pp. Available online at http://cetus.pmel.noaa.gov/cgi-bin/MobySoft.pl.

Alaska Department of Fish and Game
State Wildlife Grant
ANNUAL INTERIM PERFORMANCE REPORT

Grant Number: T-1 **Segment Number:** 6
Project Number: 4
Project Title: Cooperative acoustic monitoring of Pacific Right Whales
Project Duration: July 1, 2003 – June 30, 2007
Report Period: July 1, 2005 – June 30, 2006
Report Due Date: September 30, 2006
Partner: University of California San Diego, Scripps Institution

Objectives:

1. Construct and deploy two High-frequency Acoustic Recording Packages (HARPs) to acquire information on population abundance and trend, important habitats, and spatial and temporal geographic distribution of the North Pacific Right Whale; project will include data on other cetaceans, including humpback, fin, and killer whales.
2. Increase the spatial extent of the current acoustic monitoring program across the historical summer range of the right whale with two new HARPs.
3. Analyze data and conduct analyses of seasonality.

Summary of Accomplishments:

The following accomplishments are related to Objectives 1 and 2.

1. One ADF&F funded HARP that had been deployed at mooring site M2 during April 2005 was successfully recovered using the NOAA Ship *Miller Freeman* in October 2005. This instrument recorded acoustic data continuously at 80 kHz between April and September 2005.
2. Two ADF&G funded HARPs were deployed at mooring sites M2 and M4 during October 2005 using the NOAA Ship *Miller Freeman.* These two HARPs were successfully recovered in May 2006, aboard the *Miller Freeman*. These HARPs recorded continuously at a sampling rate of 80 kHz until late January 2006.

The following accomplishment is related to Objective 3.

3. Data from these HARPs have been processed using automated right whale call detection software, configured to detect 'up' calls. Right whale up calls were detected on 10 separate encounters in October, November, and December 2005. Humpback whale calls were also detected throughout theses recordings.
4. HARP data were also studied for the presence of killer whale calls. A long-term spectral average of the data was scanned visually, and then promising times were examined in greater detail. On the M2 HARP 49 killer whale encounters were found between April 2005 and January 2006 (10 months). On the M4 HARP (located further north) 14 killer whale encounters were found between October 2005 and January 2006 (4 months).

Significant Deviations:

1. No ADF&G funded HARPs were deployed in April 2006, owing to the occupation of the PMEL-NOAA moorings by PMEL-owned acoustic recorders. This means that we will not acquire acoustic data for the April – October 2006 period, a deviation from the original proposal.
2. We have initiated a new effort to identify killer whale calls in the Bering Sea HARP data, an expansion of the originally proposed data analysis effort, which will be undertaken by Dr. Erin Oleson (SIO-Postdoc).

Actual Costs during this Report Period *(personnel plus all operating expense totals)*:
(Reported costs included ADF&G indirect calculated at 13.5%)

Federal (from ADF&G):	Partner (nonfederal share):
$6,797	$2,266

Project Leader *(or Report Contact Person)*: J Hildebrand

Additional Information:
In April 2005, one NOAA-funded autonomous Acoustic Recording Packages (ARPs) was recovered along the Bering Sea shelf break between Dutch Harbor and the Pribilof Islands

1. Data were downloaded from the recovered ARP, and are being processed by graduate student Lisa Munger.

FEDERAL AID
FINAL PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-1 **Segment Number:** 6

Project Number: 4

Project Title: Cooperative acoustic monitoring of Pacific Right Whales

Project Duration: July 1, 2003 – June 30, 2007

Report Period: July 1, 2006 – June 30, 2007

Report Due Date: September 30, 2007

Partner: University of California San Diego, Scripps Institution

Project Objectives

1. Construct and deploy two High-frequency Acoustic Recording Packages (HARPs) to acquire information on population abundance and trend, important habitats, and spatial and temporal geographic distribution of the North Pacific Right Whale; project will include data on other cetaceans, including humpback, fin, and killer whales.
2. Increase the spatial extent of the current acoustic monitoring program across the historical summer range of the right whale with two new HARPs.
3. Analyze data and conduct analyses of seasonality.

Summary of Project Accomplishments for entire project

Objectives 1 and 2:

1. One ADF&G funded HARP that had been deployed at mooring site M2 during April 2005 was successfully recovered using the NOAA Ship *Miller Freeman* in October 2005. This instrument recorded acoustic data continuously at 80 kHz between April and September 2005.
2. Two ADF&G funded HARPs were deployed at mooring sites M2 and M4 during October 2005 using the NOAA Ship *Miller Freeman.* These two HARPs were successfully recovered in May 2006, aboard the *Miller Freeman*. These HARPs recorded continuously at a sampling rate of 80 kHz until late January 2006.

Objective 3:

3. Data from these HARPs have been processed using a combination of manually browsing spectrogram data and automated right whale call detection software. Right whale calls were detected on 21 days in July through September 2005 at site M2, and on 10 days in October through December 2005 at sites M2 and M4. Humpback whale calls were also detected throughout these recordings.
4. HARP data were also studied for the presence of killer whale calls. A long-term spectral average of the data was scanned visually, and then promising times were examined in greater detail. On the M2 HARP 39 days with killer whale encounters were found

between April 2005 and January 2006 (10 months). On the M4 HARP (located further north) 12 days with killer whale encounters were found between October 2005 and January 2006 (4 months).

Project Accomplishments during last segment period only (July 1, 2006 – June 30, 2007)

Objective 3:

1. We have prepared a manuscript detailing right whale seasonal and daily calling patterns for publication.
2. We determined source levels of right whale calls and propagation loss on the southeast Bering Sea (SEBS) middle-shelf using calls received on multiple, calibrated hydrophones and localized to the source. These results can be used to predict range to an animal based on received levels at a single hydrophone.
3. We developed a second technique for estimating range to an animal using a single hydrophone, by modeling dispersion of normal modes in a shallow waveguide. We applied this technique to each call received on peak calling days and used received levels and propagation loss to check and improve our range estimates.
4. We are using acoustic ranging techniques to estimate minimum local abundance/density of right whales over the entire 2000-2005 study period. We will relate seasonal trends in right whale occurrence to oceanographic data obtained for 2000-05 from PMEL biophysical sensors on moorings at M2 and M4, and further investigate right whale acoustic behavior on shorter timescales.

Significant Deviations*:* No ADF&G funded HARPs were deployed in April 2006, owing to the occupation of the PMEL-NOAA moorings by PMEL-owned acoustic recorders. This means that we did not acquire acoustic data for the April – October 2006 period, a deviation from the original proposal.

Project Leader: J. Hildebrand

Additional Information:

1. In April 2006, one NOAA-funded autonomous Acoustic Recording Package (ARP) was recovered along the Bering Sea shelf break between Dutch Harbor and the Pribilof Islands
2. Data from the recovered ARP were processed by graduate student Lisa Munger and right whale calls were detected on one day in June 2005.

Alaska Department of Fish and Game
State Wildlife Grant
ANNUAL INTERIM PERFORMANCE REPORT

Grant Number: **T-1** **Segment Number:** **16**
Project Number: **3**
Project Title: Bowhead Whale Diet Investigation: St. Lawrence Island, Bering Sea
Project Duration: 20 May 2005 – 30 June 2008
Report Period: 20 May 2005 – 20 May 2006
Report Due Date: August 20, 2006

Objectives (a) Collect stomach contents, harvest data, and other biological tissues from bowhead whales harvested on St. Lawrence Island in 2005, 2006, and 2007 in cooperation with the Gambell Whale Captains Association, Savoonga Boat Captains Association, North Slope Borough Department of Wildlife Management (NSB-DWM), Alaska Eskimo Whaling Commission (AEWC), and Alaska Department of Fish and Game.

(b) Analyze the stomach contents of bowhead whales collected during this study and from previous collections to determine the composition of the bowhead diet in the Bering Sea by season, sex, and whale size class.

Summary of Accomplishments

Gay Sheffield traveled to St. Lawrence Island during the fall 2005 whaling season (Nov. 30 – Dec 4) to collect harvest data, stomach contents, and other biological tissues. Three adult bowheads were harvested and sampled (Table 1). These three whales are the first bowhead whales from the northern Bering Sea sampled during late fall. All whales had prey in the stomach and/or intestine and were classified as "feeding". In the laboratory, samples were thawed, rinsed, and sorted macroscopically into major taxonomic groups, examined microscopically, and identified to the lowest taxonomic level at the University of Alaska Institute of Marine Science. Euphausiids and copepods occurred in all whales sampled (Table 2). Three randomly selected subsamples (1 cubic inch) were taken from each animal and the numbers of prey contained in the subsample were approximated. Biological samples other than stomach contents were provided to the NSB-DWM for ongoing studies and/or archived at the University of Alaska Museum for future studies (Table 3).

Gay Sheffield also traveled to St. Lawrence Island during the spring 2006 whaling season (April 19 – May 8), but the spring season was unsuccessful primarily due to poor weather conditions. No additional harvest data or samples could be collected.

Additional bowhead whale samples are needed in order to address diet comparisons by season, sex, and whale size class.

