

# Biosurvey News



The Newsletter of the Oklahoma Biological Survey  
Fall 2003

## Oklahoma Natural Areas Registry: Oliver's Woods

by **Kim Shannon and Caryn Vaughn**

Oliver's Woods is an 80 acre tract of virgin bottomland forest on the southern edge of the OU campus, where Highway 9 and Chautauqua intersect. The area contains an excellent example of a bottomland forest community dominated by American elm, green ash, and hackberry. The woods provide habitat for a diversity of wildlife including small-mouthed salamanders, chorus frogs, box turtles, ground skinks, rats, ringneck and ribbon snakes, packrats, deermice, moles, fox squirrels, armadillos, opossums, raccoons, woodpeckers, owls, wood ducks, the tufted tit-mouse and chickadees, warblers in migration, and many more.

Oliver's Woods has been a favorite spot for OU class field trips for over half a century. In the 1940s Zoology professor Dr. Arthur Bragg had his class in the woods and was speaking to them about a frog, which he held in his hand. Unexpectedly, the landowner appeared, shotgun in hand, and asked Dr. Bragg what he was doing. Taking the man literally, Dr. Bragg proceeded to tell the farmer all about the frog. The farmer, Fred G. Oliver, put his gun away and joined the class. The next week, he gave the 60-acre tract to the University as a wildlife refuge and study and research facility! The University later purchased an adjoining 20 acres. In 1966 the refuge was threatened by the relocation of state highway 9. Local naturalists protested, and the route was shifted from the bottomland forest to the northern edge of the refuge.

Today, Oliver's Woods serves as a vegetated oasis in the midst of urban Norman. Its importance as an example of bottomland forest and an urban biodiversity preserve was recently recognized by the OU Board

of Regents which registered the property with the Oklahoma Natural Areas Registry in 2002.

The Oklahoma Natural Areas Registry began in 1984 and currently works with over 70 landowners who voluntarily protect over 38,500 acres. Registered sites provide essential habitat for rare, threatened, or endangered species, are comprised of rare natural community types (like the bottomland forest at Oliver's Woods), or have both. Properties with unique geological features may also be considered for registration as a natural area.

Any interested individual or organization may recommend potential Registry sites. Scientists with the Oklahoma Natural Heritage Inventory evaluate recommended sites for qualification in the program. Registration involves no payment or receipt of funds. Because the Oklahoma Natural Areas Registry is a voluntary program with no regulatory authority, its success is attributed to the Oklahoma landowners who are committed to protecting our state's natural biodiversity.

For more information about the Oklahoma Natural Areas Registry, see the website at <http://www.biosurvey.ou.edu/heritage/registry.html> or call Kim Shannon at (405) 325-7658.



*Conservation Specialist Kim Shannon at Oliver's Woods.  
Photo by Amy Buthod.*

**Inside this issue:**

Oklahoma Natural  
Areas Registry:  
Oliver's Woods  
*page 1*

New Research  
Projects: Mussels  
and Ecosystem  
Function  
*page 2*

New Course:  
Internships in  
Conservation  
Biology  
*page 2*

Boiling Springs  
BioBlitz Nets 1071  
Species in 24 Hours  
*page 3*

Botany of Red River  
Basin Focus of  
Symposium  
*page 4*

Moss and Liverwort  
Collections  
Organized at the  
Bebb Herbarium  
*page 4*

Research Results:  
Fire, Life History,  
and Nest Success  
Along Prairie  
Roadsides  
*page 5*

New on the Web  
*page 5*

Biodiversity: The  
Conchas Crayfish  
(*Orconectes deanae*)  
*page 6*

## New Research Projects: Mussels and Ecosystem Function

Caryn Vaughn, director of the Survey and an associate professor in the Department of Zoology, has been awarded a \$275,000 grant from the National Science Foundation to investigate how the biodiversity of freshwater mussels influences the functioning of river ecosystems.

