Biosurvey News

The Newsletter of the Oklahoma Biological Survey
Spring 2004

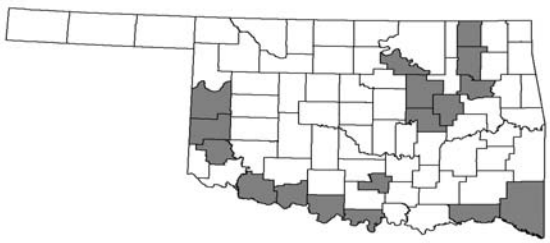
Research Projects: Vegetation Inventories

The primary objective of the Oklahoma Biological Survey is to gather, analyze, and disseminate information on animal and plant forms and ecological communities within the state. We frequently provide information concerning Oklahoma's biota to federal and state agencies. Over the past few years, OBS has acquired numerous grants from such agencies to conduct comprehensive floristic inventories throughout Oklahoma.

Columbine (Aquilegia canadensis) at the Oologah Wildlife Management Area. Photo by Bruce Hoagland.

A comprehensive floristic inventory requires the collection and identification of at least one example of every species encountered. Before going out into the field, botanists will examine maps of the region to determine which habitat types are present. Sites representing the various habitats are selected and visited monthly throughout the growing season.

Areas held by the Bureau of Land Management in Cotton, Jefferson, and Tillman counties have been surveyed, as well as the National Park Service's Chickasaw National Recreation Area and Washita Battlefield National Historic Site. Oklahoma Department of Wildlife Conservation Wildlife Management Areas including Deep Fork, Eufaula, Hackberry Flat, Hugo, Keystone, Love Valley, McClellan-Kerr, Oologah, Red Slough/Grassy Slough, and Sandy Sanders have been also been inventoried.



Counties in Oklahoma with areas recently inventoried by OBS botanists.

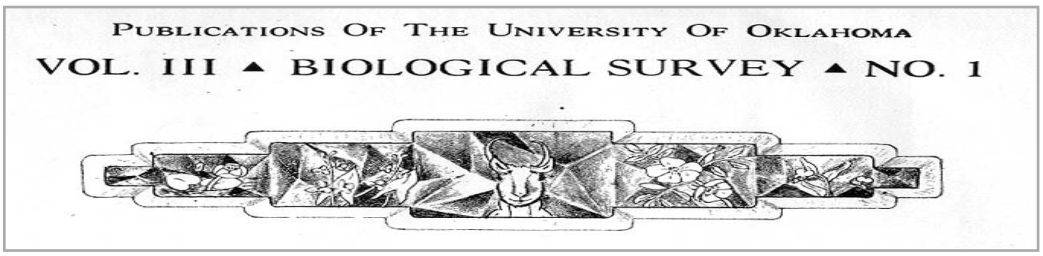
In addition to providing a complete record of an area's vegetation for the sponsoring agency, the data collected from these surveys directly benefits researchers at OBS. As a result of the inventories, over 85 instances of species tracked by the Oklahoma Natural Heritage Inventory have been observed. Invasive weeds that are new introductions to the state also have been noted. Finally, gaps in our overall knowledge of the Oklahoma flora have been filled, with over 5,000 new collections deposited in the Robert Bebb Herbarium and the Oklahoma Vascular Plants Database.

Powdery alligator flag (Thalia dealbata), a species tracked by Oklahoma Natural Heritage Inventory, at the Hugo Wildlife Management Area. Photo by Bruce Hoagland.

Publications of the Oklahoma Biological Survey to Resume After a 70 Year Hiatus

by Wayne Elisens

More than 70 years after distribution of its last volume, the *Publications of the Oklahoma Biological Survey* (POBS) will resume publication during 2004. Last printed in 1933, the new series of the POBS will provide an outlet for publishing high quality, externally reviewed investigations concerned with the biota of Oklahoma and adjoining regions. Reflecting a research emphasis similar to the original series, articles will focus on all aspects of natural history, including ecology, systematics, and biogeography. Issues will be published at irregular intervals and distributed to regional libraries in hard copy format and as pdf files on the series website.



Logo of the Publications of the Oklahoma Biological Survey as it appeared in 1931.

