

Project 1A – Amendment No. 1 Concentration and Effects of Selenium in Shorebirds 2007 Sampling Season

SUBCONTRACT WITH: Weber State University
PRINCIPAL INVESTIGATOR: Dr. John Cavitt
CONTRACT VALUE: \$34,190
SCHEDULE: April 1, 2007 through September 30, 2007 (elapsed time: 6 months)

Project Objectives

The project objectives are generally to:

1. Determine ambient selenium concentrations in brine fly larvae and in American avocet eggs.
2. Determine stomach contents of nesting birds.
3. Determine selenium and mercury concentrations in nesting American avocet blood and liver.

General Assumptions

1. All work completed as part of this scope of work will follow UDWQ's Quality Assurance Plan protocol. Samples will be shipped to the laboratory selected by UDWQ following required protocol. Cost of laboratory analysis is not included in this scope of work.
2. All necessary clearances/permits to complete the work specified herein will be acquired prior to and maintained for the length of the work. All access will be properly coordinated and permission obtained.
3. Safety is of the essence. Health & safety protocol will be identified and followed.

Scope of Work

Task 1. Preparation of Workplan, and Budget Estimates

Prior to executing Project 1A Year 2, a workplan and the associated components (i.e., budget, required protocols, etc.) will be prepared by Dr. Cavitt and then reviewed by the project technical advisors, Great Salt Lake (GSL) Science Panel, Utah Division of Environmental Quality, and GSL Steering Committee. This task also includes Dr.

Cavitt's participation in study team meetings, conference calls, and other tasks on an as-needed basis.

Deliverables:

1. Draft and Final Data Quality Objectives for Project 1A (to be completed by 4/30/2007).
2. Workplan including scope of work; project costs; project schedule; health & safety plan; protocols for collecting birds, their eggs, and invertebrate samples; handling and shipping of samples (to be completed by 4/30/2007).

Task 2. Collect Nesting Adult Female American Avocets

Pintail Flats at Ogden Bay Waterfowl Management Area (where "Ogden Bay" samples were collected in 2006) will be searched for American avocet (AMAV) nests during late April – May 2007. A minimum of 10 nests will be marked during egg-laying when 1 or 2 eggs are present. The following day a spring-loaded nest trap will be placed on targeted nests to catch the laying female. Following capture, male avocets accidentally captured will be released, females will be euthanized by cervical dislocation (USFWS Permit #MB043593-0; UT Division of Wildlife Resources COR# 1COLL7037). Ten females will be dissected, and blood and liver samples will be obtained for analysis following the same procedures as in 2006. In addition, the reproductive tract will be dissected and the developing egg will be removed. Eggs that have an eggshell membrane (with or without a complete shell) will be processed for selenium analysis in a manner similar to that used for eggs collected from nests. Dietary information will be obtained by direct examination of gut contents. Immediately following collection, esophageal, proventricular, and ventricular contents will be removed, separated, and placed in individual containers with 80% ethanol. In addition, the mouth (pharynx) will be rinsed with 80% ethanol and wash collected. Invertebrates will be identified to family or order, counted, and measured. The volume composition of samples (as percent) will also be determined. Any eggs present within the nest will be collected, returned to the laboratory and prepared for selenium analysis. It is assumed that Gary Santolo will assist in sampling birds (2days, travel expenses are included).

Schedule

This task will be completed by July 1, 2007.

Task 3 – Collect Brine Fly Larvae from the Foraging Areas

Foraging areas will be delineated from the point birds are observed foraging. Brine fly larvae will be collected from the mudflat, benthos, and water column within the foraging area with sufficient biomass for analysis (target 3 samples of 2 grams each) and additional biomass when that is feasible. Brine fly larvae will be collected at Ogden Bay Waterfowl Management Area, and Saltair. Water and sediment samples will also be collected from the same location where brine fly larvae were collected. Standard operating procedures (SOPs) prepared for the 2006 sampling season for this project will be followed for collecting water, sediment, and food samples in 2007.

Schedule

This task will be completed by July 1, 2007.

Task 4 – Process and Ship Samples to Analytical Laboratory

All AMAV tissue, eggs and brine fly larvae will be properly stored and prepared for shipment to an analytical laboratory. Chain of custody and documentation will be prepared and copies maintained within the Avian Ecology Laboratory at Weber State University.

For purposes of estimating analytical costs, it is assumed that the following number of samples will be collected and sent to the laboratory. Blood and liver samples will be analyzed for both selenium and mercury. Egg, food, water, and sediment samples will be analyzed only for selenium.

- 10 AMAV blood samples
- 10 AMAV liver samples
- 20 AMAV egg samples (10 from the oviduct and 10 from nests)
- 6 brine fly larvae samples (3 from Ogden Bay and 3 from Saltair)
- 2 water samples (1 from Ogden Bay and 1 from Saltair)
- 6 composite sediment samples (3 from Ogden Bay and 3 from Saltair)

Schedule

This task will be completed by July 1, 2007.

Task 5 – Final Report

A final report will be prepared including the following:

- Description of methods and assumptions
- The location, number, and reproductive condition of birds collected; samples and amounts removed from birds; and determination of the food material collected.
- The locations of food, water and sediment samples (including foraging microhabitat) and water depth at foraging sites
- Results of selenium and mercury analyses of samples.
- Data from 2007 sampling season
- Discussion of results including comparison to results from 2006 sampling season.

Schedule

Draft report will be complete by September 1 assuming laboratory results are received a minimum of 30 days before. Final report will be complete by September 30 assuming a 2 week review period.