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## National Land and Range Contest

By Janet Reeder

Close to a thousand youth, with special training and knowledge of soil, plants and ecology converged on Oklahoma City recently for the National Land and Range Judging Contest. Students from 35 states represented by 170 teams took part in the 57th year for the popular FFA and 4-H judging event.

Terry Bidwell, has been involved in the contest since 1986. Bidwell, a professor in the Department of Natural Resource Ecology and Management at Oklahoma State University, stays actively involved in the contest and keeps the materials updated. He also rewrote the contest in 1990 to make it more current.

"This year's range contest was by far the most difficult for plant identification," Bidwell said. Bidwell is always impressed by the knowledge of the participants in the contest.

"These are some of the best kids in the country—best of the best—who have won respective state range contests," he said.

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## Remediation of Decommissioned Swine Lagoons

By Dr. Tom Hennessey and Dr. Rod Will

NREM faculty are collaborating to test the effectiveness of using cottonwood and sycamore to remove excess phosphorous from decommissioned swine lagoons.

The process involves mixing sludge materials with soil and employing a short-rotation woody crop system to establish fast growing stands of locally adapted trees. Trees were planted this spring and should exceed 15' tall in three years.

The trees will mine excess phosphorous from the soil-sludge mixture and sequester it in biomass and leaf litter that will be removed from the site.

This approach is considerably less costly than physical removal and disposal of sludge, avoids odors, and produces potentially valuable wood and fiber.

There are an estimated 400+ swine farms in Oklahoma that use lagoons to store and treat liquid manure. If successful, techniques using vegetation to remediate decommissioned lagoons may offer a cost effective and environmentally friendly alternative to farmers throughout the state.

*Dr. Hennessey and Dr. Will are both faculty in NREM at Oklahoma State University.*



*NREM graduate student Adam West uses an auger to create a planting hole at a swine lagoon.*

*Contest Continued from Page 1*

Bidwell said students examine the land and evaluate the soil and plant communities for cattle and wildlife management. The event teaches and reinforces best practice methods and approaches to land management.

Winners were recognized at a banquet in the Great Hall of the National Cowboy and Western Heritage Museum in Oklahoma City that evening, where they also heard a keynote address by Oklahoma Lt. Gov. Jari Askins.

National championship trophies were awarded to FFA and 4-H team and individual winners in land judging, range judging and homesite evaluation.

In FFA Range Judging, the Gans, Okla., chapter won the team competition. Daniel Merrill, also of Gans, took the first place individual FFA award.

The Butte, Newell, S.D., chapter won the 4-H team category, and Sammi Shaykett of Butte, also placed first in the individual category.

The first land-judging contest, created by three Oklahoma conservationists, was begun in 1942. Oklahoma City has hosted the national contest, long sponsored by the Oklahoma Association of Conservation Districts, for teams who qualify by placing among the top five teams in state events, since 1952.

This year's event was honored with a proclamation from Oklahoma's Gov. Brad Henry declaring May 7, 2008, as National Land and Range Day in Oklahoma. Contest co-sponsors included: Greater Oklahoma City

Chamber of Commerce, Oklahoma Farm Credit, OSU Oklahoma Cooperative Extension Service, USDA NRCS, the Oklahoma Conservation Commission, Oklahoma Department of Career and Technology Education, Oklahoma Farmers Union, and Oklahoma Farm Bureau.

More information about the annual event can be found on the Oklahoma Conservation Commission Web site at <http://www.ok.gov/okcc/>.

*Janet Reeder is a Communications Specialist at Oklahoma State University.*



*Contest participants face rainy weather, Photo by Janet Reeder*

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## Natural Resource News

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## Research Notes

# Reptile Ecotoxicology

By Dr. Larry Talent

Ecotoxicology is the study of the toxic effects of natural or synthetic chemicals that pollute the environment and harm species, populations, and ecosystems. Although the harmful effects of pollution have been well documented on fish, amphibians, birds, and mammals, there is a lack of information on the effects of pollution on reptiles. This is unfortunate because many reptile species appear to be declining throughout the world and pollutants have been identified as one of the major contributing factors.

