

# Biosurvey News

The Newsletter of the Oklahoma Biological Survey  
Spring 2006



## Survey Researcher Disputes Ivory-Billed Woodpecker Claim

by Michael Patten

The conservation and ornithological worlds were abuzz last spring with the stunning announcement that the Ivory-billed Woodpecker—a spectacular species long thought to be extinct—had been rediscovered in the Big Woods of eastern Arkansas. Like many, I was giddy at the news, which I heard on National Public Radio over breakfast. I rushed to the Sutton Center and checked *Science* magazine's website countless times as I awaited the article's posting. Finally, shortly after lunch, there it was. I poured through it . . . and was surprised by the paucity of evidence. I thought I had missed something. I had: there was a thick file of supplementary online material, but it did not clear up my concerns. I then obtained a copy of the Luneau's now famous video, sometimes called the Zapruder film for birds, and found little to buoy my fading hopes. So it began.



*The Ivory-Billed Woodpecker. Watercolor  
by John James Audubon.*

Within a few days, Louis Bevier and I were chatting about holes in the evidence and, more importantly, that we felt various alternative interpretations provided much better fits to the various images published from the short (~4 seconds) video clip. Over the next month or so, we worked with several others to produce an alternative interpretation, one that suggested that the bird in the video was in fact a Pileated Woodpecker, a common species that can only be called the “null expectation” for any large woodpecker seen in North America. Louis and I were so concerned that we traveled to the Cornell Laboratory of Ornithology in early summer for an all-day meeting with the announcers, a team led by John Fitzpatrick. We went through all of the evidence, including intriguing (but far from definitive) sound recordings, and were treated to a couple of old films, including one of actual Ivorybills at a nest hole in northeastern Louisiana in the early 1940s.

Our meeting was constructive in some ways, though neither side was swayed. Given the charged atmosphere and the outpouring of support for crucial protection of long-suffering hardwood forests in the Southeast, our next step was unclear. After all, not many folks enjoy being wet blankets, and there was potentially more at stake than with a run-of-the-mill misidentification.

Our spirits were lifted when we learned that David Sibley and Chris Elphick had reached similar conclusions independently. I can only understate how much more accomplished an artist David is than either of us, but even our crude sketches of launch position and flight pattern were in line with his superior renditions. We thus began working as a team, although even then our goal was uncertain. At the least, we would await the annual meeting of the American Ornithologists' Union, held in Santa Barbara in late August, to see if Cornell had any new data. They did not. Moreover, in a plenary address by Fitzpatrick, he thanked us specifically for input but failed to take into account what we viewed as any mistakes in interpretation. At this point, and with the harried withdrawal of a different rebuttal, we set our sites on setting the record straight as best we could. But even then, we were reluctant. The rediscovery had been such a point of celebration that we could do little but rain on parades. Besides, the bottomland forest really does need protection.

CONTINUED ON PAGE 2

## Registry Program Gets New Representative

By Priscilla Crawford

In January Priscilla Crawford became the new Oklahoma Natural Areas Registry representative. This year she plans to re-contact all participants in the program and begin her multi-year plan to visit all the registered sites and see Oklahoma's rare plants and animals in person. She also will be setting goals for the coming years in preparation to celebrate the 25th anniversary of the Oklahoma Registry program in 2009. She already has met one of her self-imposed goals – writing a mission statement: Oklahoma Natural Areas Registry encourages citizen-based conservation of Oklahoma's natural diversity through a voluntary land-preservation program that promotes awareness of rare species, natural communities, and important geologic features. Please contact her at 405-325-7658 or [prill@ou.edu](mailto:prill@ou.edu) if you want to learn more about the Registry program.



### *IVORY-BILLED WOODPECKER (CONTINUED FROM PAGE 1)*

In the past several weeks, the four of us have said over and over that we hope the Ivory-billed Woodpecker does still survive, and that we strongly support further searching and conservation efforts on its behalf. But a realistic assessment of the profound weakness of the current evidence is important for future decision-making, which could have repercussions far beyond the bottomland forests of Arkansas. The natural world would be in much better shape if conservation dollars were limitless. Realistically, such dollars are woefully limited. Wise allocation of those limited funds requires the very best science.

