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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

Mussel identification and sampling workshop Aug. 20–23 in Junction

Freshwater mussels in Texas face a variety of environmental issues and are increasingly at-risk, according to Texas A&M Institute of Renewable Natural Resources (IRNR) experts. To help equip researchers, students and professionals involved with mussel work in the state, IRNR will host the Texas Freshwater Mussel Identification and Sampling Workshop **Aug. 20–23** at the Llano River Field Station in Junction.

Freshwater mussels are one of the most imperiled groups of animals in the world, said **Dr. Charles Randklev**, IRNR research scientist.

“More than 50 mussel species have been documented here in Texas, and 15 species are listed as state-threatened, due to habitat loss,” Randklev said. “Five of those were recently added to the U.S. Fish and Wildlife Service candidate species list, and six others are currently being reviewed for possible listing under the Endangered Species Act.”

Due to these listings, mussels are now being incorporated into biological assessment surveys and research programs throughout the state, increasing the need for trainings such as this program, he said.

The workshop will cover methods for identifying and sampling mussel species in Texas, as well as mussel ecology, conservation status and management, said **Julie Groce**, IRNR senior research associate.

Sponsored by IRNR and the Texas Comptroller’s Interagency Taskforce on Economic Growth and Endangered Species, the workshop will feature presentations by state mussel experts, hand-on activities and viewing of museum specimens. Participants will have the opportunity to use skills learned at the workshop during a field excursion to the San Saba and Concho Rivers, Groce said.

Attendees can check-in at 5 p.m. on **Aug. 19**. The first three days of the program will begin at 8 a.m. and wrap up around 5:30 p.m. The final day will begin at 9 a.m. and conclude at 12:30 p.m. A registration fee of $400 includes workshop materials, transportation to and from field sites, refreshments, meals, and lodging at the Field Research Station. Registration deadline is **Aug. 9**.

For more details on the workshop, see the course flyer and registration form. For questions about the workshop, contact Randklev at crandklev@ag.tamu.edu or 817.966.3235. For questions about the Llano River Field Station facilities, contact **Dr. Tom Arsuffi**, Llano River Field Station director, at tom.arsuffi@ttu.edu or 325.446.2301 (x235).

Invasive aquatic species: a concern even abroad

Giant salvinia, water hyacinth and other invasive aquatic plants are a problem not only in some of Texas’ wat[illegible] as Caddo Lake, but worldwide as well.

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Elizabeth Edgerton, a master's student in the Department of Wildlife and Fisheries Sciences at Texas A&M University, said the native wetlands and freshwater ecosystems in Australia and New Zealand are also suffering from the growth of these invasive species.

Edgerton saw the damage first-hand during her recent 5-week study abroad trip to Queensland and Sydney, Australia, and the north island of New Zealand. She is currently working on developing a risk assessment model for identifying potential invasive aquatic weeds in Texas for her master's degree. Edgerton is also a research assistant for the Texas A&M Institute of Renewable Natural Resources and Texas Water Resources Institute (TWRI).

While attending the International Conference on Aquatic Invasive Species this April in Niagara Falls, Edgerton had the opportunity to meet New Zealand researcher **Paul Champion**, who developed the New Zealand Risk Assessment Model for invasive aquatic weeds and currently works for the National Institute of Water and Atmospheric Research in New Zealand.

After learning that Edgerton was already going to be nearby in Australia and that her topic of research followed his risk assessment model, Champion invited her to extend her study abroad trip and come to New Zealand, she said.

"I wanted to go and see the kind of work that has been done — see it firsthand," Edgerton said.

While there, Edgerton said she also had the opportunity to meet **John Clayton**, who co-authored New Zealand's Risk Assessment Model, tour the institute's quarantine facilities and visit the lakes used for invasive species research.

She was also able to see directly how invasive giant salvina has become in Queensland's freshwater wetlands and learn from an aboriginal group, the Nywaigi people, about their control methods.

Currently, the Nywaigi people are trying to control giant salvinia by applying a herbicide treatment. Since 90 percent of the wetland is already being choked by a variety of invasive aquatic plants including giant salvinia, water hyacinth and hymenachne, Edgerton said they are now planning to remove a berm that was built years ago to stop the seawater from flowing into the wetland.

