July 2012

Conservation Matters

THE TEXAS LAND, WATER AND WILDLIFE CONNECTION

A publication of the Texas Water Resources Institute and the Texas A&M Institute of Renewable Natural Resources

*Note: As of **Aug. 1, Dr. Roel Lopez** will assume director duties of the Texas Water Resources Institute and the Texas A&M Institute of Renewable Natural Resources. **Dr. Neal Wilkins** has been appointed president and chief executive officer of the East Wildlife Foundation.*

TWRI grant recipient studies perception of water reuse in Texas

Last year's exceptional drought placed Texas' water supply under great strain, and the state's growing population—which might reach 46 million by 2060—is predicted to further deplete existing supplies. To meet this ever-growing demand, water suppliers across the state are considering and implementing different water management strategies, including water reuse.

Texas State University-San Marcos graduate student **Shae Luther** is studying how communities and people view water reuse strategies, with her advisor, **Dr. Richard W. Dixon**, associate professor of geography. Water reuse strategies include using treated wastewater to irrigate crop fields, lawns or parks; flush toilets and contribute to drinking water supplies.

Luther, a resident of Austin, Texas, and recipient of a 2011–2012 Texas Water Resources Institute (TWRI) $5,000 research grant, investigated reuse projects currently in place in Midland, Potter, Lubbock and Collin counties in Texas. "These counties were chosen because they reported using more than 10 million gallons per day of recycled wastewater," Luther said.

Luther's research began by interviewing water managers about their water reuse projects and whether they incorporated the public's input in the project planning process. She then surveyed the counties' residents about their perceptions of water reuse. Ninety-seven percent of the residents surveyed viewed water reuse as a "valid conservation strategy for preserving fresh, potable water resources," as long as it is used for irrigation or other indirect uses.

Luther also found that water managers saw reused water as a viable option for quenching the growing population's thirst. However, she found the public thought otherwise: only 8 percent of the people Luther surveyed were willing to consider drinking reused water.

"Most people seemed rather willing to accept water reuse practices such as irrigation," Luther said, "but usually only those with minimal or no human contact."

She said she hopes water managers will use her data to create stronger education programs that address the public's perception of water reuse and conservation. "Water reuse is a viable strategy for maintaining sustainable water supplies," Luther said, "but without community backing, future projects may face insurmountable opposition."

Her research was funded by TWRI with funds obtained through the U.S. Geological Survey (USGS) as part of the National Institutes for Water Research annual research program. TWRI is the designated institute for water resources research in Texas.

For more information on Luther's research, visit USGS Research Grants.

Study updates population of endangered golden-cheeked warblers

The projected number of golden-cheeked warbler males across their breeding range in Central Texas is more than previous estimates had indicated, according to results from a Texas AgriLife Research study recently published online in the Journal of Wildlife Management.

The study—the first to survey for the presence of the warblers and their habitat across their entire breeding range—estimated that approximately 262,000 male warblers occur within 4 million acres of potential habitat in parts of nearly 40 counties in Central Texas, said **Dr. Heather Mathewson**, assistant research scientist at the Texas A&M Institute of Renewable Natural Resources (IRNR) and lead author of the paper.

Mathewson said the golden-cheeked warbler was designated as federally endangered in 1990 because of concerns about a small population size and loss and fragmentation of its woodland habitat. Since then, abundance estimates for the species have mainly relied on localized population studies on public lands and qualitative-based methods.

"Those estimates — some now over 20 years old — were often based on a limited amount of data from only a handful of study areas in the breeding range," she said. "Depending on the data and analyses, estimates varied from roughly 9,000 to 54,000 individuals."

The paper originated from an AgriLife Research study initiated in 2008 because the only information about the distribution and population of golden-cheeked warblers in Central Texas was limited and outdated, said **Dr. Michael Morrison**, professor and Caesar Kleberg Chair in Wildlife Ecology in Texas A&M's Department of Wildlife and Fisheries Sciences and lead researcher for the 2008 study.

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He said the AgriLife Research team used the range-wide field surveys along with satellite imagery depicting potential warbler habitat to develop and validate statistical models.

"The study was the first time a spatially explicit predictive model for golden-cheeked warblers was used to predict the population across the breeding range," he said.