Our paper came together over the fall. We submitted it in mid-November. It is published in the March 17th, 2006 issue of *Science*. In it, we note that the video—the only evidence we can verify independently—is brief and blurry: it shows little more than a grainy image of a black-and-white bird flying away. The poor quality makes analysis difficult, but at least we were all working with the same evidence. We also concur with something the Cornell team demonstrated: that white is overemphasized in low-quality video, meaning that black areas can disappear from view. We suspect that this is why so much white is apparent on the wings of the bird from Arkansas.

In a nutshell, our interpretation of the bird's postures and its movements differs from that of Cornell's team, enough so that we can conclude safely that white patches on the bird's wings can be accounted for by the white underwing of a Pileated Woodpecker. Furthermore, several other features visible in key frames strongly suggest that the bird is a Pileated and not an Ivorybill. The Cornell team does not refute most of these points in their response to our paper. A crucial example is the black trailing edge of the left wing visible in several frames. This feature would be present only on a Pileated. The video is poor, so we cannot "prove" that the bird is a Pileated. But we do something just as important: we show that the null expectation—that the bird is a Pileated—cannot be rejected. In the end, therefore, Luneau's video does not provide confirmation that the Ivory-billed Woodpecker still lives among us.

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#### **Biosurvey News Spring 2006**

Amy K. Buthod and Caryn C. Vaughn,  
editors

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

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# Graduate Student Research: Factors Affecting Mussel Reproduction

by Heather Galbraith

Freshwater mussels are a group of filter-feeding, burrowing bivalves that provide a number of important services to the aquatic community. The highest diversity of freshwater mussels can be found in the United States, which provides habitat for approximately 300 species. However, because of their unique life histories, mussels also are one of the most highly threatened freshwater groups in North America.

Mussel reproduction occurs when males release their sperm into the water column. Females filter algae from the water and passively collect the ejected sperm. Fertilization occurs on the interior of the females' gills where larvae begin to mature. These larvae eventually are released to complete their development as parasites on fish hosts. Because of high gene flow in these organisms that "broadcast" their sperm, speciation has been assumed to be rare, and has been attributed to the gradual accumulation of genetic differences. However, freshwater mussel beds often contain numerous closely related species, indicating that speciation might not be as rare as once thought. Understanding the process of speciation in freshwater mussels requires a more thorough knowledge of their reproductive process and the barriers to reproduction between closely related species. Therefore, I am interested in how mussel sperm "finds" the eggs of the same species without "accidentally" fertilizing another species of mussel.

On a more basic level, little is known about the timing and success of reproduction in general in mussels (particularly threatened or endangered species), and even less is known about the factors that cue reproduction. In my PhD research under the direction of Dr. Caryn Vaughn, I am using a combined field and laboratory approach to determine how temperature, photoperiod, and food availability interact to regulate energy storage and hormone levels, which ultimately govern the timing of reproduction. However, successful reproduction is not only related to timing of gamete release, but ultimately relies on the ability of sperm to "find" the eggs of the correct species. This could be influenced by species specific traits (i.e. barriers to reproduction between closely related species, as mentioned above) but also could be related to environmental conditions during gamete release. I am interested in how temperature and streamflow interact to influence fertilization success in freshwater mussels. Low sperm viability due to temperature could have profound influences on how successful sperm are at reaching eggs. In addition, streamflow could be important to both reproductive success and overall mussel population dynamics. Sperm release during high flow events may wash sperm downstream and facilitate gene flow among populations; however, low flow may limit fertilization to nearby mussels, affecting population genetics and relatedness of individuals within a mussel bed.



*Heather Galbraith collects a gonad sample from a mussel. Photo by Daniel Spooner.*

This will be some of the first detailed study of how mussel reproduction "works" in these highly speciose mussel beds. We will be able to use these data as a predictive tool for estimating good and poor years of mussel recruitment which, in turn, may be used as a surrogate measure for river health (since mussels are extremely important to the aquatic community). Additionally, the results of this work will be useful in predicting mussel reproductive success under changing temperature regimes due to habitat alterations such as impoundments, river regulation, and global climate change.

