

Society of Wetland Scientists – South Central Chapter

2025 Chapter Meeting

University of Arkansas, Fayetteville, AR

October 9-10, 2025



THANKS to all of our meeting sponsors!

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Contact: Claire Randall, claireran87@gmail.com

Welcome:

THANK YOU for registering for the SWS South Central Chapter Meeting at the University of Arkansas in Fayetteville, AR! We have a full day of amazing presenters on Thursday, October 9, along with an urban wetland field tour with catered lunch on Friday, October 10. The field tour is included in your meeting registration fee! This meeting is being conducted in support of SWS South Central Chapter members, students, academics, practicing professionals, and members of the public interested in wetlands and related topics.

The Chapter thanks the Watershed Conservation Resource Center, Beaver Watershed Alliance, Illinois River Watershed Partnership, Northwest Arkansas Land Trust, Peel Compton Foundation, and ECO, Inc. for hosting the Urban Wetland Field Tour. We also thank our incredible sponsors, along with all the students, staff, and volunteers who made this event possible. Finally, we want to thank the Springdale Chamber of Commerce, Rogers Chamber of Commerce, and the Beaver Water District for their contributions.

Registration webpage: <https://members.sws.org/ap/Events/Register/AnFovWgcVCdCN>

Program overview:

Time	Activity	Location
Thursday October 9		
7:00 AM - 9:00 AM	Registration	Hallway
9:00 AM - 9:20 AM	Welcome and SWS officer introductions	Waldrip Hall
9:20 AM - 10:00 AM	Opening Plenary - Dr. Brian Haggard	Waldrip Hall
10:00 AM - 10:30 AM	Coffee break	Hallway
10:30 AM - 12:10 PM	Technical Sessions: Wetland Assessment & Policy	Waldrip Hall
12:10 PM - 1:30 PM	Catered Lunch	Hallway
1:30 PM - 2:50 PM	Technical Sessions: Wetland Restoration & Management	Waldrip Hall
2:50 PM - 3:20 PM	Coffee break	Hallway
3:20 PM - 4:00 PM	Closing Plenary - Jodie Murray-Burns	Waldrip Hall
4:00 PM - 5:00 PM	Poster Session	Waldrip Hall
5:00 PM - 8:00 PM	Potluck Dinner (bringing a side dish is encouraged, but not required)	Agricultural Park
Friday October 10		
9:00 AM - 11:00 AM	Morning Field Tours	Various Locations
11:00 AM - 1:00 PM	Catered Lunch & Student Awards	Agricultural Park
1:00 PM - 3:00 PM	Afternoon Field Tours	Various Locations

SOUTH CENTRAL CHAPTER BOARD MEMBERS

This is YOUR Society, and engaging with our officers and board members is one of the best ways to ensure the chapter provides you with valuable content, opportunities, and activities. Get to know your officers and board members and consider volunteering to serve on the board to help shape the future of YOUR Society!

President – Eric Fuselier, 2025-2027 – efuselier@olsson.com



Eric Fuselier, PWS is an environmental scientist at Olsson in Fayetteville, AR. A member of SWS since 2016, he brings over a decade of experience in climate resilience planning, nature-based solutions, environmental restoration, permitting, and environmental impact studies for infrastructure projects. Eric has served on the South Central Chapter's executive board since 2019.

President-Elect – Jacob Berkowitz, 2025-2027 – Jacob.F.Berkowitz@usace.army.mil



Dr. Jacob Berkowitz is a Senior Research Soil Scientist at the US Army Engineer Research and Development Center, Team Leader for wetlands research, and an LSU Adjunct faculty member. His research focuses on wetland assessment and improving natural resource management via teaching and outreach.

Immediate Past President – Jessica Brumley, 2025-2027 – jessicadbrumley@gmail.com



Dr. Brumley is an Assistant Professor in the Department of Biological and Environmental Sciences at East Central University in Ada, Oklahoma. Jessica studies wetland ecosystem services and health.

Treasurer – Sydney Bufkin, 2025-2026 – sydney.d.bufkin@usace.army.mil



Sydney Bufkin is a Research Soil Scientist in the Wetlands and Coastal Ecology Branch at the U.S. Army Engineer Research and Development Center (ERDC). Since joining ERDC in 2018, she has developed expertise in wetland assessments, forestry, natural resource management, and biogeochemistry. Her research centers on hydric soils and wetland restoration, with projects addressing phosphorus pollution in the Great Lakes and investigating challenging hydric soils across the Central and Eastern U.S.

Secretary – Gary Ervin, 2021-2025 – gervin@biology.msstate.edu



Gary Ervin is a Plant Ecologist in the Department of Biological Sciences at Mississippi State University. He has 30 years of experience studying wetland plants and has served many roles in SWS, including three previous terms as an Executive Board member for the South-Central Chapter.

Executive Board:

Claire Randall, 2022-2026 – claireran87@gmail.com



Claire is a wetland scientist based in Houston, TX, with much of her work occurring in SE TX and LA. Before she got involved in wetlands work, she was mostly an ornithologist and was focused on avian studies. In her spare time, she loves traveling, reading, and cooking.

Kara Vick, 2023-2027 – kara.d.vick@usace.army.mil



Kara is the Team Lead for the U.S. Army Corps of Engineers Regulatory Division in the Galveston District, a role she has held since 2022. She began her career with the Corps in 2008 after seven years in state government, including positions with Texas Parks and Wildlife, the Texas General Land Office, and the Texas Commission on Environmental Quality. Kara holds a B.S. in Wildlife Management and Fisheries from Texas A&M University–College Station and an M.S. in Environmental Science from Texas A&M University–Corpus Christi.

Karen Metzler, 2024-2026 – kmetzler@plummer.com



Karen is an Environmental Specialist at Plummer Associates within the Natural Systems and Environmental Permitting Group. She attended Texas Tech University where she earned a degree in Natural Resources Management with a concentration in Environmental Conservation. She has over 13 years of professional experience in environmental regulatory compliance and consulting. She also holds a Professional Wetland Scientist (PWS) Certification and is an International Society of Arboriculture (ISA) Certified Arborist.

Ginger Horn, 2025-2027 – gchorn@canacre.com



Ginger is Director at Canacre, a Quanta Company, with over 34 years of experience in environmental natural resource planning. She has served in roles across federal agencies, regional councils, and consulting firms as an environmental scientist, planner, and director. Ginger specializes in environmental assessments, regulatory compliance, and permitting — including Section 404 wetland evaluations, NEPA, endangered species assessments, erosion control, and SWPPP. Her work spans local, national, and international projects for both public and private sector clients.

Other Planning Committee Members:

Jodie M. Burns – Cattails Environmental – jodieburns@cattailsenvironmental.com



An active SWS member and certified Professional Wetland Scientist, Mrs. Burns is a small business owner of Cattails Environmental, LLC. With 17+ years of experience in the consulting world, she works primarily in Oklahoma, Arkansas, Missouri, and Kansas with occasional forays into other states assisting clients in navigating our nation's complex environmental regulations. Jodie resides in Bentonville, Arkansas, with Paul, her husband of 32 years, and two of her four sons.

Laura Duffie – HDR, Inc. – lauraduffie314@gmail.com



Laura Duffie, AWB, PWS serves as an Environmental Scientist with HDR in San Antonio, Texas. Prior to HDR, Laura gained previous consulting experience working for Whitenton Group Environmental Consultants. Laura has been an active member of the Society of Wetland Scientists since 2012 and has served on the SWS South Central Chapter Board of Directors as the elected Treasurer from 2021 to 2025. She is delighted to reconnect with everyone in Fayetteville!

LOCATIONS

1) Waldrip Hall -

Meeting activities on Thursday will occur in Waldrip Hall at the Don Tyson Center for Agricultural Sciences located at 1371 W Altheimer Dr. in Fayetteville, AR 72704. Free parking is available on location. Coffee breaks and lunch will be provided on Thursday.



2) Agricultural Park –Agricultural Park is located within walking distance of Waldrip Hall, across Garland Avenue from the Pauline Whitaker Animal Science Center. There is a pedestrian path at the intersection of W Knapp Drive and Garland Avenue that will allow you to safely cross beneath Garland Ave. Parking is

also available at the park and across the street at the Pauline Whitaker Animal Science Center.