A spatially explicit model provides estimates based on features of the birds' habitat across the range of the species.

"This work is useful to landowners, conservationists and developers because it provides a framework for more reliably predicting abundance and changes in abundance given various changes to the landscape range-wide, such as vegetation removal," Mathewson said. "It also gives them the ability to evaluate the consequences of losing warbler habitat locally in terms of changing the probability of warblers being present, which is important because of the costs of mitigating for loss of an endangered species' habitat."

The research team released a report in 2010 detailing the sampling methods, statistical analyses and results of its study. Morrison said the U.S. Fish and Wildlife Service requested a peer review of the report and associated manuscripts because the importance of the study put it in the category of "Highly Influential Scientific Information." The peer review was facilitated by The Wildlife Society, the scientific society for professional wildlife biologists and managers.

"The service wanted to determine whether this study represented the best available science and whether our methods and data had been used and interpreted in a reasonable way," Morrison said. "The reviewers concluded that the overall study design, analyses and inferences are supported by sound scientific data and analysis."

Mathewson said the report and related publications do not advocate changes in the listing status of the golden-cheeked warbler nor do they imply that conservation measures to protect the species habitat are no longer needed.

"Rather, this study is one of many necessary steps in our evolving knowledge of the golden-cheeked warbler and is not intended as the final word on the matter," she said.

The peer-reviewed research paper was co-authored by IRNR researchers, including **Julie Groce**, senior research associate; **Tiffany McFarland**, research associate; **Todd Snelgrove**, program specialist; **Dr. Bret Collier**, research scientist; and **Dr. Neal Wilkins**, director. Morrison and **Dr. Cal Newnam**, wildlife biologist for the Texas Department of Transportation, were also authors.

In addition to the paper in the Journal of Wildlife Management, the team has published two additional papers from this study in the peer-review journals, Diversity and Distributionsand the Wildlife Society Bulletin. A summary of the study and the three papers is available online, and the full study report is at irnr.tamu.edu/publications.

Giant salvinia coming back with a vengeance on Caddo Lake

Researchers have found that giant salvinia weevils reared and released by the Caddo Lake Giant Salvinia Eradication Project survived the winter on the lake. However, the weevils and the researchers both have an uphill battle to fight: giant salvinia is quickly blanketing the lake again this summer.

"As expected, giant salvinia present on the lake this winter was simply waiting for warmer weather to really get going," **Lucas Gregory**, Texas Water Resources Institute project manager for the project, said on the project's blog. The project is a part of the Center for Invasive Species Eradication (CISE).

Large mats—10 to 20 acres—of giant salvinia, an invasive aquatic plant, started to form in the Clinton Lake area by early April, Gregory said, and CISE efforts were then set into motion to fight the giant salvinia using chemical applications as well as biological methods with the weevils.

Read the full blog post for more information about the project, and visit the project's Facebook page.

TWDB offering webinar on agricultural water grants

The Texas Water Development Board (TWDB) is hosting an Agricultural Water Conservation Grant Funding Webinar on **Aug. 21**, from 9:30–10:30 a.m. The Agricultural Water Conservation Program funds are normally made available on a competitive basis each year, according to TWDB, and this webinar will explain the application process and provide examples of typical funding categories as well as previously funded projects.

TWDB encourages staff from groundwater conservation districts, irrigation districts, river authorities, state agencies and state university systems to attend.

Linda Ruiz-McCall, TWDB education specialist, will host the webinar, and **Cameron Turner**, TWDB team lead for Agricultural Water Conservation Programs, will be the presenter. Turner will discuss the application process, explain how proposals are evaluated and offer a brief overview of the process of a typical grant project from initiation, negotiation, execution, through progress reporting and project completion.

Registration for the free webinar is required and available online.

Only a few "smart" irrigation controllers able to deal with 2011 drought

Only a few "smart" irrigation controllers performed well during the 2011 drought, according to Texas AgriLife Extension Service experts.

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"The controllers are still inconsistent," said **Dr. Guy Fipps**, AgriLife Extension irrigation engineer, College Station.

Fipps and **Charles Swanson**, an AgriLife Extension landscape irrigation specialist, tested nine commercial smart controllers during a 152-day period at College Station sites, from April through November during the 2011 drought.