*Heather Galbraith currently is a PhD student in Zoology under the direction of Dr. Caryn Vaughn*

## R. John and Constance E. Taylor Library Donated to the Bebb Herbarium

By Wayne Elisens

The Robert Bebb Herbarium is undergoing a dramatic increase in the size and breadth of its research library. Connie Taylor is donating the significant botanical research library accumulated by her and her late husband, John Taylor. Both John and Connie received their doctorates at OU under the supervision of George Goodman, former curator of the Bebb Herbarium, and were professors of biology at Southeastern Oklahoma State University until their retirement.

During the course of their professional careers, John and Connie Taylor assembled an extensive botanical library in addition to a large number of plant specimens. Their collection of books, journals, pamphlets, floras, and taxonomic monographs was described as the "...best herbarium research library in the state, containing several thousand volumes" in an article honoring them as the 1993 Oklahoma Scientists of the Year by the Oklahoma Academy of Science.

The *R. John and Constance E. Taylor Collection* will be maintained permanently as a non-circulating reference library and will be accessible to resident and visiting researchers in the Bebb Herbarium. Through the generosity of Connie Taylor, the library resources of the Bebb Herbarium have expanded dramatically and will better serve those who study the plant life of Oklahoma.



### BIOBLITZ 2006

by Ian Butler

BioBlitz 2006 will be held September 15 and 16 at Quartz Mountain Nature Park, which is located on the west shore of Lake Altus-Lugart.

The Quartz Mountains are the granitic remains of a once taller mountain chain. Vegetation is mainly stunted oaks and cedars, mixed grass prairie, and tallgrass prairie on moist sites. Mesquite woodlands also are present. Colorful lichens cover many of the rocky areas. The fauna includes reptiles that prefer dry areas, such as our state lizard, the collared lizard (*Crotaphytus collaris*).

You can find more information on Quartz Mountain and past BioBlitzes on our updated BioBlitz Web page, which also includes contact information and photo links. Point your browser to [www.biosurvey.ou.edu/biotiddly.html](http://www.biosurvey.ou.edu/biotiddly.html). Above all, come to Quartz Mountain this September for our 6th BioBlitz!

### NEW ON THE WEB

Updated and reorganized projects pages

New publications by Survey authors added, including downloadable PDFs when available

Newly organized BioBlitz page

Redesigned Oklahoma Natural Heritage Inventory site

Updated Oklahoma Natural Areas Registry pages

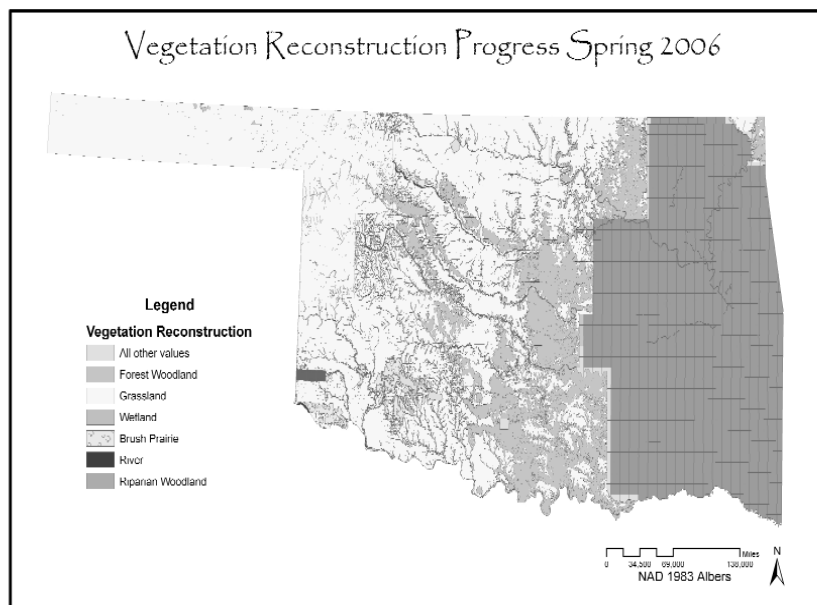
Please See  
[www.biosurvey.ou.edu](http://www.biosurvey.ou.edu)

