

**FEDERAL AID
ANNUAL 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**

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Project Title: Pacific Walrus Harvest Sample Analysis

Project Duration: November 1, 2011 to September 30, 2016

Report Period: October 1, 2012 to September 30, 2013

Report Due Date: December 1, 2013

Principle Investigator: Lori Quakenbush, WB IV, ADF&G

Project Location: Saint Lawrence Island, Alaska

I. Objective 1: Analyze samples to assess and monitor the status and health of the walrus population.

Job/Activity 1a: Work with USFWS and cooperators to determine baseline samples that should be collected annually to allow for monitoring the status and health of walruses.

Accomplishments: We worked with USFWS, USGS, researchers from universities and agencies, and veterinary pathologists from the seal and walrus Unusual Mortality Event (UME) group to develop a sample list based on the report of the 2003 Walrus Bio-monitoring Workshop and the 2004–2014 Pacific Walrus Research and Bio-Monitoring Plan sponsored by the Eskimo Walrus Commission (EWC) and funded by USFWS for samples they identified as important and based on samples collected last year. We also asked the EWC and the communities of Gambell and Savoonga, during the pre-hunt meetings for sample analyses that were important to them.

Job/Activity 1b: Work with USFWS and cooperators to determine the sample list for the spring harvest. The sample lists for 2012 and 2013 are presented in Appendix A.

Accomplishments: Working with the entities listed above we finalized the sample list, prepared a sampling protocol booklet, developed a voucher payment system for completed sample kits, and worked with the Gambell and Savoonga IRA's to make sure hunters got reimbursed for their time and expertise in sampling and answering questions

on the datasheets. In 2013, at the request of the Savoonga IRA we made arrangements with the store to accept vouchers or store credit.

Job/Activity 1c: Evaluate samples received and prioritize analyses according to importance of information and available funding. Archive samples not analyzed for future studies.

Accomplishments: Samples received in 2012 and 2013 are included in Appendix B. In 2012, we received samples from a total of 83 walruses; 30 were sampled for contaminants, 51 were sampled for diet/disease, and two had incomplete samples. Of the 81 walruses sampled, 24 were males, 57 were females and two were of unknown sex. In 2013, we received samples from a total of 66 walruses; 28 were sampled for contaminants, 38 were sampled for diet/disease, and two had samples that were mixed together and could not be identified to an individual. Of the 66 walruses sampled, 41 were males, 23 were females and two were of unknown sex.

Contaminants. *Samples from 14 walruses collected in 2012 have been analyzed for contaminants. In order to determine which of the 27 animals collected for contaminants in 2013 will be analyzed we will need to evaluate the quality of the tissues collected with the age data from their teeth, which we received in late December 2013. Many contaminants accumulate with age and some may vary by sex. Our priority is to develop a baseline for contaminants that represents all sex and age class categories. Ages are grouped by 5 year categories: <5, 6–10, 11–15, 16–20, 21–25, and >26. We will analyze up to three per age group per sex. Thus, with two sexes, six age categories, and three samples in each category we need to analyze tissues from at least 36 individuals to obtain a baseline. We will analyze blubber, liver, kidney, and muscle for organochlorine compounds (e.g., PCBs and pesticides) and liver, kidney, and muscle for metals (e.g., iron, copper, and magnesium, cadmium, lead, and mercury). We will also evaluate methyl mercury in a separate analysis. Methyl mercury is the most bioavailable and therefore the most toxic form of mercury. A preliminary analysis and comparison to data on ringed, bearded, spotted, and ribbon seals was provided to the Eskimo Walrus Commission in December 2013 (Appendix C). Summary statistics of preliminary contaminants data are provided in Appendix D.*

Disease. *Blood sera from 107 walruses collected in 2012 and 2013 have been screened for exposure to diseases including morbillivirus (distemper), brucella, herpes, leptospira, and toxoplasma. Detailed results are provided in Appendix E. In 2012, we participated in a test to see if nasal swabs could detect morbillivirus, however all 47 of the swabs and corresponding blood samples were negative so the test could not be done with walruses although it is being continued with other marine mammal species. If successful, this method would allow detection of morbillivirus by swabs alone, which simplifies collections because blood requires special equipment and handling.*

We tested intestinal material from walruses collected in 2012 for a toxic by-product of algae responsible for harmful algal blooms (HABS). We tested the contents of 53 walrus intestines (35 from Gambell, 18 from Savoonga) for the toxic algae, domoic acid. We

found that 19 (36%) had undetectable or very low levels, and 9 (17%) had higher levels. Two of these had surprising levels. G12-0023, an adult female with a calf sampled at Gambell, had 857 ng/g and S12-0014, an adult male sampled at Savoonga, had 991ng/g. These levels are not high enough to severely affect an animal as large as a walrus but it does indicate a significant exposure. Results from 2013 are pending.

Samples of skin, liver, kidney, and muscle from six walruses, and samples of heart and spleen from three animals were sent to Dr. Kathy Burek, Alaska Veterinary Pathological Services for the development of a baseline of healthy walrus tissues. During the 2011 Unusual Mortality Event it was recognized that there was limited information about healthy walrus tissue for which to compare to those suspected to be diseased. Remaining tissues from 2012 that have been processed and analyzed were sent to USFWS for archive.