The tests were the fifth year of evaluations of the controllers, which either download landscape water requirements from off-site service providers or use on-site sensors to calculate it themselves, Swanson explained. The data is then used to determine site-specific watering requirements and to operate the irrigation system automatically.

Ordinary "dumb" controllers rely on user-set timers to operate the irrigation system. When they are not set properly or run-times are not changed based on seasonal water needs, they are "notorious" for over-applying and thereby wasting water, Fipps said. Smart controllers often do better than dumb controllers, but from the tests, not all smart controllers performed the same.

During the 2011 drought, the College Station test site had less than 5.5 inches of rainfall in 2011 compared to 18 inches in 2010 and 14 inches in 2009. The 2011 drought was accompanied by unusually high temperatures and wind, so it was a good test of the controllers' performance during a drought, he said.

"No single controller was consistently able to provide the correct amount of water for all six zones tested during all seasons," Fipps said. "During the drought, evapotranspiration was 30 to 50 percent higher than average years. Some controllers did not adjust to the extreme conditions and applied inadequate amounts."

Read the full AgriLife TODAY article for more information.

Also, see "The art of smart irrigation" from the summer 2011 issue of txH$_2$O for more on this research.

Upper Llano River Watershed residents invited to two August events

Participants interested in improving and protecting the Llano River Watershed are invited to two no-cost events in August.

On **Aug. 14** in Junction, the Upper Llano River Watershed Protection Plan meeting will discuss strategies to conserve and protect the water quality in the North and South Llano rivers, according to **Dr. Kevin Wagner**, associate director of the Texas Water Resources Institute (TWRI).

The meeting is set for 6:30 p.m. at the Texas Tech University at Junction Llano River Field Station, 254 Red Raider Lane. Sign-in and refreshments start at 6 p.m.

"Surface water in the Llano River is a critical source of water in the area," said **Dr. Tom Arsuffi**, director of the Llano River Field Station. The Upper Llano River Watershed Protection Plan aims to address potential threats before they become a problem, thus making sure the watershed remains healthy, he said.

"We're encouraging citizens of the region to attend this meeting as their input is essential to the process of developing, implementing and achieving the ultimate success of the watershed protection plan," he said.

To help residents better understand watershed systems, water pollution and ways to improve water quality, a Texas Watershed Steward (TWS) is set for 8 a.m.–4 p.m. **Aug. 30** at the field station.

"Participating in the Texas Watershed Steward program is a great opportunity to get involved and make a difference in your watershed," said **Galen Roberts**, Texas AgriLife Extension Service program specialist and TWS Program coordinator. "Along with the free training, participants receive a free copy of the Texas Watershed Steward Handbook and a certificate of completion."

The program will offer seven continuing education units in soil and water management for certified crop advisers, seven units for professional engineers and certified planners, and seven continuing education credits for certified teachers. It also offers three general continuing education units for Texas Department of Agriculture pesticide license holders, seven for certified landscape architects and three for certified floodplain managers.

Preregistration is open through the Texas Watershed Steward website.

The Llano River Field Station, TWRI and the Texas State Soil and Water Conservation Board (TSSWCB) are sponsoring the watershed protection plan meeting and, along with the South Llano Watershed Alliance, Texas Tech's Water Resources Center and others are developing the comprehensive plan. This effort is also being coordinated with Texas Parks and Wildlife Department's Guadalupe Bass Restoration Initiative.

The steward workshop is sponsored by AgriLife Extension and TSSWCB in coordination with the alliance.

Funding for the Llano River Watershed Protection Plan and the Texas Watershed Steward program are through a Clean Water Act nonpoint source grant provided by the Texas State Soil and Water Conservation Board and the U.S. Environmental Protection Agency.

For more information on the TWS program, contact Roberts at 979.862.8070, groberts@ag.tamu.edu. More information on the project and the South Llano Watershed Alliance can be found at southllano.org. Read the full AgriLife TODAY stories on the watershed protection plan meeting and the TWS program.

Save the date: Water and Energy in Texas conference Oct. 3–4

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The Texas A&M Energy Institute, part of the Dwight Look College of Engineering at Texas A&M University, is hosting the Water and Energy in Texas conference **Oct. 3–4** in College Station. The program's theme will be "Solutions from Texas A&M," and speakers include professors and researchers from the Texas AgriLife Extension Service, Texas AgriLife Research, and the College of Engineering.