The original *Publications of the* [University of] *Oklahoma Biological Survey* were published from March 1929 until December 1933. Five volumes appeared in the initial series that included 21 significant contributions on the biodiversity of Oklahoma. Illustrating the breadth of research activities undertaken by Biosurvey biologists, representative articles included: "A preliminary list of the ferns and seed plants of Oklahoma", "The birds of Oklahoma", "The desmids of Oklahoma", "Fishes collected in Oklahoma and Arkansas in 1927", and "The ecology of the western Oklahoma salt plains". The list of authors reads like a veritable Who's Who of Oklahoma field biologists and contains such individuals as Carl Hubbs, Royal Jeffs, Margaret Nice, Arthur Ortenburger, and Melville Hatch.

By initiating the new series of the *Publications of the Oklahoma Biological Survey*, the Biosurvey will once again provide a publication outlet for survey, inventory, and research activities that focus on Oklahoma's diverse biota. Additional information on the POBS and instructions for authors can be viewed online at www.biosurvey.ou.edu/pobs.

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New on the Web

OBS internship program
Oklahoma bird specimen records
Updated pages for the Southwestern Association of Naturalists (SWAN)
Fall 2003 edition of *BioSurvey News*
For the latest information, please visit us at:
http://www.biosurvey.ou.edu/whatsnew.html

Graduate Student Research: Conservation of Amphibians and the Peculiar Frogs of Eastern Oklahoma

by Stephen Richter

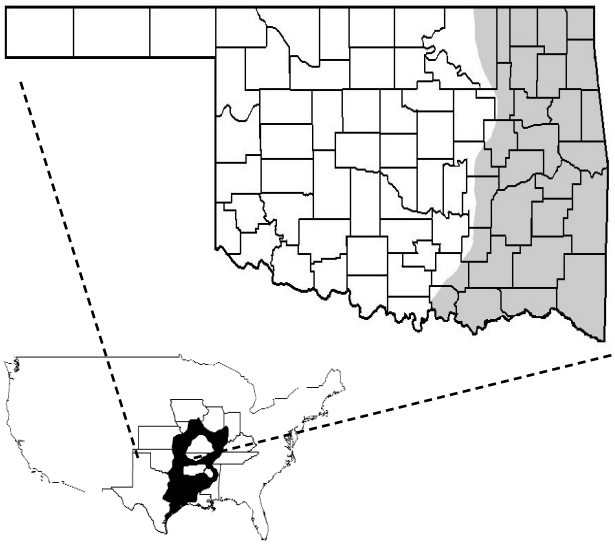
If you are ever driving through eastern Oklahoma at night during the first heavy rains of spring, stop by a few cattle pastures or large roadside ditches, and you might be lucky enough to hear loud, deep snores intermingled with scattered chuckles. These unique sounds are the mating calls of male crawfish frogs (*Rana areolata*) who are attempting to attract females to their calling sites. However, because crawfish frogs breed over a period of only a few weeks (considered "explosive breeders"), they are sometimes difficult to find. To hear the call of a crawfish frog, visit the Kansas Anuran Monitoring Program's website: http://www.cnah.org/kamp and follow the "Species" link.

Crawfish frog (Rana areolata). Photo by Mike Redmer.

Many species of amphibians are declining worldwide. In some areas, exact causes are unknown but are hypothesized to be interactions of factors including pesticides, herbicides, introduction of exotic species, increased UV-b radiation, climate change, and infectious diseases. The primary cause of worldwide population declines is more obvious— habitat modification as human populations continue to expand. Habitat modification ranges in severity from fragmentation of suitable habitat to complete habitat loss. Most amphibian species cannot thrive in human-dominated landscapes.

Oklahoma is home to one species of frog that has the ability to coexist with humans, at least in rural areas. Crawfish frogs are found in the central United States, primarily in lowland areas. In many parts of the frog's distribution, populations are vanishing because their habitat is being converted to agricultural fields, parking lots, home sites, and other human constructs. Once found in prairie habitat throughout most of their range, crawfish frogs have been reduced to patches of cattle pastures and remnant prairie habitat.

Fortunately for crawfish frogs, many of the modifications to their habitat in eastern Oklahoma are conversion of prairie habitat to cattle pastures, and crawfish frogs appear to do relatively well in cattle pastures that are not overgrazed. Additionally, most cattle ponds turn out to be great breeding grounds for these frogs. Homes for these unusual frogs are abandoned crayfish burrows, abandoned mammal burrows, and other below-ground cavities.



Geographic distribution of crawfish frogs.

