



PennState Extension



**Association of Natural Resource Extension Professionals
2024 Biennial Conference
Hershey, Pennsylvania
May 5-8, 2024**

Proceedings and Abstracts

May 5, 2024

Gettysburg Battlefield Pre-Conference Tour

Experience the hallowed grounds of Gettysburg where over 160 years prior, the turning point of the American Civil War took place on July 1-3, 1863. This full-day tour will include multiple stops at locations on the actual battlefield where history was made. Your guide will be a Penn State Extension Educator who grew up and continues to do living history programs in Gettysburg. Along with the historical tour, you will see and hear about the environmental challenges facing the National Park Service and find out what is being done to ensure future visitors can learn what took place on the hills and fields around Gettysburg. Tour stops will include the Gettysburg National Military Park Museum and Visitor Center; Gettysburg National Cemetery where President Abraham Lincoln gave The Gettysburg Address in November 1863; battlefield locations of Culp's Hill, Devil's Den, the Wheatfield, walk Pickett's Charge like the soldier did on the afternoon of July 3rd, and more.

May 6, 2024

Welcome

Opening Remarks from Penn State Extension Director and the Secretary of PA Department of Agriculture

Jenna Mitchell Beckett

PA State Director and Agriculture Program Director
Alliance for the Chesapeake Bay

Matt Silveira

Manager in Environmental Sustainability
Hershey Company

Concurrent Session 1

Climate science and self expression: a climate change and performing arts curriculum for underprivileged youth

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A curriculum was developed to increase understanding of the environmental and social challenges related to climate change, and to employ performing arts education to foster creative expression and empower students to express their perspectives. This program was delivered as an after-school program to students in two low-income communities in Southern New Jersey, Bridgeton and Salem City. State curriculum standards addressed included Performing Arts, Science, Comprehensive Health, Social Studies, and Career Readiness. Partners included a social justice nonprofit organization, the education center of a historic theater organization, the education staff of a watershed association, and Cooperative Extension. Due to the afterschool nature of the program and expectations of students, the program delivery focused on physical or hands-on activities, and highlighted basic concepts in climate science. Assessment was often integrated into closing performing arts activities. In general, students

began with little knowledge or appreciation of climate change topics but gained an understanding of these topics through intuitive examples and engaging activities.

Climate-ready woodlands: Rewilding your backyard woods

Presenting author: Anna Stockstad (UMN Extension)

Co-authors: Angela Gupta and Emily Dombeck (UMN Extension)

As Minnesota's climate changes, forests will face increasing pressure from tree diseases and pests, heavier and more frequent rainfalls, warmer temperatures, and prolonged drought. New research in forest management, especially around climate change and invasive species, has highlighted the need for updated recommendations for tree selection. Using modeled climate response data from the Minnesota Department of Natural Resources and the Northern Institute of Applied Climate Science, University of Minnesota Extension created a suite of regionally specific recommendation lists of climate-resilient trees and plants (z.umn.edu/climateready). These lists also incorporate the benefits of trees and understory plants for charismatic microfauna, such as insects, which are often overlooked during planting decisions despite fulfilling critical roles in forest ecosystems. Through adoption of these recommendation lists, managers and stewards can holistically improve forest health by enhancing the resilience of Minnesota's woods to climate change.

Increasing the public's grass identification skills through multiple outreach methods

Presenting Author: Erin Garrett

University of Illinois Extension

While grass identification is often overlooked because it is considered too challenging, increasing popularity of prairie restoration, planting grasses in home landscapes, and spread of invasive grasses makes identification of grasses an important skill. Extension Educator Erin Garrett created a series of grass identification resources to make the process approachable and achievable.

The Which Grass is Which? series focuses on identification of different groups of grasses. Garrett delivers this programming through in-person presentations, hikes, and webinars, for natural resource managers, landowners, plant enthusiasts, Extension volunteers, and more. She focuses on easy to digest information, using field identification practices and including her detailed photography. To guide expansion of her content, she distributed a needs assessment to participants of her webinars. Based on the responses, she increased asynchronous materials by starting the Grasses at a Glance blog and short video series, as well as building website content. In five years, she reached about 2,000 participants through direct programming, garnered over 25,000 views of her recorded webinars, generated over 55,000 views of her blog posts in the first year and a half, and received over 61,000 views of her short videos in nine months.

Evaluation feedback exhibits the success of these resources in increasing grass identification knowledge and likelihood of participants putting their new skills to use.

Many Extension professionals have a niche area of expertise. Through embracing that expertise and being flexible in the ways that information is shared, Extension programming can be delivered to meet lesser-known needs of the public.

Refining and realigning for Water Stewardship: The Case of the Florida Waters Stewardship Program

Presenting Author:

Michelle Atkinson, UF/IFAS Extension Manatee County

Co Authors:

Shannon Carnevale, UF/IFAS Extension Polk County

Lara Milligan, UF/IFAS Extension Pinellas County

Michael D'Imperio, UF/IFAS Extension Sarasota County

The Florida Waters Stewardship Program (FWSP) serves as a transformative community education initiative focused on reshaping public attitudes toward water resources in Florida. Launched in 2016, the program employs a structured, yet adaptable, seven-session curriculum designed to cultivate informed community "Water Stewards." The curriculum includes comprehensive coverage of water resource management, surface waters, groundwater, water supply, conservation, legal aspects, and land use impacts.

A distinctive element of FWSP is its balance between theoretical and applied learning. Each participant engages in a stewardship project, bridging education to actionable impact. This hands-on approach is fortified by field excursions to diverse water environments and enriched by engagement with local stakeholders through guest lectures and panel discussions.

This holistic focus, augmented by regular in-class and online communications, fosters a vibrant community of learners and professionals committed to collective action for sustainable water use and management. To date, FWSP has conducted 14 courses across west-central Florida, engaging 239 participants and inspiring 40 community action projects.

As water resource challenges continue to escalate, FWSP serves as an exemplary model in Florida for education-driven community engagement with locally relevant topics. The program is on a trajectory of continual growth, extending its reach to new counties while refining its curriculum to meet emergent water resource issues.

Reaching Underserved Communities with Climate-Smart Forestry: A Pilot Peer Education Extension Program

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Women have the potential to contribute to climate change solutions, but many lack formative experiences in forest management which could be a barrier to participation in climate-smart forestry opportunities. A needs assessment study with women forest owners in Pennsylvania and South Carolina revealed that climate-smart forestry incentives could be useful for some legacy planning goals. Based on this, we designed a peer-education program that integrates legacy planning and climate change topics and trains community members to be informed companions for small landowner groups. The goal of the program is to help women connect their personal values about family and forest ownership to climate change mitigation/adaptation efforts and initiate women to explore carbon incentives and legacy planning opportunities. The Climate Smart Forest Legacy (CSFL) program is comprised of extension professionals, cohort leaders, women landowners and local forestry professionals. Cohort leaders received 2-3 hours of training in leadership skills and program procedures. Then the cohort leaders conducted interviews with 2-4 forest families and used a forest management quiz to help them establish management priorities. Information collected was used to curate a collection of extension articles relevant to the interests and needs of the learners. The cohort leaders hosted 2 guided discussion groups with learners and arranged a meet and greet with selected forestry professionals. Evaluation data revealed significant changes in knowledge and attitudes towards legacy planning and climate change topics, despite not having an extension professional in discussion groups. Participants also experienced the benefits of engaging in a collaborative learning environment.

Concurrent Session 2

Exploring program development needs of local landowner service providers

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Coauthors: Wyatt, Gary, and Dombeck, Emily; University of Minnesota Extension

For a regional Extension natural resources team, programming and content targeting local landowner service providers (LSPs) offers a strong opportunity to increase adoption of

active forest management activities by landowners. Interested in LSPs as a target for new private lands-focused programming, we report the results of a needs assessment to identify priority learning and content needs for LSPs serving woodland owners.

In summer, 2022 we surveyed LSPs from state and federal agencies, landowner associations, wood product companies, and forestry consulting firms about the volume, content, and difficulty of response of questions received from landowners; barriers to providing quality responses; help needed from Extension; and what communication tools LSPs use to engage landowners. We received 275 usable responses for a response rate of 42%.

Most LSPs received 0-4 questions per week. Questions on five topics were both common and difficult to respond to: Invasive species, insects & disease, woodland improvement or restoration, agroforestry, and controlling yard tree damage. Six other topics, while less common, were rated difficult to respond to by 50% or more respondents: Tax programs, harvesting timber, climate change concerns, carbon credits, ownership succession planning, and non-timber forest products.

LSPs communicated with landowners via telephone, websites, and email. Time, lack of shareable content, and limited knowledge were the greatest response barriers. We plan additional focus group data collection this winter; new content development and dissemination through LSPs; and coordinated strategic landowner engagement. Our results will be relevant to other Extension forestry programs targeting LSPs with forestry programming.

Food forests and agroforestry - plants and programs

Author: Wyatt, Gary J., University of Minnesota Extension. wyatt@umn.edu

Urban and rural families show increased interest in growing their own food by more frequently planting both annual and perennial options in their gardens and backyards. There is also a growing interest in planting community food forests and gardens in neighborhoods that are underserved and in food deserts. These food forests and edible landscapes have a connection with agroforestry and forest farming. Agroforestry is being promoted through USDA programs as practices that may be productive in a changing climate. State and federal funding programs are also supporting food forests and agroforestry practices as the need for such a resource increases. The University of Minnesota Extension Forestry team has created programs to increase awareness of agroforestry practices, food forests, and foraging opportunities, with educational programming targeting local Extension Educators and natural resource and conservation professionals. This session will highlight programs such as Fridays with a Forester, foraging workshops co-hosted by local Extension Educators and the MN Agroforestry Institute. The Agroforestry Institute offered extensive training in the five agroforestry practices which include windbreaks, riparian forest buffers, silvopasture, alley cropping, and forest farming. After the introduction of work being done at the University of Minnesota, we invite the group to

participate in an interactive discussion aimed at sharing innovative agroforestry programming that is being conducted throughout Extension.

Heirs Property and Succession Planning Challenges: Past, Present, and Future

Authors: Kurt Smith, NC State University

Heirs' property continues to be a vexing problem throughout the United States, but particularly in the South. It constitutes the most vulnerable form of land ownership that one can have. Heirs' property has a particularly challenging past with African American land loss at over 90% since 1910, and Native American loss well over 90 million acres largely through the phenomenon known as heirs' property ownership. In addition to its history, the problem persists in the farm and forest community in the modern era, without regard to race or economic status. More work needs to be done in the era of succession planning and estate planning to prevent already prolific land fragmentation on prime agricultural and forested lands from getting worse. Extension is in a unique position to work on the issue with strong intergenerational connections within the agricultural community. Several strategies and tools exist to work the problem and will be explored during this presentation.

Refining and realigning: hybridizing the Michigan Conservation Stewards Program

Authors/co-authors and affiliations:

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The Michigan Conservation Stewards Program (CSP) helps individuals gain knowledge and expertise that empowers them to engage in stewardship activities in their local communities. CSP introduces participants to the foundations of conservation, Michigan's natural communities, and ecosystem management. Conservation partners are critical to CSP's success, enriching both program content and local field experiences. In return, they receive highly knowledgeable graduates as potential volunteers. Before the pandemic, this program was offered almost entirely in-person, with supplemental course content provided via Michigan State University's online learning platform D2L. During the Pandemic, CSP was forced to adopt a fully virtual format which was delivered to 137 individuals across four regional learning cohorts in 2021. While in-person programming resumed, we designed a hybrid program delivery model which was delivered in 2023 to 175 students across seven locations. The hybrid format provided online educational content that students completed prior to attending weekly in-person evening

sessions. Participants also attended 1-2 weekend field days and completed a capstone (applied) project. The change in program delivery provides a unique opportunity to compare the fully virtual with the modified hybrid model. We will present virtual and hybrid program data including qualitative and quantitative participant feedback. We will spotlight results from pre- and post- course surveys from the recent hybrid programs, looking at changes in participant knowledge and attitudes about conservation, whether the course met their expectations, highlight reflections on their own learning, and propose how these results help document the program's impact and inform future curriculum and course improvements.

Super scientists: teaching youth scientific inquiry and life skills through science fair

Authors:

Andrea Lazzari, County Extension Director/Agriculture & Natural Resources Agent, UF/IFAS Extension Indian River County

Holly Abeels, Florida Sea Grant Extension Agent, UF/IFAS Extension Brevard County

Incorporating science fair into the elementary curriculum is an effective way to improve students' mastery of scientific concepts. The goals of science fair and 4-H overlap significantly. Both encourage scientific literacy and understanding, promote hands-on learning, and support the development of essential life skills such as critical thinking, planning, keeping records, responsibility, and communication.

Super Scientists is a six-week school enrichment program where fourth-grade students complete a classroom science fair project, going through each step of the scientific method from asking a question and developing a hypothesis to conducting an experiment and drawing conclusions.

At each step along the way, students write in their logbooks and fill out a miniature display board. Students practice their research and technical writing skills, reinforce graphing, data summarization, and other mathematical concepts, strengthen their public speaking and communication skills, and practice life skills such as critical thinking, curiosity, and organization. From 2017 – 2021, 186 4th grade students participated in the program and completed pre- and post-surveys. Results show a 76% increase in understanding what constitutes an experiment, a 27% increase in identifying the steps of the scientific method, and a 169% increase in identifying experimental variables. 48% of students reported an increased interest in STEM careers.

In this session, we will provide details on the program's structure and content, share outcomes and impacts, provide copies of curriculum resources, and discuss ways to adapt and implement this program in other locations.

Concurrent Session 3

Advancing Agricultural Best Management Practices in Florida: Collaborative Working Groups for Enhanced BMP Education and Implementation

Albertin, A.¹, Zhuang, Y.², Mayo, D.³, Carter, E.³, Leonard, D.⁴

¹UF/IFAS Northwest Extension District, ²UF/IFAS Central Extension District, ³Jackson Co. Extension, ⁴Calhoun Co. Extension

Farmers have implemented Best Management Practices (BMPs) on their lands for many years on a voluntary basis. However, with the passing of the 2016 Florida Water Bill, producers in areas with an impaired water body and mandated restoration plan are required to implement BMPs on-farm. In 2017 to better assist producers, stakeholders consolidated into four Extension-led regional working groups with the goal of enhancing BMP education and implementation in Florida. Groups members include staff from the USDA-NRCS, the Florida Department of Agriculture and Consumer Services, the Water Management Districts, the Department of Environmental Protection, Soil and Water Conservation Districts, several NGOs and faculty from UF/IFAS Extension and Research. Each group meets quarterly. Results from two BMP Working Groups (WGs) will be presented. In the NW Extension District WG, outcomes include collaboration among members in joint field days and multi-institutional grants to enhance outreach activities such as farm tours, professionally produced educational videos and to purchase conservation agriculture equipment for on-farm demonstrations. Grants also provided additional cost-share funds for producers to implement BMPs. In the Central District, survey results showed that WG members found the meetings very helpful. Respondents increased knowledge of Ag BMP regulations and/or technologies (76%), collaborations and communication among agencies in the region (86%) and meeting the needs of stakeholders through targeted research (50%). The group has also conducted a workshop for beginner farms, offering technical and financial support for BMP implementation. Ripple Effect Mapping is planned to capture the untold stories and behind-the-scenes activities that have resulted from the working group. Through effective regional stakeholder collaboration on BMPs, promotion is enhanced and producers may be more likely to implement practices and remain compliant with state laws.

Boating and waterway management to benefit the marine environment and coastal community resilience

Chantille Weber, Rick O'Connor, and Scott Jackson

UF/IFAS Extension Bay and Escambia Counties, Florida Sea Grant

UF/IFAS Extension, partnered with Florida Fish and Wildlife Conservation Commission (FWC), county coastal resource coordinators, and law enforcement representatives in Northwest Florida to create an education program addressing critical boating concerns. A

survey, developed in consultation with key stakeholders, helped identify target audiences and key topics for the "Stem to Stern" workshop.

The workshop covered six key areas:

1. Boating and Waterway Access: Highlighting the impact of anchoring and mooring regulations on community development and waterway access.
2. Regulation and Enforcement: Emphasizing marine enforcement efforts, including derelict vessel management and the FWC Volunteer Vessel Turn-in Program or VTIP.
3. Waterway Environments: Addressing environmental concerns, such as invasive species and seagrass conservation.
4. Boating Safety: Promoting safe boating practices, particularly in pontoon boating.
5. Public Education: Strategies for effective public communication and responsible boating practices.
6. Pollution and Marine Debris: Initiatives aimed at combatting pollution and marine debris, along with preparedness measures for handling storm-related challenges.

A post-event evaluation was conducted with 24 of 50 (48%) completing the survey, which revealed 75% of attendees rated the workshop as "Excellent". Participants expressed intentions to share information (90%), follow up with presenters (74%), and utilize formed networks (58%). Notably, new connections were established to address pontoon boat rental safety and seagrass protection. The success of 'Stem to Stern' is highlighted by attendees who expressed interest in attending future statewide events (50%), further indicating the potential for continued engagement in the vital field of boating and waterway management.

