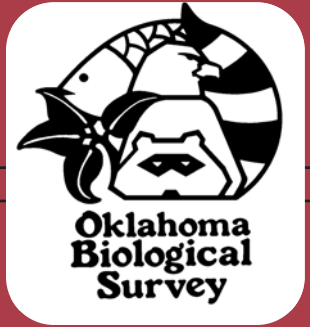


Biosurvey News



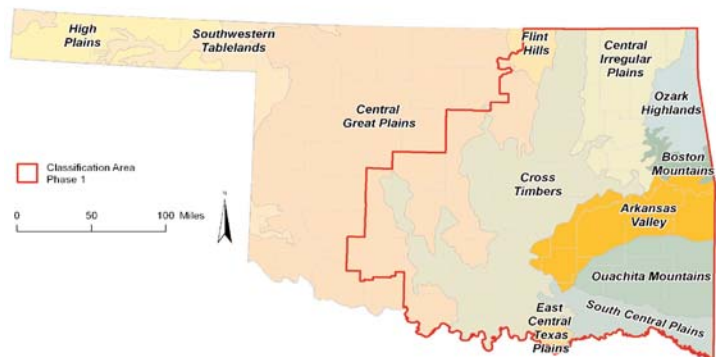
The Newsletter of the Oklahoma Biological Survey
Spring 2012

An Updated Land Cover Map for Oklahoma

Systematic inventories and standardized classifications of the nation's biological resources are prerequisites to efficient natural resource stewardship. Resource professionals in Oklahoma, representing federal, state and nonprofit entities, have identified the need for a contemporary, scalable land cover dataset. Such a land cover dataset has an assortment of potential utilities for resource management, from habitat assessment to climate change monitoring.

The last statewide land cover dataset for Oklahoma was released in 2001. However, it was based on Landsat TM satellite imagery from 1991 to 1993. In addition to the age of the source material, an accuracy assessment indicated the data suffers from poor land cover predictability. Moreover, the vegetation classification was based upon an older schema (UNESCO 1973), predating more recent efforts to standardize land cover classification by the Federal Geographic Data Committee's National Vegetation Classification Standard (FGDC 1997; 2008) or the recently devised Ecological Systems classification by NatureServe. The true shortcoming of many state-level vegetation land cover maps produced in the 1980s and 1990s due to lack of classification standardization became evident when attempts were made to join each state into a seamless national map.

To reconcile the need for an updated land cover map, the Oklahoma Geographic Information Council formed an ad hoc Landcover Workgroup in January 2010. Working group members include federal, state, and tribal agencies and non-governmental organizations. Participating organizations include the Oklahoma Biological Survey, U.S. Fish and Wildlife Service, U.S. Geological Survey, Oklahoma Office of Geographic Information, Oklahoma Water Resources Board, Oklahoma Chapter of the Nature Conservancy, Natural Resources Conservation Service, Center for Spatial Analysis at the University of Oklahoma, Playa Lakes Joint Venture, and Chickasaw Nation. Together, they collaborated to establish project priorities and methodologies, to identify data availability, and to discuss potential funding opportunities. Representatives from the Oklahoma Biological Survey volunteered to take the lead on attempting to secure funding and the creation of the new land cover dataset.



The phase 1 classification area in relationship to Omernik's Level III ecoregions. Map courtesy of Todd Fagin.

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BioBlitz! Oklahoma 2012, Foss State Park and Washita National Wildlife Refuge

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Join us for the annual weekend celebration of Oklahoma's biodiversity. BioBlitz! is a 24-hour rapid inventory of all species--from plants to protists, animals to algae, and all other living things, too!

On Friday, Oct. 5, the official inventory timer will start at 4 p.m.--getting the weekend rolling! The next 24 hours are filled with specimen-collecting, informative talks, expert-led walks, and activities for people of all ages and backgrounds.

