

5th Natural Resources Extension Professionals Conference Park City, Utah; May 14-17, 2006

Oral Presentation Abstracts Listed by Session

Note: Presenting author(s) *italicized*

Monday, May 15, 2006

Plenary Session, 8:30 a.m. – 12 p.m.

Getting Serious about Sustainability – Domestic Perspectives – *Ruth McWilliams*, USDA-Forest Service, Washington, D.C.

“Sustainable development begins at home.” This vision, as expressed by the US Government and others at the World Summit on Sustainable Development in 2002, necessitates broadening and deepening our understanding about issues confronting the United States as well as our commitment to finding sustainable solutions. Natural resource professionals have knowledge, skills, and abilities needed to help people and places throughout the United States maintain or enhance natural resources and related natural functions while creating social and economic benefits. This notion of ‘strong sustainability’ brings with it challenges and opportunities for creating powerful, purposeful change – from both individual and collective perspectives. Together we need to increase our capacity to work toward sustainable solutions, build legitimacy and support for them, and figure out how to create value for society – all the while recognizing that our local actions have global implications and effects, and vice versa.

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Getting Serious about Sustainability - Global Perspectives: Finding the Ability in Sustainability – *Okechukwu Ukaga*, Northeast Minnesota Sustainable Development Partnership, University of Minnesota

The World Commission on Environment and Development and its 1987 publication, *Our Common Future*, which defined sustainable development as development that meets the needs of the present without compromising the ability of future generations from meeting their own needs, catalyzed a global discuss that has more or less resulted in a somewhat universal appreciation of the importance of simultaneous consideration of economic, environmental and social dimensions in designing projects and policies. This global concept of sustainable development was made a bit more concrete at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro through the Rio Declaration on Environment and Development and the adoption of *Agenda 21*. Notably, the *Program of Action* required among other things that signatory states adopt a national sustainable development strategy.

At the 2002 United Nations Conference on Environment and Development in Johannesburg, participants re-affirmed their commitment to sustainable development, noted the modest progress made so far, but acknowledged that challenges abound and that we still have a long way to go in our quest for global sustainable development. It is safe to say that this is still the situation in 2006 as quality of life for most people has decreased, stayed about the same or improved only marginally across the world, 14 years after the Rio Declaration on Environment and Development and the adoption of Agenda 21. Clearly, international agreements are not enough. They must be translated into action, and action must in turn result in positive difference in quality of life (i.e. economic, environmental and social conditions).

Against this background, this presentation offers a practical and more holistic approach to understanding and implementing sustainable development. Specifically, it suggests that “ability in sustainability” depends on some critical factors among which are: (1) understanding sustainable development principles; (2) applying appropriate hard and soft technologies; (3) monitoring and evaluating our efforts and progress; and (4) using participatory programming and interactive communication to create and recreate realities.

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Merging Extension with a Developing World: Strategies to Promote Resource-Efficient Residential Communities – *Mark Hostetler and Pierce Jones*, University of Florida, Gainesville, FL

Residential developments have a huge impact on natural resources, and sustainable or “green” communities are beginning to be built throughout the United States with goals to conserve natural resources, to create healthy lifestyles, and to promote a sense of community. Buzz words can be heard in the media and in town meetings: *sustainability, smart growth, new urbanism, low impact development, and conservation subdivisions*. With one stroke of a pen, developers and policymakers can determine how a community will look and feel for many years to come. Citizens make day-to-day decisions that determine whether a community operates as intended by policymakers and developers. How can we (extension) turn this big ship, collectively called development, into something a little more sustainable that is a win-win for all parties involved? During this session, we will explore and exchange ideas about how extension can partner with developers, policymakers, and homeowners. We will briefly present some outreach efforts as part of a new program at the University of Florida called the Program for Resource Efficient Communities (PREC – <http://www.energy.ufl.edu>). PREC has been actively partnering with several developers and build/design professionals to create “model” resource-efficient communities. Working with two master planned Florida communities, *Madera* and the *Town of Harmony*, we have encountered both successes and failures. In particular, we will focus on ways to engage developers and policymakers. Reaching these audiences has not been a tradition in extension, but developers and policymakers play a major role in creating healthy, resource-efficient communities.

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The NEMO Network: A Sustainable Land Use Education Network – *David Dickson*, University of Connecticut Cooperative Extension System, Haddam, CT

This presentation will highlight the formation, growth, progress and wide-ranging impacts of the National NEMO Network, an autonomous collective of 32 programs throughout the country that educate local land use decision makers about the link between land use and natural resources, and encourage communities to pursue sustainability through natural resource based planning.

The original Nonpoint Education for Municipal Officials (NEMO) program was created in 1991 at the University of Connecticut as a partnership between the Cooperative Extension System, the Connecticut Sea Grant College Program and the Natural Resources Management and Engineering Department. As educators from other states learned of the success of the program in catalyzing change to land use practices, they began to pursue adaptations of the NEMO model. By 2000, fifteen states had developed their own NEMO programs and founded the National NEMO Network as a means (1) to facilitate the open exchange of ideas, educational materials and resources between programs; and (2) act as a resource for those looking to start a program.

From changes to community plans, to natural resource inventories, to open space preservation, to low impact developments, communities catalyzed by NEMO education are changing the way they plan, regulate and build their landscape. The experience and success of the programs in the NEMO Network provides insight into what makes an effective educational program and the value of a network of like-minded programs.

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Sustainable Living 101: A Values Approach to Intelligent Consumer Decisions – *Viviane Simon-Brown*, Oregon State University, Corvallis, Oregon

“The long and short of the matter is that forest conservation depends in part on intelligent consumption, as well as intelligent production of lumber.”

~ Aldo Leopold, 1928, “The Home Builder Conserves”

In a 1995 national telephone survey by the Merck Family Fund, 67 % of the respondents acknowledged that “Americans cause many of the world’s environmental problems because we consume more resources and produce more waste than anyone else in the world.” And 88% of Americans agreed “protecting the environment will require most of us to make major changes in the way we live.” But the same survey showed that Americans really don’t know what the specific ecological implications of their lifestyles are, and don’t know precisely what to change.

At Oregon State University and other land-grant institutions, we focus our educational efforts on teaching students to professionally manage natural resources. However, as population, economic and consumption pressures increase, helping consumers take a thoughtful approach to understanding their cultural, economic and environmental ethics and addressing their responsibilities as consumers of natural resources, become viable educational tools.

Launched at the first ANREP conference, the Sustainable Living Project at OSU has been offering off-campus programming on intelligent consumption to typical American adults and older youth throughout Oregon and Washington since 1998. Workshops are based on identifying the personal values, ethics and beliefs that underlie decision-making; considering the barriers to living sustainably; examining national trends; and determining personal priorities. In a 2002 follow-up survey, 84% of the ex-participants contacted, indicated they actively used workshop information in making major family decisions such as purchasing a house or a vehicle. Over 7,500 people have participated in workshops, and over 380,000 browsers have visited the website.

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Monday, May 15, 2006

Concurrent Session I, 1:25 – 3:00 p.m.

A. Invasive Species I

Pasture Weeds and Invasive Plants Education – *Peggy Compton*, University of Wisconsin-Extension, Platteville, WI; Jerry Doll, University of Wisconsin-Extension, Madison, WI; Rhonda Gildersleeve, University of Wisconsin-Extension, Dodgeville, WI; Environmental Resources Center, University of Wisconsin-Extension, Madison, WI

This project began when we received a \$5,000 grant to fund pasture weed management projects in Southwest Wisconsin. We established thistle control demonstrations on two farms and produced *The Dirty Dozen* weed

identification booklet. Our work has expanded into a wider set of programming topics (invasive species and brush management), new audiences (rural landowners, agency professionals, members of invasive species organizations) and additional products (*The Dirty Dozen and Beyond* booklet, Extension handouts and poster displays). Our efforts have produced 18 field days with total attendance of over 600 participants and the distribution of over 7,000 copies of our weed identification and management booklets.

The brush management and invasive species demonstrations, field days and printed materials have led to action. Landowners are using mechanical, cultural and chemical practices to better manage their pastures and to reverse the influx of undesirable woody species on their land. On post-field day evaluations, participants indicated that they had learned to identify weeds, to improve the timing of herbicide applications, the importance of monitoring previous treatments, proper chemical application techniques and the importance of using multiple tactics on invasive weeds.

This program is a success not only because it meets a real need for traditional and new clientele but also because it integrates the efforts of a Basin Educator, County Agricultural Educator and Campus Specialist in a joint effort. It also brought UW-Extension (the content), the Environmental Resources Center (the production) and the Natural Resource Conservation Service (significant financial support) together in a synergistic and fruitful manner.

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Preventing the Spread of Aquatic Invasive Species from Water Gardening – Barbara Liukkonen, Eleanor Burkett, University of Minnesota, St. Paul & Brainerd, MN

The water garden industry is a billion dollar a year enterprise in the U.S. and has been identified as a vector for introducing aquatic invasive species (AIS). Aquatic plants are increasingly available locally and over the Internet, few people recognize the risks of releasing them into natural waters, and invasive “hitchhikers” often accompany plant shipments. A comprehensive educational strategy for suppliers and gardeners is critical.

In 2004, we surveyed consumers and nursery professionals. Survey tools measured awareness and knowledge, identified sources of plants and information, characterized sales and gardening practices, investigated willingness to pay, and assessed opportunities for education. Educational messages and materials were developed and refined through focus groups with horticulture professionals, agency staff, and water gardeners.

Respondents indicated the threat from aquatic invasive species is of serious concern (91% consumers, 57% professionals), but most were unable to correctly identify non-native, invasive species of concern. Few consumers (7%) purchase plants or animals over the Internet; 56% choose plants at local retail outlets. Most (86%) expressed a willingness to pay more for hitchhiker-free plants.

Two thirds of nurseries had received unintended plants or animals in shipments. Fewer than 15% had a process in place to eliminate hitchhikers in plant receipts; only 25% had a process to prevent unintended plants in sales. Nearly all retailers (95%) were willing to provide their customers with education about AIS.

During 2005, 37 nurseries piloted educational materials: 94% distributed tip cards and 70% handed out the small poster. Over 60% used the plant sticks and nursery tags. Most (93%) used the materials to educate employees. Over 85% would be ‘very likely to use’ the tip cards in the future and 80% would be ‘very likely to use’ the large poster. Over half said they would pay full or partial cost to distribute them to customers.

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Cooperative Weed Management Areas: Developing Statewide Capacity to Address Invasive Weed Issues

– Susan Donaldson, University of Nevada Cooperative Extension, Reno, NV, Dawn Rafferty, Nevada Department of Agriculture, Reno, NV

Throughout the west, invasive weeds are on the march. Some estimates suggest that 4600 acres of public lands become infested by these weeds daily. In Nevada, the issue is doubly urgent due to the large percentage of public lands (87%) and the lack of capacity to implement weed management. Many county and area needs assessments conducted since 1998 have identified the issue as a top priority, whether related to agriculture, horticulture, or natural resources. By 2001, it was clear that a sustainable approach to coordinated weed management was needed statewide.

Using the Idaho Coordinated Weed Management Area (CWMA) Cookbook as guidance, in 2002, the Nevada Department of Agriculture hired a coordinator to help form CWMA's across the state. CWMA's are groups of individuals that band together to address invasive weeds on a geographical, political, or watershed-wide scale. Members are often volunteers, land managers, and educators. The areas vary from urban to rural. The University of Nevada Cooperative Extension assisted by working with individual groups and providing capacity-building trainings for the groups. These trainings varied from “weed schools” providing information on mapping protocols, plant identification, and approaches to weed management, to specialty trainings on group management techniques, grant writing, and volunteer motivation. Evaluation data collected at the workshops and trainings were used to determine needs for future workshops.

Today, there are 29 CWMA's covering most of the state of Nevada. Of these, 17 are active and accomplishing some level of weed management. Some are high-achieving, and engage in seamless inventory, mapping, control, and public education and outreach. Others require a higher level of assistance and guidance. This talk will focus on the benefits and pitfalls of the CWMA model for invasive weed management, and strategies for group capacity-building.

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B. Sustainable Agriculture

Gauging the Impacts of an Experiment in Sustainability – V. Phillip Rasmussen, R. L. Newhall, J. Freeburn, A. B. Kurki, R. J. Daines, Western SARE, Utah State University, Logan, UT

As Sustainable Agriculture Research and Education program, or SARE, edges toward its 20th anniversary, it becomes instructive to reflect both informally and formally on how much ground the program has covered. SARE was initiated in 1988 as part of the U.S. Department of Agriculture's Cooperative State Research, Education and Extension Service to fund competitive grants supporting agricultural systems that are economically, environmentally and socially sound. Western SARE, one of four SARE regions, is administered at Utah State University under regional coordinator Dr. Phil Rasmussen, while its Professional Development is administered as a subcontract under the University of Wyoming and the National Center for Appropriate Technology, a nonprofit organization based in Montana. Western SARE has disbursed nearly \$35 million to fund grants in three primary areas: Research and Education, Farmer/Rancher and Professional Development. As this experiment in sustaining sustainability has matured, Western SARE has conducted surveys gauging the reach and impacts of its Professional Development Program (2004) and its Farmer/Rancher grants (2005). Both surveys indicate that the concepts of sustainability and their on-the-ground application are gaining considerable traction. To round out the picture, Western SARE is embarking on a survey of its Research and Education grant recipients to determine whether the current course of research is meeting the needs of the Western agricultural producers and their support teams. These critical milestone surveys will help chart the course of Western SARE - whether it's “on course” or in need of corrections.

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Sustainable Agriculture Research and Education (SARE): Providing Grants and Information to Improve Profitability, Stewardship and Quality of Life – *Deborah Cavanaugh-Grant*, University of Illinois, Urbana, IL

Since 1988, the Sustainable Agriculture Research and Education (SARE) program has helped advance farming systems that are profitable, environmentally sound and good for communities through a nationwide research and education grants program. SARE is part of USDA's Cooperative State Research, Education, and Extension Service (CSREES) and is managed in partnership with four regional land grant hosts (North Central, Northeast, South and West). The Sustainable Agriculture Research and Education (SARE) Professional Development Program (PDP), authorized in Title XVI of the Food, Agriculture, Conservation and Trade Act (FACT) of 1990, was developed to meet the sustainable agriculture professional development needs of Extension, Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA) and other agricultural educators. The overall goal of the program is to provide continuing education in sustainable agriculture concepts and practices to enable educators to respond to the future needs of farmers, ranchers and the public. The anticipated long-term outcome of the PDP is an increase in the number of farmers and ranchers adopting sustainable agricultural practices and systems.