"The hope of trying this method is to see if the saltwater will kill the freshwater invasive plants and restore the wetland," she said. "I was also able to talk with them about some of the successes and not so successful attempts they have had in controlling the species."

To watch in real-time the progress they are making in removing these invasive species in the wetland on the Nywaigi property, called Mungalla Station, see www.mungallaaboriginaltours.com.

The risk assessment model Edgerton is working on is beneficial for research on current invasive species, along with up-and-coming invasives, she said.

Her model uses a question and answer format, she said. Each question is weighted, and at the end, the points from each question are totaled. The higher the point value, the more likely it is to be an invasive species.

"By developing the risk assessment model, we will be able to predict potential future invasive species as well as prioritize current invasives for control," Edgerton said.

Giant salvinia (*salvinia molesta*) is a small free-floating plant that grows in clusters and develops into dense, floating mats, and is one of the most challenging aquatic plants in Texas. It can spread rapidly due to its invasive nature and fast growth, even doubling in size in as few as 4 days under ideal conditions, Edgerton said.

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To learn more about TWRI's giant salvinia research, see the website, project blog and Facebook page.

Stakeholders eager to learn from new riparian education program

With notebooks, water and cameras in hand, about 65 landowners and stakeholders explored a riparian floodplain near Plum Creek on a warm June day, all in the name of learning how to better manage land for riparian and stream ecosystem health.

"I walked in knowing little, and now I understand wetlands, upland plants and how to look at my land differently," said Caldwell County landowner Elizabeth Wymer.

The first Texas Riparian and Stream Ecosystem Education Program workshop was held in the Plum Creek watershed June 25 in Lockhart, said **Nikki Dictson**, Texas A&M AgriLife Extension Service program specialist for Texas Water Resources Institute (TWRI) and riparian program coordinator.

Texas has more than 200,000 miles of riparian areas — the green vegetation zones along streams, rivers and lakes — that provide economic, social, cultural and environmental value to the state.

"Stream and riparian ecosystems are critical to many water issues facing Texas," Dictson said. "Through this educational program, landowners and other citizens can better understand and improve their management of riparian and stream ecosystems, reducing nonpoint source pollution and providing tremendous ecosystem benefits and direct economic benefits to communities."

This workshop included indoor classroom presentations by representatives from TWRI, Texas Parks and Wildlife Department, Texas A&M Forest Service and Guadalupe-Blanco River Land Trust. The educators covered the basics of what elements make up a riparian area, watershed and riparian management practices, stream processes, riparian vegetation and hindrances to healthy riparian systems.

"Attendees received an overview of basic stream processes and practices that will protect and improve the management of riparian and stream ecosystems and the many benefits that healthy systems provide," Dictson said.

For the outdoor educational presentations, the group ventured over to the Plum Creek Wetland Mitigation Site north of Lockhart. Personnel from AgriLife Extension, U.S. Department of Agriculture Natural Resources Conservation Service, Nueces River Authority and Plum Creek Watershed Partnership discussed feral hog control, agricultural best management practices and incentive programs, plant identification, riparian and floodplain functions, erosion and healthy stream indicators during field presentations.

"I really walked away with some good knowledge, and I know this program is going to have a positive impact on my land," Wymer said.

This program is managed by TWRI and is funded through a Clean Water Act grant provided by the Texas State Soil and Water Conservation Board and U.S. Environmental Protection Agency.

The next riparian workshops will be held **Sept. 12** in Gatesville, **Sept. 17** in Seguin and **Oct. 16** in Junction. For more information on riparian areas, this program and upcoming trainings, visit texasriparian.org.

Learn prescribed fire from the experts with new online resource

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Prescribed fire, also known as controlled burning, is an effective way for land managers to maintain native landscapes, sustain rangeland production, enhance wildlife and reduce potential wildfire fuel loads, according to experts. Prescribed fire is the practice of planned burning that is done under specific guidelines and for the outcomes designed by plan. Experts from across the nation have partnered with eXtension.org to create a new online community on the beneficial use of prescribed fire.

The Prescribed Fire Community of Practice (CoP) provides a variety of online resources including articles, an Ask the Expert tool, webinars, online training and social media resources from the nation's top experts, according to CoP developers. The goal of the effort is to provide open access to timely, science-based information as well as local, regional and national experts. The Ask an Expert tool gives users a quick response from a regional fire professional, and the CoP also shares timely fire news and events.