In the mixed grass prairie ecoregion, Foss Reservoir in western Oklahoma (about 15 miles west of Clinton, Okla.) has a diversity of features including gently rolling hills, deep ravines and bottomlands laced with creeks.

BioBlitz! is for everyone interested in learning more about Oklahoma's natural diversity and for those wanting to share their passion and expertise for Oklahoma's biota. University professors, home school families, scout troops, high school and college classes and enthusiastic amateurs all enjoy this weekend of biological exploration.

The inventory concludes at 4 p.m. on Saturday, Oct. 6 with a celebration and tally total. But the fun doesn't end. BioBlitz! participants are encouraged to enjoy the park and refuge for another night while not being under the inventory timer. Hike the extensive trail system of both the park and refuge or simply relax around the campfire.

Register as a Citizen Scientist or Expert Biologist and you will receive an event T-shirt, two nights of tent camping, Friday night snacks, light Saturday morning breakfast, and 24 hours of biological diversity!

Registration is \$7 for students, \$12 for non-students. Registration information can be found at our website: www.biosurvey.ou.edu

-Priscilla Crawford

BioBlitz! Oklahoma 2012

October 5-7

Foss State Park
Washita National Wildlife Refuge



Survey Biologist Receives Research and Partnership Award

Dr. Jeff Kelly is a recipient of a Research Partnership Award from the U.S. Department of Agriculture for his collaborative work with the U.S. Forest Service, U.S. Fish and Wildlife Service, University of New Mexico, New Mexico State University, City of Albuquerque, Middle Rio Grande Conservation District, Drylands Institute and Bosque del Apache Wildlife Refuge on bird responses to invasive species, fire and fuel removal in vulnerable southwestern ecosystems.

Graduate Student Research: Possible Responses of Playa Lake Invertebrate Ecology to Human-Induced Changes

Playa lakes are temporary (seasonally inundated), isolated (unattached to a source of water) wetlands that are located in the Great Plains of the United States. Playa lakes are most numerous in the Southern High Plains of the Texas Panhandle but also can be found in the Oklahoma Panhandle. Playa lakes are hydrologically important because they serve as recharge points for the Ogallala Aquifer. They also increase the biodiversity of the Great Plains by providing habitat for insects, amphibians and migrating waterfowl. Playa lakes are endangered wetlands due to lack of governmental protection and various human-induced changes. Two of the greatest human-induced changes challenging playa lakes are hydroperiod (length of inundation) alterations, via draining or deepening, and sedimentation. I am interested in examining possible responses of the invertebrate community structure of playa lakes in response to these possible changes.



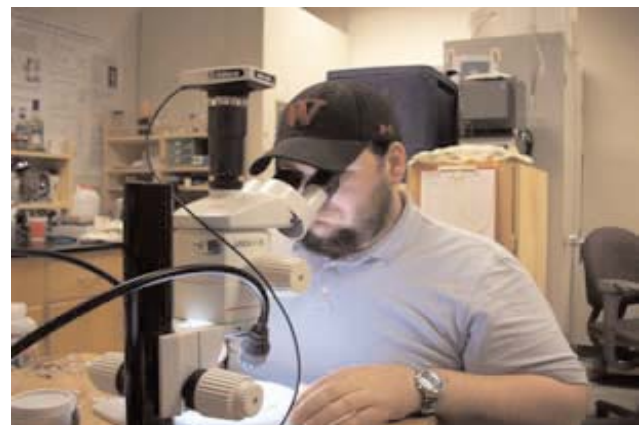
A dry playa. Photo by Eric Bright.

Global climate change may alter playa lake hydroperiod since their hydroperiod is directly related to precipitation. Many climatologists predict that the Great Plains will become drier and will experience an increase of extreme droughts as the result of global climate change. As a result, playa lakes should remain dry. Currently, I am running an experiment in which I am actively controlling the hydroperiod in playa lake mesocosms. I am examining the invertebrate community structure and other ecosystem processes (algal and plant communities).