Freshwater mussels are powerful "biofilters" that link the water column and bottom sediments through their feeding and burrowing activities. Historically, these mussels made up a very large proportion of the bottom-dwelling fauna of many eastern North American rivers. Today many rivers have experienced a drastic decline in both mussel abundance and species diversity. Vaughn's research will examine how these declines are impacting river function. Over the next three years Vaughn and Daniel Spooner, a PhD student in the Department of Zoology, will conduct experiments manipulating mussel abundance and richness and measuring the resulting impact on river function. Experiments are being conducted in stream mesocosms in a greenhouse on the OU campus and in the Kiamichi River in southeastern Oklahoma.



*Filter-feeding freshwater mussel.  
Photo by Caryn Vaughn.*

## New course: Internships in Conservation Biology

by Liz Bergey

The Biological Survey has begun an internship program that enables students to combine classroom knowledge with the "real life experience" of working at the Survey. Students will gain skills and try out possible career options, while receiving academic credit. Internships will allow OBS personnel to increase their participation in teaching, while receiving help in projects and or programs that fall within the mission of OBS. Within the Survey, interns can work in any of the programs, including the Oklahoma Natural Heritage Inventory, the Sutton Avian Research Center in Bartlesville, and the Bebb Herbarium. Stipends are available to cover tuition and some other costs. To learn about specific programs and faculty research projects, students should visit the Survey website ([www.biosurvey.ou.edu](http://www.biosurvey.ou.edu)). Interested students can then contact the Director or any of the faculty listed on the website.

## Boiling Springs BioBlitz Nets 1,071 Species in 24 Hours

By Ian Butler

The Oklahoma Biological Survey's 3rd annual BioBlitz 24-hour species inventory at Boiling Springs State Park ended with a surprise Saturday afternoon, September 13th, when the final species tally topped last year's total of 1,017 species.

One hundred and sixty-one volunteer biologists and naturalists ranged over Boiling Springs State Park and the Cooper and Ft. Supply Wildlife Management Areas September 12-13 tallying all kinds of plants and animals for this event, which takes place in a different part of the state each year.



*Ian Butler presents a plaque to a Boy Scout volunteer. Photo by Caryn Vaughn.*

Some species that interested biologists included spotted gar, Bell's Vireo, Graham's crayfish snake, tiger beetles, bryozoans, pincushion cactus, and the brittle cap mushroom. The fulvous harvest mouse and nine-banded armadillo found during the event were previ-

ously unreported for Woodward County, though probably not unknown to local residents.



*This spadefoot toad was one of 30 species of amphibians and reptiles found at Boiling Springs. Photo by Julian Hillard.*

The tally included 24 species of fish, 86 species of birds, 30 species of amphibians and reptiles, 21 species of mammals, 85 taxa of aquatic invertebrates, 37 species of fungi, and 28 species of algae. The two largest groups were terrestrial invertebrates (471 species) and plants (289 species). See the results online at [http://www.biosurvey.ou.edu/bioblitz/bb\\_results.html](http://www.biosurvey.ou.edu/bioblitz/bb_results.html).

Friday morning more than 100 students and 22 teachers from five area schools arrived by buses to take part in biodiversity activities under the direction of staff from the Sam Noble Oklahoma Museum of Natural History, the Oklahoma City Zoo, and the Tulsa office of the U.S. Fish and Wildlife Service.

Last year's BioBlitz in the species-rich Ouachita Mountains rolled through Beavers Bend State Park and adjoining public lands along Broken Bow Reservoir. At that

time volunteers were ecstatic with a final tally of 1,017 species. This year biologists speculated that the drier, western habitats of Woodward County would result in a lower species tally of around 800 to 900 species at Boiling Springs. The greater tally at Boiling Springs is a direct result of greater volunteer participation. More biologists were on hand to identify terrestrial invertebrates than had been available at Beavers Bend.

BioBlitz is an annual event sponsored by the Oklahoma Biological Survey. Partner organizations include the Oklahoma Department of Wildlife Conservation, the Oklahoma Department of Tourism and Recreation, the Sam Noble Oklahoma Museum of Natural History, the Oklahoma City Zoo, and the Tulsa office of the U.S. Fish and Wildlife Service.