Significant Deviations

1. Intestinal samples were collected when stomachs were not available for sampling.
2. The additional subsampling of one cubic inch from each frozen prey sample allowed for standardized count estimates of prey.

Table 1. Summary information for bowhead whales harvested near Savoonga during the fall 2005 whaling season. Pregnant animals indicated by *.

ID Number	Date	Sex	Total length
05S5 *	29-Nov-2005	Female	16.46 m
05S6 *	29-Nov-2005	Female	17.07 m
05S7 *	29-Nov-2005	Female	18.29 m

Table 2. Prey items from bowhead whales harvested near Savoonga during fall 2005.

Prey Items		05S5	05S6	05S7
Euphausiids				
	Thysanoessa raschii	X	-	X
	Unidentified euphausiids	-	X	-
Copepods				
	Calanus marshallae	X	X	X
Shrimp				
	Unidentified Hippolytidae	X	-	X
Fish				
	Unidentified vertebra	-	-	X

Table 3. Tissues collected from bowhead whales harvested near Savoonga during fall 2005 and the recipient of those tissues.

	05S5	05S6	05S7
Stomach contents	ADF&G	ADF&G	-
Intestine	NSB-DWM	-	NSB-DWM
Eyeball	NSB-DWM	-	NSB-DWM
Ovaries	-	NSB-DWM	-
Skin	NSB-DWM; UAM	NSB-DWM; UAM	NSB-DWM; UAM
Fetal skin	NSB-DWM	NSB-DWM	NSB-DWM
Baleen	NSB-DWM	NSB-DWM	-

ADF&G = Alaska Department of Fish and Game (Fairbanks)
NSB-DWM = North Slope Borough, Department of Wildlife Management (Barrow)
UAM = University of Alaska Museum (Fairbanks)

Actual Costs during this Report Period *(personnel plus all operating expense totals)*:

Federal (from ADF&G):	Partner (nonfederal share):	Total:
$7,059	$ 2,353	$ 9,412

Project Leader *(or Report Contact Person)*: John "Craig" George (NSB-DWM) / Gay Sheffield (ADF&G)

Additional Information:

Presentations of fieldwork and research results were made to the Cities of Gambell and Savoonga, Gambell and Savoonga IRA Tribal Councils, Sivuqaq Native Corporation, and the Gambell and Savoonga Whale Captains Associations. Reports of work accomplished were provided to the St. Lawrence Island AEWC Commissioners, Gambell Boat Captains Association, and the Savoonga Whaling Captains Association.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-1 **Segment Number:** 16

Project Number: 3

Project Title: Bowhead Whale Diet Investigation: St. Lawrence Island, Bering Sea

Project Duration: 20 May 2005 – 30 June 2008

Report Period: 20 May 2006 – 30 June 2007

Report Due Date: September 30, 2007

Partner: North Slope Borough Department of Wildlife Management and Alaska Department of Fish and Game

Project Objectives

1. Collect stomach contents, harvest data, and other biological tissues from bowhead whales harvested on St. Lawrence Island in 2005, 2006, and 2007 in cooperation with the Gambell Whale Captains Association, Savoonga Boat Captains Association, North Slope Borough Department of Wildlife Management (NSB-DWM), Alaska Eskimo Whaling Commission (AEWC), and Alaska Department of Fish and Game.
2. Analyze the stomach contents of bowhead whales collected during this study and from previous collections to determine the composition of the bowhead diet in the Bering Sea by season, sex, and whale size class.

Summary of Accomplishments

Objective 1: No whales were harvested at St. Lawrence Island during the fall 2006 whaling season but Gay Sheffield was in communication with the St. Lawrence Island AEWC Commissioners, Gambell Boat Captains Association, and the Savoonga Whaling Captains Association as to the status of hunting and was ready to travel to whales that were available for sampling.

The NSB-DWM provided harvest data and field notes for bowhead whale stomach contents from whales harvested from St. Lawrence Island villages during 1984–2004. Data were reviewed and the electronic database was updated.

St. Lawrence Island harvested a total of eight bowhead whales during spring 2007 (Table 1). Gay Sheffield traveled to St. Lawrence Island during mid April to mid May and collected harvest data, stomach contents, and other biological tissues from seven bowhead whales during this period (Table 2). Sampling occurred concurrently with the butchering process. Digestive tract contents (from stomachs or intestines) were obtained from five of the seven whales harvested. The internal organs remained inaccessible for two whales (07S4, 07G2) that were butchered while floating in the ocean. Other biological samples were provided to the NSB-DWM for ongoing studies and/or archived at the University of Alaska Museum for future studies (Table 2).

Objective 2: In the laboratory, aliquots of stomach or intestine samples were thawed, rinsed, and sorted into major taxonomic groups, and examined microscopically at the University of Alaska's Institute of Marine Science for identification. Preliminary results indicate that three of the five bowheads for which stomachs or intestines were sampled had been feeding prior to their death (Table 3). Stomachs of two subadult males (07S1 and 07S3) were empty or contained only parasitic nematodes. Preliminary analysis indicated that shrimp dominated the diet samples from 07S2 and 07G3 though other prey were also identified (Table 3). Fine quartz grit was found in the intestinal sample of 07G3 indicating feeding near the seafloor. Copepods dominated the sample from 07G4. Although euphausiids and fish were found in fall 2005 diet samples, none were found in the spring samples and amphipods were identified as an additional prey item during spring 2007. Amphipods (*Anonyx* sp.) were sampled from the throats of 07G4 and 07G3 but it is unknown if these invertebrates were scavenging the whale carcasses (that had remained in the water >12 hr) or whether they were prey items.

Further work in the laboratory is scheduled to identify amphipod, copepods, and shrimp to the lowest taxonomic level possible. Additional bowhead whale samples will be collected, when available, during the fall 2007 and spring 2008 harvests in order to address diet comparisons by season, sex, and whale size class.

Significant Deviations

1. Intestinal fecal samples were collected when stomachs were not available for sampling.
2. The additional subsampling of one cubic inch from each frozen prey sample allowed for standardized count estimates of prey.

Table 1. Summary information for bowhead whales harvested near St. Lawrence Island during the spring 2007 whaling season.

ID Number	Village	Date	Sex	Total length (meters)
07G1	Gambell	3-Apr-2007	Female	8.8 m
07S1	Savoonga	13-Apr-2007	Male	10.0 m
07S2	Savoonga	15-Apr-2007	Female	8.3 m
07S3	Savoonga	16-Apr-2007	Male	10.7 m
07S4	Savoonga	27-Apr-2007	Female	15.3 m
07G2	Gambell	1-May-2007	Female	16.3 m
07G3	Gambell	1-May-2007	Female	15.3 m
07G4	Gambell	1-May-2007	Female	15.2 m

Table 2. Tissues collected from bowhead whales harvested near St. Lawrence Island during spring 2007 and the recipient of those tissues.

	07S1	07S2	07S3	07S4	07G2	07G3	07G4
Stomach contents	ADF&G	-	ADF&G	-	-	-	-
Intestine contents	-	ADF&G	ADF&G	-	-	ADF&G	ADF&G
Eyeball	NSB	NSB	NSB	NSB	-	NSB	NSB
Skin	NSB	NSB	NSB	NSB	NSB	NSB	NSB
Muscle	NSB / UAM	NSB / UAM	NSB / UAM	NSB / UAM	NSB / UAM	NSB / UAM	NSB / UAM
Kidney	-	NSB / UAM	NSB / UAM	-	-	-	-
Liver	-	NSB / UAM	NSB / UAM	-	-	-	-
Spleen	-	NSB / UAM	NSB / UAM	-	-	-	-
Blubber (ventral)	NSB	-	NSB	-	-	-	-
Blubber (dorsal)	-	NSB	-	-	-	NSB	NSB
Ovaries	-	NSB	-	-	-	-	-

ADF&G = Alaska Department of Fish and Game (Fairbanks)
NSB = North Slope Borough, Department of Wildlife Management (Barrow)
UAM = University of Alaska Museum (Fairbanks)

Table 3. Preliminary results of prey items from bowhead whales harvested near St. Lawrence Island during spring 2007.

Prey Items	07S1	07S2	07S3	07G3	07G4
Amphipods	-	X	-	-	-
Copepods	-	-	-	-	X
Metridea sp.	-	-	-	X	-
Shrimp	-	X	-	X	-

Project Leader: John “Craig” George (NSB-DWM) and Gay Sheffield (ADF&G)

Additional Information

Presentations of fieldwork and research results were made to the Gambell and Savoonga IRA Tribal Councils, Sivuqaq Native Corporation, and the Savoonga Whale Captains Association. Reports of work accomplished are provided to the AEWC, St. Lawrence Island AEWC Commissioners, Gambell Boat Captains Association, and the Savoonga Whaling Captains Association. One of the most important aspects of the work that Sheffield has conducted on St. Lawrence Island has been to include the Native community in the scientific work. This community outreach effort will pave the way for future studies by shedding a positive light on scientific research.

