

(NOTE – THIS ECONOMY ACT ORDER IS STILL IN DRAFT, BUT DOES SHOW THAT THESE AGREEMENTS CAN VARY AS EACH AGENCY MAY HAVE SPECIFIC REQUIREMENTS OR INSERTS)

ECONOMY ACT ORDER & AGREEMENT

BETWEEN

U.S. ARMY CORPS OF ENGINEERS

PORTLAND DISTRICT

AND THE

U.S. GEOLOGICAL SURVEY

DEPARTMENT OF THE INTERIOR

ECA-CENWP-V-2011-1-NRM

Reference: Memorandum of Agreement of 2011 between the U.S. Army Corps of Engineers, Portland District and the Department of Interior, **U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center** for the negotiation of reimbursable work projects under the Economy Act (31 USC 1535).

Requesting Agency:

US Army Corps of Engineers, Portland District

Operations Division, **CENWP-OD-SR**

P.O. Box 2946

Portland, OR 97208-2946

(503) 808-4306 (phone)

(503) 808-4329 (fax)

Agency DUNS # DOD960419

ALC – **00-00-8736**

Administrative Point of Contact:

Linda VanBlaricom

Supervisory Budget Analyst

U.S. Army Corps of Engineers

POB 429 Lowell, Oregon 97452

(541) 937-2131 (phone)

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Linda.A.Vanlaricom@usace.army.mil

USACE Project Lead

Roberta Swift

Wildlife Biologist

USACE, Willamette Valley Project

26275 Clear Lake Road

Junction City, OR 97448
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Roberta.Swift@usace.army.mil

Servicing Agency:

U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center
777 NW 9th Street, Ste 400, Corvallis, OR 97330-6169
(541) 750-1035 (phone); 541/750-1069 (fax)
DUNS # 137826140
TIN #53-0196958
ALC (14-08-0001)

Administrative Point of Contact:

Denise Hammond, Budget Analyst
(541) 750-1035 (phone)
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Denise_hammond@usgs.gov

USGS Principal Investigator:

Dr. Collin Eagles-Smith, Ecologist
U.S. Geological Survey, FRESC, Corvallis Research Group
3200 SW Jefferson Way, Corvallis, OR 97331;
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Tracking/Agreement Number: **ECA-CENWP-V-2011-1-NRM**

Scope of Work:

Project Title: Mercury exposure risk assessment for purple martins at Willamette Valley Projects, 2011

Abstract: Purple martins are a species of concern in Oregon, where their populations have declined, likely due to numerous factors. They prefer to nest in open areas and are often found nesting and foraging on aquatic invertebrates in close proximity to wetlands and other water bodies. Therefore they may receive substantial mercury exposure at water bodies with elevated mercury exposure. Elevated mercury concentrations have been documented at two Willamette Valley Lakes with purple martin nesting colonies: Dorena and Cottage Grove. The purpose of this work is to assess mercury concentrations in purple martin eggs at Fern Ridge, Dorena and Cottage Grove lakes in order to produce a risk estimate for mercury exposure to purple martins at these three lakes, using Fern Ridge Lake as a baseline for comparison.

Statement of Work:

Background, Introduction, or Rationale

Mercury is a priority issue nationwide because of its ubiquity and high toxicity to wildlife and humans. Birds are particularly sensitive to the effects of mercury exposure, and reproductive impairment is among the most vulnerable endpoints. Avian sensitivity to the effects of mercury exposure varies substantially among different species: songbirds are generally quite sensitive. Fortunately, many songbirds are primarily terrestrial foragers, feeding on prey from areas where mercury exposure tends to be limited. However, some species are wetland-dependent and forage on invertebrates that emerge from aquatic habitats. This is important because methylmercury production is known to be elevated in wetland habitats, where unique biogeochemical properties facilitate conversion of inorganic mercury to methylmercury, the more toxic and bioaccumulative form to humans and wildlife. In fact, recent work has shown that some wetland-dependent songbird species are bioaccumulating concentrations of mercury in their tissues and eggs that are associated with reproductive failure and other toxic manifestations in less sensitive fish-eating birds. Additionally, at environmentally-relevant mercury concentrations there have been documented effects to endocrine function, immune response, behavior, reproduction, and survival in species such as tree swallows and song sparrows. Thus, in areas with elevated mercury concentrations, there may be substantial risks to aquatic-dependent songbirds due to enhanced mercury exposure.

