

Name	Moderator	Abstract
Healthy Soils, Healthy Forests	John Kabrick	<p>This workshop examines how forest and woodland management practices affect soil health and what foresters can do to ensure healthy soils. It will begin with a presentation that defines soil health and identifies soil properties that are considered to be indicators of healthy soils. It will include presentations that describe the impact of forest and woodland management practices such as clearcutting, thinning, selection harvesting, and prescribed burning, and soil compaction from harvesting equipment on soil health indicators based on research conducted in the Ozark Highlands and elsewhere. The role of Missouri's new Forest Management Guidelines for maintaining healthy soils will be presented. Finally, it will conclude by identifying the most important things that forest managers need to do in order keep forest soils healthy.</p>
Missouri Careers in Fisheries	Blake Stephens	<p>The workshop focus will be to communicate what it takes to get started on a career path in fisheries. The primary objective will be to engage students and young fisheries professionals and fill in knowledge gaps for attendees to better prepare them for success in their career search. Seasoned professionals will benefit from sharing knowledge and experience and potentially finding recruits for seasonal employment. The specific agenda isn't finalized, but will include speakers from different disciplines within the fisheries field. One common theme that will be emphasized is the need for a well-rounded employee that seeks out ways to balance formal education and relevant experience. Specific skills that are desirable will be highlighted, as well as existing structure within agencies to continue to train and develop employees. Additionally, examples of pathways to getting to where you want to go professionally will be laid out. Breakout sessions will follow with ample opportunity for students and young professionals to interact with seasoned professionals.</p>

<p>The Relationship of Soil Characteristics and Biota with Native Plant Restorations</p>	<p>Ryan Diener</p>	<p>Speaker 1: Anne Hipton, Post Doctoral Researcher in the Bever/Schultz lab, University of Kansas, in the Kansas Biological Survey</p> <p>Title: Soil communities and restoration: the role of mycorrhizal fungi in grassland reconstruction</p> <p>Abstract: Soil microbial communities can have significant impacts on diversity and productivity of plant communities above ground, thus natural communities as a whole. Specifically, mycorrhizal fungi live in and on plant roots, and provide nutrients and sometimes water to plants in exchange for carbon. More than 80% of all land plants associate with mycorrhizal fungi, and arbuscular mycorrhizal fungi (AMF) are especially important drivers of plant community composition and diversity in grasslands. Land use disturbances such as tillage and grazing alter biological and environmental processes, which in turn impact the structure of AMF communities. During my dissertation work, we found that AMF community composition varied across different land use histories in prairies of Missouri. This suggests that implementing soil inoculation, specifically AMF, into restoration practices on disturbed land may increase overall restoration success. Currently, in the Bever/Schultz lab at the University of Kansas, we are working on ways to implement soil community inoculation (specifically with AMF) into restoration practices in disturbed and invaded grasslands.</p> <p>Speaker 2: Kristine Nemec, Integrated Roadside Vegetation Management Program Manager, University of Northern Iowa Tallgrass Prairie Center</p> <p>Title: Influence of Plant Species Richness and Seeding Density on Invasion Resistance and Soil Quality</p> <p>Abstract: The plant species richness and seeding density used in a prairie restoration affects the ecosystem services provided by the restoration. We assessed the effects of richness and seeding density on soil quality and resistance to invasive and other unseeded plant species in experimental tallgrass prairie plots in central Nebraska. In 2006, twenty-four 55 m x 55 m plots were planted with six replicates in each of four treatments: high richness (97 species typically planted by The Nature Conservancy), at low and high seeding densities, and low richness (15 species representing a typical Conservation Reserve Program mix, CP25), at low and high seeding densities. Seeding density was not important in affecting invasion resistance, except in the cover of unseeded grasses. Increased seed</p>
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ALICE-Safety Workshop	Ken Polley	<p>Across the country, our society has seen an increasing number of active shooter events where people are being killed or severely injured. According to the FBI, the “rate of which ASE [active shooter events] occur went from approx. 1 every other month from 2000-2008 to more than 1 per month between 2009-2012.” About 40 % of these events occur in the business or work place. The Missouri Department of Conservation is being proactive by implementing a training program to inform and educate its employees on how to react if they find themselves in an active shooter event. MDC will be providing training based on the nationally accepted A.L.I.C.E. system. A.L.I.C.E [Alert, Lockdown, Inform, Counter, Evacuate] is a set of proactive strategies that moves beyond lockdown and increases the chance of survival during a violent intruder event. ALICE is supported by more than 1,800 law enforcement agencies around the country and complies with the new standard of care recently developed by the Federal Department of Education, the Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), and the Federal Emergency Management Agency (FEMA). This seminar will introduce you to the ALICE system and show you why and how, you and your work team should prepare for an active shooter event.</p>
Soil Health: Importance for Everyone	Randy Miles	<ol style="list-style-type: none"> <li>1. Soil Health—Where Are We? Where Do We Need to Go? Donna Brandt, University of Missouri</li> <li>2. Soil Health is Not Just for Agronomists! Soil Health Considerations for Natural Resources Managers. John Kabrick, USDA Forest Service, Northern Research Station</li> <li>3. Need for Collection and Assessment of Soil Biological Properties, Mark Abney, USDA-NRCS</li> <li>4. Soil Microbiology and Soil Health Assessment, Kristen Veum, USDA-ARS</li> </ol>