Our research is focused on evaluating the effects of man-made environmental pollutants on native North American lizards. Lizards are exposed to environmental contaminants by several routes including ingesting contaminated material, contact with their skin, and uptake of contaminants from the soil by incubating eggs.

Our research is primarily concentrated in two areas; 1) evaluating the effects on lizards ingesting contaminated material relative to growth, reproduction, and physiology, and 2) evaluating the effects of exposure of embryos to contaminants during incubation on subsequent growth, reproduction, and physiology.

We are presently collaborating with U.S. Army researchers and are evaluating the effects of soil contaminants on growth, survival, and physiology of western fence lizards.

Reptiles are commonly found on many U.S. Army installations in areas where the soil is contaminated with heavy metals, explosives, rocket fuels, and other toxic materials. Reptiles can be exposed to soil contaminants by ingesting contaminated food or soil.

Another area of research is evaluating the effects of endocrine disrupting chemicals on developing western fence lizard embryos. Endocrine disruptors are chemicals that mimic hormones and can disrupt the normal development of animals. Most lizards bury their soft-shelled eggs a few inches deep in moist soil where they incubate, absorb moisture, and double in size before they hatch.

Many water soluble contaminants that are present in the soil can enter the incubating egg and affect the developing embryo.

Our current research is concentrated on pollutants that mimic the female hormone estrogen. Exposure to estrogenic chemicals during development feminizes male lizards and we will be conducting research to determine the long-term effects on development, reproduction, and behavior.

*Dr. Talent is an Associate Professor of Wildlife at Oklahoma State University.*



*Western Fence Lizards, Photo by Sean Ball*

## Developing Virginia Pines for Oklahoma Christmas Trees

*By Dr. Chuck Tauer and Justin Jones*

What species can Oklahoma Christmas tree growers grow and sell as a Christmas tree in Oklahoma? A reasonable answer is use native adapted species. Unfortunately this includes very few species, all of which are far from ideal for Christmas tree production. In fact, of Oklahoma's native conifers, only eastern redcedar has seen some use as a Christmas tree, and it is much in disfavor.

The next best choice of a species for Oklahoma is to use a non-native species with some potential. This species is then developed through selection and breeding for use as a Christmas tree. This is the approach that we have taken with Virginia pine, a species known to have potential

as a Christmas tree across the south. Our objective was to develop a population of Virginia pine adapted to local growing conditions.

Such a population was developed through a series of selection. The first step was to collect Virginia pine seed from across its native range. Virginia pine is native to much of the south. In 1983 we collected seed from 123 trees representing 38 different natural stands of Virginia pine. The seeds were grown in an OSU nursery in 1984 and field planted in 1985. Two large test plantings were established for growth data and future materials, and three smaller plantings were established with cooperating Christmas tree growers to evaluate the collections in operational use.

Trees in all plantings were measured at age one through five, and again at age seven. These data, as well as the input from the growers, were used to identify the best individual trees from the best families in the original collection.

In 1990 the Oklahoma Department of Agriculture, Food and Forestry (ODAFF), Forestry Services Division, began grafting the selected trees into a seed orchard to produce seed to grow improved seedlings for sale to Christmas tree growers. The seed orchard was also used to make crosses among the best select trees for a second generation of improved pine.

Justin Jones (ODAFF) and the Western Gulf Forest Tree Improvement Program (WGFTIP) are continuing this improvement at the Forest Tree Improvement Center in Idabel, OK. Ranking crosses of current second generation trees based on growth will allow a third generation breeding orchard to be established. A four acre seed orchard produces seedlings for Christmas tree sales.

Virginia pine is now the most commonly grown Christmas tree in Oklahoma, and because of this work, a greater percentage of the trees grown become sellable sooner.

*Dr. Tauer is a Professor of Forestry at Oklahoma State University. Justin Jones is with the Forestry Services Division, ODAF.*



*Virginia pine Christmas trees ready for sale.*

## Black Bear Research in Oklahoma

By Dr. Chip Leslie

In 2000, the Oklahoma Cooperative Fish and Wildlife Research Unit partnered with the Oklahoma Department of Wildlife Conservation to evaluate the expanding black bear population in southeastern Oklahoma, primarily in the forested Ouachita Mountains.