This presentation will provide an overview of the Sustainable Agriculture Research and Education (SARE) program, as well as detailed information about the Professional Development Program. Examples of innovative natural resources research and education projects will be presented.

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Strengthening Sustainable Agriculture on Indian Lands – *Staci Emm*, Loretta Singletary, University of Nevada Cooperative Extension, Reno, NV

This Western Region Sustainable Agriculture Research and Education (SARE) professional development program addresses the educational needs of agricultural professionals working with Indian Tribes or Native American producers in the West. While almost every reservation works with a USDA agency and agriculture professionals, most programs are not specifically designed for Native American agriculture producers or Indian Tribes. It is important for agriculture professionals to understand the “Indian situation” in order to assist in facilitating the sustainability of environmental quality and natural resources to satisfy a quality of life founded by human food and fiber needs.

This program is based on research conducted in 2005-2006. Interview questions were developed to assess Native American perceptions of quality of life on Indian reservations and obstacles and opportunities for implementing sustainable agricultural practices and programs. Questions were developed to assess USDA personnel and agricultural professionals’ understanding of the social, political and economic structure on Indian reservations. Research results will provide critical information for use in developing and piloting an educational program in Nevada, Idaho, Washington and Oregon.

Anticipated outcomes of this program include: 1) Increase USDA and agriculture professionals’ knowledge base regarding the social, political, and economic environments on Indian reservations relevant to developing sustainable agriculture educational programs on Indian lands; 2) Strengthen and increase sustainable agriculture programming and practices with Native American producers in the West; and 3) Increase the participation of

Tribal or Native American agriculture producers in the educational programming and services or programs offered by USDA agencies.

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C. Reaching Private Forest/Woodland Owners

The Evolution of the Ohio Woodland Stewards Program – *Kathy Smith, David Apsley, and Randy Heiligmann*, Ohio State University, Columbus, OH

Ohio Woodland Stewards (OWS) is a state-wide collaborative effort to provide woodland owners with the knowledge and skills to make informed decisions about the sustainable management of their forests. Since 2001, the OWS team has expanded this program from a 3-day class which was offered twice annually to ten additional classes, a web-page (with more than 130,000 visitors since 2002), and a newsletter (reaching over 5,000 clients three times annually). Approximately 1,500 landowners who own nearly 90,000 acres of land have attended more than 50 OWS classes during this time period.

One of our initial goals was to increase participation of landowners who had no previous exposure to natural resources educational programming. This has largely been accomplished by expanding the subject matter offered by OWS. We now offer a wide array of classes from tree identification to wildlife management. As a result approximately 81 % of the OWS attendees since 2001 have had no previous exposure to natural resources programming. Another goal was to provide participants with practical information which in turn could be utilized to enhance the management of their forestland. A survey of 2004 OWS participants indicates that, 82 % of them would use the information gained from OWS classes in the management of their property. The positive impact of this management will not only benefit the woodland owner but will also have cumulative positive impacts on Ohio's environment and economy for decades.

The authors will discuss lessons learned from the process of revitalizing the OWS program including: funding and staffing issues; course development, delivery and marketing efforts; program administration and marketing strategies; and plans for the future of the OWS.

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Training, Education and the Wood Supply System: What Extension Program Participants can Teach Educators – *Laura A. Grace and John B. Auel*, Department of Forestry, Mississippi State University, Mississippi State, MS

The Extension program at Mississippi State University has a long history of conducting short courses and workshops for forest landowners. The introduction of the Sustainable Forestry Initiative in 1994 provided the impetus to provide more extensive programs for logging contractors and other participants in the wood supply system dealing with topics including sustainable forestry and certification, biodiversity, endangered species, safety, and a wide range of business management issues. Participants have included loggers, landowners, forest industry employees, consulting foresters, and wood dealers. Over 3,000 individual firms and businesses have participated totaling approximately 18,000 person-days of workshop attendance. Each participant has been asked to complete a questionnaire concerning the adequacy of the workshop content and suggestions for additional educational needs.

This presentation explores attitudes and perceptions of the various participant groups (i.e. loggers, industry foresters etc.) operating within Mississippi's wood supply system towards various aspects of the existing

workshop and short course offerings as well as needs for additional educational programs. Preliminary data analysis indicates significant differences among the different occupational groups as to their perceived needs and the needs of others operating within the wood supply system. An added bonus is that the investigation has identified areas where cross-training between various segments of the wood supply system offers promise to improve overall system performance. For example, information collected to determine new program offerings relating to business management indicate that while tax issues were the most requested topic area for logging contractors, foresters perceived this to be the least important topic.

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Engaging Emerging Landowner Groups: The Oregon Women Owning Woodlands Network (WOWnet) – *Nicole Strong*, Oregon State University, Corvallis, OR, and *Elissa Wells*, Oregon State University, Roseburg, OR

In order to reach an increasingly important woodland owner audience, OSU College of Forestry Extension Service, in partnership with the Oregon Forest Resources Institute, initiated an educational program targeting women woodland owners, the "Women Owning Woodlands Network" (WOWnet). WOWnet program goals are to: 1) recognize the growing number of women taking a wide array of active woodland management roles, 2) raise basic forestry and decision making skills among women woodland managers, 3) support and increase women's access to forestry-related materials and existing organizations, and 4) encourage communication among Oregon's women woodland managers through the development of statewide and local networks.

Initial reception to this program has been very strong. One local leader training session was held in December, 2005, which has resulted in the formation of four local WOWnet groups. These local groups have planned and held six sessions, and now have a total of close to 60 members. WOWnet participants also communicate within and amongst groups utilizing a listserv and website where they can upload files, share ideas, and advertise upcoming events. This presentation will highlight important steps in the participatory process that has empowered these women woodland managers, contributed to the growth of local woodland owner communities, and encouraged mentoring among peers. We will also share some stories from WOWnet members, which will provide insight into their motivations to own and manage woodland properties, their perceived educational and social needs, and the reasons why the WOWnet is important to them.

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D. Youth Audiences

Engaging Community Youth in Urban Forestry Education and Research – *Gretchen Ferenz* and Bryan Dailey, Cornell University Cooperative Extension – NYC, New York, NY

Cornell University Cooperative Extension – NYC and Cornell University initiated an integrated research and education project, "Urban Silviculture," in Fall 2001 to study the capacity of trees to remove airborne particulates, and to provide informal education focused on urban trees and the linkage between environmental quality and human health. This project is targeted to the South Bronx, which has among the highest child asthma rates in the nation. Partner organizations include US Forest Service as well as multiple community organizations/agencies. Funding is provided through USDA/CSREES and Cornell University, and is supported by Congressman José E. Serrano.

This presentation will focus on the array of strategies used to conduct Extension education/outreach to more than 1,300 residents and other stakeholders, and related accomplishments.

'Researchers-in-Training' involves teens in hands-on learning about the importance of trees to environmental quality, and the use of tools/techniques for conducting research. While learning the scientific process, the youth examine tree growth, soils, air quality, maps, aerial photographs and other information/resources to gain critical thinking and investigative skills. Youth visit the Cornell campus to further explore research activities and gain exposure to university resources.

'Community Mapping of Tree Cover' engages students in learning about the health and condition of their community's trees through use of information technology. Activities include determining the existence and location of trees in public spaces, identifying species, assessing conditions, and recording the data using palm-pilot computers and software.

Project Website www.cce.cornell.edu/programs/urbansilviculture seeks to provide applied research and related education for community organizations, residents and other stakeholders.

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WHEP: Developing the Next Generation of Natural Resource Managers – *S. Nicole Frey*, USU Extension, Cedar City, UT; Ben C. West, Mississippi State University, Starkville, UT; David Drake, Wisconsin Cooperative Extension, University of Wisconsin, Madison, WI

The 4-H Wildlife Habitat Evaluation Program (WHEP) teaches young people valuable lessons about wildlife management, conservation, leadership, teambuilding, citizenship, and communication. Created in the early 1980s in Tennessee, WHEP has since grown to become the largest and most visible 4-H wildlife program in the United States, involving thousands of participants each year in most U.S. states. Our national event, which is attended by state-winning teams, has hosted over 500 4-H'ers from 21 states since 1989.

WHEP teaches young people about concepts like wildlife habitat needs, endangered species conservation, hunting and fishing as management tools, and wildlife damage management. Like all 4-H programs, WHEP introduces participants to new opportunities in life; about 5% of our past participants entered a career in natural resources and assumed responsibility for sustainable use of our country's valuable resources.

WHEP is open to youth 8-19 years of age. The contest portion of the WHEP is divided into 5 activities, including identifying common wildlife foods, interpreting wildlife habitat from aerial photographs, prescribing wildlife management practices, developing a rural wildlife management plan, and developing an urban wildlife management plan. In addition, participants must give oral reasons to a panel of judges for some of their decisions.

In the years since its inception, WHEP has become synonymous with youth conservation education. Awarded The Wildlife Society's Conservation Education Award in 1996, WHEP is poised to further expand and involve even more youth in the future.

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Environmental Service Learning Lays Groundwork for Living Sustainably – *W. L. Sheftall, Jr.*, University of Florida Extension, Tallahassee, FL

A community's ability to live and grow sustainably amidst high quality natural resources requires both knowledge and motivation among its citizens. Florida's youth lack a basic understanding of their local

environmental heritage. They assume a birthright to clean water for future health, recreation and biodiversity without the knowledge and conservation ethic to ensure it. State and national emphasis in education has shifted to testing and accountability for mastery of basic skills, not environmental literacy.

An environmental education partnership was catalyzed to develop a whole-school, field-based, hands-on, service-learning curriculum. Volunteer Extension educators were recruited and trained to teach this curriculum to students in a pilot middle school.

Volunteers were educated about the area's signature natural resource – the world's largest mapped wet cave system. This karst hydrogeological system links the population, land use, stormwater and wastewater effluent of the state's capital city, with the drinking water, spring flow and ecotourism of its rural, down-gradient neighbor.

Volunteers learned background information to enable interpretive instruction in the field. They experienced field trips they later led, and hands-on field labs they later supervised. Instructional themes were ecology of a spring-run stream (6th-grade); chemistry, clarity and flow characteristics of springs (7th-grade); and maps, karst geomorphology, and spring-fed hydrogeology (8th-grade).

Teachers chose students to serve as peer mentors in a cascade. Mentors were trained by Extension Volunteers to lead groups of students through the hands-on field labs.

Student data collection, analysis, and presentation of results on-line provide a valuable service to park management. Volunteer Extension educators and students alike have become interested in how to live sustainably in order to protect fragile, non-renewable resources they now better understand and value.

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E. Professional Development

The Environmental Career Skills Program – Sustaining Our Environment and the Extension Profession
– *Kristi L. Sullivan*, Stephen J. Morreale, Gary R. Goff, Peter J. Smallidge, Rebecca L. Schneider, Cornell University Department of Natural Resources, Ithaca, NY

The Environmental Career Skills (ECS) program is a newly developed, field-based training and education program designed to develop essential skills for a career in natural resources and the environment. Over the past three years, this program has successfully provided a direct mechanism for Extension faculty to guide interested young adults in careers that promote environmental sustainability, conservation-based management, and Extension education. Specific program objectives are: (1) to teach participants the basics of traditional and modern field sampling techniques, spatial data collection methods, ecological principles, and map-reading and interpretation skills; (2) to introduce students to essential elements of networking and partnering with peers and professionals, (3) to develop leadership and team-building skills, and (4) to expose students to career paths and opportunities in the environmental realm, including the Extension profession.

In its first 3 years, ECS is an overwhelming success, with over 50 participants, including freshmen interested in jump-starting their careers, upperclassmen, and professionals wishing to augment their technical expertise. Immediate benefits of the program have been an obvious increase in confidence and knowledge, and the establishment of a strong professional network among the participants. Unexpected rewards include the formation of strong support groups among each year's participants and improved performance in college.

We recommend this type of program as a basis for directly integrating Extension professionals into the career development of students, and as a practical means to create a self-sustaining program in both the professional and financial sense.

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Professional Development for Wildland-Urban Interface Issues – *Martha C. Monroe*, Lauren McDonell, Annie Hermansen-Báez, University of Florida and USDA Forest Service, Gainesville, FL

The dynamic characteristics of natural resource issues in the wildland-urban interface demand new skills from resource professionals. To help provide these skills, the University of Florida Institute of Food and Agricultural Sciences (IFAS) Extension Service, in cooperation with the USDA Forest Service, the Southern Group of State Foresters, and the US Fish and Wildlife Service created a professional development program for natural resource professionals working in the wildland-urban interface. The program consists of four training modules: 1) Interface Issues and Connections, 2) Managing Interface Forests, 3) Participating in Land-use Decisions and 4) Communicating with Interface Residents and Leaders. The modules are being used by natural resource agencies across the South to help their staff solve challenging interface problems.

An assessment identified the need for agencies to conduct in-service training with their staff and highlighted these four module topics. The project has involved authors across the region, pilot tests in Texas and South Carolina, and extensive review. The package includes 37 interactive training exercises, 29 fact sheets, 23 case studies, 4 trainer's guides, PowerPoint® presentations, and a video. All of the materials are available at <http://www.interfacesouth.org>. One of the modules is being adapted by extension agents in Florida for a public program on community planning.

Extension specialists and agents in many states can help resource agencies address new needs and challenges in the wildland-urban interface. Although the case studies are South-specific, these training materials could be easily adapted and used in many parts of the country.

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Evaluating Successful Strategies in Forestry Extension - An International Perspective – *James E. Johnson*, Virginia Tech, Blacksburg, VA; *Janean H. Creighton*, University of Arkansas-Monticello, Monticello, AR; and *Eric R. Norland*, USDA Cooperative State Research, Education, and Extension Service, Washington, DC

Our changing world and the explosion of new research-based knowledge has resulted in an even more urgent need for effective knowledge transfer strategies. This trend is especially true in the fields of agriculture and forestry. The traditional way in which new research knowledge is transferred and adopted is through some form of extension endeavor. Many effective extension models are in place around the world, some within traditional governmental agencies, some in the private sector, and others functioning through non-governmental organizations. The subject of successful strategies, or "best practices" in forestry extension, was the theme of an international conference held in Troutdale, Oregon USA in 2003. At this conference, 35 papers were presented on this theme, representing 11 countries from around the world. From these papers a compilation of 119 best practices were identified. This set of practices served as the basis for a mailed questionnaire that was sent to 500 forestry extensionists in 70 countries. The best practices associated with the extensionists themselves were analyzed at regional and continental scales.