Broadening Extension through Student Training (BEST)

Presenting Author: Calvin Norman

Co Authors: Jesse K. Kreye, Sanford S. Smith, Melissa M. Kreye, Allyson B. Muth, Tyler Groh, & Faith Kibuye

Recruiting new Extension professionals is a large the challenges shared by Extension Services across the nation. To help recruit new Extension professionals and raise the profile of Extension with graduate students, we developed the Broadening Extension through Student Training (BEST) program, a weeklong training program that taught students: the land grant system/Extension policy, non-formal education theory and approach, stakeholders and audiences, methods and practice of extension programming, best practices for creating impact, youth extension, and diversity, equity, and inclusion challenges in Extension. This program was initial pilot in 2022 with six graduate students. It was highly successful, and a slightly modified form of this program was offered in to graduate students from across the College of Agriculture in summer of 2023 using lectures, panel discussions with extension professionals, and group discussions and assignments to 15 graduate students. BEST has resulted mentorship for selected graduate students and the production of several programs, webinars, or factsheets that were

led by or originated from BEST students. BEST has also been paired with a spring webinar series where College of Agriculture graduate students educated the public about their research. This series reached ~1,100 participants with five webinars. This webinar series was excellent training for graduate students and will be offered again in 2024. Both programs have been highly successful in raising the profile of Extension and have resulted in several students applying for jobs in Extension.

Expanding audience reach and impact with woman-focused forestry programming

Renee Strnad, NC State University Extension Forestry

Jenn Fawcett, NC State University Extension Forestry

NC State University has provided woman-focused programming in the past and continues to develop and promote forestry educational programming that is designed to be more inclusive of women. Data from the 2018 National Woodland Owner Survey in the United States shows an 8% increase in women being the primary owner of family forest land from 2006 to 2018, thereby making decisions for close to 57 million acres (2.3 billion hectares) of forest land across America. Women also represent a large majority of joint ownerships, with potential to contribute to management decisions and activities on many more millions of acres. However, research has shown that women are less likely than men to participate in forest management activities.

This presentation will highlight past programming efforts and how national models like Women Owning Woodlands and state models like ForestHer have been used to help build partnerships across North Carolina. This session will include time for discussion around individual states' successes and struggles and building a list of recommendations for other states that would like to undertake similar programming efforts.

Running a successful rain barrel webinar

Author: Justin Mansberger

Abstract:

The program titled "Uses and Benefits of Rain Barrels" is a webinar given to homeowners interested in learning more about installing a rain barrel on their property. Rain barrels are an easy and relatively cheap method to help eliminate stormwater problems that homeowners can face. Stormwater and related issues, like flooding, continue to become increasingly problematic. A rain barrel is one of the best management practices that can help not only reduce stormwater problems but also help a homeowner reduce water consumption and save money.

The webinar starts by addressing the issues that stormwater can cause in our environment and why it is becoming such an alarming problem. It then transitions into specific

ways the audience can help counteract this problem, specifically by stating the various benefits rain barrels can have when used correctly. The audience gets a step-by-step guide on building a rain barrel, such as the essential parts and practices. Lastly, attendees learn how to maintain and care for their rain barrels with general maintenance and winterizing tips.

The educator has presented this program eight times over the past three years since the establishment of the program. Over 1,500 people attended these eight programs, but most attended during two nationwide webinars in April of 2022 and 2023. Two post-evaluation surveys were sent out to attendees to gauge the effectiveness of the programs. Attendee's general knowledge about rain barrels increased from 3.0/5.0 to 4.2/5.0, and their understanding of maintaining a rain barrel increased from 2.8/5.0 to 4.2/5.0.

Concurrent Session 4

Bringing the Woods to the Classroom: Using virtual reality to build the local forest sector workforce

Lauren Grand, Oregon State University

Oregon's forest sector is finding it difficult to fill positions vital to keeping our rural businesses running at full capacity. Jobs in forest management and manufacturing are especially important to the building of our community and local economy. Oregon is comprised of 50% forestland and is the largest lumber and plywood producer in the country. Despite our rooted connection with the forest sector, there is a lack of awareness and/or interest to pursue these jobs. Virtual Reality (VR) is a technology where students can put themselves into the forest and engage with forestry tools and harvesting equipment without leaving the classroom. Students see what it is like to control a harvesting machine and gain an understanding of the skills needed to perform this job. To address workforce needs, the goal of this project is to bring the forest into the classroom through virtual reality, and increase interest among youth about employment in the forest sector. OSU Master Woodland Manger volunteers will be trained on the delivery of the VR program and can assist during the in-class sessions. This presentation will cover considerations for developing a virtual reality program, examples of what worked and what didn't, and the current results of the success of the project and where we go from here.

Burning to incorporate fire into your programming? An overview of programs, tools and resources to help you expand or get started

Lead Presenter:

Leslie Bobby, Southern Regional Extension Forestry

Coauthors:

Carrie Berger, Oregon State University

David Godwin, Southern Fire Exchange

Jennifer Fawcett (NC State University),

Doug Cram, NM State University

Alison Deak, University of California

Wildfires continue to impact people and landscapes across the country and beyond - with no sign of letting up (e.g., Hawaii, California, Colorado, New Mexico, Great Plains, Florida, Canada, Europe, Australia). With a growing prevalence of wildfires, the opportunity for Extension to service communities is front and center. The ANREP National Extension Wildland Fire Initiative (NEWFI) comprises members from across the nation who are actively engaged in fire-related programming. Examples include everything under the sun such as: “learn and burns” with landowners, neighbors, and youth; classroom trainings (in person and remote); developing online courses; post-fire flood and debris flow mitigation; mental health workshops; evacuation guidelines; fire hardening; youth education; prescribed burn associations; finding funding; and more. This presentation will showcase numerous wildland fire extension programs, provide guidance on how to initiate your own efforts, share network connections, and even brainstorm novel programs to fit your unique needs. Wildland fire expertise is not required - just a willingness to serve your community. Join this presentation to gain a better understanding of Extension's role in this hot topic and discover how you can make a difference.

Experiential Learning Programs Further Natural Resources Stewardship Among Ohio Women

Beth Scheckelhoff, Ohio State University Extension, Putnam County

Mary Wilhelm, Putnam Soil and Water Conservation District

Bonnie Brooks, Putnam Soil and Water Conservation District

Ohio State University Extension Putnam County and Putnam Soil and Water Conservation District staff in Ohio developed and delivered a monthly series of educational programs in 2023. The program series titled “Women for the Land” was designed using the experiential learning circle model and consisted of educational sessions, hands-on workshops, and field trips. The goals of “Women for the Land” were to: 1.) bring women with similar interests together to learn about natural resource topics important to them, 2.) provide a welcoming environment where participants openly share their own experiences and learn from one another, and 3.) provide participants with resources, tools, and assistance to apply

knowledge and skills learned following educational programs. The target audience for the program series included women from all backgrounds and varying experience in agriculture and natural resources topics. Program sessions were facilitated by one or more of the authors and focused on the following topics: women in agriculture, mental health, land leasing, pollinators and pollinator habitats, gardening, forestry, soils, native and invasive plants, wildlife, and water quality. All sessions began with participant introductions and sharing followed by one or more guest speakers. Many sessions were conducted off-site and included field trips and hands-on demonstrations followed by lunch and conversation. Participant follow-up surveys following the final November 2023 session will be shared.

Partnerships and practical solutions: leadership development through adaptation planning and resiliency

Authors: Holly Abeels and Alicia Betancourt

Affiliations: University of Florida IFAS Extension

This presentation will highlight and describe how multi-organization partnerships can help local governments work on adaptation planning for flooding and sea level rise in Florida. Two regions of Florida will be the focus of this presentation, with case studies from the Florida Keys and the Space Coast. With expertise and leadership from Extension, these meaningful partnerships engage with local governments and other organizations working on resiliency and adaptation planning. The presentation will describe how partnerships in these regions started and where the partnerships are today as well as give examples of how the partnerships have grown despite obstacles such as the COVID-19 pandemic. Partnerships and grant opportunities with local governments, universities, regional planning councils, and resiliency collaboratives will all be highlighted in this presentation. Building and fostering these partnerships support resiliency for local communities across Florida. Participants will increase their knowledge of various partnerships working towards local government resiliency in Florida and will leave the presentation with potential ideas for partners to reach out to and start building relationships for working on resiliency.

Zebra Mussel Safari: A Framework for Engaging Citizen Scientists

Sawyer Lorentz, University of Minnesota

Zebra mussels, (*Dreissena polymorpha*) have fundamentally re-engineered ecosystems, degraded natural resources, and cost billions in direct and indirect management costs across their invaded range of North America. Many eradication efforts have been initiated, but have so far proven to be unsuccessful in well-invaded ecosystems. The development of a large-scale monitoring program was identified as a valuable and necessary tool to bolster management and forecast invasions of zebra mussels. To that end, we have developed a working and expandable participatory science program, Zebra Mussel Safari, to monitor zebra mussel populations.

Following two pilot seasons that developed methods and communication tools, we recruited 55 participants from 7 lakes across Minnesota for 2023. To collect, analyze, and leverage the high-volume, volunteer collected data participants uploaded photographs of zebra mussel settlement plates through an online application to quantify local abundance relative to environmental factors (e.g., substrate, depth, disturbance, etc.). Photo processing occurs through an automated process with a high degree of accuracy compared to verified hand-counted data. Ultimately, the data are used to inform models to understand zebra mussel occupancy, suitability, and dispersal dynamics within and across Minnesota lakes. Early lessons learned from formal (i.e., survey) and informal communications are being analyzed to improve retention, data accuracy, and shared understanding in project goals. We are optimistic that our approach will provide support for managers to help guide remediation strategies for management and demonstrate the effectiveness of participatory science programs in closing data gaps.

Concurrent Session 5

A Partnership Showcase with Extension-led Master Naturalist Programs

Michelle Prysby, Virginia Tech/Virginia Cooperative Extension (corresponding author)

Duane Friend, University of Illinois Extension

Blake Moore, University of Delaware Cooperative Extension

Becky Sapper, University of Wisconsin-Madison Division of Extension

Extension-supported Master Naturalist programs exist in at least 24 states, but most of these programs are still relative newcomers to Extension's suite of volunteer programs. They frequently differ from other established Extension programs by having a much larger dependency on external partnerships. Depending on the state, partner organizations may be responsible for volunteer training, a significant portion of program funding, oversight of volunteers, management of volunteer projects, and more. These in-depth partnerships have helped Master Naturalist programs proliferate quickly, both within states and across the U.S. They also have helped programs increase their impacts on natural resource conservation, engage more diverse audiences, and operate more cost-efficiently. In this panel presentation, representatives of four states' Extension-based Master Naturalist programs (Delaware, Illinois, Virginia, and Wisconsin) will share why partnerships are critical in their programs, how they have formed partnerships, what they have accomplished because of those partnerships, and the specific ways they have nurtured the partnerships in order to sustain them over the long term. Panelists will also identify challenges that they have either overcome or are still working to address related to their partnership efforts. The session will close with a facilitated group discussion during which attendees will consider partnerships in their programs and how to use them strategically and successfully.

Bringing nature to our youngest 4-H members

Sara Lewis, Ohio State University Extension, 4-H Youth Development Educator, Fulton County

**Christy Millhouse, Ohio State University Extension, Ohio 4-H STEM Educator **

Rebecca Supinger, Ohio State University Extension, 4-H Youth Development Educator, Greene County

Have you ever taken a walk outside with a six-year-old? As they explore the world around them, you can see the excitement in their eyes as they discover new and interesting things that might seem insignificant to adults. Research shows that exploring nature is a key component in child development. Authors Alicia Deaver and Lindsay Wright (2018) in their article, “A World of Learning,” suggest that nature education improves physical, cognitive, and social/emotional development in early childhood. They write that “children who learn through outdoor play and in natural environments often have lower stress levels and improved cognitive functioning.” Author Larry Prochner (2021) defines nature-based education “as children’s active learning in the natural world in which children are afforded regular opportunities to interact with nature.”

In 4-H, our youngest members are ages Kindergarten-Grade 2 (K-2). In Ohio, we call these members Cloverbuds. Ohio 4-H provides resources to create a robust nature-based experience for these youngest members. During this session, we will explore the benefits of providing nature-based education for our 4-H Cloverbuds and best practices for conducting these nature activities. We will also touch on opportunities for partnerships across Extension program areas. Presenters will share ready-to-use hands-on activities that anyone can use with a K-2 audience. When you leave this session, you will be ready to explore nature with the same enthusiasm as a young child.

Collaborations and needs around climate change work in forestry

Presenting Author: Kris Tiles, kris.tiles@wisc.edu

List of co-author names and affiliations (if applicable)

- **USDA Northern Forests Climate Hub & Northern Institute of Applied Climate Science (Maria Janowiak)**
- **Penn state (Melissa Kreye)- Forest Owner Carbon and Climate Education program (NIFA-funded, involving 3 Hubs)**
- **Forest Stewards Guild (Erika Rowland)**
- **Minnesota Extension (Eli Sagor/ Anna Stockstad- TBD) (Climate Ready Woodlands)**

Many forestry educators inherently know that climate change will alter forests and forest management but may struggle with how to engage in the topic with our stakeholders. As interest in this topic increases, it becomes more important to understand what resources are already available as well as needs and opportunities for new ones. In this special session, we will

showcase a variety of successful resources and programming that Extension educators can use to engage their audiences and engage in an open conversation to identify the elements of successful efforts. We will highlight the work of Extension programs, the USDA Climate Hubs, and Forest Stewards Guild who have each worked collaboratively to develop locally relevant materials.

After a few panel presentations to provide examples of this work, we will facilitate active and open dialogue to explore the following questions: (1) what other programs or projects exist to address climate change in Extension forestry work, (2) what needs educators are seeing for their stakeholders, (3) what ability (time, resources, priorities) do educators have to program in this area, (4) what partnerships can help Extension address climate change programming needs.

Creating a culture of laughter

Misty Harmon, Ohio State University

The goal of laughter therapy is to increase awareness about attitudes and feelings, gain a reprieve from daily stress and worry, encourage healthy choices, build creativity, and promote peak performance. Practicing laughter daily elevates mood, improves efficiency and performance, creates social connections, helps overcome challenges, and provides health benefits. It's a complete package for physical, mental, social, and spiritual well-being year-round.

Today's climate of differing viewpoints and polarizing topics can be challenging for Extension professionals. Laughter is a universal language. There are no restrictions on incorporating more laughter into our lives, including our work. Laughter is for everyone. This hands-on workshop focuses on the benefits of incorporating simulated laughter into our lives without relying on humor, jokes, or comedy, which are subjective and vary greatly. Gain a deeper understanding of laughter therapy and how to utilize laughter in holistic wellness plans to be more effective in your professional and personal life. Explore ways to add more laughter to life as we discuss the health benefits of laughter, write a FITT laughter prescription, and practice laughter yoga together.

Extension professionals can use laughter year-round to improve team engagement and relations, boost creativity and productivity, increase problem solving, and build rapport. Laughter increases trust and trust improves team functioning. So, the next time one of your teams needs a break or a boost, let the joke or laughter be on you!

Fostering Stewardship: A How-To Guide for Trainers- Explore and Receive the New ANREP Gold Award Winning Land Steward Curriculum

Rachel Alessa Werling, Oregon State University

A decade of collaboration and creativity with a dozens of partners across disciplines has resulted in a 2022 gold award for outstanding educational materials from the Association of

Natural Resource Extension Professionals (ANREP) for the new Land Steward curriculum. Join our workshop to practice the many tools of this program and learn how it can benefit your audience. Receive a hard copy of *Fostering Stewardship: A How-To Guide for Trainers*. The award-winning Land Steward (LS) training stimulates those living on rural land to adopt best management practices (BMPs). It teaches them about land management and guides them through a planning and technical assistance process. The adaptable program uses many formats to introduce landowners to BMPs for woodlands, wildlife habitat, riparian systems, fire hazard reduction, pastures, soil health, rural economics, water systems and more. It bridges the divide of many natural resource fields with a multi-disciplinary approach to the complex management realities of life on rural land. This approach has broad appeal for landowners be they foresters, farmers, ranchers, hobbyists, or conservationists. Our interactive workshop will share the impacts of the program and highlight the varied possibilities to leverage Land Steward tools with your own program. We will explore the 11-week field training, the 9-week online or hybrid course, the Rural Resource Guideline series, and the powerful peer-to-peer learning and community building methods of the program. Consider partnering to serve your area with our offering of the online course! Leave with the curriculum and join the Land Stewards!

Re-Wilding Urban Landscapes workshop enhances participant learning and builds diagnostic skills

Lead Presenters:

Carrie Brown, Ohio State University Extension

Beth Scheckelhoff, Ohio State University Extension

Additional Presenters (all Ohio State University Extension):

Curtis Young, Eric Draper, Joe Boggs, Ashley Kulhanek, Carri Jagger, Pam Bennett, Ann Chanon, Ashley Kulhanek

Additional Contributors (all Ohio State University Extension):

Amy Stone, Jen Andon, Maria Gulley, Francesca Rotondo

The Ohio Master Gardener Volunteer (MGV) Plant & Insect Diagnostic Workshop equips MGVS with knowledge and skills to accurately diagnose commonly encountered plant and pest problems in Ohio landscapes. MGVS play an integral role in responding to eXtension Ask a Master Gardener questions as well as fielding calls and sample submissions for county extension offices in Ohio. Their ability to accurately assess plant and pest problems and provide sound solutions is essential. The MGV Plant & Insect Diagnostic Workshop utilizes slide presentations, hands-on live sample evaluations, traditional and electronic diagnostic tools, and interactive discussion to enhance participant learning. The workshop is offered in three to four locations across Ohio each year. Each workshop consists of a primer on entomology and plant pathology followed by evaluation and discussions of live plant and pest samples. The workshop will be condensed and simulated for ANREP participants to include presentations, diagnostic tools, and

live sample selection, evaluation, and discussion. All materials including presentations and teaching notes, sample suggestions, information on purchasing diagnostic tools, and evaluation materials will be provided to participants for future use in their own programs.