<p>The Missouri Ozark Forest Ecosystem Project: The First 25 Years</p>	<p>Megan Buchanan</p>	<p>The Missouri Ozark Forest Ecosystem Project (MOFEP) is a long-term, landscape-scale study that was initiated by the Missouri Department of Conservation (MDC) in 1989 to evaluate the effects of alternative forest management systems on a variety of ecosystem responses. MOFEP was originally conceived to provide land managers with science-based information regarding the ecosystem effects of timber harvest. Through interagency and multidisciplinary collaboration, MOFEP developed into a framework that supports a suite of research projects examining the response of the flora and fauna of upland oak ecosystems to three forest management systems: even-aged management (EAM), uneven-aged management (UAM), and no-harvest management (NHM). MOFEP utilizes a randomized complete block design to test the effects of forest management systems, which are applied at the scale of the compartment, a multi-stand management unit, and replicated three times. The treatments applied to each compartment are representative of the primary forest management systems used by MDC for managing state lands and include clearcut, shelterwood, and selection-system harvests. Harvest entries in the EAM and UAM compartments occur every 15 years and the project is designed to extend for at least one 100-year rotation. The study plots associated with the MOFEP research projects were established between 1990 and 1992, the first harvest occurred in 1996, and the second harvest was implemented in 2011. In this session, MOFEP researchers will present results from the first 25 years of the long-term project, including the overstory vegetation, ground flora, herpetofauna, small mammal, and bird response to the forest management systems.</p>
<p>Agroforestry Workshop</p>	<p>Joe Alley</p>	<p>Agroforestry is an intensive land management system that optimizes the benefits from the biological interactions created when trees and/or shrubs are deliberately combined with crops and/or livestock. The five primary agroforestry systems are alley cropping, silvopasture, riparian forest buffers, windbreaks, and forest farming. One of the many benefits derived from a well-designed agroforestry system is improved soil health, resulting from reduced soil erosion, increased water infiltration, and improved nutrient cycling to name a few. This workshop will further define agroforestry for natural resources professionals and focus on the science behind soil health in agroforestry systems. We will also highlight agroforestry cost share opportunities for Missouri landowners through USDA NRCS's Environmental Quality Incentives Program (EQIP).</p>
<p>Aquatic Resources Papers</p>	<p>Ray Wright</p>	
<p>Soil and Water Papers</p>	<p>Ross Braun</p>	

Wildlife Papers	DeDe Vest	
Restoring soil function in Agroecosystems (Part 1)	Raymond Archuleta	<p>This session will focus in understanding agroecology principles and biomimicry strategies for increasing soil function in soil ecosystems.</p> <ul style="list-style-type: none"> <li>A. Understand the 4 major soil ecosystem processes.</li> <li>B. Understand how to use plants and animals has bio-primers for enhancing soil function</li> <li>C. Understanding key indicators to determine soil function</li> <li>D. Understanding key management factors for increasing soil function in agroecosystems.</li> </ul>
Invertebrate Management and Conservation	Steven Buback	<p>This workshop will focus on the management and conservation of the little things that make the world go around. There are estimated to be around 25,000 species of insects in the state of Missouri, many of which are poorly known and understood. These same insects are often the most abundant organisms in an ecosystems, and primary drivers of the functions. We will focus on a few important taxa and rare species that illustrate the complexity and challenge of working with invertebrates.</p>
Restoration of shortleaf pine: science, policy, and management	Michael Stambaugh	<p>The importance of restoration of shortleaf pine communities has national attention. In Missouri, multiple efforts are underway to plan and implement restoration treatments, primarily on public lands. This workshop provides information relevant to scientists, policymakers, and managers about the ecology, guidelines, and treatment prescriptions related to shortleaf pine restoration.</p>
Fisheries Papers	Mary Scott	

How Missouri citizens monitor soil health across the state	Sandra Arango-Caro	MO DIRT – Missourians Doing Impact Research Together is a citizen science initiative with the goals to educate Missouri citizens on soil science and soil-climate interactions. The first part of the workshop will focus on presenting the components of MO DIRT: soil health monitoring, soil science curriculum, high school scientists, and outreach. Also, we will introduce the hosting institution – the Donald Danforth Plant Science Center, and the funding source – the Missouri Transect, an EPSCoR grant given to the state of Missouri by the National Science Foundation. The second part of the workshop will focus on soil health monitoring. We will explain the idea behind this citizen science project (e.g. participants, sites, soil kit, soil health indicators, data portal), and will do demonstrations on how to measure some of the soil health indicators related to soil-climate interactions (e.g. soil respiration, soil temperature, and soil moisture).
Forestry Papers	Lauren Cartwright	
Restoring soil function in Agroecosystems (Part 2)	Raymond Archuleta	<p>This session will focus in understanding agroecology principles and biomimicry strategies for increasing soil function in soil ecosystems.</p> <ul style="list-style-type: none"> <li>A. Understand the 4 major soil ecosystem processes.</li> <li>B. Understand how to use plants and animals has bio-primers for enhancing soil function</li> <li>C. Understanding key indicators to determine soil function</li> <li>D. Understanding key management factors for increasing soil function in agroecosystems.</li> </ul>