This paper will present the responses related to seven specific “extensionist” best practices and the difference between these world regions: (1) North America, (2) Europe/Australia, and (3) Asia, Africa, and Latin America. The strategies with significant differences at the 0.05 level included: (a) extensionists are members of a professional society or association, (b) extensionists involve learners in project planning, (c) extensionists receive in-service training and leadership development, and (d) extensionists establish rapport with learners, particularly if extensionists are strangers. Barriers to the adoption of these strategies will be discussed.

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Monday, May 15, 2006

Concurrent Session II, 3:25 – 5:00 p.m.

A. Improving Sustainability Education

Improving Sustainable Educational Programming – *Lance D. Stewart*, Laura A. Grace and Andrew J. Londo, Mississippi State University, Mississippi State, MS

Natural resource extension professionals often receive mixed signals from other professionals, non-governmental organizations and the media as to what constitutes sustainable natural resource management practices. The plethora of information, both accurate and misleading, can lead to difficulty in determining the type of educational programming natural resource extension programs should offer. The only procedure that ensures constituent educational programming accuracy and relevancy is a programming needs assessment of natural resource stakeholders.

The Mississippi State University Extension Forestry Program randomly surveyed 4,000 non-industrial private forest landowners owning land in five geographically diverse counties in 2004. The survey objective was to determine both short and long term educational needs of Mississippi forest landowners. Respondents were categorized by county where the land was located, age, acreage owned and income classification. Survey results indicated that all three elements of sustainability: environment, social and economic constructs were both immediate and projected needs among forest landowners.

Current and future anticipated educational needs of private forest landowners in Mississippi as well as preferences and differences existing among various types of forest landowners in different parts of the state will be explored. Identification of the needs of various types of forest landowners is paramount for Extension educators to better tailor educational programs for all natural resource stakeholders.

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Roundtable – Teaching Sustainable Development: Practice vs. Content – *Mike Reichenbach*, University of Minnesota Extension Service, Cloquet, MN; *Okey Ukaga*, University of Minnesota Northeast Sustainable Development Partnership, Duluth, MN; *Nate Meyer*, University of Minnesota Extension Service, Cloquet, MN (one hour session)

Engaging in sustainable development can be one of the most rewarding and challenging endeavors that educators undertake. However, the process must include the participants. Discussion will center around the following related questions:

-How can extension educators effectively teach sustainable development?

-How might we create a multi-faceted learning environment that empowers sustainable development through dialog, visioning and collaborations among University faculty and citizens?

-How can diversity in learning methods, teaching practices, cultures, inform our teaching about sustainable development?

A multi-faceted example of a successful process of teaching, program development and implementation that incorporates engagement are the University of Minnesota Regional Sustainable Development Partnerships. The University of Minnesota pioneered five Regional Partnerships that bring University resources and stakeholders together to facilitate sustainable development. The Northeast Minnesota Sustainable Development Partnership (NMSDP), one of these Partnerships. NMSDP aims to facilitate sustainable development in northeastern Minnesota by identifying and supporting targeted research and education projects; and by developing networks of cooperation with others. NMSDP defines sustainable development as providing a high quality of life for present and future generations without exceeding the environment's ability to recycle wastes, provide resources, and support a rich diversity of life; meeting current needs while leaving future generations as many options for resource use and development as possible.

A goal of NMSDP is to form and support partnerships that: (1) build participatory relations between citizens, communities and their University; (2) promote active citizenship and (3) invest in research, education and outreach projects that advance the understanding and achievement of sustainability. Over the past 8 years, NMSDP has engaged in projects involving over 64,000 community members; 379 community organizations and businesses; 300 university faculty connections, 418 students from 42 university programs and departments. These projects represent investments of about \$1 million in NMSDP resources and have leveraged approximately \$81 million in matching contributions, for a total of \$82 million.

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B. Building Community Capacity

Strengthening Communities in Hazardous Environments – *JoAnne Skelly*, University of Nevada Cooperative Extension, Carson City, NV

Each year, natural hazards such as wildfire, floods, hurricanes, and tornadoes threaten communities across the United States. These events impact community health and economic stability. On July 14, 2004, a firestorm devastated Carson City, Nevada. Homeowners affected by the fire urgently requested assistance to deal with damage to homes and property. Carson City turned to University of Nevada Cooperative Extension to respond providing \$222,000 for Extension to implement the Waterfall Fire Education Project. Extension was viewed as an important partner and educational resource when the fire occurred and during recovery.

Cooperative Extension became the distribution center for fire-related educational materials and rehabilitation information. Since the fire, Extension faculty have taught classes, visited sites, managed noxious weeds, educated in schools, and sent out hazardous weather alerts. We facilitated the formation of five Fire Safe Council chapters where neighbors and stakeholders in high hazard areas pool resources and work together to plan and organize efforts before an event that will reduce the threat of wildfire and increase community protection.

The fire also provided an opportunity to raise community awareness about natural resource issues that were previously disregarded including fire ecology, forest health, noxious weeds, erosion control, and water-use efficiency. Surviving any natural hazard requires more than agency response during a disaster, it requires work

after the fact. With the help of University of Nevada Cooperative Extension, through the Waterfall Fire Project, homeowners in high hazard environments in Carson City are better prepared to survive the next fire.

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Building Coalitions to Address Conservation Education on Montana's Rocky Mountain Front – *Dan Clark*, Montana State University Extension Service, Choteau, MT

A long-term solution to sustain ecologically significant areas is to have a well-educated public. With this in mind, Montana State University's Teton County Extension Office has been successful in both creating a coalition of organizations sharing a common vision and in promoting the development of an educational strategy to address important conservation issues relevant to Montana's Rocky Mountain Front.

Establishing coalitions is an effective way to address relevant community needs. Leadership from County Extension faculty can provide the spark needed to transform those with common interests into a cohesive group. For example, in Teton County, Montana, a number of agencies and private organizations were dedicating time and resources to conservation education. By joining forces, these groups were able to increase both the scope and effectiveness of their educational efforts. This new coalition was formed through the efforts of the local extension educator, who brought twelve organizations and agencies together into one coordinated body, named the Front Range Conservation Education Group (FRCEG).

The Front Range Conservation Education Group's purpose is to develop an integrated approach to conservation education by addressing the educational needs of students, teachers, landowners and managers. This is implemented through sponsoring relevant field days, events, forums, newsletters and other programs and activities to promote the conservation goals of the region.

Through their synergistic relationship, the coalition has succeeded in expanding the capacity of the community to both recognize the importance of their ecologically significant geographic area and to understand how they can participate in its preservation.

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Sustaining Wildfire Preparedness Planning in Arizona Communities – *Alix Rogstad, Christine Mares*, University of Arizona Cooperative Extension, School of Natural Resources, Tucson, AZ; *Deborah Young*, University of Arizona Cooperative Extension, Tucson, AZ

In response to very active fire seasons and continued severe drought throughout the Southwest, the University of Arizona Cooperative Extension obtained grant funding through the Arizona State Land Department's State Fire Assistance Grant Program in 2002 to develop an Arizona Fire Education Program. Additional program funding was procured through CSREES in 2004 to assist communities in their efforts to become "recognized" in the national Firewise Communities/USA program and to begin the process for developing Community Wildfire Protection Plans.

In order to change community behavior, and achieve recognition in the Firewise Communities/USA program, citizens need to build an awareness of how forest health affects their communities and livelihoods. The Arizona Fire Education Program teaches citizens how to play a more active role in wildfire risk assessment/planning, fuel reduction, fire protection, and restoration after fire, as well as gain a better understanding of fire's value in ecosystems. Our program works in tandem with multi-agency prevention efforts implemented region-wide, and

builds on the community partnerships that are in place via Cooperative Extension offices. Communities and forests are inextricably linked; in order to prevent future catastrophic wildfires, we need to work directly with communities.

Examples will be presented for using existing materials to address community-specific needs, adapting programs to fit the needs of communities, and leveraging partnerships across the state to accomplish overarching goals for forest health, wildfire awareness, and community education. We will present our methodology for initiating fire education programs within wildland urban interface communities so those communities may become empowered.

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C. Educational Tools for Forestry Programming

Oregon's Master Woodland Manager Program: 20 Years of Service and Counting – *Nicole Strong*, Oregon State University, Corvallis, OR

Oregon State University (OSU) Forestry Extension, in collaboration with several Oregon forestry agencies, began training volunteers in 1983 through the Master Woodland Manager (MWM) pilot program. The original purpose of MWM was to train experienced woodland owners to be better forest managers and to have them motivate other woodland owners through volunteer efforts. The program was expanded by OSU in 1987, adding goals of assisting county extension foresters, and informing non-forestry audiences on forestry-related issues. For the past 19 years has MWM grown to include over 300 volunteers statewide, with widespread adoption in other states and countries.

MWM training has had important forest management impacts among volunteers and those who come in contact with them. In 2004, MWM volunteers reported they provided 22,907 hours of volunteer service. This translates into more than 12 full-time extension foresters (1 FTE each). MWM's have served in many different ways, including one-on-one contacts with landowners, helping extension agents with research projects, and organizing community events and educational activities that improve public awareness of the economic, social, and ecological impacts of private forestland management. In addition, MWMs are increasingly assuming important local and regional leadership roles in organizations such as the Oregon Small Woodlands Association. Many MWM's develop passion for their work, far surpassing their 85 hour requirement. This presentation will highlight lessons learned over 20 years of the program, and strategies to continue providing relevant training to a changing landowner base and developing important stewardship skills for the family forestland community.

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Using Interactive Video to Increase the Ability of Extension Forestry in Mississippi to Conduct Non-Industrial Private Forest Landowner Short Courses – Timothy A. Traugott and *Andrew J. Londo*, Mississippi State University, Mississippi State, MS

The Extension Program of the Department of Forestry at Mississippi State University has traditionally utilized field days, short courses, and other direct contact educational methods for instructing forest landowners. However, Extension professionals have acquired new tools of information delivery over the past several years

in the form of electronic media and the Internet. There are a number of benefits to using these new delivery techniques. Chief among them are the reduction in costs and accompanying increases in productivity compared to traditional direct contact educational methods.

We will examine the use of Interactive Video as an alternative delivery method for the “Forest and Wildlife Management for Profit and Recreation” Forest Landowner Short Course to be conducted in September and October of 2005 in Mississippi. The effectiveness of interactive video as a forest landowner short course delivery method, as compared to a traditional short course, will be evaluated.

Discussion will involve an explanation of short course content, traditional and interactive delivery methods and evaluation procedures. Participant evaluations for the interactive short course will be compared to past evaluations for the same short course delivered in the traditional manner. Suggestions for how other extension programs can adopt this methodology, as well as suggestions for future interactive video programming will also be discussed.

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Forest Visualization: Self-learning Web-based Modules – *Jim Finley*, The Pennsylvania State University, University Park, PA; *Mike Wolf*, The Pennsylvania State University, Ebensburg, PA; *Paul Roth*, Pennsylvania Bureau of Forestry, Spring Mills, PA; *Laurie Schoonhoven*, *Mike Jacobson*, and *Cenk Ursavas*, The Pennsylvania State University, University Park, PA

Forest visualization software is a proven educational tool that communicates forest management to private forest owners and resource professionals alike. Evidence suggest that if the stylized visualization images use data actually collected from the owner’s property, either by the owner or their forester, discussion about management choices may actually foster sustainable management outcomes.

Working with US Forest Service Stand Visualization System and the Forest Vegetation Simulator to create images, we have used a curriculum on sustainable forest management created for Pennsylvania’s Sustainable Forestry Initiative® to develop eleven web-based learning modules. The modules introduce basic information on forest ecology and silviculture. Users then learn to collect basic stand data sufficient to create images of their forests as well as how to record their management decisions. After entering the data through a website interface, they access a server hosted by Penn State. The server creates personalized images, calculates stand level descriptive statistics, and provides economic information. The user then has the opportunity to compare stand development without management with the “prescription” they want to impose on the stand along with projections forward for 25 years. The user can then modify the cutting prescription and observe varying outcome options. Testing of the modules and the impacts on user knowledge and attitudes will start in fall 2005. This presentation will introduce the modules, their use, and preliminary evaluation findings.

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D. Enhancing Wildlife Habitat

Naturalizing the Home Landscape – *Tonie Fitzgerald*, Washington State University Extension/Spokane County, Spokane, WA

Naturalizing the Home Landscape is an educational program that addresses the problem of widespread urbanization and degradation of both water quality and wildlife habitat. It teaches people to create landscapes

that conserve water, protect wildlife, and reduce the need for fertilizers and pesticides. The program was developed after the author completed a six-month sabbatical leave to study the use of native plants in the landscape.

The “Program” consists of slide and PowerPoint presentations in one- and three-hour formats; Extension publications; tours of demonstration gardens, area home landscapes and native plant nurseries; and volunteer training.

Delivery is through presentations at Green Industry events and conferences, classes for home gardeners and green industry professionals, Lake Association meetings, teachers’ workshops and college classes. A *Naturalizing the Landscape* module has been added to the existing Master Gardener Volunteer Training Program in Spokane County. Since 1996, thousands of contacts have been made through one or more of these delivery modes.

Program partners in providing information at classes and tours include the WA Department of Fish and Wildlife, WA Department of Natural Resources, Spokane County Conservation District, and Spokane County Noxious Weed Board.

A variety of evaluation tools have been used. Post-class evaluations measure changes in knowledge and awareness about various topics. A phone survey conducted five months after one class series found that over 80% had made practice changes in plant selection, use of fertilizers and pesticides, and landscape management techniques as a result of the Naturalizing the Landscape Program.

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Barns, Birds and Barbecue: An Agriculture & Nature Tourism Event – *Holly George*, University of California Cooperative Extension, Quincy, CA

The inaugural *Sierra Valley Barns, Birds and Barbecue Tour* held June 18, 2005 focused on *celebrating the agricultural and natural heritage* of the largest alpine valley in the United States. The event demonstrated the connection between farming and ranching and the environment. Ranchers opened their operations to the public to educate them about land stewardship, conservation and farm management practices. This opportunity was an invaluable and incomparable experience from the public’s perspective. Noteworthy were the number of “locals” that participated in the event and expounded on how much they learned about the history and viability of agriculture in Sierra Valley. The inclusion of ranches that have utilized a conservation easement provided additional education about protecting our resources and assuring the sustainability of agriculture. The day wrapped up at the rodeo grounds with a barbecue dinner, live music and showcase of local artisans.