Adding to your programming toolbox: The NAAEE Guidelines for Excellence

Renee Strnad, NC State University Extension Forestry

ANREP has embarked on a three-year partnership with The North American Association for Environmental Education (NAAEE) through a multi-year initiative called ee360+. The four goals of the ee360+ initiative are to 1) drive educator excellence, 2) strengthen organizational capacity and leadership, 3) mobilize access to high-quality resources and networks, and 4) maintain excellence through evaluation, communication, and management. Through this project, ANREP was awarded three years of funding from the ee360+ initiative to help build connections between Extension professionals and the field of environmental education. This session will continue the work of the ee360+ partnership by introducing ANREP members to the NAAEE *Guidelines for Excellence* series and how the materials can support Extension work as another tool in the Extension professional's toolbox. The *Guidelines for Excellence* series set standards for high-quality programming to increase environmental literacy including program development, the creation of educational resources, professional development for those in environmental education, community engagement, and more. Participants will explore the various resources in the *Guidelines for Excellence* series, learn how to access the materials, and selected resources in greater depth.

Basic Wood Identification for Common Hardwood Species Using a Hand Lens

Author: Scott Weikert

Affiliation: Penn State Extension

Identifying trees is a skill that many, if not all, natural resource educators have mastered. After a tree is cut down and sawn into lumber, identification is more difficult, if for no other reason than most people have not been trained on how to do it. This workshop will teach participants basic features of wood anatomy that can be used to help identify common commercially important hardwood species. The workshop will include presentations and hands-on practice using a razor blade and hand lens. There will not be enough time to cover every species, but the knowledge gained from this session can be applied to identify many other species.

Brooke meets a stream doctor, featuring Dr. Watt R Shedd

Presenters:

Jennifer Fetter, Extension Educator, Water Resources jrf21@psu.edu

Brad Kunsman, Extension Educator, Water Resources bjk21@psu.edu

Get your copy of the brand-new story and activity book, Brooke Meets a Stream Doctor, Featuring Dr. Watt R. Shedd. Learn how to teach elementary-aged students about stream health in a fun and meaningful way. Each chapter includes a student investigation that can be done as a class or independently.

This session will provide an overview of stream health and the characteristics of a healthy stream that can be observed and measured by any aged learner. But then we will introduce our new elementary-aged stream health teaching tool, Brooke Meets a Stream Doctor, Featuring Dr. Watt R Shedd. This engaging storybook is a read-along chapter book written at the 4th-grade level. It includes many hands-on investigations that match the book's storyline. The book is written to provide a Meaningful Watershed Educational Experience by following NOAA's MWEE framework. (a brief explanation of the framework will also be provided). We will demonstrate some of the activities in the book and provide all attendees with a copy of the book to take back to their classroom/teaching space.

Building Safe and Inclusive Spaces Tips and Tricks for Pursuing External Dollars

Leslie Boby, Southern Regional Extension Forestry

External funds can help you achieve your programming goals or may help you on your path to tenure, but it may also be hard to figure out. In this presentation, learn about the types of funding available, ways to partner with others, and best practices for joining large grants. Funding can range from large, multi-state, multi-year grants where Extension is only one of the members to smaller, focused grants that cover one event. Learn how you can connect with funding agencies and/or organizations that may have leftover funds that could be used for your special project. External funds can be used to hire additional support in the form of full-time, part-time, or hourly personnel, or can be used to pay for travel to conferences, landowner events and more. Funds can also be used to print or purchase materials that can be used for special events, programs and more. In recent years, many large United States Department of Agriculture (USDA) grants have had a significant focus on Extension and Outreach, but many grant teams are led by others. This presentation will also cover things to think about when joining a large team. Join this presentation for an overview and recommendations to help you find the funding you need.

Re-Wilding Urban Landscapes

Theresa Badurek

University of Florida/IFAS Extension, Pinellas County

Urban landscapes, while teeming with human life, often lack plant and animal life or diversity. Habitat loss typically cannot be reversed but re-wilding proposes a path to create habitat in urban areas wherever possible. The objective of this workshop is to give extension educators the tools and methods for re-wilding and teaching re-wilding in their communities. This interactive session will include an open discussion on reaching diverse audiences by partnering with community groups and a special focus on environmental justice. Workshop delivery methods will include: an overview of the re-wilding concept, addressing the new design aesthetic, an exploration of tools and resources (both giving and encouraging sharing resources), an activity where concepts are applied in small groups, and an action checklist for bringing this concept home to any community. The expected result will be that workshop attendees are excited and prepared to start a re-wilding education program in their community. The attendees may even be able to form a re-wilding network for support, resource sharing, data collection, etc.

Stop the Invasion: Unwanted Plants, Bugs and Other Pests": A hands-on curriculum for youth audiences

Lauren Kauffman and Ellyn Siftar

Penn State Extension – 4-H Youth Development

“Stop the Invasion: Unwanted Plants, Bugs and Other Pests” is a hands-on interactive curriculum through which youth in grades 6th through 9th develop an understanding of invasive species, their effect on ecological and economic systems, and the role youth can play in surveillance, management and eradication. Workshop leaders will walk attendees through a variety of modalities possible with this science-based curriculum and will provide opportunities for hands-on learning, allowing attendees the chance to experience first-hand what this curriculum has to offer.

The activities in “Stop the Invasion: Unwanted Plants, Bugs, and Other Pests” were written by Penn State Extension 4-H and watershed youth development educators to emphasize the use of inquiry and the experiential learning model. The experiential learning model emphasizes the importance of youth being involved in the actions of “Do, Reflect, and Apply” which are ways to connect life skill development to any subject matter learning experiences. Participants of this workshop will gain an understanding of how the experiential learning model can be put into practice as they engage in the curriculum activities.

Workshop leaders have used this curriculum in the following settings: after-school programs, summer camps, in-school programming, virtually, out-of-state audiences, juvenile

justice system, and with younger youth. Workshop participants will also walk away with ideas on how to adapt this curriculum to meet the needs of diverse youth audiences.

Poster Session

What Does Taylor Swift Have To Do with Influencing Pro-Environmental Behavior?

Presenters: Amanda Rockler¹, Paul Leisnham², Adel Shirmohammadi², Sacoby Wilson³, Vikki Chanse⁴

Affiliations: ¹University of Maryland Sea Grant Extension, ² University of Maryland Environmental Science and Technology, ³University of Maryland School of Public Health, ⁴ Victoria University of Wellington.

This abstract delves into an innovative strategy that utilizes psychographics to guide the implementation of green infrastructure initiatives. It establishes a unique comparison with the diverse interests that individuals proudly associate with, exemplified by their identification as fans of Taylor Swift, often referred to as "Swifties." Instead of relying solely on conventional demographics, this approach seeks to unravel the intricate values and motivations that underlie pro-environmental behaviors. Through the segmentation of audiences, planners and practitioners gain insights into the nuanced dynamics within communities, enabling the customization of green initiatives tailored to specific psychographic profiles.

The study, showcases a coupled human-natural systems survey that spans a socio-economic gradient across two urban watersheds in Maryland. The primary focus is on examining various psychographics and their impact on pro-environmental behaviors associated with green infrastructure. The objective is to bridge the divide between individual interests and sustainable practices, recognizing the pivotal role of aligning initiatives with the diverse values, motivations, and norms inherent in communities. This methodology ensures a more profound and nuanced understanding of the drivers behind community engagement with environmental initiatives, fostering a more authentic and resonant connection.

This work emphasizes a departure from generic approaches towards a targeted strategy, amplifying the efficacy of sustainable initiatives. Tailoring initiatives to the values and preferences of the community proves pivotal in establishing a more meaningful and enduring impact within the realm of green infrastructure planning.

New Jersey leaves no bite behind: a climate change curriculum centered on food waste reduction

Authors: Amy Rowe, Sara Elnakib, Jennifer Shukaitis, Virginia Quick, Sabrina Subhit, Jeanine Cava

Affiliations: Rutgers Cooperative Extension

Food waste accounts for 24 percent of all landfill inputs, where it emits methane, a harmful greenhouse gas. In a recent assessment of a variety of climate change mitigation approaches, reducing food waste was the highest impact solution. Schools offer a unique opportunity to reduce food waste generation, as it has been estimated that U.S. schools may generate nearly 530,000 tons of food waste annually with 1.9 million metric tons of CO₂e of greenhouse gases and 20.9 billion gallons of wasted water. Providing pre-adolescents with education on the impact food waste has on the environment may potentially decrease waste generation. New Jersey was the first state to require public schools to include climate change education in the K-12 curriculum. The Rutgers Cooperative Extension Food Waste team received funding to create an Environmental Education program centered on climate change and food waste reduction targeted towards 5th graders. This program focused on food systems and sustainable behaviors and the curriculum included lessons, lesson plans for teachers, hands-on activities for the classroom, and interactive online games. The pilot study included 2 intervention schools and 2 controls. The control schools did not receive programming until after the pilot study was completed. The assessment revealed significant differences in knowledge, social norms, behavioral intentions, and perceived behavioral control. The intervention group had significantly higher mean scores compared to the control schools. Pre- and post-programming food waste audits reinforced the success of the pilot, but there were some lessons learned that will be shared here.

Stormwater Management: Expanding educational opportunities in Northwest Florida

A. Albertin¹, E. Bean², M. Deitch³, S. Dunning⁴, L.S. Jackson⁵, A.J. Reisinger³ C. Stevenson⁶, L. Tiu⁷,

¹Northwest Extension District, ²UF Agricultural and Bioengineering Dept., ³UF Soil and Water Science Dept., ⁴Okaloosa Co. Extension, ⁵Bay Co. Extension, ⁶Walton Co. Extension, ⁷Escambia Co. Extension

The Florida Panhandle has the highest average total rainfall in the state (65"), with average totals increasing in recent years. Limited and aging stormwater management has led to legacy water quality and flooding problems across the region. A need exists for local leaders and stakeholders to better understand how development impacts hydrology and water quality, and what solutions exist to mitigate impacts. We developed a regional stormwater education program to build technical capacity among stakeholders to incorporate sustainable stormwater management practices. Our audience included state, county and municipal employees, elected officials, extension faculty, professional engineers, landscape architects, and residents.

Since 2019, 272 people have participated in our annual 2-part webinar series, and 32 have received professional CEU's. Topics taught have included hydrology and pollutant load dynamics, green stormwater infrastructure (GSI) and maintenance, low impact development (LID), permitting, planning tools, social marketing, local case studies, and funding opportunities.

Post-workshop surveys indicate that participants gained knowledge in one or more topics by attending our programs. 26 participants have responded to annual 5-month follow-up surveys since 2019, 26 respondents (100%) indicated the information they received was valuable, 19 (73%) used the information at work, and 11 (42%) modified decisions related to stormwater management based on information presented. The annual increase in participation and enthusiasm from stormwater professionals, along with innovative projects designed in local municipalities shows that these workshops have achieved our initial objectives.

Successful community engagement strategies for the Spirit Lake Great Lakes Legacy Act sediment remediation project in the St. Louis River Area of Concern **Ashley J. Belle, Ph.D.**

Illinois-Indiana Sea Grant/ University of Illinois Extension

Under the Great Lakes Legacy Act program, over 400,000 cubic yards of contaminated sediments were remediated in the Spirit Lake area of Duluth, Minnesota. Remediation of the site will result in aquatic ecosystem improvement and will contribute towards the larger effort of delisting the St. Louis River Area of Concern. To support the project's goal of having timely, consistent, and appropriate messaging for the surrounding community, this presentation will highlight the education strategies, tools, and approaches utilized for successful community engagement as environmental remediation and restoration progressed. A Community Involvement Plan (CIP) was developed to identify the local community and key project stakeholders and to outline the community outreach engagement strategy. The CIP ensured the creation of a diversified outreach team composed of individuals from federal, state, local, and tribal agencies, environmental interest groups, and the neighborhood association. The outreach team met regularly to guide the design and delivery of outreach, which consisted of public events, posters, community kiosks, photo galleries, fact sheets, and neighborhood notifications. To gauge the impact of these outreach efforts, surveys were distributed to the community and analyzed. Results revealed that the scientific information provided was understandable and increased knowledge of the project. While public events ranked highest as the preferred mode of receiving information, respondents liked the diversity of outreach tools and indicated that they met a variety of different needs. This outreach work can serve as a model for other environmental projects to create diverse outreach teams and tools to effectively engage surrounding communities.

Effingham County Extension and the Longleaf Alliance's Partnership Shines Bright in Southeast/Coastal Georgia with Their Annual Fire Festival

Authors: Blake Carter, Susan French, Gail Westcot

UGA Extension Effingham County ANR Agent, The Longleaf Alliance Restoration Coordinator, Director of the Mary Kahrs Warnell Forest Education Center

Effingham County Extension and the Longleaf Alliance have created an annual event that started as a simple prescribed burn field day but has since transformed into an annual prescribed burn event to teach landowners, new and previous existing, about the benefits of burning and the assistance programs available, as well as connect the public with natural resource organizations, and teach the youth in the community about forestry as a future career path. The results have been incredible, seeing an average of 450 attendees from Effingham and the surrounding counties the past three years. Kids have the opportunity to see forestry as a potential area that may interest them as they grow up and choose their career paths. Landowners and adults have opportunities to meet with NRCS representatives, foresters, and specialists to learn more about natural resource conservation and the opportunities that planting pines can have for them long term. Since 2021, there have been three Fire Festivals that have taken place. The first year saw 300 attendees and has since seen an over 200% increase in attendance, boasting 650 community members participating in March 2023. The attendees' feedback has been extremely positive, with only suggested additions as constructive criticism. The attendees all have sited that the event is educational for the kids and adults. One quote said, "it gives the kids plenty to do and learn from, while at the same time allows dads and moms to 'talk business' with the different organizations that are in attendance."

What's the Point? Introducing Youth to Non-Point Source Water Pollution **Genevieve Christ, Penn State University**

Introducing youth to the concept of non-point source water pollution will ultimately lead to more informed citizens. The What's the Point lesson introduces youth to key concepts including what is a watershed, definition of point source and non-point source water pollution, and common categories of non-point source water pollution. This is a no-technology needed lesson that starts with a discussion of watersheds, proceeded by each youth receiving their own "watershed" (clear cup of water), each "watershed" is polluted with a small amount of non-point source water pollution (kool-aid, food coloring, vegetable oil, cocoa powder, etc), and finally all "watersheds" are combine into the Earth Watershed (plastic container). Youth are surprised how combining all the small slightly polluted watersheds leads to a bigger more polluted watershed. The lesson is wrapped up with a discussion on best practices for reducing non-point source water pollution. Youth are encouraged to come up with examples of practices they can do now. At the end of the lesson the majority of the youth gained knowledge in

understanding what a watershed is, types of non-point source water pollution, and practices to reduce non-point source water pollution.

Connecting Women and Families in Forestry: Reaching New Audiences in New Ways

Audra Cochran, Extension Educator, Clearwater County, University of Idaho Extension

Erika Eidson, Forest Health Program, Forestry Assistance Bureau, Idaho Department of Lands

Although women landowners are playing an increasingly important role in forest management decisions and forest land succession, they are consistently in the minority at forestry education events in Idaho. Recent evaluations from University of Idaho Extension Forestry educational programs indicate that women typically make up approximately 30% of attendees. Research shows that there is a need to employ unique tactics and leverage women-centric knowledge to improve engagement with female forest landowners. In recent years, efforts to connect women in forestry have gained momentum through establishment of organizations, forums, and training opportunities. These efforts aim to provide resources, mentorship, and advocacy for women working in forestry related roles and decision-making capacities. Through networking, women can share experiences, learn from peers, hone their skill sets, and address common challenges in their roles. In an attempt to reach and engage this audience, University of Idaho Extension Forestry and Idaho Department of Lands teamed up to offer a women-centric forestry training series entitled “Connecting Women and Families in Forestry.” This two-part series aimed to reach a broader audience by including children and providing children activities during the event to increase inclusion to forestry training for those with young families. Participants spent one day in the classroom and one day in the field, learning from and interacting with professionals from different agencies and companies that assist landowners with forestry management. This programming effort directly impacted twenty-one family-owned properties, opened additional networks to provide resources for participants, and highlighted numerous opportunities for the future.

A comparison of different chemical application methods for managing *Elaeagnus pungens* in South Carolina

Authors: Molly N. Darr^{1,2}, Janet W. Steele³, Timothy L. Evans⁴, Louis B. Nottingham², and David R. Coyle¹

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Elaeagnus pungens, commonly known as thorny olive, is a broadleaved evergreen shrub native to Japan and China. It was introduced to the United States as an ornamental species in 1830 and now occurs throughout the southeastern US, as well as in parts of the Northeast. Once established, this shrub produces prolific, fast-growing stem sprouts, which allows the plant to quickly increase in size and overtake neighboring vegetation. This is especially true in the southeastern U.S., where *E. pungens* benefits from an especially lengthy growing season. Studies involving the control of *E. pungens* are lacking, but there are some recommendations

regarding timing and control of various management tactics. Some suggest aggressive tillage or mowing may control *E. pungens*, but this is quite labor intensive and not practical for forested settings. Cutting alone is ineffective, due to prolific root suckering and stem sprouts, which are responsible for the characteristic sprawling, dense thickets of thorny olive seen in the southeast. No cultural or biological control strategies have been researched, and chemical control strategies are still under investigation. In this study, researchers representing Clemson University and Clemson Cooperative Extension collaborated with the South Carolina Audubon Society to determine the most effective chemical management method for a heavy *E. pungens* infestation in a forested area. We tested multiple application methods (foliar spray, cut stump and basal bark) using triclopyr with the goal of local *Elaeagnus* eradication and forest reclamation. Basal bark treatment yielded the highest *E. pungens* mortality and introduced the least amount of herbicide into the environment, making it the most cost-effective treatment. Basal bark applications also allow *E. pungens* to continue to transpire and pull herbicide into the root system over a longer period of time. We anticipate this treatment will also lead to a significant reduction in root suckering and stem sprouts.

