

**FINAL PERFORMANCE REPORT**



**FEDERAL AID GRANT NO. T-47-P-1**

**DIGITAL ATLAS OF OKLAHOMA MAMMALS:  
DEVELOPMENT OF WEBSITE-COLLECTION OF  
VERTEBRATES-OSU**

**OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION**

**December 31, 2006 through June 30, 2009**

## FINAL PERFORMANCE REPORT

STATE: Oklahoma

GRANT NUMBER: T-47-P-1

GRANT PROGRAM: State Wildlife Grants

GRANT NAME: Digital Atlas of Oklahoma Mammals: Development of Website—Collection of Vertebrates—OSU

GRANT PERIOD: 31 December 2006 - 30 June 2009

PRINCIPLE INVESTIGATORS: Karen McBee, Department of Zoology, OSU

### A. ABSTRACT

A georeferenced database was developed for the mammal collection within Oklahoma State University's Collection of Vertebrates. This collection contains over 10,000 mammal specimens collected within the state of Oklahoma and represents all native mammal species and collections made from throughout the state. The mammal database was developed in a museum collections software program called Specify which will be used as a web interface to make the database accessible to the Internet. An application was prepared to integrate the collections at Oklahoma State University into the MaNIS (Mammal Networked Information System) system, but this had not been approved at the time of this grant's closing. A portions of the grant's objective was met, but the OSU mammal collection information is not assessable, currently, to the World Wide Web as planned.

### B. OBJECTIVE:

The objective of this Phase II project is to develop a website for front-end users of the DAOM (e.g., scientists, managers, students, general public). This website will provide access to maps of current and historical distributions of Oklahoma mammals and information about holdings of mammals of Oklahoma within OSUCOV and SNOMNH collections

### C. BACKGROUND

The Digital Atlas of Oklahoma Mammals (DAOM) was envisioned as a joint project of Oklahoma State University and the University of Oklahoma based upon the records of mammals housed at Oklahoma State University's Collection of Vertebrates (OSUCOV) and the Sam Noble Oklahoma Museum of Natural History (SNOMNH). The goals of the DAOM are to verify the identity of each mammal specimen in the collections of the OSUCOV and the SNOMNH and to assign a geographic location to each specimen to create a geospatial database. A website would be created to make the geospatial database accessible over the World Wide Web. Information regarding the current and historic distributions of Oklahoma mammals is important to wildlife

managers and to land managers and planners in order to make informed decisions regarding regulations and establishing habitat conservation goals.

This project is comprised of six specific tasks as follows:

1. Complete georeferencing and verification of the localities of the specimens in the mammal collection at OSU
2. Merge the mammal collection databases from OSUCOV and SNOMNH into a single GIS interface
3. Develop standard queries so that users can generate maps based on spot locations, biotic regions, or political boundaries
4. Digitize historical journals and field notes of Oklahoma Mammalogists housed in OSUCOV
5. Develop species accounts for all Oklahoma mammals and link these to the database.
6. Serve the Digital Atlas of Oklahoma Mammals (DAOM) on the Internet

Task 1: Verify and geo-reference the mammal specimens in the OSUCOV:

Task 1 was the most labor-intensive task of the project. Initially, we planned to use a software program called GEOLocate to develop latitude-longitude coordinates for each specimen to georeference the OSU collection. GEOLocate was developed at the Tulane University Museum of Natural History and was used successfully to develop a digital atlas for the fishes of Oklahoma. Karen McBee learned about a collections software package called "Specify" and met with the personnel who developed the Specify Biodiversity Collections Software during the joint meeting of the Society for Preservation of Natural History Collections and the Natural Science Collections Alliance (SPNHC/NSCA) in Oklahoma City in 2008. Specify is compatible with GEOLocate such that GEOLocate databases can be migrated into Specify. After discussing the features of Specify, we determined that this would be the best software for managing the georeferenced collection. Specify is a research software application, database and network interface for biological collections information. It manages specimen data such as descriptions of collecting locations, as well as information about collection transactions such as loans, exchanges and accessions. Collaborating institutions such as Oklahoma State University can use Specify at no cost and will not need to generate funding for future software modifications and updates. Updates to the Specify software convinced us that converting our ACCESS/SQL based database to Specify would 1) increase the accuracy of the latitude and longitude coordinate data assigned to each specimen, 2) provide a continual source for support and upgrades to our database because Specify is an NSF-supported system, and 3) provide a network interface for our collections information.