Results of this project will compliment the ongoing National Marine Mammal Laboratory’s study near Barrow, Alaska entitled “Bowhead whale feeding in the western Beaufort Sea”. The objectives of this Minerals Management Service funded study include documenting patterns and variability in the timing and locations of bowhead whales feeding and documenting bowhead whale prey distributions in the western Beaufort Sea.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-1 **Segment Number:** 16

Project Number: 3

Project Title: Bowhead Whale Diet Investigation: St. Lawrence Island, Bering Sea

Project Duration: May 20, 2005 – December 31, 2008

Report Period: May 20, 2007 – May 19, 2008

Report Due Date: August 20, 2008

Project Objectives:

Objective 1: Collect stomach contents, harvest data, and other biological tissues from bowhead whales harvested on St. Lawrence Island in 2005-2008 in cooperation with the Gambell Whale Captains Association, Savoonga Boat Captains Association, North Slope Borough Department of Wildlife Management (NSB-DWM), Alaska Eskimo Whaling Commission (AEWC), and Alaska Department of Fish and Game.

Objective 2: Analyze the stomach contents of bowhead whales collected during this study and from previous collections to determine the composition of the bowhead diet in the Bering Sea by season, sex, and whale size class.

Summary of Accomplishments:

No whales were harvested at St. Lawrence Island during the fall 2007 whaling season but Gay Sheffield was in communication with the St. Lawrence Island AEWC Commissioners, Gambell Boat Captains Association, and the Savoonga Whaling Captains Association as to the status of hunting and was ready to travel to whales that were available for sampling.

St. Lawrence Island harvested two bowhead whales during spring 2008 (Table 1). Gay Sheffield traveled to St. Lawrence Island during the spring whaling season and collected harvest data, stomach contents, and other biological tissues from both bowhead whales during this period (Table 2). Sampling occurred concurrently with the butchering process. Digestive tract contents (from intestines) were obtained from both harvested whales. Most of the internal organs remained inaccessible for both whales (08S1, 08S2) as they were butchered while floating in the ocean. Other biological samples were provided to the NSB-DWM for ongoing studies (Table 2).

Aliquots of intestine samples were thawed, rinsed, and sorted into major taxonomic groups, and examined microscopically at the University of Alaska's Institute of Marine Science for identification. Preliminary results indicate that both bowheads had been feeding prior to their death (Table 3). The stomach of the adult male (08S2) was opened during butchering and a visual examination revealed it contained a substantial amount of blood clots. No prey were observed. Analysis indicated that large calanoid copepods dominated the diet of both whales. A

small amount of other invertebrate remains were too digested to allow identification (Table 3). Of note, copepods were identified in both whales harvested near Gambell during spring 2007.

We will analyze the diet data collected to date as well as that of previous collections to determine the composition of the bowhead diet in the Bering Sea by season, sex, and whale size class.

Significant Deviations:

1. Intestinal fecal samples were collected when stomachs were not available for sampling.

Table 1. Summary information for bowhead whales harvested near St. Lawrence Island during the 2008 whaling season.

ID Number	Village	Date	Sex	Total length (meters)
08S1	Savoonga	7-Apr-2008	Female	7.6 m (estimated)
08S2	Savoonga	27-Apr-2008	Male	13.7 m (estimated)

Table 2. Tissues collected from bowhead whales harvested near St. Lawrence Island during 2008 and the recipient of those tissues.

	Stomach cont.	Intestine cont.	Eyeball	Skin	Muscle	Blubber	Kidney	Testis	Baleen
08S1	-	ADF&G	NSB	NSB	NSB	NSB	-	-	NSB
08S2	-	ADF&G	NSB	NSB	NSB	NSB	NSB	NSB	NSB

ADF&G = Alaska Department of Fish and Game (Fairbanks)
NSB = North Slope Borough, Department of Wildlife Management (Barrow)

Table 3. Prey items from bowhead whales harvested near St. Lawrence Island during 2008.

Prey Items	08S1	08S2
Copepods		
Calanoid	X	X
Other		
Non-copepod parts (too digested for identification)	X	X

Project Leader: John “Craig” George (NSB-DWM) / Gay Sheffield (ADF&G)

Additional Information:

Presentations of fieldwork and research results were made to the Gambell and Savoonga IRA Tribal Councils, Sivuqaq Native Corporation, and the Savoonga Whale Captains Association. Reports of work accomplished are provided to the St. Lawrence Island AEWC Commissioners, Gambell Boat Captains Association, and the Savoonga Whaling Captains Association. One of the most important aspects of the work that Sheffield has conducted on St. Lawrence Island has been to update and include the Native community in the objectives and progress of the scientific work.

Results of this project will compliment the ongoing National Marine Mammal Laboratory’s study near Barrow, Alaska entitled “Bowhead whale feeding in the western Beaufort Sea”. The objectives of this Minerals Management Service funded study include documenting patterns and variability in the timing and locations of bowhead whales feeding and documenting bowhead whale prey distributions in the western Beaufort Sea.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-1 **Segment Number:** 16

Project Number: 3

PROJECT TITLE: Bowhead Whale Diet Investigation: St. Lawrence Island, Bering Sea

PARTNERS: North Slope Borough Department of Wildlife Management (NSB-DWM) and Alaska Department of Fish and Game (ADF&G)

PRINCIPAL INVESTIGATORS: John "Craig" George (NSB-DWM) and Gay Sheffield (ADF&G)

PROJECT DURATION: May 20, 2005 – December 31, 2008

REPORT PERIOD: May 21, 2008 – December 31, 2008

I. PROBLEM OR NEED THAT PROMPTED THIS RESEARCH

The bowhead whale (*Balaena mysticetus*) is a large baleen whale that feeds on zooplankton and spends its entire life in cold northern waters. Although recent studies indicate that the bowhead whale population is recovering from commercial exploitation (George et al. 2004) it remains federally listed as an Endangered Species.

We proposed to collect stomach contents and other biological tissues from bowhead whales harvested in spring and late fall from the northern Bering Sea to document bowhead feeding, provide quantitative diet data, and determine prey composition.

II. REVIEW OF PRIOR RESEARCH AND STUDIES IN PROGRESS ON THE PROBLEM OR NEED

Our knowledge of bowhead feeding ecology is incomplete and perplexing. It is reasonable to surmise that bowheads might migrate to a zooplankton-rich feeding area for the summer. Yet, in Alaska, bowheads leave their Bering Sea wintering grounds each spring, just prior to the most productive period (Coyle et al. 1996), and travel to the less productive Beaufort Sea. They return to the Bering Sea each fall just before the productivity decreases for the winter. At the onset of 19th century commercial whaling, however, a segment of the population remained in the Bering and Chukchi seas throughout the summer (Bockstoce and Bodkin 1983). Why this pattern had now changed is unclear.

Diet studies by the North Slope Borough, Department of Wildlife Management (NSB-DWM), the Alaska Eskimo Whaling Commission (AEWC), and the Alaska Department of Fish and Game (ADF&G) in the Chukchi and Beaufort seas have examined stomach contents of bowheads harvested for subsistence (Carroll et al. 1987, Lowry 1993, Lowry

et al. 2004). Zooplankton, especially, copepods and euphausiids, were the most important food items found, and more than 75% of the whales harvested in the fall were actively feeding. The Alaskan Beaufort Sea is considered a major feeding area during the summer and early fall (Lowry et al. 2004).

There are no comparable data for bowhead whales feeding activities in the Bering Sea. The stomachs of six whales harvested from 1978 to 1982 have been examined; however the contents of only one stomach are available in the published literature (Hazard and Lowry 1984; Lowry 1993). This stomach contained mostly epibenthic organisms (gammarid amphipods) in contrast to the stomachs from the Beaufort Sea, which contained more planktonic organisms (copepods and euphausiids). Isotope studies from bowhead baleen and muscle have indicated that the Bering Sea is a greater contributor of energy to adult bowheads (Schell et al. 1989) than the Beaufort Sea; however the Beaufort may be more important to subadult whales (Hoekstra et al. 2002; Lee et al. 2005).

In the Bering Sea, bowhead whales are harvested by two Siberian Yupik communities, Gambell and Savoonga, on St. Lawrence Island. These communities typically harvest bowheads during both the spring (April–May) and fall (October–November) migrations. St. Lawrence Island has a harvest quota of 16 strikes per year for both villages; however, the quota has not been reached in recent years due to poor weather and ice conditions. Whalers from St. Lawrence Island report that whales are commonly seen milling in the spring, a behavior associated with feeding (Wursig et al. 1985), and reports of food in stomachs are apparently not unusual (Hazard and Lowry 1984). This annual harvest allows an opportunity for the study of bowhead diet in the Bering Sea by examining stomach contents.

The Scientific Review Board of a multidisciplinary study entitled “Bowhead whale feeding in the eastern Alaskan Beaufort Sea” conducted from 1997 to 2000 identified the need for diet data from the Bering Sea (Richardson and Thomson 2002) and included a recommendation for “the continued collection of stomach contents from harvested whales, particularly from areas where no such data have been collected, to provide a broader base of the range of prey species, times, and locations at which bowhead whales feed.”

III. APPROACHES USED AND FINDINGS RELATED TO THE OBJECTIVES AND TO PROBLEM OR NEED

OBJECTIVE 1: Collect stomach contents, harvest data, and other biological tissues from bowhead whales harvested on St. Lawrence Island in 2005, 2006, 2007, and 2008 in cooperation with the Gambell Whale Captains Association, Savoonga Boat Captains Association, NSB-DWM, Alaska Eskimo Whaling Commission (AEWC), and ADF&G.