The potluck and social Thursday evening and lunch on Friday will both take place at the pavilion at Agricultural Park.

Thursday Evening Potluck - Following the technical sessions on Thursday, the group will gather at Agricultural Park at 5:00 PM for a potluck and social. Bringing a food item is encouraged but not required.

Friday Lunch - Following the morning field tours on Friday, the group will gather at Agricultural Park at 11:30 AM for lunch before dispersing again for the afternoon tours. Lunch on Friday will be provided.



3) **Urban Wetland Field Tour** – the field tour will take place at multiple locations and feature several urban wetlands within Northwest Arkansas. On Thursday, participants will sign up for one morning tour and one afternoon tour on Friday. **Parking is limited at some locations, so be sure to sign up for the tour(s) you plan to attend.**

This tour will highlight:

- **Surprising Biodiversity:** Explore unique habitats teeming with diverse plant and animal life, including species of conservation concern, right within city limits.
- **Conservation in Action:** Witness firsthand how proactive efforts are preserving these valuable ecosystems and transforming them into accessible natural areas, parks, and educational spaces for the community.
- **Management Strategies:** Learn directly from expert guides about the specific techniques used in urban wetland management, including habitat restoration, invasive species control, water quality monitoring, and the creation of sustainable public access. This practical knowledge can offer valuable insights for your own wetland-related projects.
- **Ecological Significance:** Understand the crucial role these urban wetlands play in water filtration, flood control, and overall ecosystem health.

To help you decide which tours you want to attend we've provided detailed information on each location starting on page 25 below.

DETAILED SCHEDULE

THURSDAY OCTOBER 9

- 7:00 AM – 9:00 AM Registration
- 9:00 AM – 9:20 AM Welcome from the chapter president, SWS officer introductions
- 9:20 AM – 10:00 AM Opening Plenary

Water Quality Issues: Bright Spots and Research Needs in Northwest Arkansas

Dr. Brian Haggard, Arkansas Water Resources Center

haggard@uark.edu



Dr. Brian E. Haggard is the Director of Arkansas Water Resources Center and Professor in the Biological and Agricultural Engineering Department at the University of Arkansas. In 2000, he received his Ph.D. in Biosystems Engineering from Oklahoma State University. The Arkansas Water Resources Center uses its resources to help address water research needs in Arkansas, where Dr. Haggard's research focuses on water quality and how

it's changing.

- 10:00 AM – 10:30 AM COFFEE BREAK

TECHNICAL SESSIONS: WETLAND ASSESSMENT & POLICY

- 10:30 AM – 10:50 AM **Developing three diverse wetland rapid assessments**

Jacob F Berkowitz, Jay Price, Williams Tomlinson, Kevin Philley, US Army Corps of Engineers, 3909 Halls Ferry Rd, Vicksburg, MS, 39180
jacob.f.berkowitz@usace.army.mil

Wetland Team members from the US Army Corps of Engineers are currently developing wetland assessment tools in the Gulf south, New York, and New England. While these methodologies share several similarities, they each exhibit unique features driven by their target ecosystem and objectives, practitioner requirements, and other factors. First, a Wetland Value Assessment (WVA) module to evaluate conditions in Wet Pine Flatwoods ecosystems is nearing completion, providing a tool to assess impacts associated with flood control projects and benefits derived from mitigation efforts in these beautiful but endangered habitats. Second, a wetland assessment designed to deliver a single, comprehensive approach to quantify physical, biogeochemical, and

habitat functions across the state of New York is under construction (addressing the needs of the New York and Buffalo Districts). Third, a very rapid (~30 minute) disturbance-based wetland assessment for the New England region is underway, allowing practitioners to quickly document conditions for small project applications (<2 acres; 0.8 ha). The presentation will outline the general assessment development approach and highlight some of the challenges associated with operating at multiple reference domain scales.

10:50 AM – 11:10 AM **Assessing biomass and carbon content of *Arundinaria gigantea* on the Tombigbee National Forest in central Mississippi**

Gary Ervin, Michelle Baumflek, Roger Cain, Mississippi State University,
Biological Sciences, Mississippi State, MS 39762
gary.ervin@msstate.edu

River cane (*Arundinaria gigantea*) is a native bamboo relative in the southeastern United States that was historically a significant component of bottomland and riparian forest understories. Although its habitat has been greatly reduced, this species continues to be culturally important for Tribal Nations of the southeastern US. Ecologically, the remaining stands of *A. gigantea* contribute important ecosystem services such as erosion and runoff control, endangered species habitat, and the potential to contribute to forest carbon stocks; however, limited research to date has explicitly focused on the carbon storage or sequestration capacities of this species. We are quantifying biomass, biomass allometry, and carbon stocks of *A. gigantea* in Mississippi in an effort to inform riparian restoration and management strategies that include Indigenous Knowledge and Tribal priorities. Results from five sites on the Tombigbee National Forest and Noxubee National Wildlife Refuge thus far suggest consistent carbon composition of above- and belowground tissues of *A. gigantea* (~45% carbon), with aboveground biomass ranging from approx. 200 to 500 g/m² in riparian cane stands. A companion study monitoring growth and carbon content of juvenile plants found that five- to nine-month-old plants had a similar carbon content (~43%) in above- and belowground tissues. Although we observed consistent patterns in biomass and carbon content, the cane populations in this study have substantially lower biomass and carbon stocks than estimated for other *Arundinaria* stands for which these data have been published, suggesting the need to consider subregional variation and site-specific ecological conditions when developing carbon estimates. This work represents an important advance towards incorporating culturally and ecologically important species into carbon programs.

11:10 AM – 11:30 AM **Comparative Assessment of Wetland Conditions Across Agricultural Ditches, ACEP-WRE Easements, and Natural Wetlands in the Mississippi Alluvial Valley, Arkansas**

FMS Abdal, Uttam Deb, Michael Eggleton, University of Arkansas at Pine Bluff, Department of Aquaculture and Fisheries, 1200 N University, Pine Bluff, AR, 71601
abdalf5786@uapb.edu

Wetlands offer a multitude of ecosystem services. Despite their importance, wetlands are rapidly lost due to agricultural expansion and urbanization. Since European settlement began 400 years ago, the U.S. has lost 46% of its wetlands. The U.S. has undertaken conservation programs targeting wetlands, including the Wetland Mitigation Banking Program (WMBP) and the Agricultural Conservation Easement Program–Wetland Reserve Easement (ACEP-WRE). Measuring the progress of these programs is imperative for the use of better public funds and environmental development. In this study, we used a Rapid Assessment Method (RAM) to measure the ecological conditions of the wetlands in Arkansas.

This study focused on the wetland condition based on six metrics and 16 sub-metrics, with a potential score ranging from 0 to 100. Metrics included wetland size, buffer and surrounding land use, hydrologic characteristics, substrate and habitat condition, vegetation /interspersions/ features and structure, and overall wetland importance. Data were collected from 31 sites in the Mississippi Alluvial Valley comprising five agricultural ditches (Controls), 21 ACEP-WRE easements, and five natural wetlands (References).

On-site observations and GIS analyses revealed significant differences in overall condition among wetland types. Mann–Whitney tests showed a consistent gradient of improvement (Control < Easement, $z = -3.418$, $p < 0.05$; Easement < Reference, $z = -3.159$, $p < 0.05$; Control < Reference, $z = -2.652$, $p < 0.05$). Kruskal–Wallis with Dunn post hoc tests identified significant gains for buffer width, connectivity, substrate condition, and habitat quality, with the order Control < Easement < Reference ($p < 0.05$). Easements exceeded references for emergent vegetation and interspersions metrics ($p < 0.05$). Within easements, ecological condition was positively correlated with site age, and higher scores were observed where easements adjoined other conservation lands. Our analysis reveals that ACEP WRE restorations resulted in large, measurable gains in wetland condition. Recovery of hydrological functions was the fastest, and the landscape of the easements was the most critical factor for full convergence.