The Purple Martin (*Progne subis*) the largest member of the swallow family, is one such species of bird that may be at risk to mercury exposure in some areas within its range. They are also a species of concern in Oregon, where their populations have declined. Purple Martins are insectivorous birds that commonly nest in human-provided structures and cavities. They generally prefer nesting locations in open areas, and often can be found in close proximity to wetlands and other waterbodies. This is important because those birds nesting on or near waterbodies with elevated mercury concentrations may forage extensively on emergent aquatic invertebrates, thus receiving substantially greater mercury exposure than birds that rely more on terrestrial prey items. Dietary mercury is rapidly accumulated into avian tissues, and is depurated by female birds into their eggs. In fact, most of the mercury in bird eggs is associated with maternal dietary exposure over the approximately two-week period prior to egg development. The risk to reproduction associated with these exposure scenarios is two-fold. Mercury may illicit a toxic response directly to the developing embryo, or it may impair a nesting adult bird's reproductive behavior to such a degree that it does not adequately tend to its nest or care for its young. Because of their conservation status, potential sensitivity to mercury, and use of wetland habitats, an assessment of mercury exposure in Purple Martins will be valuable for understanding whether mercury presents a serious risk to Purple Martin conservation.

The Southern Coast Range of western Oregon contains numerous water bodies with elevated mercury concentrations in water, sediment, or fish, which has resulted in fish consumption advisories for the protection of human health. Wildlife species in these areas may also be at elevated risk to deleterious effects of mercury exposure, though limited work has been conducted to date to evaluate the magnitude or scope of the issue. Several of the impaired waterbodies include Cottage Grove and Dorena reservoirs which

are managed by the US Army Corps of Engineers (USACE) as part of the Willamette Valley Project. In addition to managing water levels in the reservoirs, the WVP also maintains breeding structures for numerous Purple Martin colonies which are in close proximity to the lake. This study is designed to evaluate mercury exposure and bioaccumulation in Purple Martins nesting in these reservoirs and assess whether egg concentrations approach values associated with toxicological thresholds in other species.

Objectives

The goal of this study is to conduct an initial assessment of mercury exposure in Purple Martins nesting in southern Oregon reservoirs, and assess potential risk to Purple Martin reproduction based on known exposure thresholds in closely related bird species. The following objectives will be addressed:

1. Determine mercury concentrations in Purple Martin eggs from up to 10 nests in each of three colonies at reservoirs within Willamette Valley Project.
2. Compare mercury concentrations between randomly sampled, viable eggs and eggs that have failed to hatch, using standard accepted lab procedures.
3. Develop a risk estimate for each Purple Martin breeding colony based on their estimated mercury exposure.

Methods

Study Location

Work will be conducted primarily at Dorena, Cottage Grove, and Fern Ridge Lakes.

Field Sampling

Purple Martin nests will be monitored for activity and 1 egg will be removed from each of up to 10 nests per colony. Eggs will immediately be placed in well-padded, labeled polyethylene bags, and stored in fiber eggs cartons in a cooler on wet ice until return to the laboratory. Once in the laboratory, eggs will be stored in a refrigerator until dissection within 30 days of sampling.

Lab Processing

Once transferred to the lab each egg will be measured prior to dissection. The contents of each egg will be removed and examined for viability, incubation stage, and malformations of any embryos. Each egg sample will be dried and homogenized to a fine powder in an analytical mill. Dried samples will be stored in dark desiccators until analysis.

Mercury Determination

Each sample will be analyzed for total mercury concentration at the USGS Pacific Northwest Environmental Mercury Laboratory in Corvallis, Oregon. Mercury will be determined via thermal decomposition coupled with atomic absorption spectroscopy, following EPA method 7473. Prior to analysis, the equipment will be calibrated using NIST-certified standard solutions.

Statistical Analysis

Mercury concentrations will be compared among reservoirs and between random and failed-to-hatch eggs using analysis of variance models.

Educational and Training Component

Educational components include the training and involvement of a student trainee (STEP) and a recent graduate student in the concepts and methodologies involved in this study.

Work Location

Field sampling will be conducted at Dorena, Cottage Grove, and Fern Ridge Lakes, Willamette Valley Project, Portland District. Laboratory analysis will occur at the USGS Pacific Northwest Environmental Mercury Laboratory in Corvallis, Oregon.

Property and Equipment

There will be no CENWP owned property or equipment furnished to USGS under this agreement. USGS shall not procure accountable property or equipment under this agreement utilizing funds provided by CENWP.