Sparkling Community Environmental Action and Change Through Positive Youth Development with 4-H Community Action Projects for the Environment (CAPE)

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CAPE is a 4-H program that helps youth (11-18) navigate the process of exploring, developing, implementing, and reflecting on an environmental issue project affecting their community by asking decision-makers to make a change that benefits everyone. Linked to 4-H life skills, youth explore local environmental issues and community governance, then identify an issue and a project. Rather than a pre-determined service project, CAPE leads youth through a critical

thinking process to make a persuasive request of decision-makers which improves their community. Youth increase civic literacy and governance skills through self- and collective efficacy and increase life skills including critical thinking, decision-making and communication. A team from UF and FAMU worked together to create a curriculum matching the interests of youth and abilities of volunteers. A needs assessment in August 2021 (n=37 of 70 UF 4-H Agents; 82 of 1000 4-H Volunteers) found most clubs meet once a month and the concept was appealing, despite being new to community decision-making (29% of agents and 30% of leaders had engaged in the past). The pilot provided critical feedback, continuing in 2022-present, expanding to other states, additional Florida counties and museums. The team regularly discussed and shared feedback. Youth provided meeting reflections which helped tailor the lessons to the 4-H framework. Cohort results will be discussed. The curriculum was streamlined and enhanced to include eight sessions of meaningful instruction leading youth to effect policy change related to an environmental issue. The program has been adapted to different delivery modes and is available online.

Pathways to incorporate fire into your Extension programming: examples from members of the ANREP National Extension Wildland Fire Initiative (NEWFI)

Presenting Author: Alison Deak, University of California Cooperative Extension

Coauthors: Jennifer Fawcett (North Carolina State Extension), Leslie Boby (University of Georgia), David Godwin (University of Florida), Doug Cram (New Mexico State University), Carrie Berger (Oregon State University), Michael Andreu (University of Florida)

As ecological, socioeconomic, and health impacts from wildfires continue to increase, Extension agents are uniquely positioned to provide the science-based information that communities need to prepare, mitigate, and recover from wildfires. This poster, from ANREP's National Extension Wildland Fire Initiative (NEWFI), expands on the oral presentation titled "Burning to incorporate fire into your Extension programming?". Showcasing a wide variety of Extension programming from across the United States, ranging from field-based prescribed fire "learn and burns" for landowners and professionals to classroom-based youth education on fire ecology and utilization of a trauma informed care approach, we will share available resources to help Extensional Specialists and Agents incorporate fire into their Extension programming.

Ecological Planting Strategy to Mitigate the Loss of Beech Trees from Beech Leaf Disease: A Pilot Study in a Forested County Park

Jean Epiphan, Rutgers Cooperative Extension

As beech leaf disease (BLD) advances through the Eastern United States, beech trees in forests and ornamental landscapes are predicted to die within a decade of infection. The ecological impacts of American beech (*Fagus grandifolia*) mortality include loss of critical habitat provision, rain interception, soil quality protection, erosion prevention, climate cooling, and shade for terrestrial and aquatic ecosystems. It is predicted that invasive plants will quickly infiltrate new

canopy gaps created by beech decline. Even though some new arboricultural treatments that prevent dieback are available, they are not suitable for forests on a larger scale. Instead, a concentrated planting strategy of specific indigenous woody plants can potentially help mitigate the loss of beech's important ecological services. We piloted this mitigation strategy in beech dominant forests of Lewis Morris County Park where the dense sapling layers have been severely defoliated by BLD in four 0.25-0.50-acre plots. In total, 600 tree and shrub seedlings of 15 indigenous beech-cohort species were planted by staff and volunteers. Deer barriers were installed to protect each plant and allow for growth into sapling stages. Each plant was GPS'ed and each species was recorded; survival, growth, and leaf area will be monitored annually. We hypothesize that the planted zones will grow into dense groves that will mimic beech sapling understories, rather than become swiftly dominated by invasive understory plants. Interpretive signage will be installed. This project in a public park serves as an educational opportunity and demonstration of adaptive natural resource management in vulnerable ecosystems.

Organizing “Fire Festivals” as a way to reach communities about the importance of prescribed fire

Presenting Author: Jennifer Fawcett

Co-Author: David Godwin

Co-Author: Susan French

Fire Festivals are designed to be for the entire family, and are often in urban areas. In addition, they are typically free so finances are not a barrier to attending.

Fire festivals are becoming increasingly popular in the Southern U.S. as a way to communicate the importance of prescribed fire. These festivals typically target the general public, including families with children. Fire festivals include elements common to many festivals and outdoor events such as interactive exhibits, informational booths, games, food trucks, and live music. They may also include a live prescribed burn demonstration and prescribed burning equipment such as driptorches, engines, and even helicopters. A “mini” fire festival in a priority area can easily be produced at a smaller scale and can be a way to begin building relationships with partners and gauging public interest. Extension professionals can assist local partners with Festival organization, marketing, tabling, kids activities, conducting evaluations, and more. This presentation will include findings from a survey of past fire festival organizers, community implications based on feedback from festival evaluations, lessons learned, and tips on how to host a festival in your area.

Teaching wildlife data collection software tools to a community association

David Herbert, University of Florida

Amelia Island, FL is quickly urbanizing and birds face threats due to human development and removal of natural habitat. According to the Florida Wildlife Commission, the least tern is

critically threatened, but many other native species benefit from baseline data collection. Therefore, the agent taught a community association how to use global information systems, cell phone applications, and modern software data collection instruments to build a baseline birding database. An average of 6 people met nine times, from Nov. 5th, 2022 to April 2nd, 2023, from 7:00 AM to ~10:30 AM to quantify species of birds and take environmental measurements using telescopes, binoculars, and cell phone applications for an average of 21 minutes at each of six locations, keeping the same order of locations each time. Afterwards, the group learned about processing and viewing the data. Natural and developed habitats were monitored for a total count of 3,101 individual birds comprised of 91 species. Several important trends and wildlife species were noted, but the least tern was not observed this year. This project functioned well to capture baseline data for reference in future birding studies. Participants (n=7) indicated positive knowledge gain and belief-system improvement in bird identification, confidence in recording data, and ability to collaborate with the community environmental review board. Participants also made positive behavior-changes like purchasing birding references and binoculars and utilizing software tools to collect data. The group has grown to 13 participants and reconvened this year for its second season of data collection.

Institutional assessment and inventory of tree planting opportunities using iTree Eco

John Hooven

University of Maryland Extension

Abstract: The University of Maryland (UMD) Sustainability Fund approved a grant for the inventory and assessment of trees on the 988-acre Wye Research and Education Center (WREC) in Queenstown, Maryland in 2023. The purpose of the grant was to allow the hiring of two interns from UMD to provide labor to identify and inventory all trees at the WREC for future consideration of tree planting, assess current tree health, measure carbon storage, in addition to measuring other benefits that the trees provide. Contingent to the project was the use of the USFS collaborative effort iTree. Overseeing this project would be the forest stewardship educator for University of Maryland Extension. Being a traditional forester, the extension educator was unfamiliar with iTree. The educator had to learn the iTree suite of applications and then train the interns on iTree as well as the basics needed in tree identification and basic forest plot inventory. With the mixed use of landscape trees, forest areas and research agricultural areas, the WREC property would be unique for an iTree type of assessment. It was determined that the project would need to be separated into two assessments; an individual tree assessment using iTree Eco; and a forest plot type assessment, either using traditional Maryland Forest Service sample plots or utilizing the iTree Eco program using forest plots. In addition, the information collected was entered into GIS for additional data management and map production. The methods used could be easily replicated for other organizations to complete similar assessments.

Seeing is believing – how study tours can have big impacts

Amy Stone – OSU Extension Lucas County at Toledo Botanical Garden Carri Jagger – OSU Extension Morrow County

Traveling expands our minds, which opens up wonderful learning opportunities. In Extension we are promoters of Agriculture, Horticulture and Natural Resources. What better way to learn about and promote the industry, either broadly or very specifically, than through study tours? For extension professionals study tours have been organized and offered to learn about new invasive species, interact with other Extension teams, and discover programming done in other regions. For clients to our extension offices, study tours have been organized to different states where they learn about agriculture, horticulture and natural resources practices in those states. Study tours are a great way to bond and build relationships with your colleagues as well as the people in your community. Hear about our experiences and learn how to plan and implement a study tour in your own county or state.

Biochar demonstration kiln: a pilot extension program

Author: Christopher Jones

Affiliation: University of Arizona Cooperative Extension

Biochar is charcoal used for land applications. Agent Jones had a 4'x4'x2' metal kiln custom built, and has conducted 9 live demonstrations, and 8 classroom, webinar and conference presentations since March 2022, with a total audience of 370. Demonstration participants learn about building a portable flame cap kiln for demonstrating how to make biochar. Details such as burn permits, fire safety, a water source, and lighting and quenching the fire are discussed. Emerging markets for biochar include: 1) An organic soil amendment that improves water and nutrient availability for agriculture, horticulture, and wildland restoration; 2) Contaminant adsorption for stormwater systems, dairies, landfills or mining; 3) Hazardous fuels reduction in forests and wildland urban interface communities, as well as reduction of yard waste; 4) Production of bioenergy fuels including syngas and bio-oil; and 5) direct carbon sequestration: the half-life of a biochar molecule is a thousand years. Benefits and challenges of using biochar are discussed, including raising awareness about biochar; creating markets; feedstock properties and variability; and matching biochar qualities to specific applications.

Contaminants of emerging concern and aquatic natural resources: implications and remediation

Andrew Lazur

University of Maryland Extension

An alphabet soup of contaminants of emerging concern (CECs) exists in the environment and increasingly are impacting our aquatic ecosystem and groundwater resources. These

contaminants are grouped by their characteristics such as endocrine disrupting compounds (EDCs), microplastics, organic waste compounds, polyfluoralkyl substances (PFAS), pharmaceutical and personal care products (PPCPs), and volatile organic compounds (VOCs). The major sources of CECs to the ecosystems are wastewater treatment plants and industry. Other sources include atmospheric deposition, biosolid and manure applications to land, landfills, septic systems, and stormwater. Wastewater treatment removes some of these compounds, and further degradation is dependent on the biological and chemical activity in soil/sediment and water. The impact of CECs on aquatic environments is better understood for some compounds, i.e., feminization of male fish by hormones/EDC's potentially leading to reduced annual recruitment of several fish species. Other contaminants have been shown to reduce invertebrate populations and have other sublethal effects. A lesser understood issue with CECs is the impact of combinations or synergistic effects of these contaminants, or the integration of CECs and environmental stressors, i.e., pH, or water temperature, on aquatic organisms. Research in the treatment of CECs has primarily focused on point sources including wastewater and drinking water treatment, and therefore the degree of technology and efficacy is better understood. Field remediation methods are increasingly being studied with several options showing varying degrees of promise. A few of these include biochar, microbial and photocatalytic degradation, and phytoremediation. A summary of CECs, impacts, and remediation will be discussed.

Using literacy to connect youth to nature

Sara Lewis, Ohio State University Extension, 4-H Youth Development Educator, Fulton County

Christy Millhouse, Ohio State University Extension, Ohio 4-H STEM Educator Rebecca

Supinger, Ohio State University Extension, 4-H Youth Development Educator, Greene County

The books children read at a young age can influence the attitudes and behaviors they carry with them into adulthood. Providing young children with books that involve nature is a great way to get them thinking about nature early in their lives. For young children to develop language and thinking skills, they should read and be read to each day. According to a 2019 study in the Journal of Developmental & Behavioral Pediatrics, children whose parents read them five books a day enter school having heard about 1.4 million more words than kids who are not read to daily. Beginner readers should spend a minimum of 15-20 minutes reading each day. Children need to be exposed to different books with a variety of vocabulary, diversity, and life lessons. Books can help explain more complex nature-based concepts in words young children will understand. For example, the book *Waiting for Wings* by Lois Ehlert explains the life cycle of butterflies in a way that young children will connect with as they read.

To emphasize the importance of reading aloud and provide resources to increase literacy, the Ohio 4-H Cloverbud team developed Cloverbud Reading Adventures which provides activities, games, and snack ideas for a variety of books including those with a nature theme. Providing a literacy component to nature education activities can help enhance the learning. This poster will

share the importance of literacy with young children and its connection to nature education while providing information about Ohio 4-H's Cloverbud Reading Adventures.

Updating the 2018 RREA Strategic Plan and Creating a New 10-Year Vision for RREA

Authors and Affiliation:

Andrew Londo-Ohio State University

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The sustainability of the nations' forest and rangelands is dependent upon understanding of, and appreciation for the social, environmental, and economic conditions and stressors that affect these lands. The nation's Extension forestry and rangelands education programs at the land grant universities (LGU) have been instrumental for over 100 years in assisting a wide range of audiences (the general-public, landowners, industry, NGOs, youth, etc.) in gaining new knowledge that has then been utilized to adopt practices that provide benefits to mankind while sustaining natural resources.

To provide guidance to the future of RREA programs, we conducted this project funded by 2022 RREA National Focus Funds. Our goals were to update the 2018 RREA and to develop a 10-year vision for RREA. To accomplish the strategic plan, we sent surveys to the RREA contacts with each 1862 and 1890 land grant university. A heads-up announcement was sent out one week prior to the survey to all RREA contacts. Follow-up messages were sent three, four, and five weeks after the survey was sent out. Lastly, personal contacts were made to encourage survey completion. In all, we sent out 76 surveys with 46 returned for a 60% response rate. To develop the vision statement, 6 focus groups with extension natural resources professionals and external partners were conducted. The new strategic plan and 10 years vision will be presented.

Recreational business retention and expansion: Ohio's marina industry

Joe Lucente, Ohio State University and Ohio Sea Grant

Explore how your community could utilize the Ohio Business Retention and Expansion program to ascertain the needs of your community's recreational economy. Learn how this program can be adapted to fit any industry that your recreational community may wish to learn more about, work to address business needs and create linkages between business and government. Learn

how the Ohio Sea Grant College Program partnered with state-wide agencies to examine the needs of Ohio's Lake Erie Marina Industry. As a result of the business retention and expansion program conducted in 2022-2023, Ohio Sea Grant, the Lake Erie Marine Trades Association and Ohio Department of Natural Resources Office of Coastal Management learned that Ohio's Lake Erie Marina Industry plans to retain between 879-1,584 jobs with the intent of creating approximately 121 new jobs in the next year as a result of business expansion. Moreover, 121 new jobs in Ohio's Lake Erie Marina Industry will add approximately \$4,448,565 in personal income to Ohio's Lake Erie recreational communities. The retention of 1,584 jobs will add \$58,235,760 in personal income to Ohio recreational communities. In 2023, Ohio's recreational boating industry is valued at \$3.6 billion and boasts a sport fishery valued at \$1.9 billion.

Rain gardens as a wildlife habitat

Author(s): Susan Lunt

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What makes a rain garden a wildlife habitat? A quick overview of the purpose of a rain garden and how it differs from other gardens, emphasizing recommended plants to attract wildlife and their role, what makes a garden a habitat and why this is important, and a case study will be shared. In addition, an extensive list of resources will be provided.

Developing Woodland Health Service Providers from the Green Industry

Erika Lyon, Ohio State University

The goal of the Ohio Woodland Health Professionals online course is to develop a network of service providers from the green industry, including arborists and landscape architects, that can expand their service offerings to include assisting small woodland owners in Ohio with their land care goals. This course is based on The Woods in Your Backyard curriculum developed by the University of Maryland Extension in collaboration with Penn State Extension, Virginia Cooperative Extension, Alliance for Chesapeake Bay, and Virginia Department of Forestry and Eco-Write, LLC. Course content includes walking through topics outlined in the Woodland Health Practices Handbook, which covers woodland succession, how to approach educating clients through woodland health assessments, various land care practices from improving natural areas to controlling undesirable or invasive plants and creating land care plans. Following training, service providers can work with landowners on objectives for the property, complete the Woodland Health Assessment Checklist, develop Land Care plans that include specific practices and timetables, and contract and provide services along with reviewing and updating plans. During the launch of the course, ten green industry professionals enrolled, at total of 106 hours

with an average of 12 hours spent on eight course modules, which includes interactive media and developing a land care plan to be submitted for review by instructors. Instructors work one-on-one with participants regarding questions, activities, and content application. Participants receive a certificate of completion that they can add to their credentials.

Nurseries nurturing communities: Using live stake nurseries to engage communities in stream health

Author: Natalie Marioni

Affiliations: Penn State Extension

The Penn State Master Watershed Stewards (MWS) have installed several live stake nurseries across Pennsylvania to provide source material for local stream restoration efforts and site locations for educational workshops. Live stakes are branch cuttings from certain native trees and shrubs that, when planted along streambanks, grow into mature species, providing bank stabilization and erosion control. Because live staking is easy to learn, requires only minimal supplies, and the stakes are low-cost when purchased or free when harvested directly, it is a valuable technique to introduce to property owners interested in improving stream health. The MWS nurseries consist of native shrubs of species known to be successful when planted as live stakes. The nursery shrubs can be pruned annually to supply free source material for future watershed restoration. The nurseries are designed as a low-cost way to support local and regional conservation efforts and have the potential to become a focal point for conservation education by serving as prime locations for live stake and native plant workshops. This presentation outlines how the MWS program leverages partners to develop local nurseries and is engaging and educating communities in the installation and use of these nurseries. Additionally, the presentation touches on a developing phenology project utilizing the nurseries to provide research-backed recommendations for live stake harvesting and baseline data on possible phenological shifts due to climate change.