Gay Sheffield traveled to St. Lawrence Island during fall 2005 to spring 2008 whaling seasons and collected harvest data and/or biological tissues from 13 bowhead whales harvested for subsistence purposes during this period (Appendix 1).

Biological sampling occurred concurrently with the butchering process. Digestive tract contents (from stomachs or intestines) were obtained from eight of the harvested whales examined. The internal organs remained inaccessible for two whales (07S4, 07G2) that

were butchered while floating in the ocean. In the laboratory, aliquots of stomach or intestine samples were thawed, rinsed, and sorted into major taxonomic groups, and examined microscopically at the University of Alaska's Institute of Marine Science for identification.

A suite of other biological samples (ex. Muscle, eye, skin, etc.) were provided to the NSB-DWM from 12 harvested whales for ongoing studies and/or archived at the University of Alaska Museum for future studies (Appendix 2).

OBJECTIVE 2: Analyze the stomach contents of bowhead whales collected during this study and from previous collections to determine the composition of the bowhead diet in the Bering Sea by season, sex, and whale size class.

Harvest records (1972-2008) provided by the NSB-DWM were reviewed for information on feeding status during the spring. Six whales (30%) harvested during the spring had evidence of feeding. Three whales (100%) harvested during the fall had been feeding shortly before death. The sample sizes for feeding status between seasons is small and we recommend caution when interpreting these results. However, there are indications there may be a seasonal difference in the proportion of whales feeding as has been determined in bowhead whale diet studies in the Beaufort Sea.

We compared the proportion of whales feeding during the spring migration between those in the Bering Sea (30%; n=20) with the proportion of bowhead whales feeding during the spring migration in the Beaufort Sea (34%; n=91; Lowry et al. 2004) and there was no difference (P= 0.73). During the spring, bowhead whales apparently feed with some regularity throughout the range of their spring migration in Alaskan waters.

We identified prey from eight whales harvested during the monitored period (n=5 spring; n=3 fall). We recommend caution when interpreting these results from this small sample; however, over nine types of prey taxa were identified from the diet samples collected during this project (Appendix 3). Copepods occurred most frequently and were identified in 87% of the five whales sampled during the spring. These data provided the first spring prey data from bowhead whales in the northern Bering Sea since 1982. Due to sampling conditions, quantitative data were typically not available. There was evidence of epibenthic feeding with amphipods, cumaceans, polychaetes, and clams identified, though less frequently, as prey items. Euphausiids were not present in any whales sampled during the spring.

The three adult female whales harvested during late November 2005 had been feeding recently prior to death and euphausiids dominated each diet sample. These are the first prey data from the fall migration of bowhead whales into the northern Bering Sea. The sample sizes for fall diet are small and we recommend caution when interpreting these results.

IV. MANAGEMENT IMPLICATIONS

Results of this study further our understanding of the feeding ecology of bowhead whales in several ways. First, we have provided documentation that during the fall migration bowhead whales feed as they move through the Bering Strait and enter the northern Bering Sea. While the sample size is small, it is interesting that all three whales examined in the fall had been feeding. Second, feeding near Saint Lawrence Island during the

spring is a relatively regular event with a third of the animals examined had been feeding. Of note, our data indicate that this rate of feeding activity is similar to that of bowhead whales traveling past Barrow in the Beaufort Sea during the latter part of the spring. Our sample sizes for Bering Sea diet are small and we recommend caution when interpreting these results. However, there are indications there may be a seasonal difference in the proportion of whales feeding as has been determined in bowhead whale diet studies in the Beaufort Sea. Also, our data indicate there are seasonal differences in the prey composition consumed with euphausiids dominate in the fall diet but not present in the spring. Lastly, the data we document are consistent with bowhead whale feeding behavior observed by Alaska Native whalers from Saint Lawrence Island.

We have provided a new but still incomplete description of seasonal bowhead feeding activities and diet in this region. We recommend future collections of bowhead diet samples, harvest data, and other biological tissues from bowhead whales harvested on St. Lawrence Island in cooperation with the Gambell Whale Captains Association, Savoonga Boat Captains Association, NSB-DWM, Alaska Eskimo Whaling Commission (AEWC), and ADF&G to further understand the health, status, and feeding ecology of bowheads in the northern Bering Sea / Bering Strait region.

With diminishing ice predicted in the Bering Sea, the northern Bering Sea / Bering Strait region is expected to become the central transportation corridor between Asian nations and Atlantic markets and all ship traffic will transit this area. Concerns exist over the potential effects of increased ship traffic associated with oil/gas development, commercial shipping, commercial fisheries, as well as ecotourism the availability and quality of all marine resources in the region due to increased pollution, underwater noise, and human interactions. Additionally, Alaska Native communities in this region are highly reliant on the bowhead whale for nutritional and cultural needs. This project has developed, and will strive to continue building, a good working relationship amongst subsistence users and biologists. It has also increased in our collective Native and scientific knowledge of the bowhead whale.

V. SUMMARY OF WORK COMPLETED ON JOBS FOR LAST SEGMENT PERIOD ONLY (May 21, 2008 – December 31, 2008)

JOB/ACTIVITY 1: Collect stomach contents, harvest data, and other biological tissues from bowhead whales harvested on St. Lawrence Island in 2005, 2006, and 2007 in cooperation with the Gambell Whale Captains Association, Savoonga Boat Captains Association, NSB-DWM, Alaska Eskimo Whaling Commission (AEWC), and ADF&G.

Gay Sheffield traveled to St. Lawrence Island during the spring 2008 whaling season and collected harvest data and/or biological tissues from two bowhead whales harvested for subsistence purposes during April.

JOB/ACTIVITY 2: Analyze the stomach contents of bowhead whales collected during this study and from previous collections to determine the composition of the bowhead diet in the Bering Sea by season, sex, and whale size class.

Data from the diet samples as well as archived harvest records from previous collections provided by the NSB-DWM were compiled and analyzed as reported in Section III.

Objectives and preliminary results of the bowhead sampling and diet project were discussed with whaling captains, residents, as well as St. Lawrence Island IRA council members and Alaska Eskimo Whaling Commission representatives.

VI. PUBLICATIONS

Sheffield, G. 2008. St. Lawrence Island – 2008 Season. Report to Captains, Alaska Dept. of Fish and Game, Nome, AK.

Sheffield, G. 2007. St. Lawrence Island – 2007 Season. Report to Captains, Alaska Dept. of Fish and Game, Fairbanks, AK.

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Sheffield, G. 2005. St. Lawrence Island – 2005 Season. Report to Captains, Alaska Dept. of Fish and Game, Fairbanks, AK.

Sheffield, G. and J. C. George. 2009. Bowhead whale feeding in the northern Bering Sea near Saint Lawrence Island, Alaska. Alaska Marine Science Symposium 19-23, 2009, Anchorage, AK. Abstract.

Suydam, R.S., J. C. George, C. Hanns, and G. Sheffield. 2006. Subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaska Eskimos during 2005. Annual Report to the Scientific Committee of the International Whaling Commission. Paper SC/58/BRG21, Department of Wildlife Management, North Slope Borough, Barrow, Alaska.

Suydam, R.S., J. C. George, C. Rosa, B. Person, C. Hanns, G. Sheffield, and J. Bacon. 2007. Subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaska Eskimos during 2006. Annual Report to the Scientific Committee of the International Whaling Commission. Paper SC/59/BRG4, Department of Wildlife Management, North Slope Borough, Barrow, Alaska.

Suydam, R.S., J. C. George, C. Rosa, B. Person, C. Hanns, G. Sheffield, and J. Bacon. 2008. Subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaska Eskimos during 2007. Annual Report to the Scientific Committee of the International Whaling Commission. Paper SC/60/BRG10, Department of Wildlife Management, North Slope Borough, Barrow, Alaska. 7 pp.

ABSTRACT: ALASKA MARINE SCIENCE SYMPOSIUM, JANUARY 19-23, 2009, ANCHORAGE, ALAKSA

BOWHEAD WHALE FEEDING IN THE NORTHERN BERING SEA NEAR SAINT LAWRENCE ISLAND, ALASKA

Sheffield, Gay[1] and George, J. C.[2]

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We studied feeding of bowhead whales taken by Alaska Natives at Saint Lawrence Island in the northern Bering Sea during the spring (April-May) and fall (November) migrations from 1972-2008. Our objectives were to: 1) identify the proportion of harvested whales that had been feeding based on historical harvest records and 2) describe the prey identified from the stomach and/or intestinal contents of eight whales harvested during 2005-2008.

Harvest records (1972-2008) were reviewed for information on feeding status during the spring. Six whales (30%) harvested during the spring had evidence of feeding. Three whales (100%) harvested during the fall had been feeding shortly before death. The sample sizes for feeding status between seasons is small and we recommend caution when interpreting these results. However, there are indications there may be a seasonal difference in the proportion of whales feeding as has been determined in bowhead whale diet studies in the Beaufort Sea.

Of note, there was no difference (P= 0.73) in the proportion of bowhead whales feeding in the Bering Sea (30%; n=20) and the Beaufort Sea (34%; n=91; Lowry et al. 2004) during the spring migration.