The 2005 event was a resounding success from the public’s point of view. The 140+ tickets available for the bus tour of four local ranches and guided morning bird walk on property owned by the local land trust sold out in a matter of days. We received \$17,736 in sponsorships and in-kind contributions. This matched a grant from the U.S. Forest Service which allowed us to contract with an event coordinator for our first year.

Participant surveys indicated overwhelming support for making this an annual event; but can the small dedicated group of volunteers with assistance from Extension expand their membership, secure funding and set the stage for making this a sustainable event?

The group is still struggling with how to actively engage others to avoid burnout and build upon our accomplishments. *Showcasing the diversity of farming and ranching* is the mission for the 2006 event. We’ve enlisted additional host ranches and are involving more “birders” in planning.

Statewide Public Policy Facilitation for Sage Grouse Conservation Planning and Education – Participants Survey – *Sherman Swanson*, University of Nevada Cooperative Extension, Reno, NV, *Maria Ryan*, University of Nevada Cooperative Extension, Las Vegas, NV, *Michael Havercamp*, University of Nevada Cooperative Extension, Reno, NV, *Brad Schultz*, University of Nevada Cooperative Extension, Winnemucca, NV, *Marlene Rebori*, University of Nevada Cooperative Extension, Reno, NV, *Steve Lewis*, University of Nevada Cooperative Extension, Gardnerville, NV, *Rod Davis*, University of Nevada Cooperative Extension, Battle Mountain, NV, *Jerry Buk*, University of Nevada Cooperative Extension, Fallon, NV, and *Stacy Emm*, University of Nevada Cooperative Extension, Fallon, NV

As educators, University of Nevada Cooperative Extension was asked to play a unique and central role in planning for the conservation of sage grouse. We facilitated collaborative conservation planning for the Statewide Governor’s Sage Grouse Conservation Team as they developed their strategy. Then we facilitated and some of us participated in the six local sage grouse conservation planning groups that met simultaneously over a two-year period to produce the amalgamated statewide plan. To learn from this unique process, we surveyed the 494 participants in the various groups using an anonymous mail-in survey and received 176 responses (36%). About half (48%) of the respondents were paid to participate. Mostly they represented government agencies (43%). The primary interests of the others were ranching/farming (28%), environmental (9%), hunting (8%), recreation (3%), and others (15%). Participation in such planning processes can be highly effective for learning and therefore facilitation can be effective for teaching. However not all participants learn the same lessons and not all lessons are learned equally. Respondents felt that participation moderately, much, or highly affected their understanding of sage grouse biology (76%) and sage grouse habitat (71%), knowledge of natural resources (44%), or ability to respect different perspectives (52%), solve natural resource issues (42%), communicate in groups (40%), help a group function (40%) provide group leadership (36%), influence public policy (34%), create plans (30%), facilitate groups (28%), conduct research (15%) and write grants (5%). In many specific ways, group effectiveness was rated better at the end of the process than at the beginning.

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E. Water Programming

Landscape Water Conservation Education for Utah Homeowners – *Kelly L. Kopp*, Roger Kjelgren, Joanna Endter-Wada, Jennie M. Hoover, Diana Glenn, Earl Jackson, Utah State University, Logan, UT

Utah is one of the five fastest growing states in the nation and the current population of 2.3 million will double to 5 million by the year 2050. Along with this rapid growth has come a commensurate increase in demand for water and an increased need to protect existing water resources. Water conservation is one of the major strategies being employed by the state to meet increasing water demands in the municipal sector. Landscape irrigation, which accounts for up to 70% of annual residential water use in Utah, makes a logical and appropriate target for municipal water conservation efforts.

In 1999, a landscape water check program was developed by Utah State University (USU) Extension at the request of the Jordan Valley Water Conservancy District (JVWCD) to help address landscape water conservation needs. Free water checks have been provided to the customers of JVWCD's client water agencies since that time. These programs provide customers with an evaluation of their irrigation systems and an appropriate irrigation schedule.

In 2005, a survey instrument was added to the JWCD/USU Extension water check program. The survey asked water check participants about their interest in the program, their watering routines and practices, their irrigation system, water conservation measures they had taken, their motivations to conserve water, their familiarity with billing and other information related to their water use, and their yard/landscape priorities. The survey results provide insight into the human behavioral aspects of water use and conservation, which complement the assessment of irrigation system efficiency to provide a better understanding of the factors that influence water use patterns and that can help effect conservation.

Analyses of participants' water billing data is ongoing and will provide insight regarding the benefits of the landscape water check programs in terms of overall water savings and changing water management practices.

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Watershed Management Research, Education, and Outreach Program: The Center for TMDL and Watershed Studies at Virginia Tech – *Brian Benham, Rebecca Zeckoski, Gene Yagow, Kevin Brannan*, Virginia Polytechnic Institute and State University, Blacksburg, VA

The Center for TMDL and Watershed Studies at Virginia Tech (the Center) is committed to improving the quality and effectiveness of watershed planning processes, including total maximum daily loads (TMDLs), as well as expanding the professional expertise needed for their development, evaluation, and implementation. The Center conducts basic and applied watershed planning and watershed management research, and provides educational programming tailored to the specific needs of stakeholders, government personnel, and technical professionals. Personnel associated with the Center provide expertise on scientific, engineering, sociological, economic, and policy issues related to watershed management and the TMDL process. The Center's mission, products, and services reflect the service-oriented land-grant university missions of teaching, outreach, and research. The Center is actively involved in developing TMDLs and TMDL implementation plans in situations where the methodology and guidance to develop such deliverables are not well defined. To date, the Center has developed more than three dozen TMDLs in Virginia, addressing both bacterial and aquatic life impairments. The Center has developed and delivered TMDL workshops to a variety of audiences, prepared supporting TMDL-specific extension publications, and developed and delivered a graduate level course in TMDL development and implementation. In addition, the Center has partnered with the US Environmental Protection Agency (EPA) to develop a web-based TMDL knowledgebase, the EPA TMDL Clearinghouse.

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Does Arsenic in Drinking Water Affect Dairy Products? – *Barbara Liukkonen, Vince Crary, Melinda Erickson, James Linn, Michael Murphy*, University of Minnesota, St. Paul, MN

The US EPA's decision to lower the standard for arsenic in drinking water from 50 to 10 ppb has elevated public concern about potential health risks from naturally-occurring arsenic in ground water across the U.S. A study of private wells in western Minnesota found that over 50% had arsenic concentrations >10 ppb; about 8% were >50 ppb. During the study, concerns arose about health effects in dairy cows and the potential for arsenic to pass into milk. We found no research that addressed whether arsenic passes into dairy products, and limited documentation of the potential impacts of arsenic on livestock. In humans, arsenic in hair serves as a biomarker and correlates with the concentration of arsenic in drinking water, but there were no identified biomarkers to indicate arsenic exposure in livestock.

Three dairy farms in Minnesota and one in Wisconsin with arsenic concentrations >60 ppb in their water supply were recruited for the study. We sampled well water, bulk milk, feed and forage, and hair, hooves, blood, and urine from five cows on each farm. Arsenic was not detected in bulk milk samples (detection limit 5 ppb). Arsenic in blood, hair, and hooves did not correlate with drinking water arsenic, but urine appears to be a good biomarker for arsenic exposure in cattle.

Through new grant funding, we've added 20 farms to the study to compare animal tissue and dairy products from dairies with well water arsenic ranging from 0 to >100 ppb. Milk will be processed into cheese to determine if arsenic is concentrated during processing. An initial cheese sample showed no arsenic at a detection limit of 50 ppb. Bull-calves will be fed milk-replacer on farms with high and low arsenic levels, and meat and organ tissue from cull cows will be tested to investigate potential health effects.

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Tuesday, May 16, 2006

Concurrent Session III, 8:00 – 10:05 a.m.

A. Digital Technology for Programming

GIS Applications for Integrated Watershed Planning and Educational Outreach – *Kristine Uhlman* and D. Phil Guertin, University of Arizona, Tucson, AZ

The University of Arizona, Cooperative Extension NEMO Program - Nonpoint Education for Municipal Officials - is partnered with the Arizona Department of Environmental Quality and the Water Sustainability Program through the University of Arizona Water Resources Research Center to facilitate better water and land use decisions across Arizona. NEMO recognizes that water resource planning and management of nonpoint source pollutants is inherently spatial, and supports the use of geographical information systems (GIS) to simulate and predict impact of land-use change. Arizona NEMO integrates watershed management and planning to emphasize the linkages between water supply and quality with research-based, non-advocacy professional education, stakeholder-group workshops, the Arizona NEMO web site (www.ArizonaNEMO.org), and a toolbox of Arid Region Nonpoint Source Best Management Practices.

Arizona NEMO is the first attempt to adopt the national NEMO approach to conditions in the semiarid, western United States. For Arizona, the program is structured within a watershed-defined template and for the past two years we have been focusing our educational outreach efforts on the policy makers, planners, and land use decision makers impacted by water quality and water management issues. Hydrologic modeling and watershed-based plans of the Upper Gila, Verde, and the Bill Williams Watersheds have been completed and modeling of the Agua Fria, Little Colorado, and San Pedro Watersheds has begun. AGWA modeling of watershed response and vulnerability to soil erosion and sediment transport is presented, and subwatershed areas are classified based on risk of water quality degradation due to nonpoint source contaminants. Decision support tools have been incorporated into the subwatershed risk classification process, allowing for input from the community and other watershed stakeholders.

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Building and Sustaining Arizona's Wildfire Prevention Capacity through Geospatial Technology – *Alix Rogstad, Barron Orr, John Moeller, Michelle Hertzfeld and Emiko Ariyasu, University of Arizona Cooperative Extension, Tucson, AZ*

Wildfire threatens over 190 million acres of U.S. forests and rangeland. The severity of these fires has increased in recent years, posing an increasing threat to human life, property, and local ecosystems. Community expansion has exacerbated the problem by placing people and property at risk, particularly in the southwestern U.S. This includes 118 “high risk” communities in Arizona’s 3,350 mi² of Wildland-Urban Interface. Local efforts to reduce this risk involve the development of Community Wildfire Protection Plans and Firewise recognition. Both initiatives require local collaborations and collection of spatially explicit hazard assessment data.

We leverage existing Cooperative Extension programs (Fire Education and Geospatial Extension), and existing partnerships (Arizona Firewise Communities, Arizona Interagency Coordinating Group, Arizona Governor’s Forest Health Advisory Council, and the Arizona FIRE MAP) to achieve results by:

- 1) Selecting and training participants with an interest in community safety and/or geospatial technology;
- 2) Conducting seminars to support Firewise plan development that includes digital mapping and updating/manipulating data;
- 3) Providing instruction and facilitating mapping and assessments led by local community representatives;
- 4) Utilizing existing formal risk assessment standards (National Fire Protection Association, 1997);
- 5) Developing and deploying a mobile mapping and assessment lab that allows communities to access geospatial equipment (laptop computers, GPS, PDA, and simple GIS software) to collect field data digitally and associate those data with mapped locations;
- 6) Developing Web and PDA-based software to facilitate contextual geospatial data acquisition; and
- 7) Sharing data with cross-jurisdictional efforts to monitor fuels treatments in support of interagency wildfire management.

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Roundtable – Outreach and Extension Across the Digital Divide – *Daniel Cassidy, William Hubbard, University of Georgia, Athens, GA; Sam Jackson, University of Tennessee; Bryan Jordin, University of Georgia, Athens, GA (one hour session)*

The range of delivery mechanisms for forest management information to various clientele groups is expanding rapidly. The fragmentation of our forests has shifted ownership to affluent, young, absentee landowners who are not utilizing the traditional ‘seed and feed store’ methods of extension and outreach. The days of county agents or local natural resource professionals visiting a local hardware store, coffee shop, or gas station to engage landowners are being replaced by increased internet activity via email and website visits. Approaches now must be more innovative to attract the attention of landowners whose time is more in demand and knowledge of forest and land management is lacking.

Technologies such as the internet, personal digital assistants, wireless technologies, and video-on-demand have shifted our society’s mode of acquiring and using information. Twenty-four hour news programming brings us the events of the world as they happen. The traditional workday has expanded just as quickly as the distractions and other opportunities in our lives have. We have less and less time to learn in the traditional manner. Extension and outreach educational programs must learn to compete in this arena, harness the available structure that exists, and provide the new audience we are facing with more user-friendly mechanisms, such as self-paced and on-demand information systems, to ensure educated management decisions are ultimately made.

This roundtable discussion will focus on the planning, delivery, and evaluation of on-line educational experiences as well as the technology behind these outreach programs. The discussion will be guided by four professionals who have experience in designing, conducting, and evaluating distance education in various formats. Case studies of successful and not so successful outreach events will be showcased along with suggestions that will assist participants in adopting innovative strategies into their extension system. Examples include discussions and analysis of e-Extension, the Cooperative Extension Curriculum Project, online-encyclopedias, and online landowner learning systems such as the National Web-Based Learning Center for Private Forests and Range Landowners. We hope to engage participants in a discussion of what has and has not worked in the past, why, and what we can learn from our success and failures.

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B. Land Stewardship

Sustaining the Cultural and Natural Resources of Kentucky's Bluegrass Region – *Amanda Abnee Gumbert* and Carey Ruff, University of Kentucky Cooperative Extension Service, Lexington, KY and Floracliff Nature Preserve, Lexington, KY

Exploring natural and cultural resources helps us understand the choices individuals make in using land and conserving it for future generations. Development and urbanization threaten to significantly impact KY's Bluegrass Region, and educators need information and resources to include this topic in their curricula. UK Cooperative Extension partnered with Floracliff Nature Preserve to offer two educator workshops addressing the natural and cultural resources of Kentucky's Bluegrass Region. The purpose of these workshops was to give educators a clear understanding of the ecological, cultural, and historical parts of the region through hands-on field experiences and expert-facilitated tours and discussion. Fifteen Bluegrass region educators (formal and non-formal) spent three days in June 2004 exploring the water, geology, soil, and plants at Floracliff Nature Preserve. A pre- and post-workshop concept map evaluation showed a significant increase in knowledge ($P < 0.05$) in the participants. Building on the foundation laid in the 2004 workshop, ten Bluegrass region educators spent four days in June 2005 exploring animals, human history, agriculture, and industry in effort to make connections with the land and people of this unique area. A pre- and post-workshop concept map evaluation showed a somewhat significant increase in knowledge ($P < 0.10$) in the participants. These educators will reach hundreds of students, passing along knowledge that will lead to a deeper appreciation and desire for preservation of the Bluegrass Region's natural and cultural resources. In this way, the next generation of voters, consumers and homeowners will understand their environment and make educated decisions concerning their community.