To learn more and to join the CoP, visit extension.org/prescribed_fire. The Prescribed Fire resource area is among 75 eXtension.org topic areas. eXtension.org is a program of the Cooperative Extension System of land grant universities nationwide, which includes the Texas A&M AgriLife Extension Service.

Save water and resources with summertime landscape tips

Dr. Calvin Finch, director of the Water Conservation and Technology Center and longtime water expert, answers questions about horticulture, water conservation and the environment in his weekly gardening and water conservation columns. The articles run in South Texas newspapers, including the *San Antonio Express-News* and Primetime newspapers, his question and answer columns are published in South Texas and Hill Country weeklies, and radio and television programs air in the San Antonio market.

Recent articles have covered summertime issues, landscape tips and important water conservation questions:

- What is graywater?
- Why do you recommend that we mow our St. Augustine so tall?
- Salvias in the garden
- What are recommended tomato varieties for the fall?
- Shade trees
- Groundcovers for a drought tolerant landscape

All of Finch's columns are archived at wctc.tamu.edu/columns.

Watershed modeling workshop Aug. 13 in Austin

The Texas Water Resources Institute (TWRI) is presenting the Introduction to Watershed Modeling workshop on **Aug. 13** at the Texas Commission on Environmental Quality (TCEQ) headquarters, 12100 Park 35 Circle, Austin.

The workshop is set for 9 a.m. to 5 p.m. in the Building F, Room 3202A. Cost is $75 and includes course materials, a catered lunch and a certificate of completion.

According to **Nikki Dictson**, Texas A&M AgriLife Extension Service program specialist for TWRI, the workshop will provide watershed coordinators and water professionals with an introduction to watershed modeling.

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She said models that will be discussed include load duration curves, Spreadsheet Tool for Estimating Pollutant Load, Generalized Watershed Loading Function, P8 urban catchment model, Soil and Water Assessment Tool, Agricultural Non-Point Source Pollution Model, Hydrologic Simulation Program – FORTRAN, and Storm Water Management Model.

“Participants will gain an understanding of what model is needed for watershed protection planning, how modeling fits into the Environmental Protection Agency’s nine elements of watershed planning and the resources needed to take the next steps,” Dictson said.

Dr. R. Srinivasan, director of the Texas A&M University Spatial Sciences Laboratory, will talk on the purpose, limitations, time, costs and different requirements of watershed models currently available.

Dr. Larry Hauck, lead scientist for Tarleton State University’s Texas Institute of Applied Environmental Research, will present information on tools that can be used with limited data and under resource constraints, such as load duration curves and GIS land-use-based methods.

Kyle Girten, Nonpoint Source Program team leader for TCEQ, will explain quality assurance project plans, including what the plans should cover and how the data need to be described.

“The course will conclude with a presentation on stakeholder communications and modeling,” Dictson said. “Bringing stakeholders to the table to understand the model, facilitating consensus and approval of inputs and presenting modeling results to engage stakeholders is very important.”

One TWRI continuing education unit will be provided upon course completion. Participants may register for this training at watershedplanning.tamu.edu/training, and more information is available online or by contacting Dictson at 979.458.5915 or n-dictson@tamu.edu.

The training course is supported by funding from TCEQ through a U.S. Environmental Protection agency nonpoint source grant.

Trinity River basin webinars focus on land and water management

The Texas A&M AgriLife Extension Service and Trinity Waters, a conservation organization based in the Trinity River basin, will conduct two webinars for landowners in the basin.

The webinars center on the importance of proper land stewardship and water conservation to ensure future water for rural and urban areas that depend on the Trinity River. To view the webinars, visit forestrywebinar.net. Each scheduled from noon–1 p.m., the webinars are: Turning Your Land into a Sponge, **Aug. 8**, and Meeting the Water Needs for Texans and Wildlife, **Sept. 12**.

Blake Alldredge, AgriLife Extension associate education and outreach coordinator for Trinity Waters and webinar presenter, recommends visiting the website at least three days prior to the webinar to ensure computer compatibility. He said the latest Java version is required.

“Since the Trinity River provides water for more than 40 percent of the state’s residents, the background and proper land stewardship offered through these webinars should help landowners enhance their property’s productivity and sustainability while greatly benefitting many other Texans,” Alldredge said.