As an amphibian biologist, my research focuses on the ecological, demographic, and genetic consequences of habitat fragmentation and various levels of population isolation. Populations that become completely isolated (that is, have only one breeding pond) are much more likely to go extinct because of catastrophes (e.g., infectious disease), environmental variables (e.g., drought), and demographic factors (e.g., inbreeding). What's more, they have no nearby sources to allow for recolonization. At the other extreme, subpopulations that are situated within a complex of ponds have the benefits of individual movements between ponds. These among-pond movements act to maintain genetic variation and provide recolonizers to subpopulations with the misfortune of decline or extinction. Perhaps what is more interesting is the range of scenarios and consequences between complete isolation and complete interconnectedness. It is within this range of scenarios that man and amphibian can coexist given proper management based on sound science.

Stephen Richter is currently a PhD student in Zoology under the direction of Drs. Richard Broughton and Janalee Caldwell. His dissertation research is focused on within and among population-level genetics of crawfish and gopher frogs.

Renowned Cinematographer Visits Oklahoma

Cal and Neil Rettig at the Sutton Avian Research Center in Bartlesville.

Neil Rettig and his partner, "Cal", a live, male Harpy Eagle, made a special appearance at the Sam Noble Oklahoma Museum of Natural History January 20, 2004. Rettig visited Oklahoma as a guest of the Sutton Avian Research Center, an affiliate program of the Oklahoma Biological Survey. Rettig's visit was part of an annual educational forum sponsored by F&M Bank & Trust Co., American Electric Power/Public Service of Oklahoma, Acron Group of Companies, Intervest Properties, and Frisco Title Corp., as well as Reynolds Ford and Arvest Bank of Norman. Rettig has made documentaries for the Discovery Channel, the BBC, National Geographic, and Disney. Rettig himself has been the subject of a film by National Geographic on outstanding nature cinematographers. His work includes dozens of television specials on wildlife from raptors to primates. He has filmed from the frozen Arctic to the hot and humid rainforests. Rettig is currently finishing a project for the BBC on the Mississippi River.

Besides speaking at the SNOMNH, Rettig spoke to 7,000 Oklahoma students during his time in the state as well as making an additional public presentation at the Tulsa Historical Society. Rettig encourages students to dream and to pursue their dreams. He spoke to them of first seeing the Harpy Eagle in the *Encyclopedia Britannica*, including the facts that it was both rare and little known. He told his friend he was going to film that eagle. Rettig saved money from painting houses and other odd jobs, and he later headed to Guyana. He brought back the first detailed footage of Harpy Eagles nesting in the wild, including an egg hatching.

The ingenuity of constructing a blind 30 feet from the Harpy's nest 150 feet off the ground and getting the photographs initiated Rettig's reputation of being the one to call to get difficult nature shots. He was the director of photography for "Mountain Gorilla," the first natural history film produced by Imax Systems Corp. for large-screen IMAX cinemas. During this production, Rettig pioneered methods to move the camera vertically and horizontally to give the audience the best images of the rainforest canopy.

Oklahoma Breeding Birds Atlas Published

Oklahoma's first breeding birds atlas is now available for purchase from the University of Oklahoma Press. The atlas is the result of a cooperative effort between the Oklahoma Biological Survey and the Sutton Avian Research Center and was edited by Dan Reinking. Between 1997 and 2001, more than 100 volunteer birders and professional researchers surveyed nearly 600 locations across all regions of Oklahoma. Their careful records form the basis of the maps in this book, which show the breeding distributions of both common and rare bird species in Oklahoma. The volume also includes detailed species accounts. The atlas should prove to be an invaluable reference for birders, ornithologists, and natural resource specialists, and provides a baseline for tracking changes in bird populations over time. *The Oklahoma Breeding Bird Atlas* can be purchased from the University of Oklahoma Press ($59.95 cloth, $34.95 paper), 4100 28th Ave. N.W., Norman, OK 73069-8218, (800) 627-7377, www.oupress.com.

Development of the Oklahoma Vascular Plants Database and Website

The Oklahoma Vascular Plants Database and Website evolved from efforts by Bruce Hoagland, Coordinator of the Oklahoma Natural Heritage Inventory, to record all label data from Oklahoma plant specimens housed in state herbaria in a centralized database. Initially the project was funded by the Environmental Protection Agency with the goal of publishing an atlas of the flora of Oklahoma. However, with the added assistance of a $250,000 grant from the National Science Foundation, the project expanded to include a searchable website. Other investigators working on the project include OBS employees Amy Buthod, Ian Butler, Wayne Elisens, and Oklahoma State University's Ron Tyrl.