Growing fruits, vegetables, and leaders

McCarty, K. and Munroe, N.

FAE4-HA and FACAA

In recent years, UF/IFAS Extension has made efforts to diversify programming to include nontraditional audiences. This is a challenge that many Extension Agents face in their programming. The Gifford Youth Achievement Center (GYAC) and UF/IFAS Extension Indian River County have established a partnership to provide an after-school 4-H garden club to underserved fourth graders. GYAC serves its surrounding neighborhood, which is primarily made up of lower income, Black and Latino families. This program aims to educate youth in the areas of horticulture, nutrition, and health with a goal of helping youth discover their spark. The after-school 4-H garden club meets weekly, and is led by the 4-H and Environmental Horticulture Agents, with assistance from Master Gardeners. Youth in the club learn how to

plant fruit, vegetables, and flowers. They also learn the importance of gardening and how gardening boosts your mental health, physical activity, and nutrition. Since the program began in October 2021, we have reached over 100 youth. 87.5% of youth in the program demonstrate knowledge gain in the areas of horticulture, nutrition, and health. Teachers at the after-school program reported that youth participants have shown an increase in knowledge and interest in gardening and positive behavior change. These results suggest that youth who participate in this program are learning healthy habits and experiencing the positive effects of gardening and being outdoors. Collaboration between extension faculty, Master Gardeners, and after-school staff allows youth in underserved communities to explore different subject areas that can ignite a spark.

It is said that the next pandemic on the horizon is tick-vector disease.

Author: Timothy McDermott DVM

Affiliations: Extension Educator, Assistant Professor, Agriculture and Natural Resources, College of Food, Agricultural, and Environmental Sciences. Adjunct Faculty, Department of Veterinary Preventative Medicine, College of Veterinary Medicine. The Ohio State University.

It is said that our next major pandemic will be tick-vector disease. In 20 years practicing veterinary medicine, I watched us go from one tick of medical importance to humans, companion animals, and livestock 20 years ago to five now, including two new species in the past few years. This trend is widespread in the United States. Ticks, and the diseases they vector cause devastating illnesses and allergies that can be difficult to diagnose and treat. A tick bite can make you allergic to red meat, imagine being allergic to bacon cheeseburgers! Eradication of these ticks is not feasible meaning we will be battling tick-borne disease for the foreseeable future. We need to dispel the myths that were once true regarding ticks but are now false. We know now that ticks can vector disease in any habitat, at any time of the year, in as little as 15 minutes of feeding. Who are those who are affected by tick-borne disease? They are our family, our friends, and our colleagues. The most impacted cohorts in Ohio by Lyme Disease are youth in the 5-9- and 10-14-year age groups. We need to do a better job keeping our kids safe. It is estimated we have over 500,000 cases of Lyme disease in the United States yearly, with nearly 10% of those living in North America having had Lyme disease already. Come learn the current state of ticks nationwide and how you can keep yourself, your family, and your animals tick safe.

Connecting Teens to Nature Through Ohio 4-H Forestry Wildlife Conservation Camp

Christy Millhouse, Tracy Winters, Jo Williams
Ohio State University, Ohio 4-H, NAE4-HYDP

A group of teens excitedly talking about insects being shared by an Ohio State University Entomologist. Sessions where campers learn about radio telemetry, wilderness survival,

pollinators, dendrochronology, tree climbing and more. Connecting technology by using iPads to stargaze. This is just part of Ohio 4-H's Forestry Wildlife Conservation Camp. Held in late April, the camp invites youth from across the state to experience the outdoors hands on. Older teen counselors learn valuable life skills by leading games and helping throughout the weekend.

According to author Renee Cho in her article Why We Must Reconnect With Nature (2021), as of 2009, 93 % of teens were online. The article also states that kids ages 8 to 18 spend an average of 7.5 hours a day, 7 days a week, plugged into technology. Over that time there also has been a decline in visits to U.S. National Parks and a drop in other outdoor activities. Cho goes on to state in her article that "studies reveal that children are healthier, happier, and perhaps even smarter and more creative when they have a connection to nature". That is why opportunities such as the 4-H Forestry Wildlife Conservation Camp are so important.

This session will describe the Ohio 4-H 4-H Forestry Wildlife Conservation Camp and the unique partnership between Ohio State University and Hocking College that makes it happen. Presenters will share successes and lessons learned so others can replicate this camp. Participants will also leave with information about the structure of the camp.

Teaching youth to care for the environment, Beaver River Watershed Days **Mark Nelson Utah State University Extension**

The Beaver River, located in southwest Utah, is the life blood of Beaver County. It is used as a fishery, a recreation area and provides irrigation water for homes, gardens, and farms throughout the county. Monitoring of the Beaver River in the early 1990's identified a variety of problems ranging from high rates of sediment movement to high amounts of phosphorus. We have worked with many different agencies, schools, and private organizations to increase public awareness of the importance of taking care of the Beaver River and surrounding watershed. One method to accomplish this has been to create an annual Beaver River Watershed Day. For 18 years more than 2900 volunteers have participated in this conservation activity. High school students, 4-H & FFA members, dedicated hunters, state and federal agency people and anyone who cares about the environment has all joined together to complete hands on projects that have improved the watershed. We have planted willows, windbreaks, chop thistles, plant browse for deer and cut down small juniper trees. The Beaver Conservation District has provided lunch for all the participants each year. The success of this program has been twofold. First, we have been able to help improve the quality of the watershed and second, we have taught the youth the importance of taking care of the environment.

IUFRO EKE: What is it and Why Should You Join

By Calvin Norman

The International Union of Forest Research Organization (IUFRO) Forest Knowledge Exchange (EKE) is the international working group of forestry Extension professionals and international groups, NGOs, and professionals that do similar work in countries without formal Extension systems. This group holds a working group meeting once every two years in various places around the world—the most recent meeting was in Padua, Italy with a post-conference tour in Slovenia, and the next meeting will be in either North Carolina or Slovakia. Extension professionals should consider joining and attending the working group meetings as these meetings are the best way to learn about issues facing forests around the world, exchanging ideas and programs with a wide variety of professionals who are from all over the world—at the 2023 meeting presenters were present from countries like but not limited to Ireland, Italy, and the US—and to learn about how forestry and Extension is practiced internationally. Additionally, members have access to an unparalleled network of international professional, can present at the EKE quarterly knowledge sharing webinars, and take part in an international community of practice.

Pairing Invasive Plant Education and Management

By Calvin Norman and Emily Rojik

Invasive plant management is a much-needed topic in natural resource management education and a much-needed action in the field. To this end, we developed a novel program that educates participants while also accomplishing in-field invasive plant suppression. The primary audience is natural resource professionals and interested landowners. For the pilot workshop, Extension staff treated invasive plants two weeks in advance using several techniques to create demonstration sites. Workshop attendance was limited to 20 people, who were each required to bring a clean backpack sprayer. Attendees practiced calibrating their sprayer, watched a demonstration of safe chemical handling and mixing, and conducted supervised applications in the park for two hours. The workshop was very well-received. Using a 5-point Likert Scale ($n=17$), participants strongly agreed that they “improved their knowledge of invasive species management” ($x=4.8$), “would recommend this workshop to friends/colleagues” ($x=4.8$), and “planned to use what they learned within the next year” ($x=4.8$). In total, this workshop resulted in ~5 treated acres at no cost to the host, the Arboretum at Penn State, and generated \$600 of income for Penn State Extension. We also used the treated areas as sites for other educational programs. Future workshop logistics can be modified to expand the treated area. This program can be a cost-effective way to implement invasive plant suppression on host properties, while allowing participants to gain hands-on experience in proper herbicide application techniques. Pesticide license re-certification credits were also offered.

Mitigating Climate Change Through Forest Carbon Offset Programs: An Assessment of Corporate Timberland Companies

Sai Theja Reddy Pullalarevu, Graduate Research Assistant and Adam Maggard, Harry E. Murphy Associate Professor and Extension Specialist, College of Forestry, Wildlife and Environment, Auburn University, Auburn, AL

Forests are crucial in mitigating climate change by storing carbon as they grow and produce wood. Approximately one-third of the emissions reductions needed to meet the Paris Accord targets come from forestry activities, including afforestation, reforestation, and improved forest management. However, existing forest-based carbon offset programs have been hindered by technical complexity, long-term commitments, and demanding verification requirements, limiting participation by forestland owners. In the context of the re-emerging voluntary carbon markets and evolving carbon program methodologies, there is growing interest in aligning timber production with carbon storage goals. Corporate timberland ownership, often involving intensive forest management, presents a unique opportunity to blend economic objectives with forest-level carbon storage. To assess the potential for greater corporate involvement in carbon offset programs, this study explores how carbon markets influence forest management practices and philosophies. This research involves conducting one-on-one, open-ended interviews with a diverse range of industry stakeholders, including timber management companies, both corporate firms and Timberland Investment Management Organizations (TIMOs), and Real Estate Investment Trusts (REITs). These interviews cover a broad spectrum of topics, from exploring the potential benefits of corporate involvement in carbon markets to addressing the concerns they may have about participation. The insights gathered through these one-on-one interviews provide valuable perspectives on carbon offset programs, opportunities for participation, program integration into management plans, and climate policy priorities. This presentation will unveil the study's findings.

Increasing awareness of health risks through private water supply education and water testing

**Danielle Rhea, Penn State University
Susan Boser, Penn State University**

There are over one million residences in Pennsylvania with a private water supply. Pennsylvania is the only State lacking private drinking water regulations or guidance. Consequently, many private water supply users rarely or never test their well, spring, or cistern. While some water impurities change the water's appearance, odor, or taste, most of the contaminants that have the greatest health implications are undetectable without testing. The objective of this program was to improve the understanding of private water supply management and to increase awareness of health-impacting contaminants through free water testing to improve the safety of private drinking water in Pennsylvania. Program participants were required to attend a one-

hour presentation to obtain a water test. Water samples were collected by program participants and tested by a Pennsylvania Department of Environmental Protection accredited laboratory. Participants were provided with a recorded webinar on interpreting their water test results and one-on-one assistance by phone or email if needed. In 2021 and 2022, 786 residents obtained free water tests. Across all water samples, there were 471 health-based failures (59%) and 408 aesthetic failures (51%). 100% (N=486) of participants indicated that they learned at least some new information and 83% (N=268) of participants indicated that they took action as a result of participating in the program. Overall, this program accomplished its goals of increasing knowledge of private water supply management and awareness of health-related water quality issues, and many participants improved the management of their water supplies because of participating in this program.

Florida Horseshoe Crab Watch: Crawling Throughout the State

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The Atlantic Horseshoe Crab (*Limulus polyphemus*) is an ecologically and economically valuable arthropod. In the United States, its population ranges from Alabama to Maine but population status is generally unknown due to a lack of data. In 2015, the citizen science program Florida Horseshoe Crab Watch (FHCW) was created. FHCW is a multi-partner effort between Florida Fish and Wildlife Conservation Commission, UF/IFAS Extension, Florida Sea Grant, and the Nature Coast Biological Station.

Objectives: Create a statewide mark-recapture study to track horseshoe crab spawning populations and geographic movements in Florida.

Methods: Partners from the aforementioned entities collaborated to create the FHCW training curriculum. They modeled FHCW after the Delaware Bay monitoring program and tailored it to Florida's needs. They created the survey protocol, training program and educational videos. Training events were planned and held in individual Florida counties, eventually expanding.

Results: The FHCW is active in 20 of Florida's coastal counties and has celebrated success expanding to more southern counties (Charlotte, Collier, Miami-Dade). From 2015-present, Florida Horseshoe Crab Watch has resulted in 3,497 surveys performed, 219,092 crabs counted,

12, 475 crabs tagged, and 831 crabs resighted. More than 1,200 volunteers have performed surveys, donating 17,517 hours of volunteer time (a \$484,345 value). Data have been used in federal stock assessment by U.S. Fish and Wildlife Service. A side-by-side study proved the volunteer-collected data were statistically similar to that collected by professional scientists, further validating the methodology and program.

Conclusions: Citizen science is an effective approach to increase capacity for scientific research and engaging the community at large. Data collected through the FHCW program are scientifically sound and are creating the foundation for future horseshoe crab population estimates and science-based conservation for the state of Florida.

What's in the water? Building a contaminants of emerging concern program in the southeast

Authors: Brooke Saari¹, Katy Smith², Catherine Janasie³, Lola Renauer¹

Affiliation: ¹ SC Sea Grant Consortium; ² UGA Marine Extension and GA Sea Grant; ³ National Sea Grant Law Center, University of Mississippi School of Law

Contaminants of emerging concern (CECs) are chemicals that have been detected in the environment and may pose health risks to ecosystems and/or humans. However, CEC distribution and impacts are poorly understood, and in several cases, are not regulated by current environmental laws. In order to identify priorities, needs assessment techniques were employed to create an interdisciplinary approach to investigate CEC drivers and identify solutions. The identification of research gaps through literature review, a targeted policy scan, and the convening of an Advisory Council (AC) has formed the basis of project priority efforts. Through the identification of key CEC players, the team was able to refine priorities to be addressed through a \$300,000 competitive research program. This research program composed a study group model, blending faculty members and students with extension professionals, with the hopes of increasing awareness of CECs, and broadening stakeholder participation in the research process. The first half of this project has focused on identifying CEC needs and targeting ways to address these within the southeast, starting with a competitive research program. The results of the funded projects will serve as a tool for ongoing CEC networking and education, as well as a conduit for future community-engaged collaborations. The CEC knowledge gained will be widely distributed to help achieve goals and priorities that extend beyond the southeast. This presentation will focus on the methodology used to identify needs to develop the priorities for this research program, and how stakeholder engagement was essential to the process.

Developing energy extension and outreach initiatives in Maryland

Drew Schiavone, PhD University of Maryland Extension

Interest in energy-related outreach is rapidly growing as residential and agricultural sectors become more financially strained by high energy consumption and rising energy costs. While over 500,000 Maryland households face an unaffordable home energy burden, the high cost for farm energy, accounting for over 16% of production costs, comes amidst growing concerns over low farm profits. Maryland's ambitious energy policies pose additional challenges for transitioning energy infrastructure. While the Extension system is uniquely poised to deliver energy-related education addressing these economic, legislative and environmental drivers, limited resources have generally been allocated to energy-related outreach.

Guided by a statewide needs assessment, the Maryland Energy Extension program delivers unbiased and research-based information related to energy conservation and clean energy technology. Comprehensive and multidisciplinary outreach helps residents, agricultural producers, local governments, and other stakeholders develop regional energy strategies, assess clean energy opportunities, preserve Maryland's natural environment, and ensure sustainable energy generation, delivery, and consumption.

Since program inception, farm energy workshops have reached 111 individuals; home energy programs have reached 2,163 individuals; solar programs have reached 5,111 individuals; consultations have reached 105 individuals; and in-service trainings have reached 92 individuals through partnerships with over 30 agencies – resulting in a 52.5% average reported increase in learning outcomes. Publications and hybrid training videos have been viewed 10,415 and 562,048 times, respectively. Current implementation of energy-related measures indicates annual savings have been viewed 10,415 and 562,048 times, respectively. Current implementation of energy-related measures indicates annual savings of 349,630 kWh, \$141,789, and 3,676 MTCO_{2e} GHGs. Program participants have also reported 14,954 kW of solar installed, with an additional 70,401 kW planned or under development.

Addressing barriers that hinder collaborations between landowners and officials

Author (1): Sasha Soto, Forest Resources PhD Candidate, Department of Ecosystem Science and Management, Pennsylvania State University, James C. Finley Center for Private Forests at Penn State

Author (2): Allyson Muth, Ed.D., Director, James C. Finley Center for Private Forests at Penn State, Assistant Research Professor, Department of Ecosystem Science and Management, Pennsylvania State University

Many programs and resources are available to assist private forest landowners with responsible land-use management and planning, many of which are government-provided or subsidized;

however, studies have shown those resources are vastly under-utilized. While some landowners seek assistance through agency-networks, others have joined landowner-networks, and many choose to go it alone. We sought to understand key barriers between advice-givers, advice-takers, and collaborators through a series of surveys and semi-structured interviews. Private forest landowners helped identify resource and interpersonal barriers they encountered while seeking forestland management advice from agency officials. Social dynamics between private forest landowners and agency officials appear to be a key barrier affecting a landowner's willingness to receive land management advice from agency officials. In addition, bureaucratic restrictions and unclear policy guidelines for available programs and resources severely limit access for landowners seeking assistance. To improve access to agency resources and ease agency-landowner interactions, we suggest re-examining current policy structures as well as, encouraging agency officials to utilize their interpersonal skills. Private forest landowners have reported dismissiveness for professionals who employ a hierarchical working dynamic rather than those who afford mutual respect for the landowner's experience. This dynamic has been identified as a key barrier to a landowner's willingness to trust or accept professional advice; therefore, we offer special considerations for professional practices that may ease interactions and increase willingness to accept professional guidance.

There's an App for That: Development of a Decision Support Tool to Assist Rangeland Managers with the control of Twolined Spittlebug in Hawaii

Mark S. Thorne¹, Mark Wright², Shannon Wilson³, Daniel Peck⁴, and Melelani Oshiro⁵

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Twolined spittlebug (TLSB), *Prosapia bicincta*, was detected in Hawaii in 2016 where it had damaged over 2,000 acres of rangeland. Research revealed that TLSB expanded its range to over 176,000 acres in approximately eight generations. In highly infested areas, TLSB resulted in nearly 100% die back of key range grasses when nymph densities exceeded 50/m². The loss of these important forages provided entry for the establishment of invasive plants. These losses forced livestock producers to reduce stocking rates resulting in significant economic losses. Work on a smartphone application to identify, report, and facilitate management of the TLSB started in 2020. The app has four main features. An information guide about TLSB biology and ecology. Next, the app provides a tool to identify TLSB in the field and distinguish it from other, non-pest species. A third tool allows users to report sightings of TLSB. Reports include a geo-referenced picture and basic details about the habitat and geographical location of the pest. The reported data is then captured in a database and displayed on a web-based mapping tool. Data on TLSB populations is determined by following sampling protocols provided in the fourth tool. This tool allows users to determine the size of the TLSB population, and then, based on the

potential damage threshold calculated, select from a series of integrated pest management decisions. It is anticipated that this app will facilitate tracking and documenting the spread of the pest and lead to better pest management decisions for rangeland managers.