Five whales harvested during spring (2007-2008) provided the first spring prey data from the northern Bering Sea since 1982. Copepods occurred most frequently and were identified in 87% of the whales sampled.

The three whales harvested during late November 2005 provided the first prey data from bowhead whales during their fall migration into the northern Bering Sea. Euphausiids dominated the diet samples of whales sampled during late November. Euphausiids were not present in any whales sampled during the spring. The sample sizes for diet samples are small and we recommend caution when interpreting these results.

The data we document is consistent with bowhead whale feeding behavior observed by Alaska Native whalers from Saint Lawrence Island. Bowhead whales feed near Saint Lawrence Island during spring and fall migrations.

VII. LITERATURE CITED

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VIII. APPENDICES

Appendix 1. Summary information for bowhead whales harvested near St. Lawrence Island during the 2005-2008 monitored whaling seasons. Pregnant animals indicated by *. Estimated total lengths are indicated by **. Whales not sampled are indicated by italic font. No whales were harvested during 2006.

ID Number	Village	Date	Sex	Total length (meters)
05S5 *	Savoonga	29-Nov-2005	Female	16.5 m
05S6 *	Savoonga	29-Nov-2005	Female	17.1 m
05S7 *	Savoonga	29-Nov-2005	Female	18.3 m
07G1	*Gambell*	*3-Apr-2007*	*Female*	*8.8 m*
07S1	Savoonga	13-Apr-2007	Male	10.0 m
07S2	Savoonga	15-Apr-2007	Female	8.3 m
07S3	Savoonga	16-Apr-2007	Male	10.7 m
07S4	Savoonga	27-Apr-2007	Female	15.2 m
07G2	Gambell	1-May-2007	Female	16.3 m
07G3	Gambell	1-May-2007	Female	15.3 m
07G4	Gambell	1-May-2007	Female	15.2 m
08S1	Savoonga	7-Apr-2008	Female	7.6 m **
08S2	Savoonga	27-Apr-2008	Male	13.7 m **

Appendix 2. Tissue samples collected from bowhead whales harvested near St. Lawrence Island during 2005-2008 and the recipient of those tissues.

	Stomach	Intestine	Eyeball	Skin	Muscle	Kidney	Liver	Spleen	Blubber	Ovaries	Testis	Baleen
05S5	ADF&G	ADF&G	NSB	NSB / UAM	-	-	-	-	-	-	-	NSB
05S6	ADF&G	-	-	NSB / UAM	-	-	-	-	-	NSB	-	NSB
05S7	-	ADF&G	NSB	NSB / UAM	-	-	-	-	-	-	-	NSB
07S1	ADF&G	ADF&G	NSB	NSB	NSB / UAM	-	-	-	NSB	-	-	-
07S2	ADF&G	-	NSB	NSB	NSB / UAM	NSB / UAM	NSB / UAM	NSB / UAM	NSB	NSB	-	-
07S3	-	ADF&G	NSB	NSB	NSB / UAM	NSB / UAM	NSB / UAM	NSB / UAM	NSB	-	-	-
07S4	-	-	NSB	NSB	NSB / UAM	-	-	-	-	-	-	-
07G2	-	-	-	NSB	NSB / UAM	-	-	-	-	-	-	-
07G3	-	ADF&G	NSB	NSB	NSB / UAM	-	-	-	NSB	-	-	-
07G4	-	ADF&G	NSB	NSB	NSB / UAM	-	-	-	NSB	-	-	-
08S1	-	ADF&G	NSB	NSB	-	-	-	-	NSB	-	-	NSB
08S2	-	ADF&G	NSB	NSB	-	NSB	-	-	NSB	-	NSB	NSB

ADF&G = Alaska Department of Fish and Game (Nome)
NSB = North Slope Borough, Department of Wildlife Management (Barrow)
UAM = University of Alaska Museum (Fairbanks)

Appendix 3. Prey items identified from diet samples of bowhead whales harvested near St. Lawrence Island during 2005-2008.

Prey Items	05S5	05S6	05S7	07S2	07G3	07G4	08S1	08S2
Crustaceans	-	-	-	-	X	-	-	-
Euphausiids	-	X	-	-	-	-	-	-
Thysanoessa raschii	X	-	X	-	-	-	-	-
Mysids								
Mysis oculata	-	-	-	X	-	-	-	-
Amphipods	-	-	-	X	-	-	-	-
Copepods (calanoid)	-	-	-	-	X	X	X	X
c.f. Calanus marshallae	X	X	X	-	-	-	-	-
Shrimp	-	X	X	X	X	-	-	-
Pandalidae	-	-	X	-	-	-	-	-
Crangonidae	-	-	X	-	-	-	-	-
Fish (vertebra)	-	-	X	-	-	-	-	-
Bivalve (shell)	-	-	-	X	-	-	-	-
Polychaete (Spintheridae)	X	X	X	-	-	-	-	-

FEDERAL AID
INTERIM PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-11 **Segment Number:** 1

Project Number: 1.0

Project Title: Steller sea lion population and health assessment in Alaska

Project Duration: 1 July 2008 – 30 June 2010

Report Period: July 1, 2008 – June 30, 2009

Report Due Date: September 30, 2009

Partner: Alaska Department of Fish and Game

Project Objectives

OBJECTIVE 1: Estimate vital rates of Alaskan Steller sea lions through mark-recapture studies of branded individuals. Age-specific survival and natality rates are needed to model the dynamics of SSL populations in Alaska and to determine processes responsible for observed trends.

JOB/ACTIVITY 1A: Estimate age- and sex-specific survival probabilities. Data for annual survival estimates will be provided by a standard survey of all major rookeries and haulouts in Southeast Alaska and Prince William Sound.

JOB/ACTIVITY 1B: A video monitoring system will be installed at Lowrie Island to document early pup mortality.

JOB/ACTIVITY 1C: Data on reproductive performance of females in Southeast Alaska will be collected during multi-day surveys at all breeding rookeries.

JOB/ACTIVITY 1D: Investigation of remote-sensing and other available data on ocean conditions and prey abundance and distribution to determine underlying mechanisms for geographical and temporal variation in SSL vital rates.

OBJECTIVE 2: Develop indices of weaning and identification of diet composition for juvenile Steller sea lions. Preliminary analyses of stable isotope signatures along the length of vibrissae collected from juvenile sea lions (ages 3 to 24 months) suggest that relative changes in the ratios of carbon and nitrogen isotopes may prove to be a valuable index of shifts in diet such as that expected during the weaning period.

JOB/ACTIVITY 2A: Analysis of stable isotope (^{13}C and ^{15}N) profiles in free-ranging Steller sea lion vibrissae to determine changes in trophic signature of their diet over time.

JOB/ACTIVITY 2B: Analysis of stable isotope (^{13}C and ^{15}N) profiles in vibrissae collected from captive Steller sea lions during a controlled feeding study.

JOB/ACTIVITY 2C: Fatty acid signature analysis of blubber lipids to identify changes in diet source (i.e. biochemical weaning markers).

OBJECTIVE 3: Evaluate nutritional limitation in juvenile Steller sea lions in the western Alaska population. Underwater capture techniques have allowed us to obtain body measurements and

tissue samples to evaluate growth, body condition, health, and weaning status of juvenile SSLs from the western Alaska population in relation to those from Southeast Alaska where the population has been increasing.

JOB/ACTIVITY 3A: Analysis of body condition using body fat content measured by the deuterium dilution technique and using body morphometrics and blubber depth measurements.

JOB/ACTIVITY 3B: Laboratory analysis of blood metabolite chemistry and hematology.

Summary of Project Accomplishments:

JOB/ACTIVITY 1A: Estimate age- and sex-specific survival probabilities. Data for annual survival estimates will be provided by a standard survey of all major rookeries and haulouts in Southeast Alaska and Prince William Sound.

Three research cruises and two field camps were supported during this reporting period for the purpose of collecting brand-resight data for vital rates estimation. Steller sea lion (*Eumetopias jubatus*) rookeries and haulouts throughout Southeast Alaska (SEA) were surveyed from 27 June to 12 July 2008 to observe branded Steller sea lions (SSL), photograph and record entanglements, estimate numbers of animals on shore, and collect scat in conjunction with the University of BC. Resightings of branded individuals will be used to estimate vital rates such as survival, recruitment, and dispersal and to describe seasonal distribution patterns. Haulouts and rookeries were surveyed in Alaska from Graves Rock (Cape Spencer) in the north to Cape Addington in the south. We used two vessels and two crews to conduct surveys in northern SEA and central-southern SEA simultaneously. A count was made of all SSL that could be seen. This count is likely low as some animals were difficult or impossible to see, especially those in low-lying areas. Observers used binoculars (8X to 14X) to conduct counts and read brands. When a branded animal was seen, the boat approached closer to the haulout and digital photographs (Nikon D100 or D1X cameras) were taken. When possible, each branded animal was photographed several times and once out of the field, one to four of the best photographs were saved. When a branded animal was observed the following data were recorded: brand number, brand quality, brand verification check (observer reads and records brand number, reads brand a second time and verifies the brand number written down), status (*e.g.*, female with pup, pup suckling), tag color and number, and comments. When possible, sex and age class (pup, juvenile, adult) were recorded.