11:30 AM – 11:50 AM **Leadership for Wetlands Research and Protection**

Sarah Elaine Lewis, PhD, Edgewater Coaching & Consulting
sarah@edgewatercoaching.com

Wetlands provide beauty, habitat, clean water, erosion control, protection against flooding, fire, and drought, as well as resilience to changing sea level rise and extreme weather events. We know this to be true, and yet according to the US Fish and Wildlife Service in a 2024 report, the rate of net wetland loss in the US accelerated by over 50% between 2009–2019. As scientists and educators, we know that this decline is not healthy, not economically beneficial, nor sustainable and yet we often experience pushback in the work we do to understand, advocate for, and protect these areas, finding ourselves up against a complex system that doesn't want to change. How do we stay the course when it feels like everything is against us? During this interactive session, participants will explore how to successfully navigate complex challenges so that they can build their capacity to create the change they seek. Using the adaptive leadership framework and professional coaching strategies, participants will 1) explore what calls them to the work of wetlands science, 2) build their ability to articulate their goals, 3) identify their roadblocks, and 4) learn strategies for staying the course when bringing about positive change for wetlands and their ecosystems.

11:50 AM – 12:10 PM **A Review of the Corps of Engineers' Recently Released Recommendations and Standards for Aquatic Resource Delineation Reports and Aquatic Resource Boundary Mapping**

Jacob Berkowitz, U.S. Army Engineer Research and Development Center (ERDC)
jacob.f.berkowitz@usace.army.mil

The Corps of Engineers has recently released recommendations on minimum standards for documenting aquatic resource delineations and mapping aquatic resource boundaries electronically. The documents released on August 1, 2025, are titled Recommended Minimum Standards for Aquatic Resource Delineation Reports (ARDR) and Guide for Recording Aquatic Resource Delineations Using Global Navigation Satellite Systems (GNSS). These Corps of Engineers non-mandatory recommendations and minimum standards will be presented and reviewed through the eyes of a field practitioner to assist in raising the preliminary WOTUS report quality and mapping standards of professional society members in the SWS South Central Chapter region.

12:10 PM – 1:30 PM CATERED LUNCH

TECHNICAL SESSIONS: WETLAND RESTORATION & MANAGEMENT

1:30 PM – 1:50 PM **Linking Soil Properties, Microtopography, and Microbial Communities in Wetland Restoration**

Faye Smith, PhD, Soiled Earth Consulting
sfayesmith2020@gmail.com

Wet prairies are among the most endangered ecosystems in North America, yet they provide essential ecological services such as biodiversity support, water regulation, and carbon storage. This study investigated soil microbial community composition within a restored mounded wet prairie in northwest Arkansas to understand how belowground diversity is shaped by environmental conditions. Using high-throughput sequencing and geospatial analyses of 150 soil samples, we found that bacterial diversity and community turnover were most strongly associated with soil texture, organic matter, pH, and nutrient concentrations. Micro-topography, created by natural mounding, also influenced bacterial community structure by driving fine-scale heterogeneity in soil properties. Fungal communities showed parallel patterns, with diversity and composition closely linked to soil texture, micro-topography, and calcium concentrations. Across both groups, soil texture consistently emerged as a primary predictor of microbial community variation.

These results demonstrate that even subtle differences in soil properties and landscape position have a strong influence on belowground biodiversity. Because soil microbial communities regulate nutrient cycling, organic matter stabilization, and greenhouse gas fluxes, their distribution has direct implications for ecosystem resilience and carbon storage. The findings underscore the importance of protecting native soils and preserving micro-topographic features in wetland restoration projects. By recognizing soil microbial diversity as a core component of wetland function, conservation strategies can better safeguard the long-term sustainability of these critical ecosystems.

1:50 PM – 2:10 PM

Bush Valley Wetland Restoration: Enhancing Hydrology, Habitat, and Ecosystem Services in a Degraded Agricultural Landscape.

TJ Hein, Savanna Springs, 24240 Van Fleet Rd, Siloam Springs, AR
tj@restorewatersheds.com

Bush Valley, located in the headwaters of the Barren Fork of the Illinois River near Lincoln, Arkansas, encompasses approximately 200 acres at the divide of the Springfield Plateau and Boston Mountains. The property is hydrologically diverse, with six converging streams of varying slope and size, two perennial springs (one emerging from a historic springhouse), and a cultural landscape marked by a mid-1800s cemetery.

As one of the earliest settled areas in northwest Arkansas, Cane Hill underwent rapid ecological transformation. Prairie was converted to row crops, hillside forests cleared for orchards, and river cane eliminated from riparian corridors. Wetlands were drained and streams ditched to facilitate cultivation. By the time restoration planning began, row crop agriculture extended to the high streambanks, riparian forests had been recently clear-cut, and channelized streams were eroding aggressively as they attempted to regain lost sinuosity.

Restoration goals coalesced around three consistent themes: (1) maximizing biological uplift, (2) protecting perennial springs and streams, and (3) fostering opportunities for education and recreation. The multi-faceted success of this project was driven by the landowner's curiosity and a willingness to experiment. While wetlands were not initially identified on site, construction of several small ephemeral pools demonstrated ecological value and inspired the creation of a dozen interconnected wetland complexes. These wetlands varied in form, hydrology, and planting strategies, producing a highly diverse mosaic of habitats.

Observed outcomes have exceeded expectations. Biological uplift has been substantial, with rapid colonization by waterfowl, songbirds, beavers, amphibians, and odonates. The restored riparian corridor now filters agricultural runoff, stabilizes eroding banks, and improves water quality. In addition, the site has become a resource for university research, field tours, and conservation education—illustrating how creative, landowner-driven restoration can yield broad ecological and social benefits in the Ozark landscape.

2:10 PM – 2:30 PM

Large-Scale Restoration on War Eagle Creek

Daniel Hagood, Beaver Watershed Alliance, 162 Doolin Dr. P.O. Box 762 Elkins, AR 72727

daniel@beaverwatershedalliance.org

The Beaver Watershed Alliance (Alliance) and a growing cohort of partners are working together to establish wetlands and riparian habitat along War Eagle Creek (WEC). WEC is the largest tributary to Beaver Lake, drinking water source for 600,000 residents in Northwest Arkansas and is listed on the 303(d) list for nonattainment due to turbidity and pathogens. WEC is also home to twenty-seven Species of Greatest Conservation Need (SGCN), including two federally protected species. This presentation will focus on a stream restoration project located on WEC east of Huntsville, AR where multiple stream barriers are being removed, more than a mile of stream restoration has been completed, and over 10 acres of wetlands and riparian habitat have been established with native vegetation. In addition, the group is working towards contiguous riparian restoration projects and using data and drones to assess opportunity areas.

2:30 PM – 2:50 PM

Transforming Detention Ponds into Functional Wetlands

Annie Sales, Illinois River Watershed Partnership, 221 S Main Street, Cave Springs, AR, 72718

annie@irwp.org

Detention ponds are a common feature in urban landscapes, yet most function only as flood control structures with limited ecological or water quality benefits. Retrofitting these ponds to mimic wetland functions presents a significant opportunity to improve water quality, enhance habitat, and provide multiple community benefits. This presentation will explore design strategies that use wetlands as a reference ecosystem, focusing on hydrology, vegetation, and habitat structure to guide practical retrofits. The Apple Orchard Detention Pond Retrofit will serve as a case study, demonstrating how a conventional dry basin was transformed into a multifunctional green infrastructure feature. The project illustrates how ecological principles can be applied to stormwater infrastructure to achieve measurable improvements in water quality and biodiversity, while also creating a more resilient and engaging community space. Lessons from this retrofit highlight scalable opportunities for municipalities, developers, and neighborhoods to reimagine detention ponds as functioning wetland systems.

2:50 PM – 3:20 PM COFFEE BREAK

3:20 PM – 4:00 PM Closing Plenary

A Regional Perspective of the Complex Intersection of the Current WOTUS Definition and Karst Features, along with Local and Regional Federally-Listed Karst Species Protections in Northwest Arkansas.

Jodie Murray-Burns, Cattails Environmental, LLC
jodieburns@cattailsenvironmental.com



An active SWS member, **Mrs. Burns** is a small business owner of Cattails Environmental, LLC. With 17+ years of experience in the consulting world, she works primarily in Oklahoma, Arkansas, Missouri, and Kansas with occasional forays into other states assisting clients in navigating our nation's complex environmental regulations. Jodie resides in

Bentonville, Arkansas, with Paul, her husband of 32 years, and two of her four sons.