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The **Aug. 8** program will focus on water conservation strategies, which will lay the groundwork for the next webinar that deals with meeting the water needs of landowners, wildlife and the state.

“While these webinars were developed for landowners, anyone interested in knowing how conservation efforts impact water quality and quantity in urban areas is welcome and encouraged to participate,” Alldredge said.

The *Building Partnerships for Cooperative Conservation in the Trinity River Basin* project is managed by the Texas Water Resources Institute and funded by the Texas State Soil and Water Conservation Board through a Clean Water Act grant from the U.S. Environmental Protection Agency.

For more information, visit trinitywaters.org.

Builders and professionals invited to Dallas WaterSense home event Oct. 16

The Texas A&M AgriLife Research and Extension Center at Dallas is inviting home builders, landscape architects and municipalities staff to learn how to lead communities in promoting and building water-efficient homes at the Understanding the WaterSense Labeled Home symposium **Oct. 16**.

Admission to the program is free, and it will be held from 8:00 a.m. to 3:30 p.m. in the center’s Building E Auditorium, 17360 Coit Road.

The center has partnered with the U.S. Environmental Protection Agency (EPA) Region 6 WaterSense Program to host the symposium, increasing awareness of EPA’s WaterSense Labeled New Home Program and promoting building water-efficient homes. The center’s WaterSense home is the first WaterSense-labeled house in the Dallas-Fort Worth area.

Advanced registration is available online. For additional information about the symposium, contact **Karen Sanders**, Texas A&M AgriLife Research program assistant for urban water, at karen.sanders@tamu.edu or 972.952.9671. To keep up with the center’s Urban Water Program, subscribe to their monthly newsletter. See this EPA news release for more information on the home.

Water quality training Aug. 21 in Hamilton to focus on Leon River

A Texas Watershed Stewards Workshop on water quality and availability issues related to the Leon River will be held from 8 a.m.–4 p.m. **Aug. 21** in Hamilton.

The no-cost workshop is open to anyone interested in improving water quality in the Leon River and surrounding area. It will be held at the First United Methodist Church, 215 W. Main St. Participants are encouraged to preregister at tws.tamu.edu.

The workshop is sponsored by the Texas A&M AgriLife Extension Service and the Texas State Soil and Water Conservation Board (TSSWCB) in coordination with Texas Water Resources Institute (TWRI) and the Texas A&M Institute of Renewable Natural Resources (IRNR).

“The program is designed to help residents improve and protect their water resources by becoming involved in local watershed protection and management activities,” said **Chelsea Dorward**, AgriLife Extension agent for agriculture and natural resources in Hamilton County.

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The workshop will include an overview of water quality and watershed management in Texas, but will primarily focus on issues relating to the Leon River, including current efforts to help improve and protect this water resource. Training will include a discussion of watershed systems, types and sources of water pollution, and ways to improve and protect water quality. There also will be a group discussion on community-driven watershed protection and management.

“Surface water in the Leon River is a critical source of water in the area,” said **Mike Marshall**, watershed coordinator for the Leon River and AgriLife Extension assistant with TWRI and IRNR. “Our goal is to protect and improve water quality in the Leon by providing technical assistance and high quality education to citizens, landowners and agricultural producers about water quality management practices.”

TSSWCB and Brazos River Authority are working in partnership with the Central Texas Council of Governments, TWRI and IRNR to implement a stakeholder-driven watershed protection plan aimed at reducing pollution and improving water quality in the Leon River.

For more information, go to tws.tamu.edu. For information about the Leon River Watershed Protection Plan, contact Marshall at 254.865.2061 or mmarshallut@gmail.com or see www.brazos.org/LeonriverWPP.asp.

The Texas Watershed Steward program is funded through a Clean Water Act nonpoint source grant from the TSSCWB and U.S. Environmental Protection Agency.

Read the full AgriLife TODAY article for more information.

FWS report: fish passage program improves U.S. rivers’ flows

More than 200 blockages in the nation’s major natural resource “arteries” were removed last year thanks to the U.S. Fish and Wildlife Service (FWS) National Fish Passage Program, according to the service. Working with numerous partners, the program improves fish passage, local economies and public safety by removing derelict dams that no longer serve a purpose.