Hot topics in sustainable landscaping

Martin Wunderly, Jessica Warren, University of Georgia Extension

The Georgia Green Landscape Stewards program is a self-guided education and certification program for residents and small businesses that implement sustainable practices in their landscape. The program includes 10 education components and 64 sustainable actions that can be implemented to attain Georgia Green Landscape status. Action choices are submitted with the application, website video views are recorded, and post participation surveys are sent to applicants after certification. Native Plants and Low Maintenance Landscapes and Welcoming Pollinators were the most implemented sustainable action items. However, the Native Plants education video had many more views than all other topics. Encouraging Biodiversity at Home was 3rd, and Welcoming Wildlife was the 4th most implemented group of sustainable actions. The sustainable landscape actions chosen by clients can guide Extension programming and landscape industry services offered to interested customers.

Mosquitoes aren't a barrel of fun: efficacy of mosquito larvae control methods in rain barrels

Authors: Steven Yergeau¹, Michael Senyk², and Jessica Keen²

Affiliations:

- 1. Rutgers Cooperative Extension of Ocean County (New Jersey)**
- 2. Ocean County Mosquito Commission (New Jersey)**

Rain barrels are an excellent way for homeowners to conserve water. A concern is the potential of rain barrels to increase mosquito breeding habitats. Extension provides information on practices to reduce the potential for mosquito breeding in rain barrels, such as screening of the barrel openings, using "mosquito dunks", and creating a surface barrier of oil or soap. The relative success of these practices, however, has not been studied, so this project was developed to evaluate the effectiveness of Extension-recommended mosquito control methods appropriate for rain barrels. Five-gallon buckets were filled with one gallon of water and had one of the practices applied to them. The buckets were then left for up to three weeks to ensure mosquito egg deposition and larvae hatching. Filtered water samples were analyzed for mosquitoes which included identification and counting each species for each practice. Fourteen trials were conducted from 2021 - 2023 for a total of 173 samples collected during this study. A total of 1,927 mosquito larvae were collected in the buckets, with 1,920 from the control

buckets (no treatment practice) and the remaining seven larvae from the other practices. This means that any of the treatment options is beneficial to reducing mosquito breeding habitat with better than 99%

efficiency. Some practical issues need to be addressed, however, when choosing which option is best for homeowners. Having science-based information on how to effectively control mosquitoes allows for wider adoption of rain barrels as a practice and more water being conserved for the future.

Community engagement in a deliberative forum to address debris in the City of Miami

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Background: Litter and debris are pervasive issues around the world and in the City of Miami, Florida. The Ocean Conservancy (TOC) procured the University of Georgia to perform a Circularity Assessment Protocol (CAP) to determine debris accumulation, sources of debris, and opportunities to mitigate debris within the City of Miami. The CAP report is a 90-page document that is publicly available. Beyond the final report, TOC envisioned community work that would make recommendations from the CAP a reality. TOC asked the Miami-Dade Florida Sea Grant Extension Agent to design and facilitate an engagement strategy for City of Miami community members to better understand the findings of the CAP and to take ownership of selected recommendations. Objectives: Convene a working group (WG) representing at least three of the five City commission districts, communicate the findings of the CAP, engage the WG members in a deliberative co-learning process to develop and prioritize the CAP recommendations into a smaller, Action Guide to be presented to City commissioners by TOC. Methods: In partnership with the State Specialized Agent in Facilitation, the Miami-Dade Florida Sea Grant Agent designed and facilitated a process for the TOC CAP WG. Results: A total of 14 WG members representing four out of five City of Miami commission districts participated in the process. Five of these members were Spanish-speaking only. At the recommendation of the Miami-Dade County agent, professional interpretation services were procured, allowing for full participation in both English and Spanish. The group achieved its three objectives. Conclusions: The group successfully reached its objectives, increased their knowledge of marine debris and has fostered new connections across languages and communities. With the assistance of the agents, TOC is now developing the Action Guide. The WG members are continuing to work together and pursue solutions to debris accumulation within the City of Miami.

Collaborative research to evaluate herbicides and application methods to control autumn olive

Chris Zoller, Ted Wiseman, Dean Kreager, Clifton Martin, Christine Gelley, Clif Little, Dr. Alyssa Essman, Dr. Mark Loux

Ohio State University Extension

Invasive plants cause billions of dollars annually in damage, displace desirable plants, and reduce available land area for livestock grazing. Autumn olive is one of the invasive plants prevalent across the Eastern United States. Originally introduced for erosion control, this plant has become widespread, resulting in reduced animal grazing. The Ohio State University Eastern Agricultural Research Station (EARS) is located in Southeast Ohio and encompasses more than 2,000 acres. Autumn olive became established on reclaimed strip mine areas of the EARS. These plants have invaded significant portions of the property and reduced land available to support the commercial beef research herd. A diverse group of Extension professionals collaborated on this study that included a replicated trial of autumn olive plants. We categorized plants into small and medium/large sizes across the study area. Six herbicide treatments were applied to plants using a handheld sprayer. Herbicide treatments were applied randomly in August and an assessment was completed nine months later to rate effectiveness of the applications as compared to the control plants. There were four replicates per treatment. A scale of 1.0 (no regrowth) to 4.0 (extensive regrowth) was used to rate herbicide effectiveness. Assessment ratings ranged from 1.0 to 2.75, demonstrating acceptable control of each herbicide evaluated.

May 7, 2024

Keynote

David Greaves

Founder

Nature Under Your Nose

Lightning Talk Group A: Conservation

TreeQuest Community Scavenger Hunt: Finding, Learning and Having Fun

Vinson, A.* alyvinson@ufl.edu, ANREP/FANREP, UF/IFAS Extension Manatee County

The Great Southeast Pollinator Census – creatively educating participants about beneficial entomology

Becky Griffin, University of Georgia Extension

Kris Braman, University of Georgia

Rich Braman, University of Georgia Extension

Kasey Bozeman, University of Georgia Extension
Amy Dabbs, Clemson University
Alyssa McKim, North Carolina State University
Amanda Wilkins, North Carolina State University

Creative Conservation: The Weaving Together of Art and Agroforestry

Cathryn Pugh, Penn State Extension

Agroforestry is a land management practice that combines trees, crops, and/or livestock into one system for multiple environmental and economic benefits. Agroforestry has the potential to create a more sustainable and resilient food system, while also providing many ecological benefits such as improved soil health, increased biodiversity, and carbon sequestration. Riparian buffers are an agroforestry practice implemented to improve water quality, create habitat, and reduce stream bank erosion. These same buffers are often referred to as “multifunctional” when emphasizing their potential to grow edible plants in riparian areas. Here, Cat Pugh will discuss her Art and Agroforestry program, which seeks to broaden our focus on riparian buffers by thinking beyond food and encouraging the cultivation of plants for wild crafts. Through her work, Cat strives to get more riparian buffers on the landscape by using art to foster a connection with natural materials, support wildcraft markets, and inspire conservation practices. This approach highlights the importance of workforce development, land access, and the collaboration of artists in conservation programming. Her work is raising awareness of the importance of riparian buffers and wild crafts and promotes the adoption of these practices by landowners and farmers.

The Rutgers Environmental Stewards Impact Summit Enables Volunteers to Better Their Science Communication Skills

Authors and Affiliations: Michele Bakacs¹, Amy Rowe¹, Patricia Maguire¹, Amy Menzel², Jean Epiphan¹, Rebecca Magron¹, Jennifer Sawyer Caraballo¹, Justine Gray¹, Lynn Waclawski¹, Michael Jacob¹

¹Rutgers Cooperative Extension

²Atlantic County Utility Authority

Fox Demo Farms: Pilot Mentorship Program Evaluation

Whitney Prestby, UW-Madison Division of Extension

Lightning Talk Group B: Water

REconnect (Researcher-Educator) Symposium- (Brooke Saari)

Digital technologies to reach rural communities to improve their drinking water

Creating an Invasive Species Management Handbook and Training for Municipalities in Coastal Georgia (Jessica Warren)

Teaching Volunteers to Care for Local Streams

Follow the water: A multi-county watershed extension education program

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Water Ways on Wheels - a bike tour of the watershed

Jim Lewis, Penn State Extension

Lightning Talk Group C: Forestry and Wildlife

Creative Conservation: The Weaving Together of Art and Agroforestry

Cathryn Pugh, Penn State Extension

Hunting for hemlocks: locating and restoring eastern hemlock in Minnesota

Authors: Kira Pollack, Dr. Andrew David, and Dr. Marcella Windmuller

Pennsylvania Forest Stewards program benchmarking study and futuring processing

Authors- Jeff Osborne, Penn State University jao5194@psu.edu, Allyson Muth, Penn State University

Ideas on how to better serve vulnerable populations in your area

Carrie Berger, Oregon State University

Introducing forest succession planning through forest management

Jameson Boone, NC State University

Costs and Trends of Southern Forestry Practices: An Interactive Forest Management Cost Guide Using Microsoft BI

Maggard, Adam, College of Forestry, Wildlife and Environment, Auburn University and Natzke, Jeremy, College of Natural Resources, University of Wisconsin-Stevens Point

Lightning Talk Group D: Youth and Community Development

Beyond the Table: Panel-Style Q&A Webinar Sessions

Katie Brooks, Forestry and Wildlife Educator, Penn State Extension

Working Together to Engage 4-H Youth in Outdoor Environmental Education, Scientific Inquiry and STEM

Scuba Diving in Extension: An innovative approach for youth development and underserved groups inclusion

Blanco, V.*, victorblancomar@ufl.edu, ANREP, UF/IFAS Extension Taylor County, Florida.

Camden and McIntosh County Extension Pilot Coastal Junior Naturalist Program

Jessica Warren, University of Georgia Extension

Enchanted Garden 4-H Camp Cultivates Appreciation for the Environment

Terra Freeman, UF/IFAS Extension

Lessons learned conducting extension education via videography from 0 to 360

Author: Sanford S. Smith, Teaching Professor of Forest Resources

Affiliation: Penn State Extension

Lightning Talk Group E: Climate Change and Ecosystems

Farmers markets – sustainability niches in action

Ramona Madhosingh-Hector, UF/IFAS Extension

Green Infrastructure 5th Annual Workshop

Florida 101: An introduction to local natural resources and Extension

Carolyn Kovacs, Alex Tays, and Judy Jean

UF/IFAS Extension

How to Translate Educational Content

By Calvin Norman, Penn State Extension.

Developing a network analysis: facilitating connections within the contaminants of emerging contaminants field

Authors: Lola M. Renauer¹, Brooke Saari¹, Katy Smith², Catherine Janasie³

Affiliation: ¹ SC Sea Grant Consortium; ² UGA Marine Extension and GA Sea Grant; ³ National Sea Grant Law Center, of Mississippi School of Law

New Jersey leaves no bite behind: a climate change curriculum centered on food waste reduction

Authors: Amy Rowe, Sara Elnakib, Jennifer Shukaitis, Virginia Quick, Sabrina Subhit, Jeanine Cava

Affiliations: Rutgers Cooperative Extension

Field Tours

From Field to Stream and Important Research In Between: A PSU Research Tour

Penn State University has a plethora of ongoing research that is actively integrated into Extension programs. This tour will highlight some of this research at the Southeast Agricultural Research and Extension Center (SEAREC) as well as a riparian buffer near Hershey, PA, planted for research and Extension activities. Speakers will present on several agricultural conservation topics and research initiatives including 1) cutting edge agricultural field planting that works with no-till and cover crops to enhance water quality while decreasing soil erosion, 2) stormwater runoff mitigation strategies, 3) the Master Watershed Steward Program, 4) pollinator gardens, and 5) current research looking at ways riparian buffer maintenance can lead to enhanced water quality benefits. Come join us for a fun-filled tour as we highlight some awesome and Extension-applicable research. We look forward to great conversations.

Hawk Mountain Global Raptor Conservation and Research Sanctuary

As the world's first refuge for birds of prey, Hawk Mountain Sanctuary was established in 1938 through conservation activist Rosalie Edge deeding the land to the non-profit Hawk Mountain Sanctuary Association. Today, Hawk Mountain is a world class destination for birders and raptor researchers that also educates thousands of annual visitors on bird conservation through lectures, workshops, programs and events, while also offering access to its 8+ miles of hiking trails for firsthand learning and observation. For 85 years, visitors have been able to immerse themselves and experience hawks and other raptors living in, or migrating along, the spectacular Kittatinny Ridge. Our tour includes an overview of the Sanctuary's guidelines and history as well as a look at the natural history, identification and migration exploits of raptors before we venture outside to explore the grounds and raptor lookouts.

Michaux State Forest Field Tour Focused on Forest Recreation and Cultural Interpretation

This tour will visit an 85-thousand-acre state forest with recreational and cultural challenges, opportunities, and solutions. Stops will include: 1) an extensive network of unauthorized mountain bike trails that have been improperly and illegally constructed on thousands of acres of state forest near the famous Appalachian Trail which traverses the Forest from north to south, 2) a site that served multiple important purposes over the last 250 years including as a legacy farm that produced feedstuffs for a local iron furnace, an early CCC camp, a German/Japanese POW Interrogation Center, and now a “learning landscape initiative,” and 3) a new bicycle trail that is seen as an investment in broad public recreation and education. Speakers will include staff from the Michaux State Forest and Educators from Penn State Extension’s Forestry Resources program area.

Partnerships and Watershed Restoration- a BMP Sampler Tour

Restoration of small streams in the Lower Susquehanna region is crucial for improving the health of the Chesapeake Bay and meeting its TMDL goals. The intersection of agriculture and urban development creates a hot spot for pollution and stormwater runoff. Many organizations are working together to use a variety of funding programs, expertise, and creative thinking to make these improvements. This tour will feature several projects that encompass multiple land uses, utilized different funding programs, and all made possible through partnerships. BMPs will include riparian buffers, pollinator meadows, barnyard improvements, crop field practices, and stream restoration. Attendees will hear from project managers from the Penn State Agriculture and Environment Center, local municipal representatives, property owners, and specialists from the Alliance for the Chesapeake Bay.

Pennsylvania Amish in Lancaster County

While the Amish community’s long connection to the fertile farmland of Lancaster County is well recognized, less appreciated is their strong land stewardship ethic. Their unique culture can be a challenge for implementing conservation practices which require gas operated machinery. On this tour we will visit the Amish owned business Pequea Planters which started adapting no-till planters for use with horses around 25 years ago and currently sells between 100 and 150 annually. Now a majority of corn planted on Amish farms in Lancaster County is no-tilled, retiring the moldboard plow and bare soil on scores of farmed acres which ultimately drain to the Chesapeake Bay, the Nation’s largest TMDL. We will visit one of these working Amish farms as our second stop to learn about the of Amish farming’s unique methods and challenges and to view several of the conservation practices adopted there. We’ll cap the day with dinner at the Shady Maple Smorgasbord, regionally famous for its Old-world Pennsylvania Dutch charm and enormous buffet.

Source to Tap Kayak Trip - Swatara Creek and Tröegs Brewery Adventure

This tour will focus on overlapping environmental and human uses of the Swatara Creek as a major source water conduit in Central Pennsylvania. As gentle creek currents propel us downstream we will observe a variety of land uses and discuss how they are contributing to the

watershed. In addition, we'll highlight the drinking water treatment needs of the public water suppliers that withdrawal thousands of gallons daily from the Swatara. The plan for this field trip is twofold- the Swatara paddle followed by a tour of Troegs Brewery where the focus will be on major end users of Swatara creek's surface water and how they are impacted by changes in the water quality. An experienced guide from Cocoa Kayaks will also join us to discuss Swatara Creek ecology and environmental restoration work in the watershed.

Habitat Happenings at Middle Creek Wildlife Management Area

Middle Creek is a wildlife and biodiversity hotspot. Owned and operated by the Pennsylvania Game Commission, the state agency that oversees birds, mammals, and hunting regulations, Middle Creek is best known for its waterfowl migrations. Agency habitat managers and foresters will be on hand to discuss how different natural resources are managed from forests, early successional habitats, and water structures that enable Middle Creek to be recognized as an Important Bird Area and Important Mammal Area.

Hersheypark – Managing Stormwater in the Sweetest Place on Earth

Milton S. Hershey established Hersheypark along the banks of Spring Creek in 1906 as a leisure ground for his employees. In the decades that followed, the park has grown to become the hub of a world class entertainment complex, that includes a water park, a zoo, an outdoor stadium, two indoor hockey arenas, and all the associated infrastructure to support year-round operations. Stormwater management is a major focus at the 400-acre complex which is part of Derry Township's local MS4 program as well as regional efforts to achieve water quality goals connected to the Chesapeake Bay TMDL. Join the planning and design team from Hershey Entertainment & Resorts for a review of the development of the park, the impacts of flooding events, and a tour of the wide-ranging stormwater management practices implemented as an essential part of the largest capital investment in the history of the park. And we will have the park to ourselves since the public can only visit on weekends during this time of year!

May 8, 2024

Keynote

Morgan Ridgway

Writer | Scholar | Artist Lecturer in History and Literature
Harvard University.