Another line of research I am conducting is examining possible responses of the persistence of aquatic invertebrates of playa lakes to human-induced changes. Aquatic invertebrates that inhabit temporary wetlands need to have a stage that can overcome dry phases. Many of these invertebrates persist in playa lakes with drought-resistant eggs (aestivating stage). Once the soil receives moisture, the drought-resistant eggs hatch and the cycle repeats. I am interested in examining whether the hatching of aquatic invertebrate eggs is influenced by changes of temperature or sunlight. I plan to rehydrate playa lake soil under different temperature and sunlight regimes and to examine the invertebrate community structure emerging from the soil.

Sedimentation (from agricultural practices) is another human-induced change that is affecting playa lakes. I am interested in examining whether drought-resistant aquatic invertebrate eggs are influenced by sedimentation. I am going to rehydrate soil of various depths to determine the depth where the greatest number of invertebrates hatch. Then, in a follow-up experiment, I plan to add soil on top of playa lake soil to see how the community structure of aestivating invertebrates is influenced by increased sedimentation.

I am also interested in examining the terrestrial invertebrate community structure that inhabits dry playa lakes. Most wetland ecologists focus on the aquatic phase and not the terrestrial phase, so I wanted to see if dry playa lakes have unique invertebrate communities during the terrestrial phase. In the summer of 2010, I conducted an invertebrate survey of dry playa lakes and the surrounding upland to determine if there were differences. If differences exist, then damaged playa lakes will lose two unique invertebrate communities, terrestrial and aquatic, compared to the surrounding upland.



--Eric Bright. Eric is a doctoral student under the direction of Dr. Liz Bergey.

University of Oklahoma to Host New Climate Science Center

The University of Oklahoma recently was selected as the host institution for the Department of Interior South Central Climate Science Center (southcentralclimate.org). Along with partner institutions Texas Tech University, Louisiana State University, the Chickasaw Nation, the Choctaw Nation of Oklahoma, Oklahoma State University and NOAA's Geophysical Fluid Dynamics Laboratory, the center will receive \$4 million in funding over five years from the Interior Department. The United States has eight regional Climate Science Centers (www.doi.gov/csc/index.cfm) that provide scientific information, tools and techniques that land, water, wildlife and cultural resource managers and other interested parties can apply to anticipate, monitor and adapt to climate and ecologically-driven responses at regional-to-local scales. The South Central Climate Science Center encompasses parts of 20 ecoregions and will provide scientific guidance to eight Landscape Conservation Cooperatives (www.doi.gov/lcc/index.cfm). Oklahoma Biological Survey Director Caryn Vaughn is one of the University of Oklahoma co-PIs for the center.

Land cover map, continued from page 1

The development of a new land cover dataset was initiated in spring of 2012 with a \$25,000 award from the Oklahoma Department of Wildlife Conservation for a project titled "A Revised Land Cover Map for the State of Oklahoma." Additional funding is forthcoming from Gulf Coast Prairies Landscape Conservation Cooperative of the U.S. Fish and Wildlife Service. The Oklahoma Biological Survey will partner with the Oklahoma Department of Wildlife Conservation, Texas Parks and Wildlife (TWP) and Missouri Resource Assessment Partnership (MoRAP) to develop the database. A benefit of collaboration with TPW and MoRAP is the development of a seamless land cover map covering Texas and Oklahoma. In fact, TWP and MoRAP initiated a similar project in 2008 for the state of Texas. As a result, Texas and MoRAP have a methodology for land cover classification in place that will facilitate timely development of the Oklahoma product.

Kayti Ewing will be joining the OBS staff as a research fellow responsible for conducting field data collection. These data will be used by MoRAP for image-processing purposes. Final data products will include a revised land cover classification map based on NatureServe's Ecological Systems classification and a companion guide. The estimate for project completion is 2 ½ years.