“Free-flowing, healthy rivers and streams are vital to our nation. Many species of fish, wildlife and plants depend on the natural ebb and flow of rivers at critical stages of their lives,” said Service Director **Dan Ashe**. “I’m pleased to report last year the service and its partners reconnected more than 2,500 miles of streams and 36,000 associated wetland acres, providing opportunities for aquatic populations to increase and become more resilient in the face of greater environmental pressures.”

Estimates show there are approximately 74,000 derelict dams and millions of other manmade river impediments in the United States, according to FWS. These structures impede upstream and downstream passage for native fish, destroy or eliminate access to key spawning habitat, and degrade water quality by preventing normal stream flow that cleanses river systems. In addition, if aging dams fail, they can threaten human safety in downstream communities.

The 2012 National Fish Passage Program Annual Report illustrates many collaborative accomplishments, from Alaska to the southeast United States, according to FWS. Last year, projects were completed in more than 40 states in cooperation with approximately 300 partners across the nation. Projects included fish passage barrier removals, engineering, planning and partnership coordination, monitoring and evaluation, and barrier inventories.

Read the full FWS news release. To view a copy of the report, visit: www.fws.gov/fisheries/whatwedo/NFPP/r

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Save the date: Protect Your Groundwater Day is Sept. 10

The Texas Water Resources Institute (TWRI) and the Texas Well Owners Network (TWON) are joining with the National Ground Water Association to promote Protect Your Groundwater Day on **Sept. 10**.

The day is used to bring awareness and education to the public about what they can do to preserve and protect groundwater to meet human and environmental needs. According to the U.S. Geological Survey, 99 percent of available freshwater comes from aquifers underground.

According to the association, protecting groundwater is important not just for household well owners who rely on privately owned and managed water wells for drinking water, but also for people on public water systems whose daily habits have an impact on groundwater quality.

In Texas more than a million private water wells provide water to citizens in rural areas and to those living in small acreages at the growing rural-urban interface. TWON, an educational training program offered by Texas A&M AgriLife Extension Service and managed by TWRI, delivers science-based, community-responsive education to well owners throughout Texas. The program is currently offering two different educational events.

Well Informed one-hour sessions are opportunities for well owners to bring in their well-water samples for screening for contaminants and to learn about water well protection practices. Since 2011, the TWON has conducted 42 screenings events. The next one is **Sept. 16** in Wharton.

Well Educated sessions are no-cost, one-day trainings for private well owners who want to become familiar with groundwater resources, septic system maintenance, well maintenance, water conservation, water quality and water treatment. Upcoming Well Educated sessions are **Sept. 12** in Wimberly, **Oct. 2** in Weatherford and **Oct. 10** in Pleasanton.

Read more about TWON and Protect Your Groundwater Day.

Winter pastures training for Central and East Texas Aug. 23

Many producers contact her too late for advice in establishing winter pastures, said **Dr. Vanessa Corriher-Olson**, Texas A&M AgriLife Extension Service forage specialist, in Overton.

“And when it comes to winter pastures, there’s nothing worse than too late,” Corriher-Olson said.

To help producers do the best possible job of planning winter pastures, Corriher-Olson and **Dr. Jason Banta**, AgriLife Extension beef specialist, will be conducting the Winter Pastures for Central and East Texas short course from 9:30 a.m–5 p.m. **Aug. 26** at the Texas A&M AgriLife Research and Extension Center at Overton.

Corriher-Olson said the program will answer many of the questions people commonly have about establishing winter pastures, such as: Which species are best suited to a particular type of operation? How much in feed costs can they expect to save? How do should they interpret seed tag information? How can they create a custom soil and production map for a farm from satellite data?

Registration for the program is $60 and includes lunch and program materials. Seating will be limited to the first 50 people to register. Register online at agriliferegister.tamu.edu.

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Read the full AgriLife TODAY article for more information.

Celebration to recognize 75 years of agricultural research in the High Plains set Aug. 29

Agricultural research entities in the High Plains will celebrate “75 Years of Southern High Plains Agricultural Advancements” on **Aug. 29** at the joint U.S. Department of Agriculture – Agricultural Research Service (ARS) and Texas A&M AgriLife Research facility, one-half mile west of Bushland.