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Sustainability Through Agroforestry: Training the Trainers – *Deborah B. Hill*, University of Kentucky, Lexington, KY, Michael Gold, Larry Godsey and Dusty Walter, Center for Agroforestry, University of Missouri, Columbia, MO

Utilizing the recognized techniques of agroforestry (e.g., alley cropping, silvopasture, windbreaks, riparian buffer strips, forest farming) creates farming ecosystems that are more sustainable, largely because of the inclusion of long-term tree crops with other, annual, agronomic crops and/or livestock. Several of these techniques are supported by cost-share programs through various agencies within the US Department of Agriculture (NRCS), the US Department of Interior (F&W), and state forestry and conservation agencies,

although perhaps not by exactly the same name (e.g., streamside management zones instead of riparian buffer strips). Cooperative Extension can play a crucial role by providing training about these techniques to a mixture of field personnel from these different agencies. Including information regarding how the agroforestry techniques might interface with agencies' existing cost-share opportunities maximizes benefits to the farmers and natural resource landowners these agencies serve. Hosting the training workshops for all agency personnel at once enables them to find out from one another where crossover points exist and to make more efficient plans to assist their common clientele. Having obtained support from the administrations of all agencies involved, three day-long workshops were held in locations across Kentucky to minimize travel time. Personnel from the Center for Agroforestry at the University of Missouri worked with Kentucky personnel and provided some of the take-home materials for the participants.

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Workshop – Sustaining Natural Resources: Teaching Land Stewardship – *Mark Kopecky* and *Gail Huycke*, University of Wisconsin- Extension, Phillips, WI, *Arlen Albrecht*, University of Wisconsin- Extension, Medford, WI, *Kris Tiles*, University of Wisconsin- Extension, Park Falls, WI

North-central Wisconsin is one of the last areas in Wisconsin facing substantial development pressure and landscape fragmentation. In our recent strategic planning surveys, natural resource issues rated high in citizens' concerns. In addition, visible shifts in land use, changing demographics, timber harvesting opportunities, and political pressure necessitated educational programming to address sustainability issues. Rural landowners' conferences and tours were established in response to these needs for environmental stewardship opportunities.

The objectives of the conferences and tours are to (1) educate landowners about basic natural resource characteristics and management practices to enhance woodlands, wetlands/shorelands, and wildlife habitat; (2) introduce rural landowners to the various programs and agencies that exist to aid landowners; and (3) allow landowners to experience land stewardship through hands-on and applied examples of other landowners.

In the first three years of the initiative, over 250 people have attended five events. Evaluation surveys indicate that most of the people who attend not only learn, but apply what they learn through good stewardship practices. These results prove the effectiveness of these integrated educational opportunities. The conferences and tours benefit landowners, which benefits the resource base. The enhanced partnerships we've developed enhance our own professional effectiveness and our ability to serve the clients, further enhancing the sustainability of the resource base.

This workshop session will expose participants to all aspects of planning and conducting a similar initiative, including impact evaluations. It will include discussion of the benefits of transformational education through landowner workshops and field days.

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C. Stormwater Education

Neighborhood Stormwater/Landscape Program – *Rebecca Jordi*, University of Florida/IFAS Nassau County Extension, Callahan, FL

Objective: Provide local neighborhoods with information about proper landscape and pond maintenance practices that would protect Florida's natural waterways and watersheds. The overall goal was to draw a direct association between the homeowner landscape practices and the health of the stormwater pond with an emphasis on prevention of future problems. **Method:** This was a cooperative effort between extension and the local water management coordinator. Many local homeowner associations have strong political ties and are very well organized. The alliance formed with the homeowner associations allowed this program to be given to wide variety of homeowners who might never have sought our help until landscape and pond water problems were too advanced. The program consisted of best management practices for lawn and stormwater ponds. The practices discussed were proper fertilization, watering and mowing procedures of turfgrass and ornamentals with a specific focus on reducing fertilizer run-off and water management. **Result:** Approximately 7 homeowner associations have enlisted our help which involved an attendance of over 150 residents. Post-survey results concluded that 86% would change their practices by using slow release fertilizers and 79% indicated they would now water turfgrass on an as needed basis. In addition, a more cooperative communication has developed between homeowners, association board members, and local landscape maintenance businesses because of this program. **Conclusion:** This program could be adapted for any area and provides another opportunity for dissemination of proper research-based information to the burgeoning number of newcomers and new homeowners to our rural and suburban areas.

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Rain Gardens: A Comprehensive Response to Statewide Stormwater Education Needs – *Darren Lochner*, University of Wisconsin-Extension, Eau Claire, WI and *Suzanne Wade*, University of Wisconsin-Extension, Jefferson, WI

Stormwater is a critical environmental issue in Wisconsin. The results of a University of Wisconsin Extension (UWEX) survey of Madison residents, showed people lacked knowledge about stormwater, their contribution to stormwater or what they could do to help. They did, however, express a willingness to take actions, including establishing rain gardens, if they knew how.

Stormwater is a difficult subject for the general public since most feel they have little personal control over the problem. Rain gardens pose an incredible opportunity to educate people about stormwater while demonstrating a positive action they can take. However, good educational materials about rain gardens are scarce. UWEX Educators responded to these factors by developing, along with Department of Natural Resources staff, a comprehensive set of educational tools.

Rain Garden Educator's Kits: The kit, designed for all educators, contains a cd with electronic presentations on the value of rain gardens and steps to build one, locations of demonstration sites with case studies, web resources, and sample brochures of successful workshops and tours. The kit also contains a rain garden how-to manual along with other materials.

Rain Garden Demonstrations Sites and Signs: The demonstrations sites allow visitors to visualize the potential for rain gardens in their own backyard or business. An outdoor educational sign was also developed so these sites are permanent places where individuals can see, smell, and touch rain gardens year round.

Rain Garden Displays: UWEX educators designed a rain garden table top display to raise awareness of the stormwater/water quality connection at events.

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Rainstorming in Oregon – Assisting Coastal Communities in Reducing Runoff, Improving Water Quality, and Meeting Water Quality Standards – *Derek C. Godwin*, Oregon State University Extension Service, Salem, OR; and Frank Burris, Oregon State University Extension Service, Gold Beach, OR

Oregon's predominantly rural coastal watersheds are known for their high quality salmon habitat and water quality. However, these coastal communities are facing increased demand for housing and urban development and must balance population growth with the ability to meet water quality standards. Most cities and county planning departments do not have ordinances, Stormwater Master Plans, or Comprehensive Land Use Plans that address development impacts on stormwater and water quality. They also do not have the capacity to institute these changes.

Rainstorming is a pilot project focusing on coastal Oregon communities. The project delivered educational presentations to city and county planning commissions, provided consulting services to land use planners to develop plans and ordinances, and supplied developers with engineering services to design demonstration projects such as raingardens, bioswales, and stormwater wetlands.

This project obtained EPA 319 funds and has created new partnerships with OSU Extension Service and Extension Sea Grant, Oregon Department of Environmental Quality, Oregon Department of Land Conservation and Development, the Council of Governments in Lane County and Rogue Valley, private consultants, and coastal land use planners.

Rainstorming has implemented projects demonstrating low impact development techniques; reviewed and updated ordinances to address stormwater and water quality; and assisted in developing Stormwater Master Plans and updating Comprehensive Land Use Plans to address stormwater and water quality. Its success has spawned a new statewide cooperative effort that will work with small and large communities in Oregon. The project has also joined the NEMO network and will incorporate other related efforts in the U.S.

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Lake Superior Streams: Making Stormwater and Stream Data Come Alive for Citizens, Students, Contractors, Resource Agencies, and Decision-Makers – *Cynthia Hagle*, Minnesota Sea Grant, Duluth, MN; Richard Axler, Natural Resources Research Institute, Duluth, MN; Marion Lonsdale, Duluth Public Works Department, Duluth, MN; George Host, Natural Resources Research Institute, Duluth, MN; Jesse Schomberg, Minnesota Sea Grant, Duluth, MN; Elaine Ruzycski, Jane Reed, Natural Resources Research Institute, Duluth, MN; Bruce Munson, Department of Education, University of Minnesota Duluth, Duluth, MN

This project uses web-based delivery and unique animated visualizations of real-time stream monitoring data to address issues of sustainability in critical western Lake Superior basin watersheds. Urbanization and rural development are placing pressure on western Lake Superior streams and nearshore waters. Stormwater runoff and discharge of partially treated domestic wastewater threaten public and ecological health. Degradation of coastal streams and nearshore waters represents a significant social and economic impact to a region where the local economy and character are closely linked to a pristine environment.

The project began in 2002 as *Duluth Streams*, a partnership between the University of Minnesota and City of Duluth Stormwater Utility. Now *Lake Superior Streams*, www.LakeSuperiorStreams.org, the project has grown to include 22 Minnesota and Wisconsin organizations charged with stormwater management in the western Lake Superior watershed. Sensors in five area streams collect water quality data every five minutes and transmit data to the website daily. Interactive data animation tools help make water quality data understandable and accessible. The website incorporates interpretive information, curricula, case studies and a site design toolkit to educate contractors, consultants, developers, realtors, students, teachers, homeowners, agencies and decision-makers. The website averages ~200,000 hits/month and serves as a delivery mechanism for common educational messages, as well as a home for water quality data, management tools, and community resources oriented toward increasing understanding of the relationship between land use choices and aquatic ecosystem health.

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D. Sustainable Forestry

Conserving Privately Owned Forests: The Role of Attitude and Knowledge – *Gary W. Micsky*, Penn State Cooperative Extension, Mercer County, Mercer, PA

Privately owned forest lands are important to economic, ecological, and social well being. Public policy is critical for ensuring that we sustain private forest values. This study explores issues affecting the management and conservation of privately owned forestlands. Specifically the study addressed three questions: 1) Are issues affecting sustainability of privately owned forests adequately understood/addressed by public policy makers? 2) Are public policy decisions compromising stewardship efforts by not addressing forestland parcelization? and 3) Do forest landowners perceive public support of their forest stewardship efforts?

Twenty-three public policy makers and twenty-three private forest landowners participated in key informant interviews providing detailed information and perceptions relating to forest management in Mercer County, Pennsylvania. A modified snowball technique served to identify potential key informants in each group. To help guide policy development related to the research questions, the key informant interviews explored stakeholder understanding of specific forest stewardship issues, opinion development, educational needs and resources, and concerns relating to private forest management in Mercer County. Data drawn from these interviews provide a new/different baseline of concerns and issues, and informs an understanding of needs and approaches for conserving privately owned forests.

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A New Manual and Educational Program Promote Sustainable Forestry In Eastern Oregon – *Paul T. Oester*, Stephen A. Fitzgerald, William H. Emmingham, Oregon State University, Corvallis, OR

Like most forests of the interior West, the forests of eastern Oregon are valuable for timber, wildlife, forage and visual beauty, but many fall short of their potential. A history of fire suppression, heavy grazing and repeated selective economic harvests has created over-dense, post-settlement forests with invading shade tolerant species. Consequently, many forests have under realized fiber yields, poor quality trees and are at high risk from wildfire, defoliators, beetles and disease. Annual mortality approaches 30% of growth.

As part of an outreach effort to help family forestland owners and managers understand the complex ecology and management of eastern Oregon forests, we published *Ecology and Management of Eastern Oregon Forests: a Comprehensive Manual for Forest Managers*. In 208 pages and nine chapters, richly illustrated with color photographs and graphics, the manual creates a road map for managers. The book brings together the best current science and provides management guidelines and scenarios intended to help managers visualize and implement real world solutions.

Step two was a series of regional 1 ½ day workshops designed to facilitate manual use by building participants skills in determining their forest type and its potential and how to use the manual's management guides to meet their objectives. Step three was a survey assessing how well the manual and workshop served user needs and the degree to which workshop participants implemented sustainable forestry concepts and practices. Our presentation will include an overview of the manual and results of the follow-up survey.

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Sustaining Family Forestlands Across the Generations – *Brad Withrow-Robinson*, Chal Landgren, Oregon State University Forestry Extension; Mark Green, Oregon State University, College of Business, Austin Family Business Program; Clint Bentz, Boldt, Carlisle and Smith LLC, Salem, OR; Renee Irvine, University of Oregon, Dept. of Planning, Public Policy and Management; Susan Watkins, private woodland owner, McMinnville, OR; Michael Cloughesy, Oregon Forest Resources Institute; and Gail Wells, Gail Wells Communication, Corvallis, OR

The ownership of family forests is poised at a crossroads. Over the next couple decades, a substantial portion of the current owners of forest property will pass their forest to new owners. In many families the next generation is largely unprepared for the transition and many families lack the skills needed to manage the coming changes. Without adequate planning for family transition, many of these properties could shift into other types of ownership (industrial forestry, as well as real estate, pension funds or other investment groups) and uses. This is a matter of concern because, as a class of ownership, family forest lands provide unique and significant ecological social and economic benefits. This ownership group manages their properties for a diverse range of goals quite unlike industrial or federal managers, and often along the rural/urban interface. This provides options for wildlife, recreation and timber production not met by other ownership groups.

In a broad collaborative effort led by OSU Forestry Extension, this project aims to help families and communities in Oregon recognize the unique benefits they derive from family-owned forest lands and facilitate ways for them to continue to sustain those benefits for generations through issues identification, business and management planning and timely decision making. In the first year of the program we are developing materials to inform forest landowners, their families, the public and policy makers about the issues involved. We are developing practical, hands-on educational materials to help families communicate about important issues and make the decisions necessary to achieve the future management they elect. These materials include a DVD and workbook on family succession planning. They will be used in workshops offered across the state, as well as modified and incorporated in to Extension's Core programming such as Basic Forestry Shortcourse and Master Woodland Manager.