Concurrent Session 6

Beyond the sign: Augmented reality outreach for aquatic invasive species prevention

Brock Bahlmann, University of Minnesota; Megan M. Weber, University of Minnesota; Ingrid Schneider, University of Minnesota

Signs are pervasive throughout the human landscape and used to convey many types of messages. Given signs are relatively low-cost and easy to produce, environments can become saturated with them and subsequently diminish their impact. To address this challenge, we wanted to think beyond the sign to explore if and how critical conservation messages might stand out and influence behavior change. We were particularly interested in influencing boating anglers' intention to perform preventative behaviors against the spread of aquatic invasive species.

In this session, you will learn about how we created and are testing augmented reality to increase boating anglers' intent to take actions that prevent the spread of aquatic invasive species. A multi-step process included systematic observations of boating anglers at public water accesses to see which prevention actions were most frequently missed when leaving a water body, interviews with boating anglers to understand constraints and opportunities to perform preventive behaviors and message creation and testing in two formats: static signs and augmented reality. You will get the opportunity to see what we learned at each of these stages, see the augmented reality messages in action, and learn about what's next for this project and the toolkit we'll create at project completion.

Community coastal landscaping workshops and giveaways

Carrie Stevenson, ¹Beth Bolles, and ²Samantha Bolduc

¹UF IFAS Extension, ²Escambia County, Florida

Escambia County's Perdido Key Visitor Center is home to a demonstration landscape that showcases native coastal plants. The vegetation is suited to dune ecosystems and landscapes within the endangered Perdido Key beach mouse's habitat. Due to local ordinances requiring beach mouse-friendly landscaping on nearby property, residents sought help finding plant sources from county employees.

While demand for appropriate landscape materials was high, supply was low. To meet this need, we sought and received funding (\$13,200) to host landscaping workshops and plant giveaways. The goal of these was to improve resident awareness and access to native coastal plant species. This project also engaged four local nurseries to stock target native species and provided funding to update the Perdido Key Landscaping Guide to include local nursery information.

Escambia County staff, Extension Agents, and Master Gardeners designed workshops focusing on native species and maintenance of coastal landscapes. Workshops were free of charge and located in coastal communities (Pensacola Beach, Gulf Breeze, and Perdido Key) to reduce barriers to participation. Workshop participants received a variety of native species to implement the lessons learned. We also hosted two free plant giveaways for the larger community and provided basic species information and planting guidelines. All species were from the approved Perdido Key Habitat Conservation Plan Approved Plant List and support native wildlife and pollinators.

Two evening and two daytime workshops, along with two weekend giveaway events, engaged 300 coastal residents. During these events, 1,200 native plants were given away and 200 landscape guides distributed to attendees.

Long term impacts of in-person vs. online education for family forest owners in northwest Washington

Kevin Zobrist, Washington State University

Washington State University Extension offers a multi-week forestry course for family forest owners called Forest Stewardship Coached Planning. This comprehensive course teaches best management practices for family forests. Participants are “coached” in the writing of their own personalized forest management plan. Thirty-four in-person courses were offered in northwest Washington during 2008 – 2022, and 16 online courses were offered during 2012 – 2022. Follow-up surveys were sent to participants one, three, and eight years following each course to assess long-term impacts of behavior and condition change. This presentation summarizes the results of those surveys. The results demonstrate that these education programs have significant impacts on behavior change. Three-year survey results demonstrated condition changes, with respondents reporting income generation, improved environmental conditions, and improved quality of life based on what was learned in the course. Eight-year survey results demonstrate sustained impacts and continued benefits eight years later. The results show that both the online and in-person courses have similar long-term impacts. The only major difference is that online participants are less likely to complete a written management plan. With the proliferation of online landowner education programs due to the COVID-19 pandemic and the potential to reach new, more diverse audiences, it is important for educators to understand how a shift to online learning might change program impacts. This study demonstrates that online education of family forest owners can be just as impactful in the long term as traditional in-person education programs.

Preparing industry for a sustainable future in green infrastructure: the living shorelines training

Armando J. Ubeda (UF/IFAS Florida Sea Grant aubeda@ufl.edu), Mandy Baily (UF/IFAS Florida Sea Grant ily@ufl.edu)*, Savanna Barry (savanna.barry@ufl.edu), Rick O'Connor (roc1@ufl.edu), mbaily@ufl.edu), Vincent Encomio (UF/IFAS Florida Sea Grant vencomio@ufl.edu), Savanna Barry (UF/IFAS Florida Sea Grant savanna.barry@ufl.edu), Rick O'Connor (UF/IFAS Florida Sea Grant roc1@ufl.edu)

In 2018 multiple partners from governments, non-profits, universities, and private industry developed the Living Shorelines Training for Marine Contractors course. Living shorelines, in which native shoreline vegetation and oyster reefs, are utilized as a sustainable and resilient method of shoreline stabilization, habitat enhancement, improving water quality, and sea-level rise adaptation. Florida Sea Grant (FSG) extension faculty initiated teaching this course, virtually, in 2021. For 2023-2024, FSG obtained support from the FL Department of Environmental Protection to conduct in-person training in 12 locations throughout Florida. The objective of the course is to train professionals in living shorelines as a 'green,' alternative to traditional, 'gray' infrastructure such as seawalls and bulkheads. The main goal is to increase industry practice in living shorelines.

The 2-day course covers the design, permitting, installation, monitoring, and maintenance of living shorelines. Instruction is performed through lectures, videos, group activities, and field trips. Pre-and post-tests measure knowledge gain. Behavioral changes of course graduates that result in living shoreline installations are tracked.

Since 2021, 250 students, over 12 courses, were taught. Knowledge gain increased by 16%. In 2021 alone, we estimated an economic impact of \$3-4M as a result of this training. Courses provided networking opportunities among students and included instructors from local, state, and federal agencies alongside individual experts.

Initial results show great promise that professional training in living shorelines may further a green industry that will improve the health and resiliency of Florida's coastlines. The project team will continue these efforts in 2024.

Sustaining forestry and wildlife 4-H youth programs in North Carolina

Renee Strnad, NC State University Extension Forestry

North Carolina State University Extension Forestry has been the home of two statewide programs for over 20 years; the Forestry Invitational and the Wildlife Habitat Education Program (WHEP). With numerous programs that North Carolina youth can be involved with throughout the state, our 4-H forestry and wildlife programs have seen little growth. One way we have attempted to address this is making all the information for the forestry and wildlife programs easily accessible online, including training resources, as well as webinars and sessions for Extension professionals not directly tied to 4-H programming.

This session will briefly introduce participants to the resources available for forestry and wildlife youth programming from Extension Forestry, share our online training portal for the Forestry Invitational and the WHEP program, and provide a space for discussion on ideas with and from other states.

Concurrent Session 7

40 years of ROI (revenue generation, opportunity, and impact): The roads traveled and paths ahead for an innovative, integrated, and impactful natural resource Extension program

M. Jennison Kipp¹, UF/IFAS Extension Sustainable Communities State Specialized Program Agent, mjkipp@ufl.edu, 352.273.0245

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¹UF/IFAS Extension Program for Resource Efficient Communities (PREC), Center for Land Use Efficiency (CLUE); ²UF/IFAS Department of Wildlife Ecology and Conservation

“Necessity is the mother of invention,” planting the seeds of innovation and clearing the way for a journey off the beaten path. In 2004, the Program for Resource Efficient Communities (PREC) was founded to tackle at a systems level the many natural resource challenges associated with Florida’s rapid urban growth. We were born from the pressing need for credible, economically viable, technically feasible, and scalable solutions that balance urban growth with environmental protection. To meet this need, we simply had to step off the beaten path. Yet we’ve remained true to our PREC mission of promoting the adoption of best design, construction, and management practices that measurably reduce energy and water use and environmental degradation in Florida’s new master-planned communities. We pursue the mission with four core and interconnected initiatives addressing water conservation, energy efficiency and equity, climate resilience, and low-impact development (LID) + green stormwater infrastructure (GSI).

While demand for PREC services has ebbed and flowed over the years, it is surging today as private- and public-sector decision makers face very real and increasingly acute constraints to operating “business-as-usual”. In this organized special session, we will share highlights and lessons learned from two decades of organizing, generating revenue, building partnerships, delivering, and maintaining this innovative, integrated, and impactful program. We hope it will ultimately help guide others beyond the beaten path to unexpected destinations for ROI in Extension.

Building Communities of Practice - an Aquaponics Example

Author: Laura Tiu, Ph.D.

Affiliation: University of Florida/Florida Sea Grant

A University of Florida Extension's high-priority initiative is "increasing the sustainability, profitability, and competitiveness of agricultural and horticultural enterprises." Creating a community of practice (COP) is one model to address information and training needs of clientele. Aquaponics is a relatively new food production system that is complex and requires intensive training and support. To address the increasing demand for information and training, an Aquaponics Community of Practice was formed in 2016. In the following years, workshops, a demonstration system, one on one training and consulting and a communication listserv have been used to expand this initiative. This presentation will elaborate on the successes and challenges of this effort.

Multi-organizational model to develop service providers for small acreage woodland owners

Jonathan Kays, University of Maryland

Over 60 percent of private woodland parcels in the United States are 1-9 acres but represent only 6% of the land area. In urbanizing states, it can be over 80% of parcels and 20% of land area. The Woods in Your Backyard (WIYB) program organized in 2006 provided workshops and a guide for landowner self-assessment and woodland management planning that was revised in 2016. It is difficult for landowners to hire service providers to implement recommended natural area management services (NAMS), such as lawn conversion, invasive plant control, wildlife habitat enhancement, trail building, vine control, and other services. Foresters do not traditionally work on small-acreage properties that lack commercial timber management opportunities.

In 2018, the WIYB Partnership formed to develop a training program for green industry professionals (landscaper, arborist, foresters, etc.) to learn how to incorporate NAMS into their business. The project produced three quality for sale print publications that have sold over 18,000 copies, three webinar training series from 2020-2023 targeted to service providers, web-based resources, an online service directory for landowners, and a train-the-trainer workshop to share the program with other educators. Impacts for landowners and service providers have been impressive. The presentation will discuss the multi-organizational program model led by Extension, share program results, and lessons learned.

The Woods In You Backyard (WIYB) Partnership is ongoing and composed of Maryland, Pennsylvania, and Virginia extension organizations, Alliance for the Chesapeake Bay, and Virginia and Maryland state forestry agencies, and provides a logic-based program model.

Plant to Plate: A collaborative food systems program focusing on sustainability

Campbell, C., UF/IFAS Family, Youth, and Community Sciences Department; Elliott, R., Rhoden, J., Marek, A., Bailey, M., Nobles, P., UF/IFAS Extension Marion County

Background: In Marion County, over 87% of the population does not consume the recommended five daily servings of fruits and vegetables, and close to 64% are overweight or obese. By educating the public on sustainable gardening and edible landscaping practices, public health and food security can be improved while protecting natural resources. Objectives: Plant to Plate participants will gain the knowledge to and will select Florida-friendly plants for their gardens and edible ornamental landscapes, will conserve water used for irrigation, and will increase their consumption of healthy fresh produce. Methods: UF/IFAS faculty from multiple program areas provided a one-day Plant to Plate workshop in May 2023 followed by an optional edible demonstration garden tour. Participants were introduced to local agriculture, and were taught vegetable production, hydroponics, microirrigation, edible ornamental landscaping using Florida-Friendly Landscaping principles, and healthy cooking and food preservation methods. Participants also received two edible plants and three starter kits. Results: Thirty-three people participated. On average, they strongly agreed they learned from the program and intended to adopt behaviors to sustainably grow and cook fresh, healthy produce at home. A six-month follow-up survey to evaluate behavior change will be sent in November, and the program will be repeated in 2024. Conclusion: By presenting a holistic food systems program and providing plants and multiple take-home kits to minimize barriers to behavior change, the UF/IFAS Extension Plant to Plate program encourages the adoption of healthier, more sustainable gardening and lifestyle practices.

Spotting the Spot: Educating and Engaging Youth in the Battle of the Spotted Lanternfly

Author: Amy Stone

Affiliation: Ohio State University Extension, Lucas County, Agriculture and Natural Resources

Author: Jess Soffee, Ohio State University Extension, Lucas County, 4-H Youth Development

Author: Jonathon Shields, Ohio Department of Agriculture (ODA)

Abstract:

The Spotted Lanternfly (SLF) is a non-native, invasive insect, that is making Ohio home since its introduction into the US in 2014, and its first detection in Ohio in 2022.

As we quickly learned that we needed to engage the public to look for and report this non-native planthopper across Ohio, we realized that several of the initial infestations in our county were near schools and thought youth could play a valuable role in monitoring and being part of the 'SLF Stomp-Squad.'

As we were in the neighborhoods doing survey work, the youth would come out and ask some great questions and kept us posted where they are seeing the most SLF in the area when

we revisited. The youth were ideal candidates to assist in spreading the word about this unwanted insect through their connections in their own neighborhoods. We felt utilizing the schools in, or near the SLF infestations would increase the impact.

Students learned about the insect's life cycle, its favorite host plants, the impact the insect can have on in their neighborhood and on agriculture, how they can report the pest, they learned about the educational materials created to increase awareness through Extension and ODA. Youth were able to try their skills in an indoor SLF scavenger hunt utilizing 3-D printed SLF stages including nymphs, adults and egg masses in the classroom, which conference participants will also experience. Their classrooms were provided their own SLF kit to be able to engage family members, friends, and neighbors.

Concurrent Session 8

4-H Youth Build Partnerships to Raise Awareness about Coastal Community Conservation

Rachel S. Pienta, PhD, University of Florida

Wakulla 4-H youth identified coastal littering as a growing concern in their community. To address the issue, they embarked on a social awareness campaign effort. They wrote and applied for a 4-H Community PRIDE seed grant to create signage that would highlight the impact of littering on natural resources. The youth were awarded \$1000 to put toward their project. With guidance from their 4-H agent and volunteer club leaders, youth partnered with Keep Wakulla County Beautiful, Wakulla County government, and the Florida Department of Transportation to design road signs with original artwork for installation on county and state roads. One of the road sign designs was chosen as the 2023 shirt design for Wakulla County's International Coastal Clean Up event. In addition, they presented their project to the Board of County Commissioners. Youth also interviewed two board members of Keep Wakulla County Beautiful on the Wakulla 4-H podcast. 4-H youth invited youth from six nearby counties to participate with them in the annual International Coastal Clean Up. Organizers saw event participation increase from prior year registrations by over 150 participants, bringing the participation to over 600 registered youth and adults. Through this project, 28 youth learned how to plan a campaign, engage partners, and gained experience in public speaking while learning about coastal conservation and efforts to reduce plastics in waterways.

Collecting environmental and educational impacts of volunteers

Author: Erin Frederick, Brandon Woelkers

Affiliations: Penn State Extension

Penn State Extension began using Hands on Connect software to both communicate with and track Master Watershed Steward activities in 2021. Volunteers are able to sign up for

volunteer opportunities, receive news items, and enter their volunteer hours and educational contacts all within the portal. Over the past few years of work by Penn State Extension and Hands on Connect, the system can now collect environmental metrics such as the number of trees planted, length of riparian buffer restored, and number of trash bags removed. These environmental metrics have been critical in showcasing the impact of the volunteers to state and local stakeholders.

This session will review the development process, reporting options and views, features and capabilities. It will also highlight all the metrics the system can collect, future plans, and lessons learned in acclimating the volunteers to this new system.

Creating and Delivering Effective Natural Resources Education that Everyone Enjoys

Author: Sanford S. Smith, Teaching Professor of Forest Resources

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This workshop provides a fun tutorial on how to create, teach and evaluate using the Peers and Pros 360o method. It is a novel teaching approach that uses a group activity to promote collaborative learning among peers in groups. It can be implemented anywhere and in conjunction with other extension events (e.g., field tours, presentations, meetings). The approach initiates short meaningful discussions in peer groups using previously identified theme-based topics and discussion points. Clarifications on technical details, wrap-up thoughts, and advice are provided by professionals at the conclusion of the discussions after each theme. Benefits from this approach include:

- **Enjoyment.** Peers frequently enjoy the expression of diverse opinions and learning from each other. Professionals in turn learn much.
- **Clarification.** Group discussions help fill in partial understandings of complex issues.
- **Trust.** Peer validation provides credibility to the discussion, in addition to the content provided by university or agency experts.
- **Community.** Everyone can receive valuable social and learning benefits, regardless of their former knowledge and experience.
- **Impact.** Educators gain a better understanding of the information needs, experiences, and opinions of the peer learners in real time while teaching a session.

Participants will walk away from this session with the confidence, skills, and understanding of the details to use this method. It may just change the ways you think about teaching and presenting programs for the rest of your career.

Incorporating climate change into Extension programming

Duane Friend, Dr. Shibu Kar, Dr. Deanna Hence, Dr. Elizabeth Goelbie, Laurie Nowatzke, Karen Winter-Nelson

University of Illinois Extension

Incorporation of climate change into Extension programs has become more important in recent years.

To determine Extension climate change programming needs, a survey of Illinois Extension employees was conducted in early 2022. Results from the survey showed that over half of respondents said they are interested in incorporating climate change into their Extension programming, but their top concern is presenting complex climate information accurately to sometimes skeptical audiences. Two-thirds said they needed training and workshops on climate relevant programming content.

To help Extension Educators and others to confidently discuss climate change related topics, Illinois Extension has developed an online climate outreach curriculum for Extension personnel. The curriculum includes climate science basics, terminology, climate communication, diversity, equity, and justice issues, and provides links to climate resources. This presentation will discuss the survey of Extension employees and will provide current information on course content, use of the course, and evaluation results.