The database currently includes over 150,000 records from the University of Oklahoma, Oklahoma State University, the University of Tulsa, the University of Science and Arts of Oklahoma, Northeastern State University, Northwestern State University, Southeastern Oklahoma State University, Cameron University, Panhandle State University, the University of Oklahoma Biological Station, and the Botanical Research Institute of Texas. Upon completion, it is estimated that the database will contain information from over 350,000 plant specimens!

The website can be found at http://geo.ou.edu/botanical/ or by selecting the "Atlas of the Flora of Oklahoma" button at www.biosurvey.ou.edu. Search options allow the user to generate a species list for a selected Oklahoma county or to generate a distribution map for a particular species.

The database, website, and atlas will provide the citizens of Oklahoma, the scientific community, and the general public with information about Oklahoma's flora. The information also can be used to guide biological surveys and for tracking rare species. The completed project will provide one of only a few databases including the flora of an entire state's floristic collections.

Mark Your Calendar for BioBlitz 2004

by Ian Butler

The Oklahoma Biological Survey will host the fourth annual BioBlitz from 3 p.m. Friday, September 10 to 3 p.m. Saturday, September 11 in Okmulgee. BioBlitz is a rapid inventory of all the species that volunteer biologists and naturalists can find and identify in exactly 24 hours within a given area. The Biological Survey invites you to see the results and mingle with biologists on Saturday between 9 a.m. and 3 p.m. at Okmulgee State Park, on the shore of Okmulgee Lake. Once a year the Oklahoma Biological Survey hosts a BioBlitz in a different part of the state. Field biologists, naturalists and other volunteers tally as many species as possible in a 24-hour period in a local state park or wildlife management area. At last year's BioBlitz at Boiling Springs State Park in Woodward county, 160 biologists and naturalists tallied 1,071 species.

Staff from the Sam Noble Oklahoma Museum of Natural History, the Oklahoma City Zoo, the Oklahoma Department of Wildlife Conservation and the U.S. Fish and Wildlife Service will take part in the inventory, and on Saturday, September 11, will offer interpretive activities and programs throughout the day for children and adults.

More information about BioBlitz 2004 and how you can join in will be on the Survey's Web site in April. Look for http://www.biosurvey.ou.edu/bioblitz.html.

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Amy K. Buthod and Caryn C. Vaughn, editors

Biosurvey News is published twice each year and reports on the activites, programs, and news related to the Oklahoma Biological Survey. We welcome readers' comments and suggestions.

The Oklahoma Biological Survey is proud to be a unit in the College of Arts and Sciences at the University of Oklahoma.

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Biodiversity: Oklahoma Phlox (*Phlox oklahomensis*)

by Kim Shannon

One of northwest Oklahoma's best-kept secrets is the Oklahoma phlox. This diminutive wildflower has a very limited distribution in Oklahoma and Kansas and was at one time considered for federal designation as a threatened plant species. But what these individual plants lack in size, they make up for when they bloom in large numbers.

Phlox oklahomensis is a member of the Phlox family (Polemoniaceae) and is on average about eight inches in height. This small perennial is characterized by its long, narrow, opposite leaves and its white, pink, or lavender flowers. While there are 300 species of Phlox worldwide, there are only eight species found in Oklahoma. Of those eight species, two (*P. oklahomensis* and *P. longipilosa*) are considered endemic to Oklahoma.

The flowers have five lobed petals that are fused to form a corolla tube. In bud, the petals are twisted tightly shut. The Oklahoma phlox typically blooms in April and the flowers most often open at night. Self-pollination produces fruit three to four weeks after flowering. The small seeds erupt from the capsules and can be projected up to 6 feet away from the original plant.

The Oklahoma phlox is only found in Woods and Woodward counties in Oklahoma. It thrives in well-drained calcium-rich soils of mixed-grass and tallgrass prairies that are periodically grazed. While this plant currently flourishes in northwest Oklahoma, it can be threatened by and deserves to be protected from overgrazing, repeated prescribed burns in the early spring, and ultimately land conversion.

During an exceptional year, hundreds of these plants often bloom simultaneously and blanket the hillsides of northwest Oklahoma in pink and lavender flowers.

The Oklahoma phlox.
Photo by Kim Shannon.