*Graduate student Shane Jones identifies aquatic invertebrates. Photo by Caryn Vaughn.*

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# Botany of Red River Basin Focus of Symposium

by Wayne Elisens

On the 19th of April, 2003 a symposium entitled “Botany and Ecology of the Red River Basin” was presented at the 50th anniversary meeting of the Southwestern Association of Naturalists (SWAN) held at the University of Oklahoma. The symposium was a collaborative research effort jointly supported and financed by the Oklahoma Biological Survey, the Botanical Research Institute of Texas (BRIT) in Fort Worth, the OU Department of Botany and Microbiology, and the OU College of Arts and Sciences. It was co-organized by Wayne Elisens and Bruce Hoagland of the Oklahoma Biological Survey and Sy Sohmer, director of BRIT.

Speakers addressed a wide range of topics relating to the Red River Basin: physical geography and hydrology, human paleoecology, pre-settlement ecology, vegetational distribution, flora and plant geography, ecoregional conservation planning, and environmental preservation. Dan Flores, noted environmental historian from the University of Montana, gave a particularly exciting presentation entitled “The Ecology of the Lower Red River in 1806”. Dr. Flores literally “wrote the book” on the Freeman and Custis Expedition of 1806 designated by Thomas Jefferson to explore the Red River. Whereas the morning talks focused primarily on basic science and baseline ecological data, the afternoon presentations dealt with conservation issues and collaborative efforts to preserve the basin’s biological and archaeological heritage.

After the symposium, five BRIT staff visited the Bebb Herbarium and participated in strategic planning for future collaborations between BRIT and OU as part of a Memorandum of Agreement between our institutions. Efforts are ongoing to produce an edited volume on the botany and ecology of the Red River Basin.

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## Moss and Liverwort Collections Organized at the Bebb Herbarium

by Wayne Elisens



*Heather Read files a moss specimen in the Bebb Herbarium. Photo by Wayne Elisens.*

Until recently, the research collections of mosses and liverworts at the Bebb Herbarium had been crammed into metal drawers, cardboard boxes, and old shoeboxes (some from the 1930s). Specimens were not readily available to biologists, and as a consequence our understanding of the diversity of these small and often inconspicuous green plants within the Oklahoma flora has been limited.

Over the past year we have consolidated, organized, and repackaged the moss and liverwort specimens in the Herbarium. As a result of efforts undertaken primarily by two undergraduate herbarium assistants, Amy Ramsey and Heather Read, the Bryophyte collections at the Bebb Herbarium are now fully accessible to the scientific community. These collections total over 1,500 specimens in 71 families and include over 700 Oklahoma specimens representing 37 families and over 100 genera.

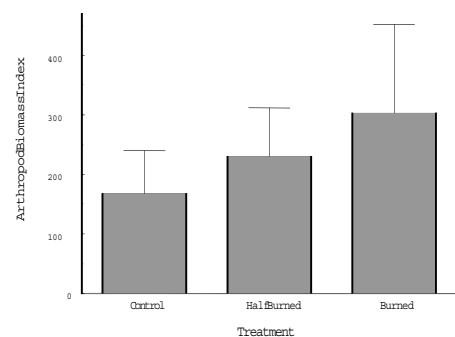
# Research Results: Fire, Life History, and Nest Success Along Prairie Roadsides

By Eyal Shochat, Don Wolfe, Michael Patten, & Steve Sherrod

Roadside vegetation can provide important habitat for breeding birds in landscapes dominated by grasslands. The attributes of roadside vegetation, such as the number of trees, hedge height or width, and plant species composition, affect bird abundance, distribution, composition, and diversity. Roadside vegetation can also affect nest success, but to date there are relatively few works on reproductive success of birds nesting along roadsides. Conservation programs may benefit from studying the various effects of roadside vegetation on nest success because it directly relates to bird fitness.

Between 1992 and 1996 the Sutton Avian Research Center conducted a study on bird nest success in the tallgrass prairie along roadsides in Osage County, Oklahoma. The study included around 1,400 nests of 23 species. The goals were to test whether and how prescribed fires, as well as other factors (nest and plant height, tree density and life-history traits) affect nest success. The fields adjacent to the studied roadsides included control, half-burned (where only one side of the road had been burned) and burned plots. Burning may cause drastic changes in both vegetative cover and arthropod abundance. During the breeding season birds rely heavily on arthropod food for their nestlings, so drastic and somewhat unpredictable changes in food abundance may greatly influence nest success.