-Todd Fagin, Bruce Hoagland and Dan Hough



Photos from the Field

A male common collared lizard (*Crotaphytus collaris*) basks at the Wichita Mountains National Wildlife Refuge. Photo by Amy Buthod.

Toads to Roads

An experience I vividly remember took place one evening in the late spring of 1953 after a very heavy rain. I was new to the campus, and Dr. Arthur Bragg of the Oklahoma Biological Survey invited me to accompany him that evening to observe an amphibian breeding aggregation in the area where Robinson Street and Interstate Highway 35 intersect today.

This area was flooded with one to two feet of water and a number of amphibian species were calling, but the one species I remember most was the Great Plains Toad, *Anaxyrus (Bufo) cognatus*. There were perhaps over a hundred males of this species calling and the chorus was so loud that it was not possible to carry on a conversation. Amplexing pairs were abundant. The toads were so excited that when I picked up a calling male he continued to vibrate his vocal sac.

Today, this area is covered by a black top road.

In the 1930s and 1940s, Dr. Bragg recorded a number of breeding sites for this toad along Berry Road, and on the campus of the University of Oklahoma. In 1985, populations were still present just north of the juncture of Berry Road and Robinson Street in Norman where Berry Road extends onto the North Campus.

This species, along with many other species of amphibians, have lost their breeding sites to human development. We have roads, but no toads. The chorus is silent.

-Charles C. Carpenter, Curator Emeritus, Sam Noble Oklahoma Museum of Natural History and Professor Emeritus, Department of Zoology



The Great Plains Toad (*Anaxyrus cognatus*). Photo courtesy of Tom Spinker (<http://www.flickr.com/people/42389547@N00/>).

New on the Web

Historic Aquatic Biological Literature of Oklahoma added to searchable databases

Now hosting the Oklahoma Native Plant Society website

Updated Bioblitz! Oklahoma pages including online registration

Updated plant tracking list

Updated Survey internship pages

www.biosurvey.ou.edu

Follow us on Facebook! Like our page and stay up to date on events and activities at the Oklahoma Biological Survey.



<https://www.facebook.com/pages/Oklahoma-Biological-Survey/161597383891344>

Survey Director Featured by National Science Foundation

On March 12, the National Science Foundation's online magazine, Science Nation, featured the work of Director Caryn Vaughn and her graduate students. They are studying the role that freshwater mussels fill in ecosystems. Mussels perform important services such as biofiltration and nutrient recycling. Restoring mussels could restore important services to many rivers. You can read the story and watch the video here:

http://www.nsf.gov/news/special_reports/science_nation/musselloss.jsp

MY 15 MINUTES OF FAME(?) - OR THE SCIENCE NATION SHOOT

On a lovely Friday morning in late October I am driving from Norman to the OU Biological Station on Lake Texoma to participate in a regional aquatics conference. I am happy to be getting away because the last few weeks have been unusually busy with meetings involving the Oklahoma State Water Plan, the Biological Survey's annual BioBlitz! and field trips for my course in Stream Ecology. My secretary calls me on my cell phone and asks "if I will please read my email and call back the lady from NSF!" Apparently said lady, a producer at NSF, has been calling and emailing me for about a week and I have been blissfully ignoring her. I pull over and read the emails (of course I don't text and drive!) and call her back. She is doing several stories on NSF-funded projects at OU and a colleague suggested my mussel work. Although I am disappointed that this is about publicity rather than NSF handing me a large amount of money, I tell her I am happy to participate and continue on to my conference, thinking that this is all going to take place in January. A few days later, on Oct. 30, she calls back and says they want to shoot my lab on Nov. 7. Panic ensues. She wants to go to field sites, but these are all three to four hours away so we must set up a mesocosm experiment at the OU Aquatic Research Facility (ARF). This involves getting all the other faculty and graduate students who use the facility to clean up their space in one week. Oh, and we have to go in the field (the four hour drive) and collect mussels and set up an experiment. Somehow this all gets done within one week. The big day arrives! My four graduate students and I meet the producer and cameraman at the ARF. They spend several hours filming us looking in the mesocosms, holding up mussels, and generally just trying to look like we know what we're doing. Then we go back to my office where they set up spotlights (really) and ask me questions. The worst part is when they film me walking back and forth into and out of my office (and thankfully those shots were not used!). They really want "some nice video of mussels," which of course I don't have, so I show them the awesome videos shot by Chris Barnhart at Missouri State (<http://unionid.missouristate.edu>), and these end up being a big part of what goes up on the site. All in all we spent about a week preparing and eight hours shooting for a three-minute video. However, I am quite happy to have the attention for my lab, for Chris' videos, and for mussel conservation -- and the NSF people were great.