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3-D Forest Sustainability in Mississippi – *Andrew J. Londo*, Laura A. Grace and Lance D. Stewart, Mississippi State University, Mississippi State, MS

Forests hold a significant share of Mississippi's wealth. Forestry is consistently one of the top two industrial economic sectors in the state. Sustaining an economically productive, socially acceptable and environmentally sound forestry environment requires a good understanding of the resource and the people involved. The Mississippi State University Extension Service is on the forefront of educational efforts promoting sustainable use of forest resources by focusing on three separate, but related, dimensions: Development, Diversity and Dissemination.

As conservation was the rallying cry of the 20th century, sustainability is the focus of the 21st century. Sustainability has three dimensions, environment, social and economic. Utilization of natural resources is permitted because of a social license granted by society and will continue as long as society considers the value of outputs to be greater than the value of the inputs.

The Mississippi State University Extension Forestry Program has developed innovative efforts in reaching the goal of sustainability. This process considers the environmental, social and economic needs within Mississippi to direct efforts of development, diversity and dissemination.

- Development includes improvement of current practice and innovative approaches to market and non-market uses.
- Diversity in people and programs reaching out to all individuals and interest groups with a role or interest in the development and conservation of forest resources.
- Dissemination efforts include traditional resident instruction, forest landowner programs, professional logger education classes and continuing education classes.

By adhering to a three dimensional goal of sustainability the Mississippi State University Extension Forestry Program is able to provide educational enrichment opportunities for all natural resource stakeholders.

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E. Collaborations and Partnerships

Growth and Clean Water: Synergy to Protect Community Water Quality – *Susan Donaldson*, University of Nevada Cooperative Extension, Reno, NV; *Chris Conway*, Kennedy/Jenks Consultants, Reno, NV; *Terri Svetich*, City of Reno, Stormwater Permit Coordinating Committee, NV

As are many growing communities, the Reno/Sparks metropolitan area is struggling to balance the impacts of growth with protection of natural resources. Numerous needs assessments have identified issues related to water quality as high priorities. Storm water quality in the area is regulated under an NPDES Phase I permit and considers the total maximum daily load (TMDL) requirements for the Truckee River. At the same time, efforts to diversify the economy have centered on the need to promote recreational opportunities including a whitewater park and other activities on the river that require clean water and appealing surroundings.

It was clear that community partnerships were needed to enlist the broad support and achieve the behavioral changes needed to protect local water quality. This paper will discuss successful interrelationships among a number of programs, including:

1. NEMO (Non-point Education for Municipal Officials, education and training for land-use decisionmakers)
2. Truckee Meadows Storm Water Permit Coordinating Committee (SWPCC, working to meet the conditions of the NPDES storm water permit while cooperatively working with the development/construction industry to protect water quality during and after construction)

3. Truckee River Tributaries Watershed Protection Plan (working with local governments on planning, erosion control, and restoration to address issues on river tributaries; administered through the SWPPC)
4. WaterWatch (engaging the public in protecting water quality with the help of a local broadcast meteorologist and a website).

Each program has a specific audience and concrete goals. Evaluation components are built into the primarily educational programs, such as NEMO and WaterWatch, which are coordinated by Cooperative Extension, while water quality monitoring during storm events and routine monitoring of construction sites provides feedback to the SWPCC. The presentation will provide an overview to program elements and evaluation results, and the framework within which successful collaboration occurs.

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Governor's Conferences on the Management of the Illinois River System – *Robert Frazee*, University of Illinois Extension, East Peoria, IL

In 1985, a group of scientists and citizens became concerned about the increasing problems of sedimentation and erosion in the Illinois River Watershed. This group organized the First Governor's Conference on the Management of the Illinois River, which was held in 1987. This conference has continued to be held on a biennial basis with a Governor's designation, thus demonstrating the high priority being placed upon our natural resources.

Over the past twenty years, these conferences have brought together local, state, and federal leaders to create awareness of the problems of soil erosion and sedimentation, develop working coalitions, apply conservation practices to the watershed, develop river/watershed legislation, and generate funding. The foundations for the following programs can be directly attributed to successful interagency and multi-disciplinary cooperation, fostered at the Governor's Illinois River Conferences and subsequently implemented:

- Development/funding for low-cost Streambank Stabilization Methods;
- Development of over twenty large-scale watershed restoration programs;
- Formation/operation of the Illinois River Coordinating Council;
- Development of the Integrated Management Plan for the Illinois River System;
- Illinois Conservation 2000 Programs and Funding;
- Illinois River Conservation Reserve Enhancement Program– 110,000 acres enrolled;
- Illinois Rivers 2020 Initiative;
- Dredging of Sediment from the Illinois River; and
- Island construction utilizing dredging sediment.

This presentation showcases the value of interagency cooperation associated with organizing and conducting ten Governor's Conferences on the Management of the Illinois River. University of Illinois Extension has provided the leadership to organize these conferences.

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Sustainability through Collaborative Resource Stewardship – The Cottonwood Ranch Experience – *Kent McAdoo*, University of Nevada Cooperative Extension, Elko, NV; *Jay Davison*, University of Nevada Cooperative Extension, Fallon, NV; *Sherman Swanson*, University of Nevada Cooperative Extension, Reno, NV; and *Agee Smith*, Cottonwood Ranch, Wells, NV

The Cottonwood Ranch Holistic Management Team (HMT) was borne of conflict associated with the impacts of livestock grazing on public lands, particularly with regard to riparian areas. In 1995, to address economic and ecological sustainability, several interested citizens and the land management agencies agreed to engage in a process called Holistic Management. This process integrates ecological, social, and financial considerations into a holistic plan in an effort to meet the needs of diverse land users.

Based on management suggestions from the HMT, the Cottonwood Ranch has worked collaboratively to modify their livestock grazing plans in consideration of multiple rangeland resource values and to develop appropriate adaptive management strategies. Even as early as 1997, sampling by BLM range specialists indicated that riparian habitat along streams of the Cottonwood Ranch were responding favorably to strategic changes in livestock management. An evaluation conducted in 1999 showed that 13.5 miles of stream were functioning properly, 19.3 miles were functioning at risk, and only 1.1 miles were non-functioning. Approximately 75% of the “at risk” reaches were judged to be in an upward trend.

During the ten years of Holistic Management, the Cottonwood Ranch owner/operators experienced positive economic change. At the outset of this project, they owned 65 cows and had to lease cattle to achieve full stocking rates (400 – 800 head). Within five years, the ranch was able to stock the ranch with its own cattle. The ranch has also successfully diversified its operation, offering a guest lodge and big-game guide services.

Perhaps the best indication of the Cottonwood Ranch HMT’s effectiveness is its success in bringing together diverse interests to work toward common goals. The Cottonwood Ranch HMT continues to make progress in achieving balanced collaborative management approaches for economic and ecological sustainability.

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Setting the Stage for the Future: UW-Extension’s Role in the Governor’s Conference on Forestry – *Suzanne Wade*, University of Wisconsin – Extension, Jefferson WI and *Darren Lochner*, University of Wisconsin – Extension, Eau Claire WI

Wisconsin’s 16 million acres of forests are a valuable asset meeting unique, diverse and not always compatible needs. In 2004, at the Governor’s Conference on Forestry, 250 influential forestry leaders from forest-based industries, universities, environmental groups, landowners, conservation groups, professional associations and local, state and federal agencies came together for an unprecedented effort to work on critical forestry issues. The Conference was one step in the statewide forestry planning process based on the Statewide Forest Stewardship Plan.

Conference results: 1) Better understanding by forest leaders of economic, social and ecological implications of forestry issues. 2) Synthesized information, trends, issues and actions. 3) Formation of new and successful partnerships. 4) Creation of an Implementation Steering Committee with conference themes as standing entities. 5) Steps taken to establish a state forest legacy program, establish partnerships with college students, develop education materials and revise the Technical Standards for Best Management Practices. Finally, the dialogue begun at the Conference is helping to articulate common ground and the work to be done; embracing the possibility that more can be done together, if disagreements don't distract from common goals.

The UWEX Basin Educators were a major partner in planning and orchestrating the Governor's Conference. They used their skills in process and facilitation to harness the enthusiasm and expertise of the participants translating these into actions and outcomes.

This presentation will highlight the role of the Basin Educators: specific steps and methods used, resulting action plans, trials and problems encountered and successes resulting from the effort.

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Tuesday, May 16, 2006

Concurrent Session IV, 10:25 a.m. – 12:30 p.m.

A. Invasive Species II

Sustaining Aquatic Ecosystems Amidst Invasive Species Infestations Through Prevention Education –
Mike Koles, University of Wisconsin-Extension, Waupaca County, Waupaca, WI

The Waupaca Chain O'Lakes is a group of interconnected lakes that encompass 800 acres. Water quality combined with proximity to population centers contribute to a highly developed shoreline and significant level of non-resident use. According to a mid-1990s management plan, the Chain suffers from "excessive use during weekends or holidays and [resulting] diminished recreational enjoyment of the resource". During the planning process, sustainability concerns due to "excessive use" were limited to shoreline erosion, safety, and recreational enjoyment; however, these issues were demoted with the late 1990s infestation of purple loosestrife and Eurasian Watermilfoil. Curly-leaf pondweed was first identified in 2004.

Chain stakeholders partnered to implement an herbicide application program beginning in 2001, but no attention was provided to prevention. This was an especially large gap given that zebra mussels, rusty crayfish, round goby, spiny and fishhook waterfleas, and white perch are present within nearby water bodies.

Initially, several programs were provided to increase understanding of the array of invasive species and the role of prevention in sustaining the resource. This prompted them to obtain a grant to develop a strategic plan that identified desired prevention strategies. The planning effort included a significant teaching component focused primarily on adult education methods and examples of other communities' prevention programs. A subsequent implementation grant was also received. Prevention strategies utilized to date will be focused on during the presentation and some handouts (e.g., educational brochure, educational placemats) provided.

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Flirting with Disaster...Unsustainable Pesticide Use? – Mindy Habecker, Dane County-University of Wisconsin Extension, Madison, WI

Few weed management tools have had an impact on agriculture as immediate or dramatic as Roundup ready crops. Within a few years after their introduction, Roundup Ready crops constitute about 90% of the nation's soybeans, 70% of the corn and cotton, and high percentages of canola. The wheat and sugar beet industry are in the process of having this technology registered for their communities. American agriculture and international agriculture are increasingly dependent on the use of the herbicide glyphosate (active ingredient in Roundup).

Roundup, successfully used for more than 30 years, runs the risk of becoming unsustainable with its exclusive and extensive use. In the past 8 years, 6 weeds have developed glyphosate resistance.

Many states, including Wisconsin have yet to assess if glyphosate-resistant weeds are occurring. University of Wisconsin (UW) Extension designed and held a statewide forum bringing the pesticide industry, commodity groups, and farmers together to see if more proactive investigation and management are needed. The conclusion was a resounding “yes” and a multi-year action plan for the state. Since this is a national and international issue, in 2004 a two-day national forum was conducted. Represented were six of the major agricultural commodities, major industrial manufacturers of this technology, and Extension researchers from across the nation. After educational sessions given by both industry and University researchers, commodity representatives engaged in facilitated discussion on the meaning of these findings and possible policy and management implications.

UW-Extension along with Iowa Extension designed and conducted this national forum. A national policy advisory paper will be published and distributed this year on the findings of this forum. The author, who helped design both the state and national forum and facilitated both of them, will describe the process of how this issue concerning the sustainability of current weed management was designed and implemented.

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Roundtable – Help, We’re Being Invaded! Why Should You Care? And What Can You and Your Federal Partners Do About It? Come Discuss With Experts – Michael Bowers, Catalino Blanche, CSREES, Washington, D.C.; Amy E. Hays, Texas A&M University; Leslie J. Mehrhoff, University of Connecticut; and Chris Dionigi, National Invasive Species Council (NISC) (one hour session)

Invasions by non-indigenous species are a local, regional and national concern, impacting both ecological and economic sustainability. One recent study estimated that they cost each US household \$1,300 annually. History has taught us that once an invasive species becomes established, it is almost impossible to remove. Hence, the early detection and rapid mobilization of responders to new incursions is the most effective and cost-efficient tool in our arsenal. This roundtable will explore the national-to-local links in the fight against invasive species with experts from a variety of federal, state and non-profit organizations. Specifically, we will discuss how to coordinate our local efforts to achieve regional or national results. Likewise, we will discuss ways our national efforts can help early detection and local control. Maybe we need a National Invasive Species Science and Prediction Center. Or maybe it’s a Network. We will brainstorm about what model (a center or network) might best serve as a coordinating body or a clearinghouse of information on early detection-rapid response methods and strategies.

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B. Thinking Outside the Box

Promoting Sustainable Communities and a Sustainable Environment in Rural New England – Susan Westa, Green Valley Institute, University of Connecticut, Brooklyn, CT

The Green Valley Institute is helping communities balance growth and conservation in a 35-town region known as the Last Green Valley in southern New England. The Green Valley Institute (GVI) is a partnership between two Cooperative Extension Systems, the University of Connecticut and the University of Massachusetts, and the Quinebaug Shetucket National Heritage Corridor. The Quinebaug Shetucket Heritage Corridor, located in

northeastern Connecticut and south central Massachusetts, is one of the few rural regions remaining in the otherwise highly developed corridor that runs from north of Boston to south of Washington, D.C.

In New England, land use decisions are made at the local level by volunteer boards and commissions often with limited professional assistance. GVI's goal is to provide these towns with the tools and information they need to make sound land use and natural resource decisions.

GVI works with communities to find new ways to accommodate growth without adversely impacting natural resources and rural character. We help communities identify those areas that are most important for protection and teach them about innovative planning and zoning tools that protect open spaces and focus growth where it works best. GVI has developed workshops and seminars, model projects, and recruited and trained new volunteers to address these issues. GVI is a model for other rural regions who are working to sustain the character and quality of life of their communities, as well as the surrounding environment.

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Extending Animal Traction to the Classified Forests of the Republic of Guinea to Aid in Establishing Sustainable Forestry – *David W. Patterson*, University of Arkansas, Monticello, AR

The villagers around the classified forests of Guinea have been clearing forest land to plant crops and abandoning the land after it has ceased to be productive. To stop the forest depletion, a plan was developed to establish sustainable forestry on the classified forests and the national forestry agency and villagers have agreed to live under its guidelines. The plan included an allowable annual cutting limit which is strictly enforced.