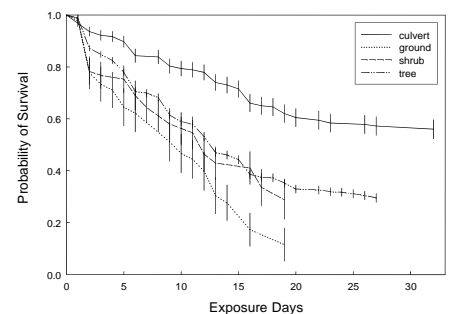
Owing to the resulting lush vegetation on which certain species of insects feed, burning increased arthropod biomass. Consequently, bird nest success increased with burning and was the highest near burned plots. Although nest predation also increased with burning, it appears that the increase in food abundance was the most important factor affecting nest success. Nest success also increased with tree height and nest height, but was not affected by tree density. Therefore, roadside management at the local scale (tree cutting) is less important than grassland management at the larger spatial scale (field burning) for species breeding along roadsides.



Differences in arthropod biomass between unburned, half-burned, and burned fields in Osage county, Oklahoma. The biomass index incorporates both abundance and size of arthropods caught with step-stake flags.

Life-history traits greatly affected nest success. Ground-nesting species were less successful and culvert-nesting birds were more successful than shrub- and tree-nesting species. Between these four groups, nest predation rates were negatively correlated with nest success, sug-

gesting that most failures were due to predation. Although nests of ground-nesting species were exposed for the shortest time (maximum 21 days), about 90% of them failed. In contrast, nests of culvert-nesting species were exposed for the longest period (up to 39 days), but almost 60% succeeded. The extremely high nest failure rate of ground-nesting species may suggest that roadsides represent a sink habitat for them.



Cumulative probabilities of nest survival for ground-, tree-, and culvert-nesting bird species in roadsides.

The results indicate the importance of spring fires to nest success for certain species by creating a temporal increase in food abundance. However, since fires open the landscape and may ease predator access to the nests, not all bird species benefit from burning and ground-nesting species suffer from high rates of nest failure. To increase nest success of shrub- and tree-nesting species it may be more important to keep trees tall and their foliage dense than to manipulate tree density in roadsides.

## New on the Web

BioBlitz! 2003 results

Oklahoma's Botanical Heritage poster

Laboratory for Organismal Diversity and Genomic Evolution

Return of the Southwestern Association of Naturalists pages

Updated biodiversity inventory of Ouachita Upland Rivers

For the latest information, check out:

<http://www.biosurvey.ou.edu/whatsnew.html>



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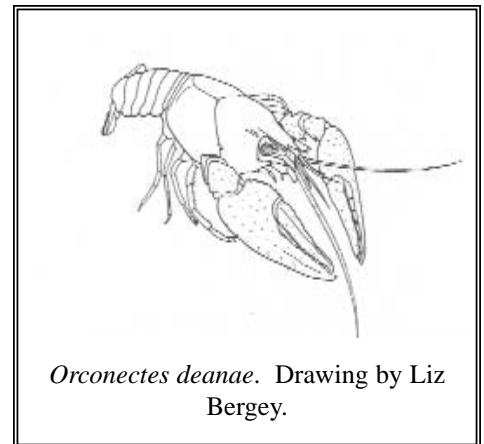
### ***Biodiversity: The Conchas Crayfish (Orconectes deanae)***

by **Liz Bergey**

At first glance, a shifting sand river seems like a very wet desert--a lot of sand and little life. The oases in this aquatic desert are the frequent piles of woody debris, where large numbers of fish and invertebrates congregate. One of the

inhabitants of these woody debris piles is the Conchas crayfish (*Orconectes deanae*). This crayfish is a moderate-sized, olive-brown species with lots of small black "freckles". Like most other crayfish, this species breeds during the cooler months. Female crayfish carry their eggs and young under their tails, and are secretive. This winter-breeding may allow females "in berry" to hide away during a time with a low food supply, and be active and have

self-sufficient young during the coming warm months, when there are better conditions for feeding and growth.



*Orconectes deanae*. Drawing by Liz Bergey.

**Biosurvey News  
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Amy K. Buthod and Caryn C. Vaughn,  
editors

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