The Conservation and Production Research Laboratory will celebrate 75 years of scientific advancements with field and building tours, posters and speakers. Speaking throughout the day, they will outline what agriculture issues have been addressed over the years and the science-based solutions found.

“Innovations in Soil, Water and Environment Management since 1938” is the theme for the celebration, according to **Dr. Dave Brauer**, USDA-ARS research agronomist and co-chair of the event.

The daylong event will begin at 9 a.m. with registration and continue through an evening meal. **Dr. Bob Stewart**, longtime director of the USDA facility and current director of the Dryland Agriculture Institute at West Texas A&M University, as well as other employees, past and present, will share reminiscent accounts of research developments and important outcomes, said **Dr. Jerry Michels**, AgriLife Research entomologist and co-chair.

“Over the years, scientists, regardless of agency or university affiliation, have established high producing teams that have advanced scientific knowledge and produced enduring benefits to mankind in this region and beyond,” said **Dr. John Sweeten**, AgriLife Research director at Amarillo.

Morning field tours will include stops to look at integrated pest management, alternative crops, irrigation technologies and management, conservation tillage, wind erosion prevention and chemical control for fallow. The lunch program will feature leadership from both the state and federal agencies discussing the importance of the High Plains’ facility.

The afternoon program will move indoors for historical presentations on other programs, such as wheat breeding, cattle production, air quality and a panel discussion with representatives of the agriculture industry on what might dominate research for the next 25 years. Specialized tours will be arranged for viewing various facilities.

The research facilities demonstrate the active and productive partnership between ARS, USDA’s chief scientific research agency, and The Texas A&M University System including AgriLife Research, Texas A&M AgriLife Extension Service and West Texas A&M University, researchers said.

Read the full AgriLife TODAY article for more information.

Water, wastewater and desalination short course Oct. 27–29

Texas A&M University’s Food Protein R&D Center is sponsoring the 9th annual Water Issues and Technologies: Process Water, Wastewater, and Desalination practical short course **Oct. 27–29** in College Station.

The course will cover pretreatment equipment, processing, systems, field testing, case studies and post-treatment technologies for membrane technology. The registration fee is $895 if paid by **Sept. 30** and $995 thereafter.

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To register or for more information, visit the course's website or contact **Dr. YongJae Lee**, program head, at yongjaelee@tees.tamus.edu or 979.845.2758.

Well owner program in Llano successful

Thirty-nine participants brought well-water samples to be screened at the recent Texas Well Owner Network (TWON) Well Educated training at the Texas Tech Llano River Field Station in Junction.

The event was conducted by the Texas A&M AgriLife Extension Service. **Drew Gholson**, AgriLife Extension program specialist and network coordinator, said attendees at the training were provided information and instruction on household wells, how to improve and protect water resources, groundwater resources, septic system maintenance, well maintenance and construction, and water quality and treatment.

In Texas, Gholson said, private owners are responsible for monitoring the quality of their well water, ensuring their drinking water is safe and maintaining all other aspects of their water system.

"That's why these Texas Well Owner Network trainings are important," Gholson said. "The TWON training helps private landowners better understand the testing, inspection and maintenance of their wells."

"As more and more people move into the community, it is important that landowners annually test their wells and storage tanks from where they get their drinking water," said **Znobia Wootan**, president, South Llano Watershed Alliance.

Funding for TWON project is 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. The project is managed by the Texas Water Resources Institute. Those interested in future TWON trainings can find more information at twon.tamu.edu/training. Read the full AgriLife TODAY article for more details.

New IRNR and TWRI projects

Bacteria Growth, Persistence and Source Assessment in Rural Texas Landscapes and Streams

Building upon results from TSSWCB Project 07-06 and further focusing on addressing informational needs identified in the "Bacteria TMDL Task Force Report," this project will focus on two primary tasks: 1) evaluating the predominant water quality parameters affecting instream bacterial fate and 2) evaluating and quantifying contributing E. coli loading to designated LU/LC types. These specific tasks were selected as those that will provide the most valuable information to watershed managers and practitioners who are faced with accurately predicting and planning to manage E. coli loading in Texas watersheds. This will be supported by education and outreach efforts that deliver project results to personnel at local, regional, state and national levels.