Steller sea lion rookeries and haulouts in Prince William Sound (PWS) and the Northern Gulf of Alaska were surveyed July 16-25, 2008 to observe branded animals, to document birth of pups to branded animals, and to estimate numbers of animals on shore. The principle objectives of this trip were to provide annual resighting data for survival studies and to survey breeding age females ($\geq$ 4 yrs of age) for reproductive studies in PWS. Nine sites were surveyed in PWS and along the outer coast from Point Elrington to Seal Rocks. Sea lions and branded animals were present at all sites except The Pleiades. 129 individual branded Steller sea lions were identifiable in photos. A total of 52 branded males were observed; 45% (13 of 29) of males of known natal rookery were born in the eastern stock (12- from Southeast Alaska, 1-from St. George Reef, California). No branded females from the eastern stock were observed.

Personnel were deployed to the Lowrie Island field camp in southeast Alaska from mid-May to July 2008 to undertake observational research. Age specific survival and reproductive rates of sea lions was assessed on Lowrie Island and 4 nearby offshore pupping areas in the Forrester Island complex . Steller sea lions at Sugarloaf Island, Alaska were surveyed July 19-26 2008 to observe branded animals, document pupping of branded animals and to estimate numbers of animals on shore. A simple camp was deployed for 8-days. A chartered 25' water taxi out of Homer, Alaska (F/V Triton) was used to transport gear and people to and from the island, requiring a 3 hour boat ride. 11 surveys were conducted at the north site and 8 at the west site where 46 individual branded non-pups were identifiable in photos; 34 females and 12 males. The principle objective of this trip was to survey breeding age (≥ 4 yrs of age) females for studies comparing reproductive performance between eastern and western stocks.

JOB/ACTIVITY 1B: A video monitoring system will be installed at Lowrie Island to document early pup mortality.

This project was placed on hold in summer 2008 and is being re-evaluated. Initial costs were estimated and potential equipment/systems researched in 2008. The preliminary work suggested the following system would be appropriate for this project: 4 IQ705 5.0MP video cameras, a Lenel Net DVR, OnGarud Video Database server software, 4 9.0-90.0 mm varifocal lenses, and weatherproof housings. Cost estimates for this system were $12,000. Lack of personnel time to research the viability of this project was the major deterrent to moving this project forward.

JOB/ACTIVITY 1C: Data on reproductive performance of females in Southeast Alaska will be collected during multi-day surveys at all breeding rookeries.

Of the 53 branded females ≥ 4 yrs old observed in Prince William Sound 42% (22 of 53) were born at Seal Rocks, 40% (21 of 53) were dive-captured animals that were originally captured in PWS ("=" branded females). Fewer were born at Marmot (n = 5), Sugarloaf (n = 3) or Fish Islands (n = 2). No 4 yr olds were observed at rookeries or haulouts with a pup (n = 6) and no branded females > 4 yrs of age were observed with or nursing a pup at haul-out sites.

The proportions of females > 4 yrs of age at rookeries (n = 40) seen either with or nursing a pup were:

54% (7 of 13) for 5 yr olds
50% (4 of 8) for 6 yr olds
59% (10 of 17) for 7 yr olds
50% (1 of 2) for 8 yr olds

Of females aged 5-8 yrs at rookeries or haul-outs without a juvenile (n = 45), proportion with pup was:

40% (2 of 5) for Marmot or Sugarloaf females (aged 6 and 8 yrs)
59% (13 of 22) for Fish Island or Seal Rock females (aged 5 and 7 yrs)
44% (8 of 18) for "=" branded females (aged 5-8 yrs)

These results suggest that sample size of breeding age females at Seal Rocks/Fish Island is sufficient for future annual reproductive studies. We expect more females will be available as the 2004-2008 cohorts and younger "=" branded females mature. Multiple

surveys (5-7) per rookery are required to examine reproduction at these sites, due to marginal resighting rates of females per survey and particularly low probability of resighting females and their pups nursing per survey (0.118). Proportions with pup in PWS fell within ranges observed in Southeast Alaska. In PWS, 55% of females at rookeries and 43% of females at rookeries and haulouts were observed with pup.

Of the 32 branded females $\geq$ 4 yrs old observed at Sugarloaf Island the proportions of females either seen with or nursing a pup were:

50% (3 of 6) for 4 yr olds* (or 17% see below)
80% (4 of 5) for 6 yr olds
85% (17 of 20) for 8 yr olds
0% (0 of 1) for 20 yr olds

The sample size of breeding age females at Sugarloaf Island is sufficient for future annual reproductive studies. We expect more females will be available as the 2004-2008 cohorts and younger "=" branded females mature. The supplemental camp added 60% more breeding-aged females to the resight cruise sightings at Sugarloaf (32 vs. 20); one 4-yr-old seen at Sugarloaf during the resight cruise, T244, was not seen by the Sugarloaf camp. Multiple surveys at the rookery assisted with pup sightings and will provide multiple occasions for resighting rates and pup detection rates to be accounted for with mark-recapture models. Resight rates of females and females and their pups were similar to those seen in Southeast Alaska in 2007. Proportions with pup at Sugarloaf were high compared to Southeast Alaska rookery data 2005-2007, and Seal Rocks (PWS) data 2007-2008.

JOB/ACTIVITY 1D: Investigation of remote-sensing and other available data on ocean conditions and prey abundance and distribution to determine underlying mechanisms for geographical and temporal variation in SSL vital rates.

No research activity on this job/activity during the reporting period.

JOB/ACTIVITY 2A: Analysis of stable isotope (^{13}C and ^{15}N) profiles in free-ranging Steller sea lion vibrissae to determine changes in trophic signature of their diet over time.

Progress was made in several aspects of the analysis of diet composition and weaning status using stable isotopes and fatty acid composition analysis. Laboratory preparations and data analysis time were supported by this funding.During this reporting period, carbon and nitrogen isotope values for over 2500 whisker samples have been returned to our lab for data analysis and inclusion in the Access database. To date over 10,000 vibrissae (whisker) sections have been analyzed by collaborators at the Crustal Imaging Laboratory, USGS in Denver, CO or by the UAF Stable Isotope Facility to reconstruct timelines of isotopic change in the whiskers of approximately 216 individual young of the year and juvenile Steller sea lions in the Aleutian Islands (n=47), southeast Alaska (n=105), and Prince William Sound (PWS; n=64). Nineteen young of the year sea lions recaptured in PWS have had two whiskers analyzed to document changes in diet between 5 and 10 months of age and to determine the growth rate of whiskers. Key findings from this study include new knowledge that the stable isotope signatures from whiskers of young sea lions prove to be a valuable index of shifts in diet, such as that expected during weaning and that seasonal changes in the stable isotope composition of ingested milk samples are reflected in the whiskers of dependent pups, suggesting that pup whiskers can provide a history of changes

in their mothers' diets both during the nursing period and possibly *in utero* (Rea and Eischens 2008, Rea *et al.* 2008). One publication has resulted from early analysis comparing the stable isotope composition of Steller sea lion milk, serum, and vibrissae in order to understand fractionation rates in tissues (Stegall *et al.*, 2008). This data analysis will continue into the next funding period to determine the weaning age of animals studied since 2000 with emphasis on juveniles and specifically animals for which foraging data is available.

JOB/ACTIVITY 2B: Analysis of stable isotope (13C and 15N) profiles in vibrissae collected from captive Steller sea lions during a controlled feeding study.

Significant progress has been made during this reporting period in our laboratory preparation of sea lion whisker samples for stable isotope analysis at the UAF Stable Isotope Facility. Pairs of whiskers collected from ten juvenile Steller sea lions held temporarily captive at the Alaska SeaLife Center have been sectioned and delivered to the analysis laboratory to determine changes in diet signature during the 2 to 3 month period of captivity. By comparing isotopic profiles of the vibrissa collected when the animal was brought into the research facility with the isotopic profiles prior to release back to the wild, we can also determine growth rates of the vibrissae in this species. The remaining 8 sets of vibrissae collected from these transiently captive animals will be processed for stable isotope analysis during the next reporting period.

JOB/ACTIVITY 2C: Fatty acid signature analysis of blubber lipids to identify changes in diet source (i.e. biochemical weaning markers).

Data on the fatty acid composition of blubber samples collected from free-ranging juvenile SSL (n=53) were delivered to our laboratory by the UAA ASET laboratory during this reporting period. Initial data analysis on these samples has begun to determine if the fatty acid composition of the blubber changes between 5 and 10 months of age in pups recaptured in Prince William Sound. The preliminary analysis indicates that there are slight changes in the fatty acid signature that could be attributed to seasonal changes in the diet of adult females in this area, but there are no indications of significant changes in signature that would indicate early weaning in any of these study animals by 10 months of age.

JOB/ACTIVITY 3A: Analysis of body condition using body fat content measured by the deuterium dilution technique and using body morphometrics and blubber depth measurements.