With the recent clarification of the implementation of the Waters of the U.S. definition in light of the SCOTUS Sackett case ruling, the federal protection on losing streams and related karst ecosystems in Northwest Arkansas has all but disappeared. These karst ecosystems support specialized species adapted to underground cave environments and other subsurface features. Northwest Arkansas has three federally-listed species found in karst ecosystems: Ozark Cavefish (*Amblyopsis rosae*), Benton County Cave Crayfish (*Cambarus aculabrum*) and Hell Creek Cave Crayfish (*Cambarus zophonastes*). The USFWS has recently released a Programmatic Biological Opinion (PBO) in conjunction with a Karst Conservation Strategy (KCS) for the State of Arkansas (Arkansas Field Office, Conway, AR) which provides a mitigation opportunity for potential impacts to karst features that may be providing suitable habitat for these federally-listed species. The PBO and KCS details will be reviewed and specific examples of projects which used this mitigation opportunity will be shared.

4:00 PM – 5:00 PM Poster Session

5:00 PM – 8:00 PM Potluck and social at Agricultural Park (bringing a side dish is encouraged, but not required)

POSTER PRESENTATIONS

Accuracy of Visual Percent Estimates Among Wetland Delineation Field Professionals

Nicole Castro, HDR, 613 Northwest Loop 410 #700, San Antonio, TX 78216
nysam1214@gmail.com

Visual estimates of percentages are common for wetland field professionals when conducting wetland delineations. Field professionals estimate percent vegetative cover of each species present within a defined plot size as well as the percentage of matrix and redoximorphic colors in soil horizons. These estimates will directly determine the presence or absence of a wetland, wetland type, and hydric soil indicators and indirectly affects hydrology indicators (FAC-Neutral test, sparsely vegetated concave surface), which in turn, can affect permitting and mitigation requirements. As such, accurate visual estimates of percentage cover are an essential part of a wetland delineator's job.

The purpose of this study was to analyze the accuracy of visual percent estimations among wetland professionals of varying experience.

Five pictures of known percent cover were provided to wetland delineators. Each picture in the survey was timed and professionals were instructed not to focus on accuracy any more than they would in the field. The assessment is currently open and will close on August 20, 2025 at midnight. Percent cover estimates from the survey will be compared to the true percent values of each picture. Linear regression will be used to plot accuracy by years of experience. A positive relationship, with accuracy increasing with more experience, is expected. Results will be summarized along with conclusions, implications, and potential further study needs.

Competition or Cooperation? Examining the influence of wetland plant interactions on phytoremediation

Gary Ervin, Gray Turnage, Tatiana Lobato-de Magalhães, Brook Herman, Mississippi State University, Biological Sciences, Mississippi State, MS 39762
gary.ervin@msstate.edu

Understanding the specific nutrient and biomass allocation strategies of wetland plants is crucial for selecting species for restoration or creation of wetlands that will function in nutrient remediation. For several years, we have been carrying out mesocosm experiments to study the roles of wetland plants in nutrient phytoremediation, in part to better understand species-specific contributions to remediation but also to determine whether species interactions alter remediation outcomes. Recent work has involved studies of four common emergent wetland plant species: *Juncus effusus*, *Phragmites australis*, *Schoenoplectus tabernaemontani*, and *Typha latifolia*. These species were grown in monoculture and species pairs over three growing seasons to assess contributions to nutrient uptake, biomass and nutrient allocation patterns, and changes in these properties when grown in the presence of another

species. Results have shown that species pairs perform as well as or better than monocultures in multiple performance metrics and that some of these species appear to experience stronger intraspecific than interspecific competition. Furthermore, results suggest that functional ecological attributes of the species were more significant in driving outcomes of interactions than was the generally perceived “invasiveness” of the species.

Assessing biomass and carbon content of *Arundinaria gigantea* on the Tombigbee National Forest in central Mississippi

Gary Ervin, Michelle Baumflek, Roger Cain, Mississippi State University, Biological Sciences, Mississippi State, MS 39762
gary.ervin@msstate.edu

River cane (*Arundinaria gigantea*) is a native bamboo relative in the southeastern United States that was historically a significant component of bottomland and riparian forest understories. Although its habitat has been greatly reduced, this species continues to be culturally important for Tribal Nations of the southeastern US. Ecologically, the remaining stands of *A. gigantea* contribute important ecosystem services such as erosion and runoff control, endangered species habitat, and the potential to contribute to forest carbon stocks; however, limited research to date has explicitly focused on the carbon storage or sequestration capacities of this species. We are quantifying biomass, biomass allometry, and carbon stocks of *A. gigantea* in Mississippi in an effort to inform riparian restoration and management strategies that include Indigenous Knowledge and Tribal priorities. Results from five sites on the Tombigbee National Forest and Noxubee National Wildlife Refuge thus far suggest consistent carbon composition of above- and belowground tissues of *A. gigantea* (~45% carbon), with aboveground biomass ranging from approx. 200 to 500 g/m² in riparian cane stands. A companion study monitoring growth and carbon content of juvenile plants found that five- to nine-month-old plants had a similar carbon content (~43%) in above- and belowground tissues. Although we observed consistent patterns in biomass and carbon content, the cane populations in this study have substantially lower biomass and carbon stocks than estimated for other *Arundinaria* stands for which these data have been published, suggesting the need to consider subregional variation and site-specific ecological conditions when developing carbon estimates. This work represents an important advance towards incorporating culturally and ecologically important species into carbon programs.

Microbial Communities in Mine Drainage Contaminated Wetlands

Leif Olson, Kara Dé Leon, The University of Oklahoma, Center for Restoration of Ecosystems and Watersheds, School of Civil Engineering and Environmental Science, 202 W. Boyd St., Room 334 Norman, OK 73019
lolson@ou.edu

Natural and ecologically engineered wetlands host biogeochemical processes that contribute to the mitigation of mine drainage contamination. The sulfur and iron cycles are especially important, as sulfate reduction and iron oxidation both precipitate and help immobilize dissolved metals, decreasing downstream contamination. Sulfate reduction is primarily driven by microbial respiration, while iron oxidation can be primarily abiotic, depending on pH. This research is examining microbial communities in wetlands receiving legacy artesian lead-zinc mine drainage discharge at the Tar Creek Superfund Site in northeast Oklahoma. Water and sediments were sampled in constructed and incidental Typha marshes with influent mine drainage. Trace element concentrations were measured and environmental DNA was sequenced with two methods: Illumina short reads of the 16S rRNA V3/V4 region and Oxford Nanopore long reads of the 16S-ITS-23S rRNA operon region. Preliminary results indicate a relatively high abundance of iron and sulfur cycling taxa, with surface water samples containing more iron cycling, and specifically iron-oxidizing bacteria, than sulfur cycling organisms. This indicates the biological potential for trace metal precipitation through sulfate reduction and iron oxidation, but also the dissolution of precipitated metals through complementary redox processes as organisms associated with sulfur oxidation and iron reduction are also abundant. Current analyses are underway to identify environmental variables linked to community composition and use long read sequences to increase taxonomic resolution. Utilizing natural wetland-based processes for metal precipitation has been a key feature of passive treatment systems that effectively remediate mine drainage with a lower cost and environmental footprint than active treatment technologies. An improved understanding of the biological activity involved in natural and engineered wetlands can potentially inform improved design of these systems, as well as elucidate more of the underlying theory linking microorganisms to metal cycling in wetlands.