Specify 5 software was installed on an OSU server and the OSU Collection of Vertebrates' mammal collection database was migrated into it. The collection was next placed in the queue for migration to Specify 6 which was released in mid 2009. Dr. McBee attended a workshop to be trained on the use of Specify 5 and Specify 6 WorkBench. She was advised by Specify personnel and database managers from several other institutions on how to set up queries for the network interface and which kinds of data to shield from various audiences. For example, exact geographical locations for caves with sensitive populations of bats or collection sites for species of special concern should be accessible to researchers and ODWC personnel, but not accessible

to the general public. Specify 6 WorkBench was installed on the DAOM computer at the OSU Collection of Vertebrates and the research technicians were trained in its use by Dr. McBee. The WorkBench Update incorporates for calculating latitude and longitude georeference coordinates and has the capability to link multiple image files to each specimen record.

As a result of our consultations with the Specify personnel, we learned that completing the georeferencing in Specify WorkBench would proceed best if our locality data were as 'clean' as possible. We devoted several months to examining the 10,000+ - specimen collection at OSU to find those specimens where the same locality was recorded in multiple ways and converting all of those data to the same format. For example, we've found locality data for specimens collected at the Wildlife Research Annex of the Oklahoma Cooperative Fish and Wildlife Research Unit recorded in five different ways, and specimens collected at the USDA Southern Plains Experimental Range recorded in 11 different ways.

Task 2: Merge the mammal collection databases from the OSUCOV and SNOMNH:  
The two mammal databases were not merged into a single GIS interface as planned.

Task 3: Begin development of standard queries:

We prepared tables of species locations and summary statistics of the species records in order to develop standard queries that will allow external users to generate maps based on spot locations, biotic regions, or political boundaries. An initial set of queries were developed.

Task 4: Digitize historical journals and field notes:

Specify WorkBench allows collections to directly link images and files to the specimens. We scanned the historical journals and field notes within the OSUCOV so that these could be linked to the relevant specimens. A scanner was purchased and used to create image files for the existing journal articles and field notes. Additionally, we digitized specimen card files that link habitat data with individual specimens.

Task 5: Develop species accounts for all Oklahoma mammals to link to the database:

Work was initiated on draft text accounts for selected mammal species but this task was not completed.

Task 6: Serve the Digital Atlas of Oklahoma Mammals (DAOM) on the Internet:

Dr. McBee completed the application process to have the OSUCOV mammal database accepted as part of the MaNIS (Mammal Networked Information System) system. As of the close of this grant, the collection has not been accepted. The Specify 6 software program was designed to be the interface through which the OSUCOV mammal database would be served to the Internet, but this has not been implemented yet. In lieu of a workable Internet interface, the Oklahoma Department of Wildlife Conservation has requested that Oklahoma State University provide it with a copy of the current mammal database.

#### D. SIGNIFICANT DEVIATIONS:

Specify Biodiversity Collections Software was used to develop a geo-referenced database of Oklahoma mammals instead of writing preparing a customized software program based on

Microsoft ACCESS. While tasks 1, 3 and 4 were completed, tasks 2, 5 and 6 were not completed by the end of November, 2009. There is not currently a web-accessible database of Oklahoma mammals containing the collections at Oklahoma State University; however, a geo-referenced database does exist and should be provided shortly.

E. PREPARED BY: Mark Howery, Oklahoma Department of Wildlife Conservation  
in lieu of  
Dr. Karen McBee, Project Leader  
Department of Zoology  
Oklahoma State University, Stillwater, OK 74078

F. DATE: 23 December 2009

G. APPROVED BY: \_\_\_\_\_  
Alan Peoples, Wildlife Division Chief  
Oklahoma Department of Wildlife Conservation

*Lindsey Hueske for John D Stafford*  
John D. Stafford, Federal Aid Coordinator  
Oklahoma Department of Wildlife Conservation



Microsoft ACCESS - Wilds lists 1, 3 and 4 were completed, lists 2, 5 and 6 were not completed by the end of November 2009. There is not currently a web-accessible database of Oklahoma mammals containing the collection of Oklahoma's mammal history; however, a general internet search can find and should be provided shortly.

APPROVED BY: Mark Howley, Division Director of Wildlife Conservation  
in lieu of  
Dr. Karen Miller, Project Leader  
Department of Zoology  
California State University, Fullerton, CA 92731

DATE: 21 December 2009

APPROVED BY: Alan Frazier, Wildlife Division Chief  
Oklahoma Department of Wildlife Conservation

*John D. Stifford*  
John D. Stifford, Federal Aid Coordinator  
Oklahoma Department of Wildlife Conservation