# Vegetation Reconstruction of Oklahoma Territory Circa 1871

by Iyla Griffin and Bruce Hoagland

To assess changes in wildlife habitat, land managers need a baseline to compare with modern conditions. Unfortunately, there has been a limited amount of research on pre-settlement vegetation in Oklahoma, although the Government Land Office (GLO) surveys of the 19th century provide a rich data source. The objective of the GLO surveys was to establish the township, range, and section grid used for land description and to facilitate settlement. Unlike other states, Oklahoma was surveyed twice by the GLO, first in the 1870's (the Oklahoma Territory and the Chickasaw Nation) and again in the 1890's (the rest of the state) as lands in Indian Territory were being allotted. After conducting field work, the GLO surveyors would prepare plats (township maps) showing the location of physical and cultural features in the township. Vegetation types mapped by the surveyors included forests, woodlands, grasslands, wetlands, and shrublands. The GLO plats currently are available in paper and microfiche formats, though plats for Oklahoma never have been joined for broad scale analysis of vegetation distribution. The goal of this research project is to digitize the Oklahoma plats from the 1870's and create a GIS map and database. A digital map will be instrumental in performing analyses to determine the extent and significance of wildlife habitat that existed circa 1871. Once distribution of historical wildlife habitats has been determined, we can compare these maps with modern data sources to ascertain which have experienced decreases in extent and see if wildlife habitat has decreased over time. In areas that have experienced significant disturbance, these data can help guide land management and will be useful for wildlife habitat restoration efforts. Additionally, the GIS maps may be a valuable tool for comparing vegetation and wildlife habitat as well as human settlements and transportation networks.

We have digitized the 1,471 total townships that comprise Oklahoma Territory, and currently are in the editing process. We have identified over 30 different land-cover features, including salt plains, chinaberry groves, sand dunes, and mesquite brush. The most common vegetation types that we find on the survey maps are grasslands, forest woodlands, riparian woodlands, wetlands, and brush prairie. In areas of human settlement, we have captured over 60 different settlement types including Indian villages or encampments, houses, agricultural sites, early medical facilities, schools, and stores. Among the other features we have been able to digitize from the maps are transportation networks and hydrology features including wagon roads, Indian trails, cattle trails, principle streams, springs, lakes, washes, sinks, and salt springs. Once completed this GIS will be the first for the state of Oklahoma to contain all the historical settlements and land-cover types in a single searchable geographical database.



*Vegetation of Oklahoma, circa 1871.*



## ***Biosurvey News***

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### **Biodiversity: The Western Prairie Fringed Orchid (*Platanthera praeclara*)**

by Amy Buthod

Oklahoma has two plant species listed as threatened or endangered under the U. S. Fish and Wildlife Service's Endangered Species Act. One of these is the western prairie fringed orchid (*Platanthera praeclara* Sheviak & Bowles). According to historical writings and herbarium specimens, this showy orchid once was widespread to locally common throughout the western portions of the North American tall grass prairie. Today there are fewer than 175 known populations of the plant, and the majority of these are comprised of fewer than 50 individuals.

The western prairie fringed orchid is a terrestrial, herbaceous perennial found in moist, calcareous, or sub-saline prairie habitats. The plant possesses an underground tuber and a large, showy inflorescence of at least a dozen creamy-white flowers. Blooming from mid-June through late July, each flower has fringed petals and a long, thick nectar spur to attract its long-tongued hawk moth pollinators. The orchids produce a fruiting capsule that contains thousands of dust-like seeds.

The western prairie fringed orchid is classified as threatened throughout its entire range of Iowa, Kansas, Minnesota,

Missouri, Nebraska, North Dakota, and Oklahoma. Pressures on populations include land conversion, overgrazing, poaching, suppression of natural fire regimes, and herbicide use. Herbivory, invasives, and the species' erratic flowering patterns also are concerns. A final factor adding to the plant's vulnerability is its reliance on symbiotic relationships with specific fungi. Symbiotic relationships are close associations between different organisms of different species that may benefit each member. This relationship is particularly important for the orchid during seedling establishment, as the plant has no endosperm or seed leaves (cotyledons) to provide energy for growth. Habitat fragmentation has been suspected to lead to the loss of the orchid's mycorrhizal symbionts and thus complicate its recovery.



*The western prairie fringed orchid. Photo by the National Park Service.*