Timeline & Period of Performance

Work to be at date of signature of government contracting office, by June 30 2011; through May 31 2012. Draft report by February 30 2012. Final report by May 31, 2012.

Training and field collection will begin in April 2011 and will occur during spring and summer 2011. Laboratory processing and analysis will begin once field sampling is completed and will likely occur during Fall 2011 (Sept. – Nov). Data analysis and a draft report will be completed by February 2012, and the final report will be submitted by May 31 2012.

The agreement will terminate on May 31, 2012, but may be amended at any time by mutual consent of the parties. Any party may terminate this agreement by providing 30 day's written notice to the other party. When an accepted agreement is cancelled by the buyer, the seller is authorized to collect costs incurred prior to cancellation of the agreement plus any termination costs.

Reports/Deliverables

The following will be provided to Roberta Swift of the U.S. Army Corps of Engineers.

- 1) Digital draft report including statistical analysis and data summary comparing mercury exposure and developing a risk estimate for Dorena, Cottage Grove and Fern Ridge Lakes by February 30, 2012
- 2) Digital data files containing analyzed egg mercury concentrations for 10 purple martin eggs by May 31, 2012. These data will remain the joint property of USGS and USACE.

- 3) Digital final report by May 31, 2012. A draft final report to be submitted by May 31, 2012. The final report will be in a form appropriate for printing and binding as a stand-alone document or for eventual publication in a peer reviewed journal. Publication of any products resulting from this agreement will be the responsibility of the USGS but WVP requests the opportunity for review. The results of work performed will be available for use or publication by the USGS in connection with its ongoing programs, unless prohibited by security considerations.

The Corps of Engineers, Willamette Valley Projects will:

1. Designate a Resource Advisor in the planning and implementation of the work.
2. Provide information and coordination necessary to obtain permits to accomplish the work in accordance with state and federal wildlife authorities (USFWS, USGS, ODFW).
3. Coordinate and implement onsite work in collaboration with dam safety, operations and natural resources management divisions.
4. Assist with field logistics by providing labor and transporting staff to field sites by boat where necessary.

The U.S. Geological Survey Forest and Rangeland Ecosystem Science Center will:

1. Develop and coordinate with Willamette Valley Project to plan and conduct field work on Corps projects.
2. Provide trained personnel, supervision, equipment, and supplies necessary to safely and efficiently implement field and laboratory studies.
3. Conduct laboratory and statistical analyses using scientifically accepted methods and equipment.

Reimbursement for services:

Reimbursement of the U.S. Geological Survey for services provided under this Order will be made only for those services rendered prior to May 31, 2012. Funding in an amount not to exceed \$16,232.75 is set aside by the Corps of Engineers for reimbursement of the U.S. Geological Survey's labor, supplies, and equipment costs incurred during performance of all or portions of the work.

PR&C: _____

Ordering Work Item: _____

Funded Work Item: _____

Work Category Code: _____

FSN and MIPR Accounting Classification codes: 96X_____

Federal Customer Agency Location Code: 00-00-8736

Federal customer's Job number (cost code): (Ask your budget person)

Treasury Account Symbol: AMSCO #

Payment Procedure:

Upon completion of all or a portion of the agreed tasks in this Order, the **U.S. Geological Survey** shall furnish an invoice evidencing the work, and as a basis upon which payment will be made to **U.S. Geological Survey**. Payments will be authorized for that work which has been completed at the time of invoice submittal. Payments shall be made electronically via the Military Interdepartmental Procurement Request (MIPR) process. Invoices shall be submitted in triplicate as follows:

- a. The original and one copy to:
ATTN: **Linda VanBlaricom (541) 937-2131**
U.S. Army Corps of Engineers
POB 429 Lowell, Oregon 97452

- b. One copy will be furnished to the Corps representative for this Order, who will review and certify its accuracy:
ATTN: **Roberta Swift (541) 461-2869**
U.S. Army Corps of Engineers
Fern Ridge Lake Project
26275 Clear Lake Road
Junction City, Oregon 97448

Signatures for USGS Economy Act Order ECA-CENWP-V-2011-1-NRM:

The date of approval for this Economy Act Order shall be the date on which it is signed by the **Willamette Valley** Projects Operations Manager, Portland District.

Erik S. Petersen
Operations Project Manager
U.S. Army Corps of Engineers
Willamette Valley Project

Date

Carol A. Schuler
Director
U.S. Geological Survey

Date

Forest and Rangeland Ecosystem Science Center