### Volume 9 Issue 2



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### **Monitoring and Managing Wetlands**

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### **INSIDE THIS ISSUE**

**Managing Wetlands - 1** 

**Bat Mortality - 2** 

Full Ponds May Pose Problems - 3

Recolonizing Black Bears - 4

Awards, News, Events & Social Media - 5 Understanding the abundance, distribution and quality of natural resources are fundamental to developing effective monitoring and management strategies. This information helps to identify resources in need of protection, and ecosystems in need of restoration. We are working in partnership with the Oklahoma Conservation Commission (OCC) to improve the quality and accuracy of wetland maps and develop wetland assessment protocols. Traditional wetland mapping techniques rely on identifying wetlands using aerial imagery from a single date. This is problematic for semi-arid regions like central and western Oklahoma where wetlands are temporarily or intermittently inundated; when dry, these wetlands may be largely invisible from aerial imagery. We are supplementing traditional mapping protocols with long-term, multi-season satellite data.

...continued on page 2

By developing protocols to separate water and upland pixels in satellite images collected every 16 days, we can begin to identify areas that are wet frequently enough to be designated a wetland. Currently, we are applying this mapping approach to the Pleistocene Sand Dune Ecoregion adjacent to the Cimarron River in central Oklahoma.

While maps are essential to wetland managers, knowing where wetlands exist is only half the story. Assessment techniques to determine the condition of wetlands are necessary and can be used to help ensure that wetlands lost to development are replaced with wetlands of equal or greater quality. Since wetlands provide a number of services to society including water purification, groundwater recharge, flood attenuation and recreation, the maintenance of highly functioning wetlands is critical. With the OCC, we are currently developing the Oklahoma Rapid Assessment Method (OKRAM) which measures the quality of a wetland by recording stressors such as pollution and land-use change. By using OKRAM at a variety of wetlands across the state, we can begin to estimate the range of wetland quality, identify the primary factors causing degradation and develop actions to improve the wetland resources of Oklahoma.

# Understanding Bat Mortality on Wind Farms

#### **By - Maureen Thompson**



Bats sometimes collide with wind turbines causing mortality.

Since the 1960's, energy consumption has far exceeded energy production in the United States, but the distance between the two has begun to decrease in the last 7 years. In 2014, cumulative output from wind, solar and other renewable power sources was greater than ever before, and wind energy makes up a large component of this renewable energy boom. Although wind generated electricity is generally considered clean, large numbers of birds and bats collide with wind turbines.

Bats are long-lived mammals with low reproductive rates (~1 pup per pair per year). They require high adult survivorship to avoid population declines. Bat populations are therefore unable to recover quickly from broad-scale impacts, and many species are known or suspected to be in decline.

As a result of bat collision mortality rates and the potential for population level impacts, national concern and monitoring efforts at wind facilities have increased

in the past decade. The majority of studies of wind energy impacts on bats have focused on individual wind facilities. No large-scale meta-analyses based on raw bat mortality data have been conducted. Additionally, no meta-analyses of mortality rate correlates have been published.

We are addressing these research gaps as part of a project funded by the U.S. Geological Survey. Our preliminary data, collected from studies conducted at over one hundred wind facilities, illustrates that most bat fatalities occur between late July and mid-September and that the primary species affected are tree-roosting species, mainly the hoary bat, Eastern red bat and silver-haired bat. Furthermore, we have found tremendous variation in the methods used to study bat mortality at wind facilities. This variation likely influences our understanding of the importance of collision mortality to bat populations. Information from our analyses will be useful for planning future wind farm sites, designing mortality monitoring protocols, and improving our understanding of impacts of wind facilities on bat populations.

### **Full Ponds May Pose Problems**

**By - Marley Beem** 



The top photo is a pond during the drought, the bottom photo is the same photo of the pond full in 2015.

Following the heavy spring rains of 2015, pond owners should keep an eye open for several potential problems, and seek advice if they are observed.

First, pond overflows may have eroded your spillway. Look closely at the outside toe of the spillway where such erosion most often begins. If any at all is seen, seek advice from your local Natural Resource Conservation Service office (nrcs.usda.gov - state websites - contact us). A minor repair job now can avoid major repair expenses later.

Second, undesirable fish species may have been introduced to the pond as water flowed overland. Fish the pond with a variety of baits and methods to see if bullheads, common carp or other new species are observed. If new or unknown species are observed, take photos and consult with a fisheries biologist. Oklahoma state fish hatcheries are home to fisheries biologists who can help identify and offer advice on dealing with undesirable fish species (wildlifedepartment.com - fisheries programs - contact us).

Third, nutrients released from exposed pond bottom areas may result in nuisance growth of mats of filamentous algae or algal scums.