Faculty from NREM, the Coop Unit, Zoology, and three M.S. recipients (Angie Brown, Lynne Gardner-Santana, and Sarah Bales) used various field approaches including radio telemetry and genetic assessments to understand habitat use, population characteristics, distribution, and rates of westward expansion.

Results showed that female black bears used areas of 14-20 square kilometers, and males moved

over larger areas. Pine-hardwood and oak-hardwood poletimber stands were the most preferred habitats.

An unusual preference for pine stands by black bears in our area may be tied to local forest management practices that include thinning and burning.

Using DNA in hair samples obtained noninvasively from black bear in summers 2004–2006, we genetically identified 161 individual bears. With mark-recapture population modeling, we estimated that about 450 bears occurred in southeastern Oklahoma.

The population had a relatively high proportion of young individuals with more males than females, which is expected in an

expanding population. Such a population could permit a limited sport harvest of bears in the state.

The density of black bears in Oklahoma is believed to be relatively low because they have not saturated available habitat in the western part of the Ouachita Mountains. Levels of genetic diversity are high and comparable to other black bear populations in North America. Our results suggest a very healthy bear population that no doubt will grow and expand into available habitat.

*Dr. Chip Leslie is a Professor of Wildlife Ecology at Oklahoma State University.*



*Graduate student Angela Brown gives a tranquilized bear water.*

## Outreach

### Fire, Wildlife, Timber, and Cattle Grazing Field Tour at Pushmataha WMA

Tuesday, October 7, 2008, 1:00 p.m. – 4:00 p.m.

Sponsored by Oklahoma Cooperative Extension Service, OSU Department of Natural Resource Ecology and Management, and the Oklahoma Department of Wildlife Conservation

#### PRESENTATIONS BY

Mr. Jack Waymire, Sr. Biologist and Pushmataha WMA Manager  
Dr. Ron Masters, Director of Research, Tall Timbers Station, Florida  
Dr. Terry Bidwell, Extension Rangeland Specialist, OSU

#### TOPICS TO INCLUDE

- History of Pushmataha Wildlife Management Area
- Utilizing Prescribed Fire, Timber Harvest, and Cattle Grazing to Meet Your Land Management Objectives
- Integrated Timber, Livestock, and Wildlife Management
- Stocking Rate and Carrying Capacity for Cattle

#### Pushmataha Wildlife Management Area

Go 2 miles south of Clayton on Hwy, 271, and then turn west on county road. Go approximately 3.1 miles to the Management Area Headquarters

**Contact:** Terry Bidwell 405.744.9618  
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### 2008 NREM Graduates

DOMINIC A. BARRETT, MS  
LISA D. BOAK, BS  
ANGELA G. BROWN, MS  
AMBER J. FRITCHIE, BS  
SHAYLA N. HIGHFILL, BS  
JOSHUA B. SMITH, BS  
AMANDA M. STRICKLIN, BS  
CHRISTOPHER D. BANUELOS, BS  
LAURA C. DUNN, BS  
PETER J. EINSIG, BS  
COLTER D. FLUMAN, BS  
CAROLYN R. GEURIN, BS  
NATHAN T. GOODACRE, BS  
BRYAN R. HAAGENSTAD, BS  
ZACKERY P. HENSON, BS  
CASEY L. LARGENT, BS  
JEREMY I. LOVEKAMP, BS

STEPHANIE G. MARSHECK, BS  
JAMES C MILLER, BS  
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KEVIN K. PARSONS, BS  
JORDAN M. RATLIFF, BS  
DAVID A. REMPE, BS  
JOSHUA T. RHINE, BS  
HALEY S. SMITH, BS  
TYLER L. STEFANSEN, BS  
MEGAN I. SWEETWOOD, BS  
CURTIS R. TACKETT, BS  
ANDREW J. TURNER, BS  
COLIN M. WALDEN, BS  
JOSEPH A. WALKER, BS  
RACHEL S. WINTERS, BS  
TROY A. ZAIKIS, BS

## Giving to NREM

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Natural Resource Ecology & Management  
008 C Ag Hall,  
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