The hope was to instill in the villagers a sense of value in the trees; thereby, resulting in less damage to the forests. It was felt that to maximize the value of each tree, all of its parts should be moved to the roadside for processing so that all of the resulting products can be loaded on passing trucks for transport to the cities.

The plan was to have the villagers use animal traction to move the wood to the roadside. The villagers did not know about animal traction; therefore, I was requested to train the forest technicians so they could train the villagers in using their cattle to move the wood from the forests. We had to design a small yoke for the small size cows they have and construct a wagon made of junk car parts to haul the wood. In one forest, the logs were bigger and we had to design a block and tackle to give the cows a mechanical advance in rolling the logs onto the wagon. After the process was demonstrated, the forest technicians were encouraged to help in developing the outline for the training manual that was written for them to use in training the villagers.

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Workshop – Follow the Money: Developing a Template for Justifying Funding Natural Resource Extension – Peter Pohl, University of New Hampshire, Durham, NH; *Deborah B. Hill*, University of Kentucky, Lexington, KY; and Eric Norland, CSREES, Washington, DC (one hour session)

Many of us in natural resource extension have come up against local, county, in-state, regional, or state organizations (including legislatures) that control purse strings for our personnel, projects and programs, and that are themselves focused more on agriculture, health or education than on natural resources. This places us in the position of justifying our existence, despite the fact that well-managed natural resources might have profound positive influences *on* agriculture, health and education. Peter Pohl had the experience of persuading his county board to increase substantially funds for a county position (for which there had been no increase

since 1988) and set about educating them on the value of well-managed natural resources in his area. His information included exactly what the resources were in his county (e.g., percentage in land cover, forest cover, water resources, ownership patterns), how many people were employed in forestry or other natural resource-related businesses, what tax revenues various forest- or other natural resource-based enterprises brought into the county, etc.

Since the funding problem is pervasive, it seemed wise to bring together a group of people from different states to brainstorm about what the most useful bits of information would be in order to convince recalcitrant decision-making bodies to financially support natural resource extension personnel, programs and projects. Although circumstances vary widely across the United States, developing a basic template that gives people a place to start in preparing talking points or bullets for presentation to a funding source would be useful. This would include not only the *types* of information that might be most useful, but also *where* and *how* that information can be accessed.

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C. Marketing and Targeting

Understanding the Texas Absentee Landowner: Their Goals, Interests, and Needs for Implementing Wildlife Management – Billy Higginbotham and *Andrea Feldpausch*, Texas A&M University, College Station, TX

Rural Texas land use patterns have changed from predominately farming and ranching to include outdoor recreational activities. As urban dwellers acquire rural properties, the absentee landowner group is increasing. We conducted a study using six regional-based resource management workshops to determine workshop effectiveness and landowner needs. Quantitative survey techniques were administered on-site before the start of each workshop, and then again as a mail survey 6 months later. We found that 85% of workshop attendees (n=205) maintained ownership of their lands for personal/recreational use. Over half of the workshop attendees (62%) were interested in managing for wildlife over managing for livestock, but only 58% actively managed for wildlife before attending the workshop. However, after participation, 90% of mail survey respondents (n=172) stated having adopted an average of 4 new wildlife management practices with savings and/or earnings of \$1,114 per landowner statewide. Surveyed landowners also showed an interest in agricultural and wildlife tax valuations to reduce the cost of property tax (92%). When asked what they would do if exemptions were lost, half of the respondents considered selling and/or subdividing their properties. A need for information was also noted when landowners rated time and information as having significantly higher priority over money and labor (p<0.05). Using the results from our study, further development of absentee landowner programming to reach and provide research-based information focusing on effective wildlife management practices would be beneficial to this increasingly important landowner group.

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Successful Social Marketing Approaches to Address Water Quality Issues in Hood Canal – Robert Simmons, *Pat Pearson, Emily Piper*, Cammy Mills, Washington State University Extension, Shelton, WA

To reduce anthropogenic nutrient loading to Hood Canal, Washington State University Extension implemented two social marketing based campaigns to educate and instill behavior changes among watershed residents. Beginning in 2005, the "Hood Canal Watershed Pledge Program" targeted all watershed residents and the "Shore Stewards" specifically targeted shoreline homeowners.

Each of the programs developed and distributed a separate booklet that highlighted natural histories of Hood Canal, water quality issues, and helped residents identify and commit to taking actions to help maintain Hood Canal's health. Each booklet addressed issues relevant to the target audience and booklets were distributed through personal contacts at festivals and meetings. The participants who committed to specific actions in the Hood Canal Watershed Pledge Program were provided a recycled glass suncatcher and the shoreline homeowners were provided a 12" round metal "Shore Steward" sign for their home. Contact information was collected for participants in order to provide them with water quality information and for program evaluation.

The social marketing elements and strategies of these programs include:

- Identification of target audiences/issues
- Development of desired behavior objectives
- Development of products to promote program objectives
- Making personal contacts and obtaining commitments
- Measurement of program outcomes; changes in awareness and behavior

Telephone surveys of representative samples of program participants were conducted to measure the effectiveness of these programs in encouraging behavior changes. This presentation will provide an overview of the programs, the outcomes and conclusions derived from the analysis of the information obtained, and future program directions.

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Marketing Extension Natural Resources Like You Mean It – *Jim Ochterski*, Cornell Cooperative Extension SCNY Agriculture Team, Montour Falls, NY

“No one knows what we can do for forest owners.”

Extension natural resource programs often suffer from low audience turnout, lack of recognition, and being considered a well-kept secret. Even though participants often report that the information and service is useful and high quality, few seem to contact or perceive Extension as a primary resource, opting for their own ideas of natural resource management, chatting with neighbors, or using the Internet to make local land management decisions.

Since June 2005, the Cornell Cooperative Extension South Central NY Regional Natural Resources program is adopting new techniques to stimulate forest owner participation. We are showing how our educational programs provide a unique value to families in the region, rather than appealing to mere curiosity or resource management consequences. In practice, this means first determining what is valuable to the individuals in our clientele. Then, we are constructing a core message that proposes to enhance that value through Extension education. Next, we use multiple channels to put that message directly in front of our clientele, making it hard for them to miss.

This presentation will review the implementation of this new marketing effort, stimulate insights about what marketing is and is not, and will provide time for discussion about what makes an Extension natural resources program valuable to an individual, family, or funding source. You will be able to draft your value-oriented marketing message and brainstorm local channels for getting your message out.

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Marketing in 3D – Targeting Lake Home and Cabin Owners for Natural Resource Education – Renee Pardello and Anita Dincesen, University of Minnesota Extension Service, St. Paul, MN

“You have questions – We have answers” is proclaimed on a 25 foot banner hanging down to the 20’ x 30’ exhibit on the convention floor. Natural Resource and Environment Educators captured the attention of 18,000 show-goers on an early spring weekend in 2005 and 2006 as they strolled the aisles of the Minneapolis Convention Center. Visitors dreamed of that most cherished Northwoods experience-- owning their own lake home or cabin. As the educators spoke with lake home owners, answering their most puzzling questions, passing out the *Natural Resource and Environment Catalog*, promoting the *Lake Home and Cabin Kit*, demonstrating shoreline restoration, proper pruning techniques and how septic systems work with hands-on displays... a larger plan was unfolding.

The Lake Home and Cabin Show was seen as one very visible, public opportunity to reach this rapidly growing target audience and aggressively market & promote Natural Resource and Environment educational programs, products and resources. The demand for lake homes, cabins and recreational properties has surged in the upper Midwest and the need for education on natural resources and the proper stewardship of land issues is at the forefront of this trend.

In this session, the presenters will outline the steps behind their business & marketing strategy that has lead to cross marketing efforts to a major new target audience and the development of new products and services. They will also share components of their recently developed 12 month Marketing Plan of which the Lake Home and Cabin Show is just one step in an ongoing marketing process.

Besides walking away with 3-D glasses, participants will walk away with valuable marketing tools and concepts to promote their own programs and understand how to prioritize their target audience.

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D. Engaging the Public

Volunteer Monitoring of *E. coli* in Upper Midwest Streams: A Comparison of Methods and Preferences – Jerry Iles, Ohio State University, Piketon, OH, Lyn Crighton, Indiana DNR, Indianapolis, IN Barbara Liukkonen, University of Minnesota, St. Paul, MN, Eric O’Brien, Iowa DNR, Iowa City, IA, Kris Stepenuck, University of Wisconsin & Wisconsin DNR, Madison, WI, Lois Wolfson, Michigan State University, Lansing MI

Bacterial contamination of surface waters is a common public health concern. Laboratory analyses can be expensive, yet such monitoring is important to ensure safe recreational opportunities. In 2004, volunteer monitoring programs in six upper Midwestern states were awarded a grant from USDA-CSREES to evaluate five test methods for monitoring *E. coli* bacteria suitable for home use. Methods chosen for this project included Coliscan® Easygel (incubated and not incubated), 3M™ Petrifilm™, Coliscan® MF Method, and IDEXX COLISURE™. The methods were evaluated both by comparing ‘home lab’ results to laboratory analyses of *E. coli* and volunteer preferences in using the home lab methods.

After one season of monitoring by volunteers using these five methods in Indiana and Iowa, the project team identified two methods that performed best based on results of analytical comparisons and user preference surveys; these were: Coliscan® Easygel (incubated) and 3M™ Petrifilm™. In 2005, nearly 40 volunteers in Michigan, Minnesota, Ohio, and Wisconsin were trained to use these two methods and asked to assess the

methods based on their own preferences. These volunteers' samples were also sent to a lab in their state for comparison of bacterial counts between home methods and lab results. Volunteers in Indiana and Iowa continued to monitor using all five methods during 2005 to ensure the best home methods were recommended for use by volunteers in other states. Bacterial testing will continue in 2006 based on results from both years of monitoring.

Ultimately, the project team will produce a training curriculum, educational materials, and recommendations about the methods, based on three years of data, for volunteers; these materials and recommendations will be transferable to other regions. This presentation will describe the project's experimental design and summarize 2004 and 2005 results on the accuracy and usability of the home lab methods.

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Delivering Integrated Forestry and Wildlife Extension Programming in Missouri – H. E. “Hank” Stelzer, Robert A. Pierce II, University of Missouri, Columbia, MO

Since 2001, Missouri landowners have had the opportunity to learn about forestry and wildlife management through two southern-based distance learning short courses: *Master Tree Farmer* and *Master Wildlifer*. While well attended, participants wanted more emphasis on Missouri's hardwood forests, integration of management concepts that were common to both programs, and a shorter format. The *Missouri Woodland Steward Short Course* was developed to meet these needs. In addition to integrating basic forestry and wildlife management concepts and practices, the DVD-based program weaves landowner interviews and walks around their woodlands with professional presentations. The short course concludes with a capstone field trip to reinforce concepts learned in the indoor sessions.

Through collaborative learning, landowners have the opportunity to develop local and regional networks among themselves and with their natural resource professionals. A network formed during the pilot testing of the short course has supported the development of a private landowner association. Through coached planning, the natural resource professionals who provided the on-site expertise for the short course have been able to more efficiently direct their time and energy by working with several landowners at once in the development of their management plans. This short course also strengthened the collaboration between Extension and local natural resource professionals in delivering adult landowner education. Another benefit of this short course has been its service as a lead-in to more comprehensive Missouri-based forestry and wildlife Extension programs.

Pilot test and first-round data will be shared as well as personal experiences in developing and delivering this program.

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The Master Well Owner Network: Volunteers Educating Pennsylvania Well Owners – Bryan Swistock, Stephanie Clemens, William Sharpe, Penn State University, University Park, PA

Three million rural Pennsylvania residents rely on private wells for their drinking water and 20,000 new wells are drilled each year. Pennsylvania does not have statewide well construction standards and surveys have found that more than half of these supplies fail to meet drinking water standards. Unfortunately, most homeowners are unaware of management strategies to detect, prevent or treat drinking water problems and some fall victim to unscrupulous businesses. In 2004 Penn State received funding to initiate a Master Well Owner volunteer program in Pennsylvania targeted at education of homeowners with private water systems. Volunteers attend

workshops where they learn about proper well construction, wellhead protection, water testing and water treatment. The workshops are a collaborative effort between Cooperative Extension and numerous project partner organizations. To date, over 200 volunteers have been trained throughout the state. They have actively provided education to over 8,000 homeowners through presentations to local groups and neighbors and table-top displays at fairs and shows. Volunteers have also utilized news media outlets to reach an additional 30,000 residents. A web site (<http://mwon.cas.psu.edu>) was created to house project resources and to allow volunteers to report their accomplishments. Surveys of homeowners that have interacted with volunteers have shown that this type of program can be effective in promoting proper management of private water systems to a large audience. During 2006 the program will be expanded to include research on Pennsylvania wells and training of new volunteers in the Delmarva Peninsula.

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Michigan's Citizen Planner Program: Building Capacity for Local Land Use Decision Making – Dean Solomon, Wayne Beyea, Michigan State University, East Lansing, MI

Michigan's fragmented land use decision-making system contributes to sprawl, straining natural resources-based industries and impacting forests, wildlife and water quality.

Michigan State University Extension's Citizen Planner program offers intensive training for citizens appointed to local land use planning bodies, elected officials and interested residents. The program equips community participants with the technical knowledge, understanding of the planning and zoning legal framework, and leadership skills to perform their duties more effectively. This locally-based program includes seven core sessions, totaling 18 instructional hours, plus optional sessions on locally-selected topics.

More than 2,500 individuals have participated in the Citizen Planner program since 2002, making it the largest short-course for planning officials in Michigan. Program graduates consistently report increased skills and feel better able to handle their planning roles.

Keys to success include:

- 1) A commitment to participant's continuing education after the initial training. The yearly *Citizen Planner Advanced Academy* offers additional networking and training to program graduates. A new *Master Citizen Planner* option will offer increased status to graduates while requiring continuing training to maintain this designation.
- 2) Expanding delivery methods, techniques and audiences. *Citizen Planner On-Line* will offer a web-based option for completing the program. The innovative *Spartanville* classroom activities encourage group interaction and problem solving. *Junior Citizen Planner* helps youth become engaged in local land use issues.
- 3) Emphasis on locally-based programs – Although coordinated statewide, all core courses are offered under county Extension office and advisory committee leadership, enhancing local team-building and networking.

Additional information is available at www.citizenplanner.msu.edu.