Funded by: Texas State Soil and Water Conservation Board

Partners: Texas Water Resources Institute, Department of Wildlife and Fisheries Sciences, Agricultural Research Service, USDA (ARS), Texas A&M Institute of Renewable Natural Resources, Department of Soil and Crop Sciences.

East Wildlife Foundation Monitoring Program: Phase I – Monitoring Program Design and Pilot Evaluation

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The overall scope of this work is to design, test, and propose alternative plans for initiating monitoring of long-term trends in the distribution and abundance of the flora and fauna across the 218,000 acre East Wildlife Foundation (EWF) properties in South Texas. Animal groups will include amphibians and reptiles, birds and mammals (including bats, small mammals, meso-mammals, and domestic animals). Additionally, trends in condition of plants and vegetative communities will be monitored in association with the wildlife surveys. Other environmental parameters of interest include soils, disease, surface water and groundwater, soil microorganisms and selected arthropods. Each of these parameters will be discussed and evaluated as potential additions to the long-term monitoring program.

Funded by: East Wildlife Foundation

Partners: Texas A&M Institute of Renewable Natural Resources, Texas A&M University – Kingsville, and Department of Wildlife and Fisheries Science

Leon River Watershed Coordinator

Project personnel will work with counties, cities, local boards and businesses within the Leon River Watershed to implement management measures identified in the Leon River Watershed Protection Plan to improve water quality and develop funding mechanisms for putting them in place.

Funded by: Central Texas Council of Governments

Partners: Texas Water Resources Institute, Texas A&M Institute of Renewable Natural Resources

Management of East Wildlife Foundation's Weather Monitoring System

The Crop-Weather Program (CWP), led by Dr. C.J. Fernandez (Texas A&M AgriLife Research at Corpus Christi), will manage the East Wildlife Foundation's weather monitoring system, including six automated weather stations. Weather stations are property of East Foundation and were installed by personnel of Dr. Fernandez' research program in 2011. This management will include maintenance of the installed field equipment, automated data retrieval via Internet Protocol communication, upload to the CWP Web server, automated data inspection and update of weather databases, and online display of weather data through http://cwp.tamu.edu.

Funded by: East Wildlife Foundation

Partners: Texas A&M Institute of Renewable Natural Resources, Texas A&M University – Corpus Christi

Status and Breeding Biology of the Crawfish Frog (Lithobates areolatus)

The crawfish frog (Lithobates areolatus) has suffered declines across much of its range and is currently considered for state protection in five of the states where it occurs. This frog is a prairie species that appears to be associated with remnant patches of natural prairies, a habitat that is becoming increasingly more scarce. Very few studies have detailed the breeding biology of this species and none of these studies have occurred in Texas. More specifically, nothing is known about breeding biology in the southernmost ecoregion in which they occur, the gulf coast prairies and marshes. Additionally, it is imperative to understand the current distribution of the species in the state. Conservation of the crawfish frog and its habitat is dependent on a thorough understanding of the distribution in the state and the severity of the range contraction as compared to the historical collection records.

Funded by: Texas Parks and Wildlife Department

Partners: Texas A&M Institute of Renewable Natural Resources, Texas Cooperative Wildlife Collection, Department of Wildlife and Fisheries Sciences, and U.S. Forest Service

New Publications / Papers

New Extension publications

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Earth-Kind Landscape Management, **M. Gu**, Texas A&M AgriLife Extension Service, HT-013, 2013.

New TWRI and IRNR publications

Costs of Saving Water in South Texas with Irrigation District Infrastructure Rehabilitation - Using Capital Budgeting with RGIDECON© , **E. Rister, R. Lacewell, A. Sturdivant**. Texas Water Resources Institute TR-438, 2013.

Environmental Flows in Water Availability Modeling, **R.A. Wurbs and R.J. Hoffpaui**r, Texas Water Resources Institute TR-440, 2013.

Evaluation of Smart Irrigation Controllers: Year 2012 Results, **C. Swanson, G. Fipps**, Texas Water Resources Institute TR-443, 2013.

Natural Resources Training Courses

Introduction to Modeling	Aug. 13
Texas Freshwater Mussel Identification and Sampling Workshop	Aug. 20–23
Texas Riparian and Stream Ecosystem Workshop – Geronimo and Alligator Creeks Watershed	Sept. 17
Trinity River Land and Water Summit	Oct. 2