Look at all those chickens! The search for Western Chicken Turtles (*Deirochelys reticularia miaria*) in the Arkansas River Valley, Arkansas, USA

Elizabeth Hays, University of Arkansas, Department of Biological Sciences, 850 West Dickson Street, Fayetteville, AR 72701
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Western Chicken Turtles are a species of Greatest Conservation Concern all states where they occur, except Texas. There is considerable uncertainty regarding the status of Western Chicken Turtles in the Arkansas River Valley, Arkansas, USA because historical records, while geographically widespread, are sparse and overwhelmingly unsourced. To determine the current distribution, abundance, and wetland occupancy of Western Chicken Turtles in the Arkansas River Valley ecoregion, we conducted intensive trapping surveys across multiple wetlands at every Wildlife Management Area that appeared suitable for Chicken Turtles along the River Valley. We used a hierarchical Bayesian modeling approach to assess wetland occupancy of freshwater aquatic turtle communities across 18 wetlands surveyed. Despite trapping in wetlands with historical records of Chicken Turtles, we caught only one Chicken Turtle. Our preliminary results suggest that populations of Western Chicken Turtle have declined substantially and may be extirpated from the Western Arkansas River Valley. We observed that wetlands managed

primarily for migrating waterfowl were drained earlier in the year, had the lowest number of turtle detections, and contained homogenized turtle communities dominated by Mississippi Mud Turtles. Our occupancy model suggests that wetlands retaining water later into the summer will increase the likelihood of occurrence of all species except Mud Turtles. Therefore, future wetland management efforts to support Chicken Turtles and diverse turtle communities in the River Valley could be as simple as allowing wetlands to undergo their natural cycles of filling and drying, rather than subjecting them to unnaturally shortened hydroperiods.

Examination of the Relationships between Biological Productivity and Emerging Constituent Removal from Wastewater and Stormwater in Treatment Wetland Mesocosms.

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Concern exists about the environmental fate of emerging constituents (ECs, including pharmaceuticals and personal care products (PPCPs), pesticides, and per- and polyfluoroalkyl substances (PFAS)), because they may be ecotoxic and pose risks to ecological and human health. Conventional wastewater and stormwater treatment processes fail to effectively removed ECs. Sustainable water reuse requires that ECs be addressed. Treatment wetlands have been shown to effectively remove many conventional contaminants (e.g., trace metals, nutrients, solids, and various other organic and inorganic contaminants) through physicochemical, biogeochemical, microbiological, and ecological processes. However, their role in EC removal is a topic of current evaluation. This research examined a suite of treatment wetland mesocosms at the Norman (Oklahoma) Water Reclamation Facility (NWRf) to evaluate removal of both conventional contaminants and numerous ECs. The experimental design includes 52 individual 220-L treatment wetland mesocosm batch reactor units, which are split into different groups based on feedwater (wastewater or urban stormwater), treatment wetland design (subsurface flow, free water surface, and open water controls), and the presence or absence of planted vegetation (*Juncus effusus*, common rush). Wetlands are some of the most biologically productive ecosystems in the world, which contributes to their effectiveness at facilitating contaminant removal. Biological productivity of planted and unplanted treatment wetland mesocosms was examined through diel oxygen changes, supplemented with biomass determinations (including algal communities), and vegetation community inventories. Concentration changes for 38 conventional and 86 emerging contaminants were examined to elucidate the role of biological productivity. Removal rates varied across different treatment wetland mesocosm types and source waters. Treatment wetlands may show promise for sustainably addressing ECs.

Macroinvertebrate and Periphyton Communities in Treatment Wetland Mesocosms

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Natural wetland ecosystems are well known to be productive and biodiverse. Treatment wetlands are designed and constructed to improve water quality by mimicking the biogeochemical functions of natural wetlands. This research examines macroinvertebrate and periphyton communities living in treatment wetland mesocosms at the Norman (Oklahoma) Water Reclamation Facility receiving secondarily treated wastewater and urban stormwater. Three different flow regimes are used in the mesocosms: subsurface flow (SSF), free-water surface flow (FWS), and open-water controls (OWC). In addition, two vegetation planting schemes (planted with *Juncus effusus* and unplanted) were crossed with source waters and flow regimes, creating a robust experimental design (n=50). It is hypothesized that differences in biotic communities exist in mesocosms based on design. Macroinvertebrate and periphyton communities will be collected and classified. Diversity metrics and statistical analyses will be used to assess differences in biological communities in each unique mesocosm design. Understanding potential differences in biotic communities will inform future treatment wetland design.

Determining Surface Water - Groundwater Interactions Using sUAS-mounted Advanced Sensors to Guide Environmental Restoration and Remediation

Jonathon Stallings, Robert Nairn, University of Oklahoma, Civil Engineering & Environmental Science, 202 W. Boyd St., Room 334 Norman, OK 73019
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Streams and wetlands play important roles in the fate, transport and biogeochemical cycling of natural and anthropogenic materials. Streams and wetlands often act as interfaces between surface waters and groundwater. Small Unoccupied Aerial Systems (sUAS) create opportunities for rapid generation of high-resolution reproducible data without many of the drawbacks of satellite or traditional aircraft based remote sensing methods. This research has two related aims: 1) to identify areas of trace metal contaminated groundwater upwellings at the Tar Creek Superfund Site, where derelict mining operations resulted in elevated concentrations of iron, zinc, lead, cadmium and 2) to determine microtopography in the former Lake Frances soil surface for creation and restoration of a mosaic of wetlands along the Illinois River. Both field sites are in eastern Oklahoma. Sensors mounted on an Inspired Flight 800 sUAS will generate needed data. Identification of areas of groundwater upwelling will be accomplished using a Gremsy VIO F1 thermal sensor during winter, when temperature differentials between surface and ground waters will likely be greatest. Identification of surface water-groundwater interactions will guide treatment system design at this site. Wetland suitability via examination of microtopography will be determined using a RESEPI HESAI XT-32 Light Detection And Ranging (LiDAR) sensor to generate digital elevation models and other products from ground point returns with a vertical accuracy of +/- 3 cm. These elevation data will be used to guide creation of

different wetland types (e.g., wet prairies, freshwater marshes, scrub-shrub wetlands, bottomland hardwood forests) as part of the proposed Lake Frances Wetland Center. The use of advanced sensors mounted on sUAS provide unique high resolution, site-specific data to guide environmental restoration and remediation efforts.

Citizens' Perceptions of Wetlands Before and During the Restoration of a Local Wetland

Delaney Ringgold, University of Arkansas, Environmental, Soil, & Water Science Department, 495 N Campus Walk, Fayetteville, AR 72701
ringgd1@gmail.com

This study investigates the impact of a wetland restoration project on homeowners' perceptions and knowledge of wetlands in a residential area in Fayetteville, Arkansas. The research employs a pre- and during-restoration survey methodology to assess shifts in public perception and awareness of wetland environments. As part of the restoration project, native vegetation was reintroduced, and non-native species were removed, with the goals of ecological enhancement and improving the visual appeal of the wetland area. Surveys, consisting of Likert-scale questions and open-ended responses, were administered to homeowners before and during the restoration process to capture changes in demographic factors, wetland knowledge, site perceptions, and preferences for future restoration. Findings reveal that residents had a high level of wetland knowledge prior to the restoration, although their opinions on the aesthetic value of the wetland were divided. While the project did improve the visual appeal of the wetland, overall perceptions of its aesthetic value did not significantly change during the restoration, except for a notable increase in agreement with the statement, "The wetland is visually appealing." This study concludes that while public knowledge about wetlands is generally strong within this community, aesthetic improvements alone are insufficient to significantly shift public perception in the short term. The research recommends future studies to incorporate more rigorous statistical analysis, extend the survey periods beyond the restoration phase, and include post-restoration perceptions to gain a fuller understanding of how wetland restoration influences community attitudes toward ecological preservation and landscape design.

URBAN WETLAND FIELD TOURS

FRIDAY, OCTOBER 10

9:00 AM – 11:00 AM Morning Field Tours (select one)

11:00 AM – 1:00 PM Catered lunch & student awards

1:00 PM – 3:00 PM Afternoon Field Tours (select one)

Several options for field trips are available. Please select **one location for the morning** and **one location for the afternoon** from the options listed below.

IMPORTANT: TO HELP US COORDINATE TRANSPORTATION AND LOGISTICS, PLEASE REGISTER ON THE SIGN-UP SHEET FOR THE TOURS YOU PLAN TO ATTEND.

MORNING OPTIONS (9:00 – 11:00 AM)	AFTERNOON OPTIONS (1:00 – 3:00 PM)
Woolsey Wet Prairie	Wilson Springs Preserve
Apple Orchard Neighborhood Detention Pond	Osage Park
West Fork of the White River	West Fork of the White River
The River Commons	The River Commons

Site descriptions and details for each field trip are provided below to help you make your selections.