Progress was made in the evaluation of nutritional limitation in Steller sea lions through studies on body composition, haptoglobin concentrations and metabolic chemistry. This funding supported both personnel time and laboratory costs to accomplish these laboratory and data analysis tasks and travel expenses for presentation of research at the 2009 Alaska Marine Science Symposium. Laboratory analysis was completed for over 150 blood samples to determine the concentration of deuterium oxide for calculation of percent body water for percent body fat estimation. These data provided estimates of changes in percent body fat for free-ranging pups captured at 5 months of age and then recaptured at 10 months of age. These data also completed a dataset of over 500 animals studied in Alaska for which percent body fat content has been measured using this method. Initial data analysis was undertaken on the portion of this data set representing young of the year pups for scientific presentation (Rea et al. 2009a). Preliminary data

analysis was also undertaken to determine if phase angle calculated from resistance and reactance data measured using bioelectrical impedance analysis was consistently represented in multiple measurements per animals and if this data is closely correlated with the percent body fat content of the animal. These analyses are ongoing through the next reporting period.

JOB/ACTIVITY 3B: Laboratory analysis of blood metabolite chemistry and hematology.

Laboratory analysis of blood metabolite concentrations were completed for over 300 animals during this reporting period and included assessment of blood urea nitrogen, non-esterified fatty acid and ketone body levels in serum or plasma collected from free-ranging pups and juveniles captured in Alaska and Russia. These data supplemented a data set on over 700 pups captured on breeding rookeries in Alaska and Russia and these data were analyzed for scientific presentation (Rivera et al. 2009). We have also made significant progress in validating the use of a spectrophotometric assay kit for analysis of haptoglobin (acute phase protein used as a physiological stress indicator) in Steller sea lions. Over 150 animals have been assessed for blood haptoglobin levels and these preliminary data will be presented at an upcoming scientific conference during the next reporting period (Rea et al. 2009b). These laboratory and data analyses are ongoing through the next reporting period.

Significant Deviations: Funding originally planned for the deployment of remote video monitoring of maternal attendance at Lowrie Island was redirected to initiating vital rates research at new western stock locations (Sugarloaf Island and PWS).

Literature and conference presentations cited:

Rea, Lorrie D, Sean D. Farley, Craig A. Stricker, Vicki K. Stegall, Carrie A. Eischens. 2008. A novel approach to monitoring changes in the diet of lactating mothers through isotopic analysis of young Steller sea lion vibrissae. Oral presentation at the 7th Comparative Nutrition Society Symposium, Liscomb Mills, Nova Scotia, Canada. August 8-13, 2008.

Rea, L. D., K.W. Pitcher, S.D. Farley, J.P. Richmond and W.S. Dunlap-Harding. 2009. Percent total body lipid content increases in Steller sea lion (*Eumetopias jubatus*) pups during the first year of life in a similar pattern to other otariid species. Oral presentation at the Alaska Marine Science Symposium, Anchorage, Alaska, 19-23 January, 2009.

Rea, Lorrie D, Judith M. Castellini and Alison Banks. 2009. Plasma haptoglobin concentrations vary by region of capture in free-ranging Steller sea lions, but not by age. Oral presentation at the 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Quebec, 12-16 October, 2009.

Rivera, P.M., L.D. Rea, B.S. Fadely and V. Burkanov. 2009. Investigating stock differences in nutritional metabolites of young Steller sea lion pups in Southeast Alaska, western Alaska and Russia. Poster presentation at the Alaska Marine Science Symposium, Anchorage, Alaska, 19-23 January, 2009.

Stegall, V.K., S.D. Farley, L.D. Rea, K.W. Pitcher, R.O. Rye, C.L. Kester, C.A. Stricker, and C.R. Bern. 2008. Discrimination of carbon and nitrogen isotopes from milk to serum and vibrissae in Alaska Steller sea lions (*Eumetopias jubatus*). Canadian Journal of Zoology 86:17-23.

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Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-11 **Segment Number:** 1

Project Number: 2.0

Project Title: Long-term monitoring and the importance of glacial habitat to harbor seals in Alaska

Project Duration: 1 July 2008 – 30 June 2010

Report Period: July 1, 2008 – June 30, 2009

Report Due Date: September 30, 2009

Partner: Alaska Department of Fish and Game

Project Objectives:

OBJECTIVE 1: Long-term monitoring of vital rates, diet, population trend, molting and pupping phenology and factors affecting population dynamics of harbor seals at Tugidak Island.

JOB/ACTIVITY 1A: Use photo-identification of individuals and mark-resighting techniques to estimate annual age and/or age-class specific survival probabilities, reproductive rates, pre-weaning pup survival probabilities, population size, and annual pup production; and determine reproductive histories of breeding females.

JOB/ACTIVITY 1B: Conduct daily counts of pups and non-pups during pupping and molting seasons each year to continue estimation of long-term trends at Tugidak.

JOB/ACTIVITY 1C: Continue monitoring pupping and molting phenology, to examine if significant shifts in timing of pupping or molting (such as observed during the period of population decline, Jemison and Kelly 2001) may result from shifts in age-structure, shifts in the timing of food web development and/or prey availability for harbor seals, or other factors.

JOB/ACTIVITY 1D: Monitor annual and seasonal variation in diet by scat collection during pupping and molting seasons (May – September).

JOB/ACTIVITY 1E: Explore how population dynamics may respond to environmental conditions by combining population data, Tugidak harbor seal diet data, and available environmental data collected around the Kodiak area.

OBJECTIVE 2: Assess the importance of glacial habitat to harbor seals, estimate the energetic costs of inhabiting glacial habitat (with and without vessel disturbance), assess diet/condition of seals foraging locally vs. those that travel outside the fjords to forage (costs/trade offs of these two strategies), and monitor over-wintering locations and survival.

JOB/ACTIVITY 2A: Equip harbor seals with dive instruments, heart-rate monitors, and VHF transmitters. Heart rate will be used as a proxy to estimate metabolic costs of harbor seals and calculate energetic expenditures. Seals will be instrumented before tourism vessel traffic arrives to obtain baseline data (i.e., “normal” resting and foraging behavior)

prior to influences of increased vessel traffic, and will retain the instruments through the peak of tourist season until they are shed during molt.

JOB/ACTIVITY 2B: Deploy Crittercams (video cameras, mounted on a seal's back, that record 8 hours of digital images before releasing from seal) to determine what prey harbor seals are foraging on (within, and beyond the glacial fjords where they were captured), and whether any changes noted in foraging behavior of seals over time are related to seasonal availability of prey, which may be unrelated to changes in vessel traffic.

JOB/ACTIVITY 2C: Capture pups and reproductive females immediately post-weaning to determine weaning weight of pups and body condition of moms and pups. Compare data with post-weaning captures at terrestrial sites. A complete suite of biological samples are obtained from each seal captured in spring and summer to assess diet, body condition, general health, immunocompetency, and exposure to disease and contaminants.

JOB/ACTIVITY 2D: Deploy satellite tags on seals captured post-weaning to track locations of seals during late-summer NMFS abundance surveys, determine where seals over-winter, and how diet, body condition, and winter locations affect first-year survival, and whether immature and reproductive-aged seals return to the fjords the following year

JOB/ACTIVITY 2E: Conduct land-based observations of vessel disturbance to harbor seals, especially seals tagged with heart-rate monitors. Determine frequency of disturbance to an individual, document exact timing of specific behavioral responses to approaching vessels (paired with changes in heart-rate of that individual to estimate energetic costs), distance/type of vessel, and subsequent response of seal prior to leaving the iceberg due to disturbance.

Summary of Project Accomplishments:

JOB/ACTIVITY 1A: Use photo-identification of individuals and mark-resighting techniques to estimate annual age and/or age-class specific survival probabilities, reproductive rates, pre-weaning pup survival probabilities, population size, and annual pup production; and determine reproductive histories of breeding females.

During the molting season, photographs of 2,533 seals were collected and archived for population studies. Age-specific survival was analyzed using data collected from 2000-2007 in the following manner. From 2000-2007, we collected 13,251 good quality photographs of up to 4,801 individuals in a photograph library. We estimated apparent age-specific survival probabilities of the seals first photographed as pups (n=569) using mark-recapture models incorporating effects of cohort, birth site, year, sex, color phase and age. For non-light-phase seals, annual apparent survival estimates were 0.66 (95CI: 0.48-0.62) to age 1 yr and 0.88 (0.82-0.90) from 1 to 7 yrs. Compared to non-light-phase seals, apparent survival of light-phase seals was reduced by 0.11 to age 1 and by 0.06 from 1 to 7 yrs. Compared to females, annual apparent survival of males was 0.06-0.07 lower to age 1 and 0.03-0.05 lower from 1 to 7 yrs. A photogrammetrically-derived index of body size indicated males were slightly larger than females from 1-4 yrs, with this sex difference more pronounced from 4-7 yrs. Resighting probabilities averaged 0.43/yr (range of 0.06 – 0.84) and increased linearly with age, nearly doubling from age 1 to 7. These analyses are currently being prepared in a manuscript.

JOB/ACTIVITY 1B: Conduct daily counts of pups and non-pups during pupping and molting seasons each year to continue estimation of long-term trends at Tugidak.

During the molting season 2008, counts of pups and non-pups were collected during every survey day at both beaches. Age-structure of seals hauled out during each survey was provided by photograph survey data.