Influencing diverse audiences of educators by leveraging forest industry and agency partnerships

Butch Bailey, Mississippi State University

Outdoor education is as important as ever for students, teachers, and society. However, opportunities for classrooms to experience the outdoors have declined. The Teachers Conservation Workshops (TCW) conducted by Mississippi State University and the Mississippi Forestry Association (MFA) have been bringing the outdoors into the classrooms for over 60 years. These workshops take place over six days in the summer, where teachers from all grade levels experience all aspects of forestry and conservation career work at a hands-on and participatory level. TCW leverages partnerships with forest industry and state and federal agencies, as well as NGOs to provide room and board for all participants at little to no cost. This presentation will focus on experiences that participating teachers have had over the years at TCW as well as lessons learned on how to approach various forest industry companies for assistance ranging from monetary support, educational expertise, and access to field and mill facilities.

The Future of Forest Insect Monitoring for Conservation and Extension

Author: Codey L. Mathis, Nash E. Turley, Michael J. Skvarla

Affiliations: Department of Entomology, Penn State University, University Park, Pennsylvania, USA.

Although forests are the dominant land cover type across the Northeast, little is known about the non-pest insects that occur there. Forests support a wide variety of beneficial insects, particularly pollinators like bees and butterflies, and in addition, insects in forests can spill-over into adjacent agricultural habitats and pollinate crops. In the last few decades, it has become clear that the understory and forest canopy host unique communities, but this has not been studied extensively within the United States. In addition, forest edges may harbor unique insect communities which remains poorly studied. Moreover, there have been concerns about the efficacy of commonly used sampling methodologies like blue-vane traps and bee bowls, which attract insects based on their fluorescent paint, in areas of varying vegetation communities. To fill this knowledge gap, we examined the differences in insect communities across several forest microhabitats (canopies, edges, understories) at 10 locations in the Stone Valley Research Forest, about 15 miles from State College, PA. We used blue-vane traps, bee bowls, and clear-vane traps to assess the fluorescent trap efficacy. Traps were deployed for 1-week periods May through September. We also surveyed the floral community, vegetation structure, canopy openness, and surrounding tree communities. In this presentation, we highlight the first year's data collection, insights into how to improve current forest insect monitoring techniques, and the Extension materials that were created from this research. By highlighting the amazing diversity within Stone Valley, we can empower people to conserve the little creatures that also call Pennsylvania home.

Concurrent Session 9

Building Safe and Inclusive Spaces in Field Settings: You have a Right to Know!

MacKnight, Maisie^{1,2} and Allyson Muth²

1) Ecology Intercollege Graduate Degree Program, Huck Life Sciences, Pennsylvania State University, University Park, Pennsylvania 16802

2) Department of Ecosystem Science and Management, Pennsylvania State University, University Park, Pennsylvania 16802

Open communication that sets inclusive culture and clear expectations of the work environment at the beginning has been shown to empower field teams. Providing information about these expectations helps foster discussion within team members as they identify and reduce risk. Supervisors need to acknowledge differences in individual identity and experience level to appropriately disclose risk. Despite increased dialogue about best practices, many

people, especially from minority groups or those with less institutional power (e.g., students, untenured faculty etc.) have reported feeling unsafe while doing fieldwork. Additionally, there is still uncertainty about applying outlined best-practices to specific settings, despite new federal grant requirements to do so. Therefore, we present a collection of field safety resources that follow the best practice of increasing communication between field members. This workshop aims to serve field team members by 1) introducing the field safety resources as a collection of communication tools and 2) provides guidance as supervisors navigate federal requirements, such as the National Science Foundation's Safe and Inclusive Plan requirements. Implementation of these resources in individual lab groups has been shown to improve individual sense of belonging and empowerment of students in the field.

Increasing capacity and diversity among floodplain professionals: developing a graduate certificate

Gerald Murphy, JD, AICP, CFM

University of Florida | Institute of Food & Agricultural Sciences (IFAS) – Extension: Program for Resource Efficient Communities

Thomas Ruppert, Esq.

Willaim & Mary University -- Virginia Coastal Resilience Collaborative

There is a great need in the United States and elsewhere to expand the floodplain management profession to address the disparate impacts of flooding on underrepresented ("frontline") communities. Floods are the most common and widespread of all weather-related natural disasters and the predominant hazard risk in the United States. Climate change, inadequate infrastructure, and increasing urbanization magnify the impacts of flooding with devastating consequences. In the first decade of this millennium, extreme rainfall events combined with changes in land use increased flooding and increased annual average flood losses to \$10 billion, despite the billions of dollars previously invested in flood control. As negative impacts from increased flooding are anticipated to increase over time, the demand—the unmet need—for additional floodplain professionals to assist private and public citizens; businesses, industry; and federal, state, and local government increases proportionately. The Association of State Floodplain Managers ("ASFPM") established the national Certified Floodplain Manager ("CFM®") program in 1998 to test the baseline of professional competence in floodplain management. As the CFM® is a baseline certification—and floodplain professionals are confronted by increasing climatic complexity—ASFPM recognizes the need for an advanced level of education for more diverse, comprehensive, and anticipatory approaches to Floodplain Stewardship. The federal government recognizes the powerfully beneficial role that Historically Black Colleges and Universities ("HBCUs") can play in developing a workforce that reflects diverse communities. Through development of curriculum for a graduate certificate in

Floodplain Stewardship with HBCUs, we can extend this benefit to better reach underserved frontline communities.

Land, Wildlife, & Management: A Deep Dive into Maryland Landowners' Practices and Perspectives

Ashley Knoch, University of Maryland

In Maryland, private landowners are crucial to wildlife management and land conservation, owning approximately 90% of the state's land. Understanding their perspectives is essential for the development of effective educational tools and programs for wildlife habitat management across the state. We conducted a comprehensive survey targeting Maryland landowners with properties of 5 or more acres. This survey employed a mixed methods approach, utilizing email, postcards, and direct mail for effective outreach.

Our survey focused on several key areas: 1) determining whether landowners actively manage their land for wildlife and what are their motivations for doing so, 2) assessing their knowledge, interest, and engagement in vegetation management, deer management, and other conservation practices on their property, and 3) exploring landowners' challenges in implementing these management practices. Landowners also indicated wildlife damage currently experienced on their property by species and their associated cost estimates. We further asked landowners about their views on potential deer management strategies, such as selling harvested venison and the practice of night hunting.

The study additionally assessed differences in these perspectives for factors such as property size and social demographics. Results from this survey will shed light on the current practices and educational needs of Maryland's private landowners, as well as their attitudes towards wildlife management. This information will be vital in guiding the development of tailored, effective conservation strategies throughout the state.

Minority Mentorship: Innovation in Capacity Building

Mark Megalos, National Woodland Owners Association

Following discussion about “fixing” the dearth of minority representation in the Natural Resources community, Sam Cook and I talked through an idea to find seed money to stand up a mentoring effort aimed at credentialing young professional for the workforce. Our tactics began with an experiential approach that leveraged travel and training money with on-the-ground work to reinforce proven business development planning and more. A team focused on recruitment, credentials, grant getting, and business development was formed to launch a three-year pilot. The U.S. Endowment for Forests and Communities funded our initial effort and we have since quadrupled grant opportunities that align with our pilot. Two-year progress report and lessons learned are proffered. Program expansion is underway based on a continuous improvement model and looming federal and institutional funding opportunities.

Nature begins at your backdoor

Amy Lang

University of Maryland Extension, 4-H Youth Development Educator

Participants in the Nature Begins at your Backdoor session will engage in a discussion around the benefits of nature-based experiences, and barriers that may prevent youth participation in nature-based programs. They will then be introduced to the six session Nature Begins at your Backdoor program which successfully utilized virtual technologies to introduce youth to nature concepts and discoveries right outside their doors, thus removing some of the common transportation, access, and time barriers. Participants will take part in a variety of hands-on activities used through the program to engage youth both in person and virtually. Activities include tree stories, an ecosystem web, a backyard safari, an insect photo challenge, a plant transpiration experiment, flower dissection and seed dispersal activities. Participants will leave with a complete toolkit for replication, including evaluation instruments.

Natural resources exploration camp: Connecting youth with nature

Kasey Bozeman, University of Georgia, College of Agricultural & Environmental Sciences

Charles Wurst, University of Georgia, College of Agricultural & Environmental Sciences

Kris Irwin, University of Georgia, Daniel B. Warnell School for Forestry & Natural Resources

Michel Kohl, University of Georgia, Daniel B. Warnell School for Forestry & Natural Resources

Nicholas Fuhrman, University of Georgia, Daniel B. Warnell School for Forestry & Natural Resources

The University of Georgia (UGA) Warnell School for Forestry & Natural Resources and Georgia 4-H partnered to offer a first-of-its-kind residential summer camp program for high school students. The 5-day Natural Resources Exploration Camp allowed students to travel to UGA's main campus to participate in learning sessions, tours, and hands-on laboratories. Youth participated in traditional camp-related recreational activities like canoeing, fishing, swimming, arts & crafts, and campfires. The camp's goal was to expose youth to various forestry, wildlife, fisheries, and other natural resource topics while also sharing college and career opportunities. Activities during the camp included sampling streams for macroinvertebrates, setting and reviewing trail camera footage to survey wildlife, wildlife tracking and trapping, flying drones, identifying native tree species, dissecting owl pellets and completing an owl prowl, interacting with live invasive species negatively affecting Georgia ecosystems, electrofishing and lake health assessment, and touring the Whitehall Deer Research Facilities and the Whitehall Fisheries Lab. During this educational session, participants will learn about (1) the goals and objectives of the camp & integrating positive youth development into natural resource education, (2) roles and responsibilities of the planning team members, (3) operational logistics, (4) content topics and

activities, (5) evaluation results, and (6) ways the camp could be replicated within your own Extension networks. All materials (schedule, evaluation, etc.) will be shared with attendees. The session will be interactive with dialogue about promising practices learned from hosting the first camp and the plans that are in place for the next season's adventures.

Subsurface aeration and vegetative growth affect water quality in a recently refilled lake

Sal Mangiafico, County Agent, Rutgers Cooperative Extension, Millville, NJ 08332.
mangiafico@njaes.rutgers.edu.

A freshwater lake in Bridgeton, NJ, USA, had been drained for four years, allowing the lakebed to revegetate. A year after the dam was restored, subsurface aeration was installed around the swimming beach. Lake water was sampled at three locations weekly for two years beginning after the dam was restored and continuing through the period with aeration. Across the two years, water quality was generally good for dissolved oxygen (DO), turbidity, temperature, pH, electrical conductivity (EC), and visual and odor assessments, suggesting that decaying vegetation did not negatively impact water quality in the lake for these parameters. However, exceedances of benchmarks were common for *E. coli*, with 37% of samples exceeding the state benchmark, and for reactive phosphorus. Subsurface aerators were assessed with a paired watershed design comparing changes in the swimming beach site with aeration to another site on the lake that served as a control. Results suggest that subsurface aerators increased DO but results for aerators were inconclusive for *E. coli* and turbidity. Further sampling with microbial source tracking may be helpful to identify sources of *E. coli*. Caution might suggest the removal of accumulated vegetation before refilling a drained lake to prevent the possibility of low oxygen conditions caused by the decay of the vegetation, though this was not observed in this study. As past studies suggest the utility of aeration to reduce *E. coli* and potentially other pollutants of concern, installation of aerators may be justified when balanced with other considerations such as cost and effectiveness.

Concurrent Session 10

Biochar in extension

Author: Christopher Jones

Affiliation: University of Arizona Cooperative Extension

Biochar is charcoal used for land applications. Agent Jones had a 4'x4'x2' metal kiln custom built, and has conducted 9 live demonstrations, and 8 classroom, webinar and conference presentations since March 2022, with a total audience of 370. Demonstration participants learn about building a portable flame cap kiln for demonstrating how to make

biochar. Details such as burn permits, fire safety, a water source, and lighting and quenching the fire are discussed. Emerging markets for biochar include: 1) An organic soil amendment that improves water and nutrient availability for agriculture, horticulture, and wildland restoration; 2) Contaminant adsorption for stormwater systems, dairies, landfills or mining; 3) Hazardous fuels reduction in forests and wildland urban interface communities, as well as reduction of yard waste; 4) Production of bioenergy fuels including syngas and bio-oil; and 5) direct carbon sequestration: the half-life of a biochar molecule is a thousand years. Benefits and challenges of using biochar are discussed, including raising awareness about biochar; creating markets; feedstock properties and variability; and matching biochar qualities to specific applications.

Chainsaw Sessions

1) Mike Powell, Penn State University

This session will be a hands-on component where participants will have the opportunity to operate a chainsaw with my instruction and presence close at hand. This training will focus on Personal Protective Equipment (PPE) necessary to safely operate a chainsaw, followed by reactive forces which will be discussed first, and then experienced and understood better when the chainsaw is put into use. Hazard analysis and field safety will be covered as this is hard to present without a woodlot. Finally, the comparison between gas and battery-operated chainsaw will be demonstrated and talked about.

2) Patrick Hiesl¹, Janet Steele², and Susan T. Guynn²

¹Department of Forestry and Environmental Conservation, Clemson University, Clemson, SC

²Cooperative Extension Service, Clemson University, Clemson, SC

Chainsaw safety training programs are often geared towards professional loggers and chainsaw users with a fair amount of experience. A population of private forest owners that is emerging and increasing in numbers are female forest landowners (FFLO). FFLO have been marginalized in technical training programs in the past and current chainsaw training programs, if available, often do not suit the needs of this population. We conducted chainsaw safety training programs geared towards FFLO and compared program evaluation results with results from male-dominated chainsaw training workshops. FFLO are limited in their technical knowledge at the beginning of a workshop, are more likely to own different types of chainsaws than male participants, and generally like having a women-only workshop. However, few chainsaw safety training programs are available to private forest owners, and even fewer are geared towards FFLO. There is an opportunity for Extension professionals to offer chainsaw safety training programs to FFLO as demand for these workshops is often surpassing workshop capacity.

3) Author: Lee Beers

Affiliations: The Ohio State University Extension, Trumbull County, 520 West Main Street, Cortland, OH 44410

Chainsaws are a common property maintenance tool for farmers, homeowners, and woodlot managers. Proper training and personal protective equipment (PPE) are required to operate these tools to minimize the risk of injury. Approximately 36,000 people are treated in emergency rooms each year due to chainsaw related injuries according to the Center for Disease Control and Prevention. Ohio State

University has been offering chainsaw safety training to both adults and youth since 2016 using formal presentations, workshops, demonstrations, and in collaboration with industry groups. The purpose of this training is to highlight the dangers of chainsaws, encourage proper use of PPE, and provide basic operation techniques. The training has been adapted to teach all skills levels, and to youth audiences that have unique challenges based on their physical and cognitive abilities.

Exploring JEDI and connections to our Extension work

Renee Strnad, NC State University Extension Forestry

James Harrison,

Bindu Bahkta, Michigan State University Extension

Julie Crick, Michigan State University Extension

The North American Association for Environmental Education (NAAEE) is leading a multi-year initiative called ee360+ to help grow the field of environmental education leaders from many diverse fields to build a stronger and more inclusive movement to grow environmentally literate and engaged communities. The four goals of the ee360+ initiative are to 1) drive educator excellence, 2) strengthen organizational capacity and leadership, 3) mobilize access to high-quality resources and networks, and 4) maintain excellence through evaluation, communication, and management. Through this project, ANREP was awarded three years of funding from the ee360+ initiative to help build connections between Extension professionals and the field of environmental education.

ANREP used some of the ee360+ grant funds to support organizational objectives and the newly formed Diversity, Equity, and Inclusion committee by supporting ANREP members' growth and exploration in this topic area by hosting two cohorts of *Justice, Equity, Diversity, and Inclusion in Outreach and Environmental Education* special topics course. This JEDI (Justice, Equity, Diversity, and Inclusion) course was developed by the Southeastern Environmental Education Alliance (SEEA) in partnership with the Center for Diversity and the Environment, EcoInclusive, Environmental Educators of North Carolina, Kansas Association for Conservation and Environmental Education, Kentucky Association for Environmental Education, and Youth Outside.

This session will bring cohort members and others interested in JEDI to discuss how the course ties into their work as extension professionals, how it has changed the way they do their work, and other supports they need as professionals in this topic area.

Natural resources exploration camp: Connecting youth with nature

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Successful collaboration between OSU Extension's Groundwater Education, Forestry & Natural Resources

Chrissy Lucas Woodruff, Oregon State University Extension Service

The Be Well Study, a collaboration between OSU Extension and the College of Health, looks at drinking water quality and stewardship behaviors of well users in Oregon. The primary goal is to evaluate the effectiveness of a community navigator led intervention that would assist well users who have high levels of arsenic, nitrate, or lead in their well water. Additionally, this study helps us learn about the health of people using well water in Oregon and the maintenance activities well owners perform. While typically Extension and the College of Health have collaborated on nutrition and physical health-based programming, this project brings together outreach expertise from Extension programs in both Agriculture and Natural Resources

and Forestry and Natural Resources and the College of Health's School of Public Health. Efforts to tie public health goals to natural resource management may offer additional opportunities to collaborate and provide essential value to the communities we serve.

This collaboration between the Groundwater Program, Forestry and Natural Resources Program, and College of Health brings together a variety of expertise from these silos to evaluate the effectiveness of an Extension-delivered navigator intervention to assist well users who have high levels of arsenic, nitrate, or lead in well water. We describe strategies and challenges to collaboration among our different programs. Quantitative and qualitative anecdotes from Be Well participants highlight how efforts to tie public health goals to natural resource management offer opportunities to collaborate and have a positive impact on the community.

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