Use of an algaecide is not likely to provide lasting control. In most ponds, regrowth of submerged weed beds will provide the best control by their competition with algae for nutrients, light and space. Patience is required – this may take several years. In the short-term, copper-based algaecides can provide only temporary relief. Do not use copper-based products around sheep and goats. Seek advice from your country extension office. Application of an aquatic dye in the spring before algal growth begins can help by reducing light levels in the water column. Dye must be applied 3 times each year or more often if flushed from the pond by overflows.

Most pond owners can still rejoice since the potential problems with a refilled pond pale in comparison to the problems of not having one.

## **Recolonizing Black Bears**

### **By - Emily Artz**

American black bears are relative newcomers to modern Oklahoma, after being extirpated from most of their distribution in the Southeast by European colonization in the 1800s. After a tremendously successful reintroduction to Arkansas in the 1960s, these large omnivores have started to extend their distribution westward, moving into eastern Oklahoma. They re-established first in the Ouachita region, where their population demography and behavior is currently being studied by NREM graduate students Morgan Pfander and Dani Techentin. In the last ten to fifteen years, they have begun to recolonize the Oklahoma Ozark region.

Natural recolonizations are rare events, so studying this population as they re-adapt to such a heavily altered environment provides some interesting opportunities, as well as some interesting challenges. Research Specialist Sara Lyda, with the Oklahoma Fish and Wildlife Research Unit,



Black bear caught in a hair snare.

began live-trapping, marking, and satellite-collaring Ozark bears in 2011, and currently has 40 tagged bears still active. From this we are learning about the movements, home ranges, and survival and reproduction in the population. However, because of its low density, estimating the size of the population with traditional capture and recapture methods can be a problem.

To supplement the amount of data we can gather in this population, we are combining live trapping with genetic mark recapture. In 2014 and 2015, master's student Emily Artz is setting barbed wire hair snares throughout the region to collect samples of bear hair, from which DNA can be extracted and used to identify individual bears. As of June 2015, Artz has over 200 hair samples that can be used to calculate an accurate mark-recapture population estimate.

This recent recolonization also gives us a unique opportunity to study how the recolonizing bears are interacting with humans and resources in a human-dominated region. The main source of human-bear conflict in the area has been bears breaking into deer feeders for the corn. We collaborated with the Tulsa Zoo to design an experimental feeding preference study, which is being piloted in the field this summer. By giving the bears access to feeders containing both human derived foods and natural foods, we can get an idea of which food source they really prefer, rather than which food source they are simply using because it is easily available. We are adapting several new techniques, as befits this new population, in order to make the best possible management recommendations as the Oklahoma Ozark population continues to grow and expand.

These projects are funded by the Oklahoma Department of Wildlife Conservation, administered through the Oklahoma Cooperative Fish and Wildlife Research Unit, and the Oklahoma Agricultural Experiment Station, administered through the Department of Natural Resource Ecology and Management.

# **AWARDS & RECOGNITIONS**

Salim Hiziroglu was elected as Fellow of the International Academy of Wood Science (IAWS) in February, 2015.

Tom Kuzmic received the Faculty Excellence Award in the OSU Interdisciplinary School of International Studies for 2014 and 2015.

Ed Miller will be awarded the Oklahoma Heritage Forester's Award in 2015 for his contributions to the development of Oklahoma's forests and natural resources.

## **NREM News**

- Ed Miller retired from OSU in June. His many contributions to NREM will be recognized for years to come. We wish Ed all the best in the next phase of his life.
- Keith Owens has been appointed as Associate Vice President of the Oklahoma Agricultural Experiemnt Station. Keith contributed greatly to NREM as Department Head over the past 7 years. And will no doubt be a tremendous asset to the Oklahoma Agricultural Experiment Station in his new role.
- Dave Engle started as Interim Department Head on June 15, 2015. The active search for a new department head to replace Keith Owens will soon be underway. NREM appreciates Dave being willing to serve in this capacity while a search is underway.
- The ongoing search for a landscape hydrology and sustainability posistion in research and teaching is underway.

### **Events**

- American Fisheries Society, Portland OR -August 16-20, 2015
- Ecological Society of America Centennial, Baltimore, MD - August 9-14, 2015, Baltimore Convention Center
- Patch Burn Grazing Meeting, Pratt, KS -August 26-28, 2015
- The Wildlife Society 22nd Annual Conference, Winnipeg, Manitoba, Canada - October 17-21, 2015
- Osage County Rangeland Management Field Day, Osage County - October 19, 2015, Contact Dwayne Elmore for more info, dwayne.elmore@okstate.edu
- Society of American Foresters National Convention, Baton Rouge, LA -November 3-7, 2015
- Oklahoma Natural Resource Conference, OKC -February 24-26, 2016, OKC Convention Center

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