WOOLSEY WET PRAIRIE

Host: ECO, Inc.

Meeting Location: 15 N Broyles Ave, Fayetteville, AR 72704

Parking is available at the Westside Waste Water Treatment Plant that is adjacent to the wet prairie.

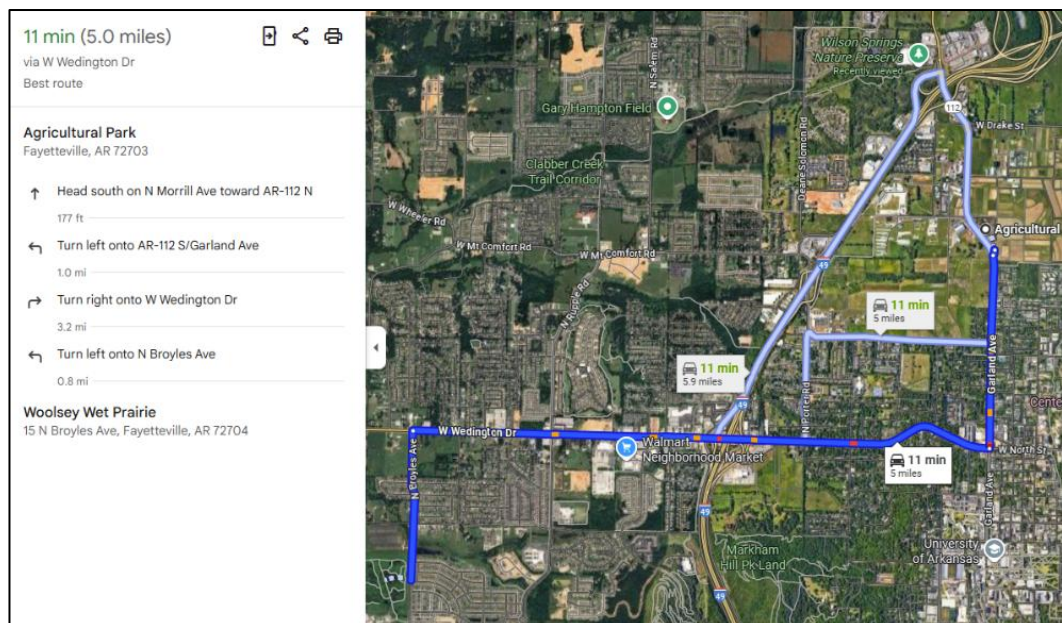


Woolsey Wet Prairie Sanctuary offers a rare look into a remnant tallgrass prairie ecosystem — a critically endangered habitat. This 40-acre preserve features diverse native wetland plants like sedges, rushes, and wildflowers, supporting a wide range of wildlife. Maintained trails and boardwalks allow for close observation without disturbing the ecosystem.

Field trip topics include wet prairie restoration and management challenges in a

rapidly developing area, as well as the ecological importance of these wetlands for flood control, water filtration, and biodiversity. Depending on the season, participants may encounter birds, amphibians, and insects that rely on this unique habitat.

This hands-on experience highlights the value of conservation in urbanizing landscapes.



OSAGE PARK

Host: The Peel Compton Foundation

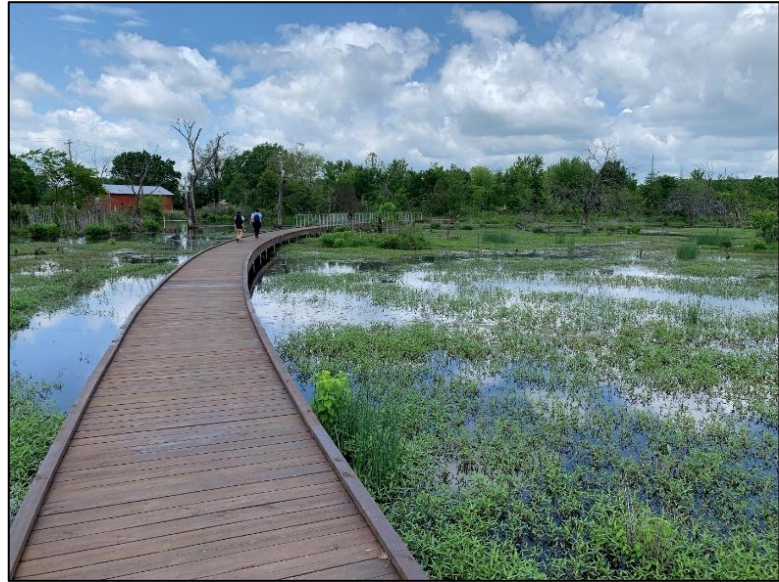
Meeting Location: 700 SW 16th St, Bentonville, AR 72712

Parking is available by the pavilion on the east side of the park.

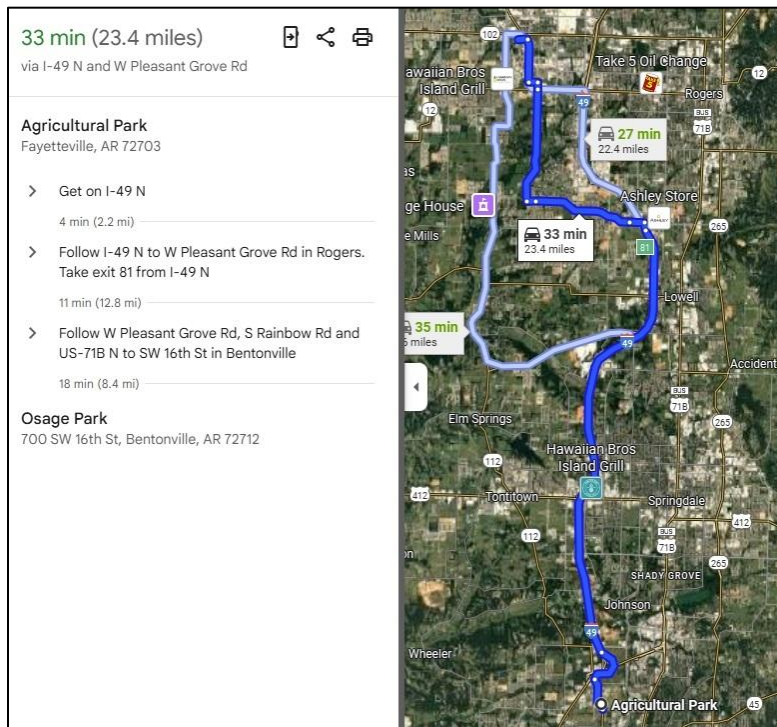
Osage Park, located in Bentonville, Arkansas, provides a fascinating example of urban wetland integration within a recreational space. This 55-acre park features constructed wetlands, stormwater retention ponds, and restored riparian areas, demonstrating how engineered solutions can enhance biodiversity and ecosystem services in a developed setting.

Field trip participants will explore the park's network of trails and boardwalks, observing the interplay

between natural and designed wetland features. This tour can focus on the park's role in improving water quality, mitigating flood risk, and providing habitat for wildlife, including numerous bird species



attracted to the diverse wetland environments.



The trip will highlight how Osage Park serves as an educational resource and a community amenity, showcasing the potential for incorporating sustainable wetland management practices into urban park design. Topics discussed can also touch on the challenges and successes of managing these constructed wetlands in a rapidly developing urban environment, providing real-world context for the conference theme.