Diet. *We also analyzed intestinal contents for diet items from 26 walruses collected near Gambell and Savoonga, Alaska, in 2012 and 2013, and identified items to the lowest possible taxonomic level. Although two intestines contained fish, only one fish species, Pacific sand lance, was identifiable; all other prey items were invertebrates (Appendix F).*

Whiskers from 31 walruses collected in 2012 have been analyzed for C and N stable isotopes by Dr. Seth Newsome, University of New Mexico, for diet related information. Additional whiskers from 36 walruses collected in 2013 have been sent for isotope analysis for diet studies. See Stable isotopes from whiskers in Appendix G for preliminary details.

Blubber thickness. *We collected blubber thickness over the sternum in 2012 and 2013 as an index of body condition. We provided hunters with a flexible ruler to insert in an incision over the sternum and bend the ruler at the surface for a measure of blubber thickness without having to write down the numbers. We will be measuring the rulers from 2013 and analyzing the data for both years soon.*

Adult female reproductive condition. *Hunters and local samplers provided information about the reproductive condition of the adult females sampled and harvested. Information included whether the female had a fetus, calf, or yearling with her and if she had milk or not. From this information we can estimate annual pregnancy rate for harvested females.*

Job/Activity 1d: Seek other partners for sample analysis.

Accomplishments: We have identified partners that will analyze samples collected and provide results. Dr. Tracey Goldstein, Wildlife Health Center, School of Veterinary Medicine, University of California, Davis, CA, analyzed nasal swabs for morbillivirus. Dr. Elizabeth Frame, NOAA, Northwest Fisheries Science Center, Seattle, WA, analyzed intestinal contents for toxic algae (e.g., domoic acid and saxitoxin). Dr. Chad Jay, USGS, Anchorage, AK, received blubber for blubber quality, diet, and energetic studies

in 2012, but needs to work out measures of body condition and samples for other times of year before analysis will begin. Dr. Seth Newsome, University of New Mexico, has analyzed whiskers for isotopes for diet studies. Samples of skin, liver, muscle, kidney, spleen, heart, and blood will be analyzed by members of the UME group to describe healthy tissues as a standard for comparison. Most of the above analyses will be at no cost to this project, however the results will be available to us for overall determination of health and for reporting to the communities.

Job/Activity 1e: Analyze samples and prepare technical report.

Accomplishments: A technical report is being prepared as results of analyses become available. We are also preparing posters and other non-report forms of information for the hunting communities. A report was provided to the Eskimo Walrus Commission at their November 2012 meeting (Appendix H) and at their December 2013 meeting (Appendix C). An oral report on the Results from 2012 sampling was presented at the hunter meetings in February 2013. A report on the Results from 2012 and 2013 sampling will be presented at the hunter meetings in February 2014.

Job/Activity 1f: Make recommendations for future samples, protocols, and analyses.

Accomplishments: Recommendations for future samples will depend on results of the analyses, input from EWC, hunters, USFWS, and researchers. For example, results from disease samples and research by the UME group may suggest different samples for next year. We are collecting recommendations for samples, protocols, and analyses from hunters and research partners as we progress and will be discussing these prior to the next sampling period. We will also discuss the sample analysis priorities with our partners and with EWC and the hunters.

Objective 2: Communicate with EWC, Native Village of Gambell (NVG), Native Village of Savoonga (NVS), communities, and walrus hunters.

Job/Activity 2a: Seek hunter/community input on research topics relevant to them.

Accomplishments: We asked EWC at their December 2013 meeting and Gambell and Savoonga at their pre-hunt meetings what information they thought was important. We presented a draft list for their comments and feedback. We reviewed the Bio-monitoring Workshop proceedings prepared by the Eskimo Walrus Commission as a basis for the draft list.

Job/Activity 2b: Present sample numbers and explain results or potential results at EWC and community meetings.

Accomplishments: Sample numbers are presented in Appendix B. We discussed the samples collected and the available results with EWC at their November meeting in 2012 and their December meeting in 2013. Results will also be presented at community meetings and the pre-hunt meetings.

II. PUBLICATIONS

None.

**III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE
THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT
PERIOD**

None.

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Date: 1 January 2014

List of Appendices:

Appendix A. Walrus Sample Lists – Spring 2012 and 2013.

Appendix B. Walrus samples collected from Gambell and Savoonga in spring 2012 and 2013.

Appendix C. Report on spring 2012 and 2013 walrus sampling to the Eskimo Walrus Commission, December 2013.

Appendix D. Summary statistics for contaminants from 2012 walrus samples.

Appendix E. Disease Exposure from 2012 and 2013 walrus samples.

Appendix F. Diet from intestinal contents.

Appendix G. Diet from isotopes in walrus whiskers.

Appendix H. Report on spring 2012 walrus sampling to the Eskimo Walrus Commission, November 2012.