JOB/ACTIVITY 1C: Continue monitoring pupping and molting phenology, to examine if significant shifts in timing of pupping or molting (such as observed during the period of population decline, Jemison and Kelly 2001) may result from shifts in age-structure, shifts in the timing of food web development and/or prey availability for harbor seals, or other factors.

Molting phenology information for 2008 was provided through count and age structure data provided during the photograph surveys.

JOB/ACTIVITY 1D: Monitor annual and seasonal variation in diet by scat collection during pupping and molting seasons (May – September).

Scats were collected in 2008 on the following dates: 5/28 (~50), 6/24 (~65), 8/13 (77), 8/24 (63), 8/30 (78). Scats were frozen and stored with Kate Wynne in Kodiak for future analysis.

JOB/ACTIVITY 1E: Explore how population dynamics may respond to environmental conditions by combining population data, Tugidak harbor seal diet data, and available environmental data collected around the Kodiak area.

Data from 2008 will be incorporated in our long-term database for future modeling of environmental correlates to harbor seal population dynamics. Required to accomplish this activity: matching of 2008-2009 photographs, further by-eye matching of adult female and pup data during pupping seasons (2000-02, 04, 06, 08), analysis of diet composition as indicated by scat samples (2000-2009), and acquiring environmental data available in the region.

JOB/ACTIVITY 2A: Equip harbor seals with dive instruments, heart-rate monitors, and VHF transmitters.

In May 2009, 15 harbor seals captured in Tracy Arm-Ford's Terror (TAFT) Wilderness Area were equipped with instrumentation packages containing a time-depth recorder (TDR), heart rate monitor and VHF transmitter. To date, 13 (87%) of the packages have been retrieved. Heart rate data collected in 2008 is currently being analyzed and a poster of preliminary results was presented at the Marine Science Symposium in January 2009.

JOB/ACTIVITY 2B: Deploy Crittercams (video cameras, mounted on a seal's back, that record 8 hours of digital images before releasing from seal) to determine what prey harbor seals are foraging on (within, and beyond the glacial fjords where they were captured), and whether any changes noted in foraging behavior of seals over time are related to seasonal availability of prey, which may be unrelated to changes in vessel traffic.

In Spring 2008, 12 seals captured in TAFT were equipped with back-mounted National Geographic Society (NGS) Crittercams for <24 hours to determine what prey foraging seals were catching. The Crittercam footage is currently being analyzed and a poster will

be presented in October 2009 at the Society of Marine Mammalogy Biennial Conference on the Biology of Marine Mammals.

We intended to deploy more Crittercams in 2009, but NGS was not able to fit the project into their schedule this year. We will deploy more Crittercams in 2010 if it fits into the NGS schedule.

JOB/ACTIVITY 2C: Capture pups and reproductive females immediately post-weaning to determine weaning weight of pups and body condition of moms and pups. Compare data with post-weaning captures at terrestrial sites. A complete suite of biological samples are obtained from each seal captured in spring and summer to assess diet, body condition, general health, immunocompetency, and exposure to disease and contaminants.

In summer 2008, 15 pups and 15 adult females were captured in TAFT. Eight of the adult females were with pups and four were in estrus. Weights and biological samples were collected from all animals captured. Biological samples include: body condition by D_2O injection and ultrasound, blubber core, skin, hair, whisker and blood.

JOB/ACTIVITY 2D: Deploy satellite tags on seals captured post-weaning to track locations of seals during late-summer NMFS abundance surveys, determine where seals over-winter, and how diet, body condition, and winter locations affect first-year survival, and whether immature and reproductive-aged seals return to the fjords the following year.

During the summer of 2008 satellite tags were deployed on pups (n=15) and adults (n=14) captured in TAFT to collect movement and haulout data. Preliminary data was presented at the 2009 Alaska Marine Science Symposium. Twelve more satellite tags were deployed on seals captured in TAFT in spring 2009.

JOB/ACTIVITY 2E: Conduct land-based observations of vessel disturbance to harbor seals, especially seals tagged with heart-rate monitors. Determine frequency of disturbance to an individual, document exact timing of specific behavioral responses to approaching vessels (paired with changes in heart-rate of that individual to estimate energetic costs), distance/type of vessel, and subsequent response of seal prior to leaving the iceberg due to disturbance.

A field camp was established in Endicott Arm June 1-26, 2009 to conduct land-based observations of harbor seal behaviors both with and without vessel disturbances.

Significant Deviations: none

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Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: T-11 **Segment Number:** 1

Project Number: 3.0

Project Title: Ice Seal Studies in Alaska

Project Duration: 1 July 2008 – 30 June 2010

Report Period: July 1, 2008 – June 30, 2009

Report Due Date: September 30, 2009

Partner: Alaska Department of Fish and Game

Project Objectives:

OBJECTIVE 1: Conduct an ice seal monitoring program to obtain samples that can be used as indices to determine the health and status of ice seal populations.

JOB/ACTIVITY 1A: Collect samples from ice seals harvested for subsistence. Collect morphometric information (length, girth, blubber thickness) and biological samples (e.g., teeth, stomach, liver, kidney, blubber, muscle, reproductive tracts, heart, lung, blood) from four species of ice seals.

JOB/ACTIVITY 1B: Analyze samples and the resulting data and prepare reports and manuscripts for use by the Ice Seal Committee and National Marine Fisheries Service for management and for incorporation into the status reviews of each species for the Endangered Species Act listing process.

OBJECTIVE 2: Conduct satellite telemetry studies to determine movements and habitat use of ice seals.

JOB/ACTIVITY 2A: Deploy satellite transmitters on ice seals with the assistance of local hunters.

JOB/ACTIVITY 2B: Analyze movements and dive data to determine movements and habitat use of ice seals. Prepare reports and manuscripts to make data available for managers.

OBJECTIVE 3: Write annual progress reports, and a final report. Give presentations at scientific and local meetings, particularly in Alaska. Publish results in peer-reviewed journals.

JOB/ACTIVITY 3A: Write annual progress reports, and a final report. Give presentations at scientific and local meetings, particularly in Alaska. Publish results in peer-reviewed journals.

Summary of Project Accomplishments:

JOB/ACTIVITY 1A: Collect samples from ice seals harvested for subsistence. Collect morphometric information (length, girth, blubber thickness) and biological samples (e.g., teeth,

stomach, liver, kidney, blubber, muscle, reproductive tracts, heart, lung, blood) from four species of ice seals.

Two biologists (John Citta and Justin Crawford) and two technicians (Mark Nelson and Anna Bryan) traveled to six villages to conduct an ice seal monitoring program by working with coastal communities and hunters to collect samples for the harvest for use in determining the health and status of four ice seal populations important to Alaska. Samples and measurements were collected during the fall harvest in 2008 and the spring harvest in 2009 for four species of ice seals in six villages.

JOB/ACTIVITY 1B: Analyze samples and the resulting data and prepare reports and manuscripts for use by the Ice Seal Committee and National Marine Fisheries Service for management and for incorporation into the status reviews of each species for the Endangered Species Act listing process.

Spotted seal samples and measurement data from the 1960s to present were analyzed to provide National Marine Fisheries Service with information regarding changes in the health and status of the population through time for incorporation into the status reviews of each species for the Endangered Species Act listing process. We provided analyses on diet, productivity, growth rate, body condition, disease, contaminants, age and sex distribution of the harvest, and survivorship in a report (Quakenbush et al. 2009).

JOB/ACTIVITY 2A: Deploy satellite transmitters on ice seals with the assistance of local hunters.

One biologist (Justin Crawford) assisted Native Village of Kotzebue personnel, the Chairman of the Ice Seal Committee, and other local hunters in the capture and tagging of ringed seals in October 2008. Thirteen ringed seals were tagged near Kotzebue. Seals were measured, sampled (blood and skin) and satellite transmitters were attached.

JOB/ACTIVITY 2B: Analyze movements and dive data to determine movements and habitat use of ice seals. Prepare reports and manuscripts to make data available for managers.

Satellite data was downloaded, filtered, and maps were made weekly for distribution and for posting on the Native Village of Kotzebue's website. Movement data were analyzed for presentations.

JOB/ACTIVITY 3A: Write annual progress reports, and a final report. Give presentations at scientific and local meetings, particularly in Alaska. Publish results in peer-reviewed journals.

Results of the sampling and telemetry studies were presented at the Ice Seal Committee meeting in Fairbanks in July 2008. An abstract for a poster presentation at the Society for Marine Mammals Biennial Conference was prepared and the poster will be presented in Quebec City, Canada in October 2009 (Crawford et al. 2009).

Significant Deviations: None.

Products:

Quakenbush, L., J. Citta, and J. Crawford. 2009. Biology of the Spotted Seal (*Phoca largha*) in Alaska from 1962 to 2008. Preliminary report to National Marine Fisheries Service from the Alaska Department of Fish and Game, Fairbanks, AK. 66 pp.

Crawford, J., K. Frost, J. Goodwin, and A. Whiting. 2009. Different habitat use strategies by subadult and adult ringed seals. 18th Biennial Conference on the Biology of Marine Mammals. (Abstract)

Prepared By: Lori Quakenbush