THE RIVER COMMONS

Host: Watershed Conservation Resource Center

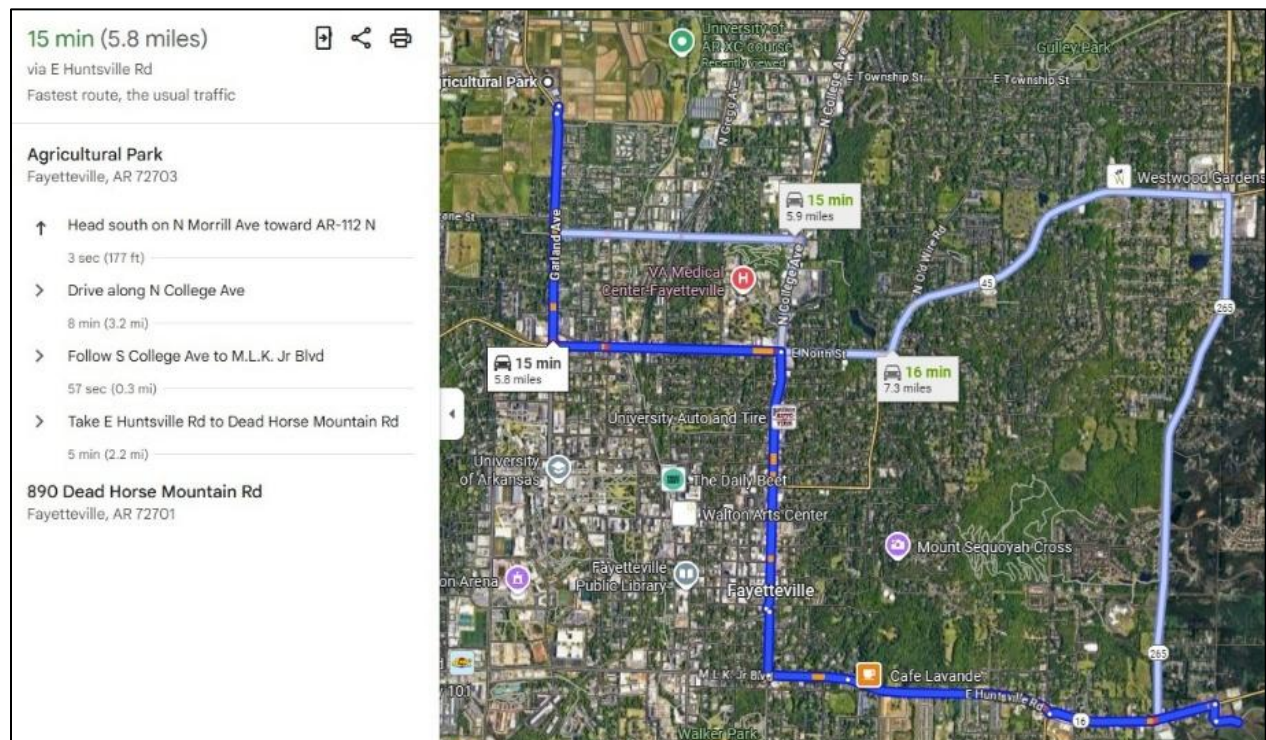
Meeting Location: 890 Dead Horse Mountain Road, Fayetteville, AR

Parking is available near the greenhouse and along the gravel driveway.



The River Commons is a 300+ acre conservation and education initiative in Fayetteville, Arkansas, located along the West Fork of the White River. Managed by the Watershed Conservation Resource Center (WCRC) and co-owned by WCRC, the City of Fayetteville, and Beaver Water District, it was established to restore critical ecosystems, protect drinking water quality, and engage communities in environmental restoration, cultural heritage, and nature-based recreation.

The site features diverse wetland and grassland habitats, mature riparian zones, and rare Ozark Highland Oxbow wetlands — a unique wetland type nearly lost to land use changes. A former soil excavation area



now supports a 25-acre wetland with emergent mudflats, providing habitat for over 135 bird species. WCRC continues to lead restoration efforts and future planning. For more information, contact WCRC at wcrc@watershedconservation.org.

The morning tour will explore a restored floodplain featuring a 25-acre wetland, while the afternoon tour highlights an expansive floodplain along the West Fork White River slated for restoration, including examples of Ozark Highland Oxbow wetlands. Participants can record the wetland plants and habitats they observe — and the top three spotters from each tour will win a WCRC cap!

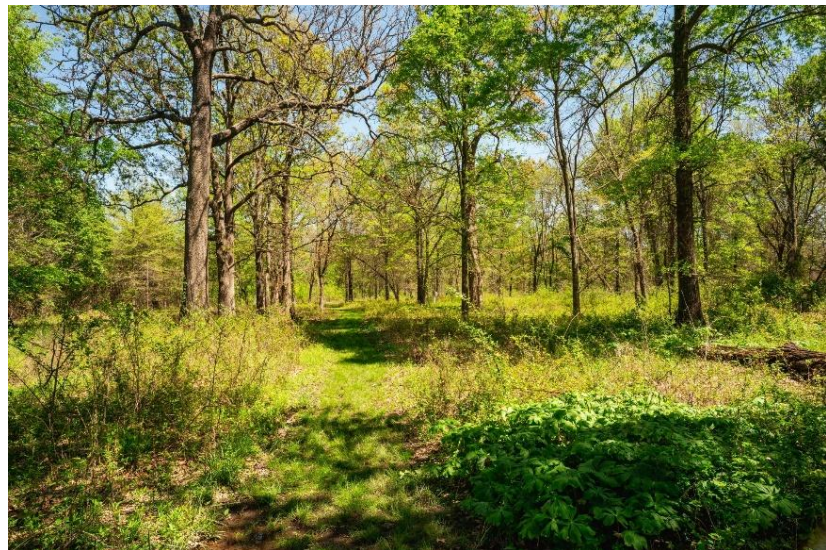
WILSON SPRINGS PRESERVE

Host: Northwest Arkansas Land Trust

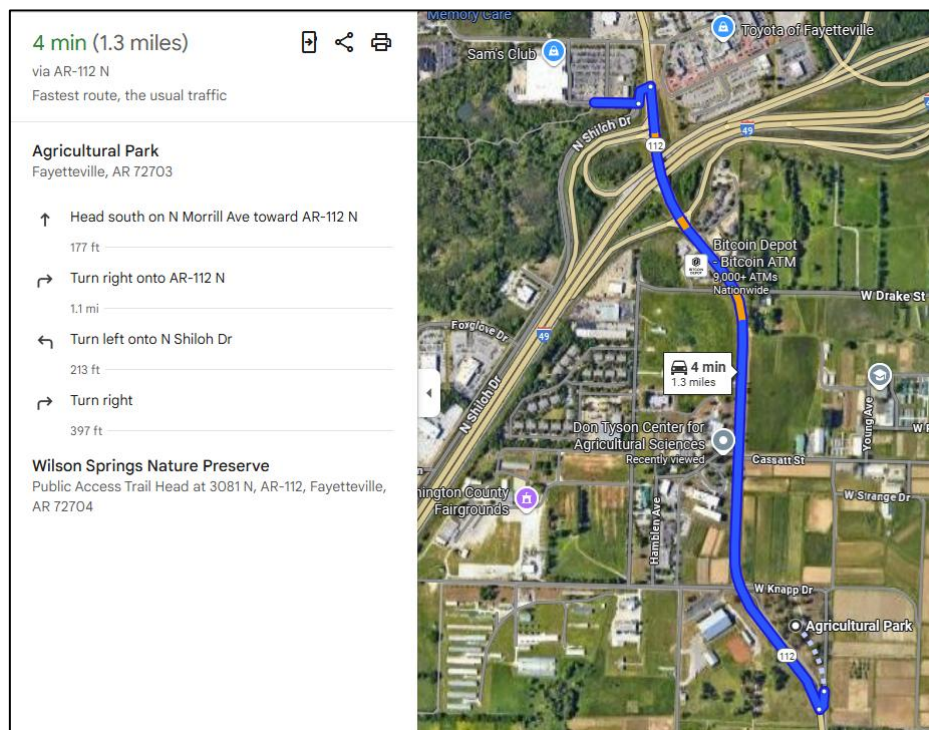
Meeting Location: Public Access Trail Head at 3081 N, AR-112, Fayetteville, AR 72704

Parking is available in the Sam's Club parking lot adjacent to the preserve.

Wilson Springs Preserve, nestled within the rapidly developing city of Fayetteville, Arkansas, offers a valuable glimpse into a diverse spring-fed wetland ecosystem. This 121-acre preserve encompasses a mosaic of habitats, including spring seeps, forested wetlands, and riparian zones, showcasing the ecological richness of the Ozark region. Field trip participants will explore trails



that wind through the preserve, observing the unique flora and fauna adapted to these hydrologically complex environments. This tour can cover the importance of spring-fed wetlands for maintaining water quality, supporting biodiversity, and providing essential ecosystem services. The trip will highlight the



challenges of protecting these sensitive habitats in the face of urban expansion, emphasizing the need for sustainable land management practices. We can also examine the role of community partnerships and educational outreach in preserving Wilson Springs Preserve as a natural oasis within a growing city, providing a compelling example of urban wetland conservation.