For more information and for the conference agenda, visit energyengineering.org.

Call for abstracts for National Conference on Livestock and Poultry Environmental Quality

The Livestock and Poultry Environmental Learning Center is hosting the National Conference on Livestock and Poultry Environmental **April 1–5, 2013** in Denver. Following the conference theme of "From Waste to Worth: 'Spreading' Science and Solutions," the program will include research, education and extension efforts related to managing environmental impacts of livestock and poultry production, according to organizers. The conference will include workshops, tours, posters, commercial exhibits and oral presentations.

The call for oral, poster, panel and workshop proposals is open through **Sept. 14, 2012**, and submissions should address the general themes of air, water and soil quality; water resource impacts; watershed management; research and outreach methods; or climate change.

Organizers encourage researchers, agricultural and environmental organizations, consultants, cooperative extension agents and specialists, equipment manufacturing and sales reps, agricultural producers, regulatory and policy staff to attend. Continuing education credits are expected to be available for certified crop advisors, professional animal scientists, professional engineers, technical service providers and others.

More information and registration is available at www.extension.org/63747/ or by contacting **Liz Whitefield** at e.whitefield@wsu.edu.

What's really killing Texas trees?

Although drought is often the cause, trees can die for other reasons besides lack of soil moisture, said **Dr. Eric Taylor**, a Texas AgriLife Extension Service forestry specialist in Overton.

"Drought is the primary contributor to tree kill, but it may not be exactly the way you might be thinking," Taylor said. "You may find this hard to believe, but relatively few trees likely died directly from dehydration in 2011. Instead, the 2011 drought severely weakened mature trees, making them susceptible to opportunistic pathogens like hypoxylon canker and insects like pine bark engraver beetles."

He said that in most instances, the trees that died in 2011 were already stressed from a number of pre-existing environmental factors such as overcrowding, growing on the wrong site, age, soil compaction, trenching or inappropriate use of herbicides. If not for these factors, a large proportion of the trees that died might have recovered from the drought.

"This is an important concept to remember because our best defense against drought is to promote a tree's health and vigor through proper care and management," Taylor said.

This is not to play down the importance of water to tree health, he said. Water, particularly soil moisture, is critical for all a tree's physiological processes. Trees require water to make and transport food, take in and release carbon dioxide, conduct biochemical reactions, build tissue and more.

"You name it, the tree needs water to do it," Taylor said.

Though moisture stress may be the trigger many trees likely died from insect damage, invasion of fungi and other diseases, and even heat stroke, according to Taylor.

"Much of the recent tree deaths and general decline might also be attributed to the extreme and prolonged heat of 2011," he said. "Extreme temperatures, not only during the day but also in the early evenings and night, have negative impacts to tree physiological processes."

Read the full AgriLife TODAY article for more information.

Playa Symposium to be held Nov. 13–16 at Texas Tech

Interested researchers are invited to the 2012 Playa Symposium **Nov. 13–16** at the Texas Tech University Merket Alumni Center. The event will provide an opportunity for people across a range of disciplines to exchange current thinking and share results of playa research and related issues.

According to organizers, the symposium will cover playa geomorphology, hydrology, animal and plant ecology and land management. Presentations will be published in symposium proceedings, and selected presentations will appear in a special issue of the Texas Water Journal. For more information and registration, e-mail 2012PlayaSymposium@gmail.com with "Interested" in the subject line.

New Publications/Papers and Training Courses

New Extension publications

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Nature Tourism: Economics of Wildlife Recreation in Texas, **Miles Phillips**, Texas AgriLife Extension Service, E-323, 2012

Nature Tourism: Marketing Strategies, **Miles Phillips**, Texas AgriLife Extension Service, E-324, 2012

Nature Tourism: Marketing Strategies: Hay Purchases: Grasses Not Adapted to Texas, Vanessa Corriher, Texas AgriLife Extension Service, 3-614

Natural Resources Training Courses

Advanced River/Reservoir Modeling with WRAP Workshop	Aug. 23–24
Advanced River/Reservoir Modeling with WRAP Workshop	Aug. 30–31
SWAT for Beginners	Sept. 10–11
Advanced Data Processing for ArcSWAT	Sept. 12

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