-Caryn Vaughn

Biosurvey News
Spring 2012

Amy K. Buthod
and Caryn C.
Vaughn,
editors

Biosurvey News is published twice each year and reports on activities, 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. The University of Oklahoma is an equal opportunity institution.
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Prepared at a cost of \$164.43 to the taxpayers of the state of



Oklahoma.

Biodiversity: The Red Damselfly (*Amphiagrion* sp.)

The red damselfly, in all its hairy, stocky glory, is a little-known creature in Oklahoma. In fact, we are not quite sure which species of red damselfly occurs in Oklahoma. How can this be? With all the work we have conducted in the past few years documenting the status and distribution of dragonflies and damselflies throughout Oklahoma, how can we not know? The reason is simple . . . this little bugger has alluded us and others since 1977.

Current taxonomy treats this damselfly as two species, *Amphiagrion abbreviatum* (Selys, 1876), the Western Red Damselfly, and *A. saucium* (Burmeister, 1839), the Eastern Red Damselfly. At one time, *A. abbreviatum* was considered to be a larger and chunkier regional variant of *A. saucium*. Debate as to whether *Amphiagrion*, a genus confined to northern North America, is one widespread species with much geographic variation or is indeed three distinct species--an east coast, a west coast, and an intermediate central-U.S. species--is ongoing. The debate continues in part because of the extreme difficulty in locating populations of *Amphiagrion* in our part of the country.

In Oklahoma, *Amphiagrion* likely was first collected by R. D. Bird in 1932 in Cleveland and Comanche Counties, when he and several Oklahoma naturalists traveled the state collecting every manner of plant and animal during their OU-sponsored natural history expeditions. Bird's six specimens have not yet been located to confirm identification to genus, let alone to species, but it appears from the notes of a later collector, George H. Bick, that these specimens probably were *Amphiagrion*. Bick collected six specimens in 1956, and we have two more from 1975 and 1977. It was not until April 9, 2012 that Jason Heinen of Oklahoma State University found a population in Garfield County and we were able to collect specimens again. The specimens currently are with John Abbott, of the University of Texas, Austin, who will determine if the Garfield County *Amphiagrion* is indeed an undescribed intermediate species.

You still may be thinking, why is it so hard to find these damselflies? You might think that because they are bright red and thick-bodied it would not be too hard to find them. But, you would be wrong. Not only are they small, with wings 14.5-19 mm and bodies 23.5-28.5 mm, they appear to be extremely picky in their choice of habitat, preferring shallow spring bogs or small running streams. They seem to need just the right amount of sunlight and short vertical perches. We still do not understand their ecological needs fully, so it really is looking for a small red needle in the very large hay stack of northcentral and western Oklahoma. And, given the many land-use changes in Oklahoma since Bird and Bick's eras, particularly



from reservoir inundation, it is easy to see how previously known populations of *Amphiagrion* may not exist any longer. We continue to search for suitable habitat, and we hope that someday soon we will know exactly which red damselfly Oklahoma can call its own.

-Brenda D. Smith-Patten and Michael A. Patten

The red damselfly. Photo by Jason Heinen