APPLE ORCHARD NEIGHBORHOOD DETENTION POND RETROFIT

Host: Illinois River Watershed Partnership

Meeting Location: Intersection of Apple Butter St. and Granny Smith Ave. in Springdale, AR 72764

Limited parking is available along the road in the residential neighborhood. Carpooling is encouraged. Please be considerate and **DO NOT** block any driveways, fire hydrants, or mailboxes.

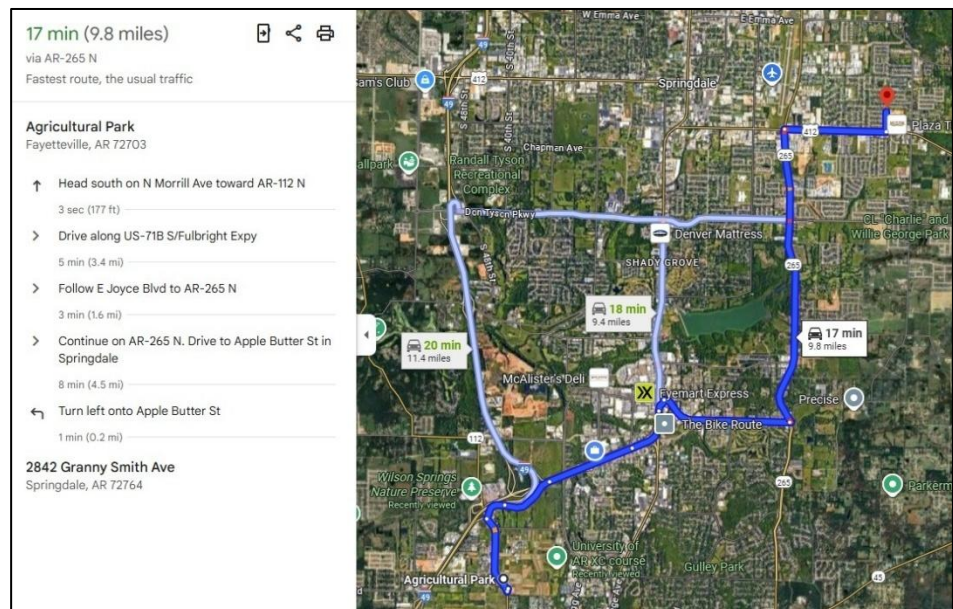


During this tour, participants will explore how the Illinois River Watershed Partnership (IRWP) and the City of Springdale transformed a conventional dry detention basin into a thriving ecological feature. This innovative retrofit demonstrates how stormwater infrastructure can be reimaged to support both environmental and community goals.

The site showcases the strategic use of native wetland vegetation and hydrologic modifications that extend water retention time, allowing for greater

sediment and nutrient uptake. These changes not only improve water quality but also create habitat for a variety of wildlife, enhancing biodiversity in an urban setting.

Participants will learn about the design process, implementation challenges, and long-term benefits of converting traditional stormwater systems into multifunctional green spaces. The project serves as a model for integrating ecological restoration with urban planning, balancing aesthetics, habitat value, and water quality improvements in a community-friendly environment.



WEST FORK OF THE WHITE RIVER

“Floodplains and Neighborhoods – An Ecological Stormwater Demonstration”

Host: Beaver Watershed Alliance & Watershed Conservation Resource Center

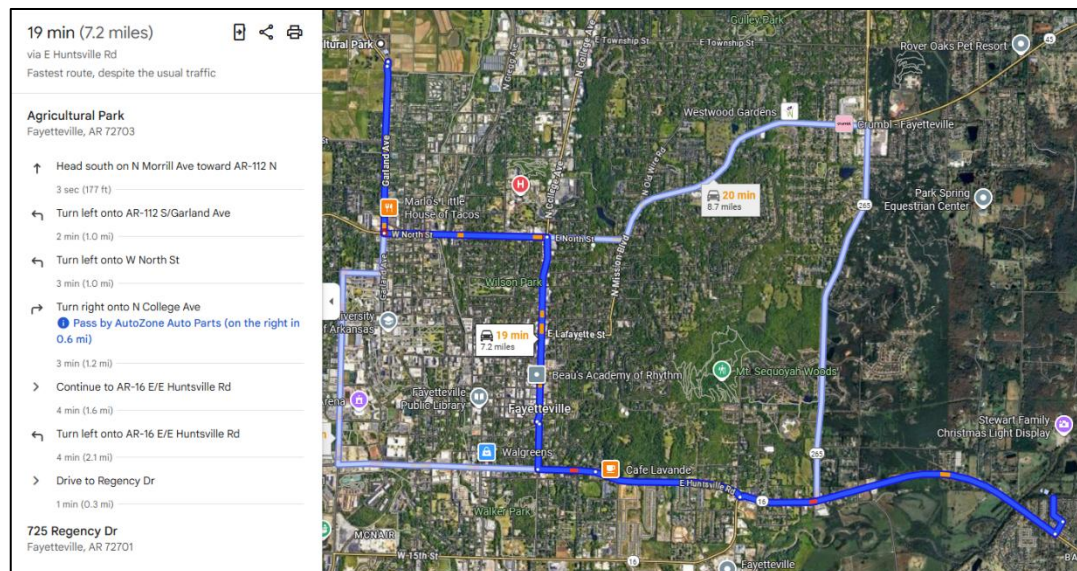
Meeting Location: 725 Regency Dr, Fayetteville, AR 72701

Parking is available at the north end of Regency Drive.

Join Beaver Watershed Alliance and Watershed Conservation Resource Center for a field tour of an innovative stormwater treatment project in Fayetteville, Arkansas, where ecology meets engineering. This collaborative effort—led by the Beaver Watershed Alliance with support from the Walton Family Foundation, Bio x Design, and the Watershed Conservation Resource Center—showcases a new approach to managing urban runoff from an established residential neighborhood.



On a 60-acre tract adjacent to the West Fork of the White River, a hay meadow and shallow ditch have been reshaped into a prairie-inspired mound-and-swale system. The design mimics natural Ozark landscapes to spread, slow, and filter stormwater before it reaches the river, reducing sediment and nutrient loads, protecting



riparian vegetation, and enhancing habitat. Additional restoration features include rock grade controls to stabilize a head-cut channel, bank full redirection

to increase water residence time, and extensive native plantings, including wetland species, to replace invasive species.

Tour participants will see first-hand how ecological design principles can be applied to retrofit stormwater infrastructure in a rapidly urbanizing watershed. The project also highlights the role of community engagement—residents have been engaged throughout the project, learning about low impact development practices through workshops and site-based education.

As urban growth accelerates in Northwest Arkansas, this site serves as a living demonstration of how ecologically-based BMPs can protect water quality, restore riparian functions, and sustain Beaver Lake—the drinking water source for over half a million people.

Comment card:

We want your feedback! Please fill out the following and leave it with a Board Member so that we can improve future meetings. Providing your contact information is totally optional.

1) What was your overall impression of the meeting (circle one):

Stinks/Dogwater Just OK Mid Very good Amazing/Bussin!

2) Would you consider attending another meeting (circle one):

Heck No Maybe Yes Can't Wait!

3) What areas can be improved (circle all that apply)?

Venue Presentations Cost Food Other

Specific items: _____

4) How would you describe the **quality of the content** presented (circle one):

Stinks/Dogwater Just OK Mid Very good Amazing/Bussin!

5) How would you describe the **professional value** delivered by the meeting (circle one):

Stinks/Dogwater Just OK Mid Very good Amazing/Bussin!

6) Favorite aspect of the meeting: _____

7) Least favorite aspect of the meeting: _____

8) Other feedback:

Society of Wetland Scientists South Central Chapter
2025 Chapter Meeting
University of Arkansas, Fayetteville, AR
October 9-10, 2025