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E. Watershed Education

Wetland Education and Restoration in Oregon – Innovative Ways of Working with Volunteers to Encourage and Conduct Wetland Restoration – *Frank A. Burris*, Oregon State University Extension Service, Gold Beach, OR; Beth Lambert, New Hampshire Coastal Program, Portsmouth, NH; Derek Godwin, Oregon State University Extension Service, Salem, OR

Healthy wetlands are essential to a properly functioning watershed, yet conversion of wetlands to other uses has dramatically reduced the ability of many watersheds in the United States to moderate storm water flows, store and release water to maintain flows during periods of low precipitation, entrain and store sediment, and limit erosion. The Oregon State University Extension Service and Oregon Sea Grant have developed a dynamic wetland education module as one component of the Master Watershed Steward program to acquaint potential Master Watershed Stewards with the need for wetland restoration, and to provide them with the tools to restore wetland goods, services, and functions. We will showcase this educational module and demonstrate how it has changed participant perceptions about wetlands, and resulted in numerous wetland restoration projects in Oregon.

We will present data and highlight the results of wetland restoration projects in coastal Oregon, with special emphasis on how volunteers were used to conduct restoration activities. We will conclude with a discussion of how to increase volunteer participation in restoration projects by channeling volunteer interests, providing training that enhances their professional qualifications, and teaching volunteers how to collect meaningful data on flexible schedules.

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Targeted Public Involvement for Fish Habitat Restoration Planning in Coos Bay, Oregon – *Guillermo Giannico*, Oregon State University, Corvallis, OR; Jon Souders, Coos Watershed Association, Charleston, OR

A fish habitat restoration plan was developed for six small basins in Coos Bay, Oregon, using both watershed assessments and landowner involvement. A high level of public participation was a salient characteristic of this process, and a key to its success. While general and open public involvement is useful in some restoration projects, its unique social dynamics may discourage key stakeholders from becoming “too involved” or participating at all. Because stakeholders who own riverbank properties are extremely important to the successful implementation of a restoration plan, we took a “neighbor-shed” approach to public involvement. This approach recognizes that landowners are more receptive to personal contacts or small group interactions, which include their neighbors, than to large public meetings, and that the existing social networks are often tied to specific valleys and institutions, such as drainage districts. The targeted public involvement we used consisted of a series of “coffee klatches” designed to attract as many landowners as possible within each of the six basins. The initial meetings were used to present the “state of affairs” in each basin. Meetings were followed up by field trips to show habitat restoration projects. A second round of coffee klatches and a workshop were used to establish restoration priorities. The third round of meetings served to present draft restoration strategies, to receive feedback from landowners to shape final implementation plans, and to sign them up for restoration projects. Surveys indicated that landowners liked the targeted approach and supported restoration they would not have supported otherwise.

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A View From The Lake: Providing Coastal Communities With A New Perspective on Natural Resource Issues – *Cynthia Hagley*, Jesse Schomberg, Minnesota Sea Grant, Duluth, MN; Sue O’Halloran, University of Wisconsin Extension, Superior, WI; Diane Desotelle, Minnesota Sea Grant, Duluth, MN

“A View from the Lake” is an educational program which uses the views of Lake Superior’s shoreline from aboard the L.L. Smith, Jr. research vessel as the context to discuss issues surrounding land use, water quality, fisheries, coastal wetlands, development, and natural resources. The research vessel visits ports along the Wisconsin and Minnesota coasts and brings residents, local officials, teachers, and visitors out on 3-hour tours along that community’s coastline, where participants learn about Lake Superior and coastal resources, view maps of their community, discuss land use and development pressures and ways to protect important resources, and try their hand at sampling the water and sediment of the lake. The goal of this program is to provide local decision makers, citizens, and educators with science-based information about Lake Superior, its near shore habitats, and the relationship between land use and water quality. The program is organized through Northland NEMO – A Wisconsin/Minnesota partnership designed to educate decision makers on watersheds, land use, and water quality. “A View from the Lake” is in its second year, and has brought nearly 1,000 participants out onto Lake Superior. Results indicate that participants are learning new information, changing their opinions of environmental issues facing Lake Superior, and are heading home planning to take actions based on what they learned: from talking to their neighbors to building a rain garden to getting more involved with community planning processes.

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Stream Side Science: Tailoring Watershed Education to Meet the Needs of Teachers – *Nancy Mesner*, Department of Aquatic, Watershed and Earth Resources, Utah State University, Logan, UT, Andree’ Walker, USU Water Quality Extension, Utah State University, Logan, UT

USU Water Quality Extension uses stream monitoring techniques to educate youth about water pollution and watershed functions. Although we provided training for teachers wishing to use our activities, classroom adoption has remained limited to those with a special interest in water or outdoor education. An evaluation of barriers to adoption of our activities found that many teachers were not confident in their knowledge of water quality science and wanted specific lesson plans. The most significant barrier, however, was the increasing need for teachers to focus on core curriculum standards with end of year testing in mind.

In response to these findings, we worked with state partners and a focus group of teachers to develop *Stream Side Science*. This curriculum uses water quality activities to address core standards for Earth System Science, a required class for all 9th graders in Utah. The curriculum provides specific classroom and field instructions, background information, a set of questions and answers to promote class discussion, and more.

Over 450 copies of the curriculum have been distributed to teachers and other partners in the state and region. Over 100 teachers have attended workshops on the curriculum activities. Early evaluation results indicate that this format is useful to teachers and will improve student’s knowledge of water quality issues.

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Wednesday, May 17

Plenary Session, 8:00 – 9:30 a.m.

Opportunities to Incorporate Sustainability into Natural Resource Recovery Efforts Following Natural Disasters: Louisiana's Perspective – *Carrie Castille Mendoza*, Louisiana State University Agricultural Center, Baton Rouge, LA

Following a natural or human-made disaster, communities experience significant stressors, including economic loss, loss of life, and psychological reactions such as grief, anger, and worry. The LSU AgCenter's Extension Service is in a unique position to help Louisiana citizens prepare for these reactions following a critical event. There are several key areas where Extension can play a vital role. Prior to this event, our state faculty and parish agents participate in emergency planning councils and made available Web-based and printed educational materials for community members to help citizens prepare for disasters. Immediately after the disaster, agents support their constituents and provide educational programs to support citizens during this phase. These programs are also designed to train volunteers and other response workers about the effects of disasters, warning signs for post-disaster stress, how to provide emotional support to victims, and how to teach stress management strategies. In the long-term, our agents can collaborate with their communities to provide long-term recovery services, which may include financial education, training for teachers, and school, work, and church-based educational programs.

The LSU AgCenter has been actively engaged in the hurricane recovery process in South Louisiana since late August 2005. Extension and research faculty in the AgCenter are concentrating on five major issue areas: (1) sustainable redevelopment, (2) housing, (3) crops and livestock, (4) commercial fisheries and aquaculture, and (5) youth and family development. Given the depth of the AgCenter's expertise and research, its historical presence in each of the hurricane impacted areas, and its ability to mobilize partners, it has been able to provide assistance at all stages of the recovery process. It will be able to continue providing assistance in Southern and Central Louisiana even after FEMA and other partner's transition out of Louisiana.

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Opportunities to Incorporate Sustainability into Natural Resource Recovery Efforts Following Natural Disasters: Mississippi's Perspective -or- The Role of Extension in Natural Resources Recovery Following Hurricane Katrina: The Mississippi Experience – John B. Auel, Adam S. Bailey, G. Don Bales, Walter M. DeLoach, Robert A. Daniels, Stephen G. Dicke, Deborah A. Gaddis, Laura A. Grace, John D. Hodges, H. Glenn Hughes, Andrew J. Londo, and *James P. Shepard*, Mississippi State University, Mississippi State, MS

Hurricane Katrina slammed into the Mississippi Coast August 29, 2005 and wrought unprecedented destruction to the state. In addition to the loss of life and infrastructure on the coast, Mississippi's natural resources were badly damaged. Initial estimates were that 1.3 million acres of timber lost \$1.3 billion in value. Urban forest damage was estimated as 2.7 million trees valued at \$1.1 billion.

Less than three weeks after the storm, extension forestry staff focused on helping Mississippi's forestry sector recover. Staff wrote new extension publications on storm damage for landowners and loggers and updated tax publications on casualty loss to timber and shade trees with recent changes to the tax code. A workshop was held on how to manage understocked stands. Two web sites were developed to assist loggers and landowners. Forty workshops were held on tax issues related to storm damaged timber, damage to urban forests, and on the management of storm damaged stands. Weekly radio programs were broadcast on timber salvage, chainsaw safety, wet storage of logs, beetle danger, wildfire hazard, and casualty losses.

Future plans include workshops on the danger of beetles, invasive species post-Katrina, and the management of storm damaged stands. The Natural Resources Conservation Service, Farm Service Agency, and the Forest Service were appropriated over \$900 million for forest recovery payments to landowners in the states affected by the 2005 hurricanes. MSU extension forestry will be educating landowners on how to participate in the programs offered by these agencies and will be increasing our programming on reforestation.

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Opportunities to Incorporate Sustainability Into Natural Resource Recovery Efforts Following Natural Disasters: Florida's Perspective – W. L. Sheftall, Jr., University of Florida Extension, Tallahassee, FL

Florida sustained damage from four major hurricanes within six weeks in September-October 2005. Opportunities for state agency-led initiatives to incorporate sustainability into natural resource recovery efforts were overwhelmed by the sequential, massive efforts at response required of state government. The sustainability which emerged in recovery was more often local and entrepreneurial – a setting ripe for Extension input.

Florida Extension faculty were catalysts for a number of local, cooperative ventures. A Forestry Specialist and County Agent in the NW Florida Panhandle path of Ivan provided leadership that catalyzed local resourcefulness and cooperation in using portable sawmills to salvage downed and damaged timber for reconstruction – a sustainable approach to supply and demand in a post-disaster market where lumber was hard to come by. This was innovative. In today's north Florida landscape of fewer pulp mills, those that remain are quickly inundated with storm-damaged wood. Standard procedure is to landfill rather than salvage much of the timber loss. This dilemma has sparked Extension faculty interest in researching the development of alternative markets, such as green fuels.

The blow-down of so many urban trees inadvertently provided opportunities for Extension faculty to assess species vulnerability to the one-two punch of saturated soil and wind. There is good prospect that local governments will be responsive to Extension recommendations for replacing lost ornamental landscape trees and street trees with more storm-tolerant species. These will help sustain the urban canopy as we enter an era of predicted increases in hurricane frequency and intensity.

News coverage of hurricane damage to Florida's urbanized coastline invariably shows marinas with a jumble of large vessels, some rafted to private yards and roadways, and sunken vessels pushed into shallow waters. Viewers are left to ponder how much expense in heavy equipment is required to untangle the boats, clear the waterways, and allow individual vessel repair to begin. The mess is made more difficult by complicated and unclear legal issues imposed by maritime admiralty and salvage law, and issues of liability and pollution. These vex the process of derelict vessel designation and removal that is key to hurricane response and recovery of coastal waters – in conflict with the state's priority of sustaining water quality and coastal habitats. Florida Extension faculty are researching these legal issues, and catalyzing discussion among federal, state, local and industry entities on how to better coordinate post-hurricane response that sustains marine natural resources which underpin the economy of many coastal communities.

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5th Natural Resources Extension Professionals Conference Park City, Utah; May 14-17, 2006

Poster Abstracts

Poster Session I

Monday, May 15, 2006; 6:00 - 8:00 pm

Note: Presenting author(s) *italicized*

- 1. Sustaining Our Shores: New Research, Demonstration and Education Through the University of Minnesota Shoreland Education Program, Erosion Control for Property Owners** - Mary Blickenderfer, PhD, University of Minnesota Extension Service, Grand Rapids, MN, *Eleanor Burkett*, University of Minnesota Extension Service, Brainerd, MN, Cindy Hagley, Minnesota Sea Grant, Duluth, MN, and Barb Liukkonen, University of Minnesota Water Resources Center, St. Paul, MN

Protecting the shorelines of lakes and rivers has been a focus of the University of Minnesota's Shoreland Education Program through Shoreland Revegetation Workshops. As the rate of development soars on lakeshores, land once considered too steep and fragile to build on is now prime real estate. Once developed these properties may face upland erosion problems. Increased boat traffic and large boat motor size produce wave energy causing erosion from the lake side. The Shoreland Education Program is developing strategies for homeowners, landscape professionals and natural resource agency staff, to address these issues through a research and demonstration project and subsequent one day workshop, Erosion Control for Property Owners.

Research includes toe and slope treatments on steep sand embankments of two trial sites. Demonstration aspects include modified treatments used in large construction projects to a scale practical for homeowners and alternatives to rock rip rap embankments. Methods used include bioengineering using natural and hard landscape materials, live plants, plant stakes and seed. Methods will be evaluated for effectiveness, time input, difficulty and cost. Future erosion control workshops will include data collected and lessons learned from this research. A video featuring this project is in production.

The project is in collaboration with the University of Minnesota Extension Service, the Minnesota Department of Natural Resources, the Whitefish Area Property Owners Association, Crow Wing County Parks and Soil and Water Conservation District. The project is funded through the Minnesota Department of Natural Resources.

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- 2. The Use of Best Management Practices (BMPs) during Forest Harvesting in Tennessee: A Statewide Evaluation** - *Wayne K. Clatterbuck*, University of Tennessee Extension, Knoxville, TN

An evaluation of forestry BMP implementation in Tennessee was conducted by the University of Tennessee (UT) Extension, Department of Forestry, Wildlife & Fisheries and the Tennessee Department of Agriculture, Division of Forestry in 2003. We desired an evaluation of the Master Logger program; whether the 5-day instruction was having an impact with on-the-ground BMP implementation. A total of 215 harvest sites stratified among five regions statewide were evaluated in terms of haul roads, skid trails, log landings, streamside management zones (SMZs) and stream crossings. Ninety five percent of the BMP observations did not have any potential water quality threats, while 82 percent of the observations had BMPs correctly implemented. The difference between 95 and 82 percent (13 percent) were areas where BMPs were not applied or incorrectly applied, but were not water quality threats. Stream crossings and skid trails were the greatest sources of potential water quality threats or were in need of correct BMP implementation. Conversely, stream crossings were avoided or not present on two-thirds of the sampled harvest sites

indicating that loggers were making an effort to stay away from waterways. The BMP data are currently being partitioned by landowner types (public, private, industry), trained or untrained logger, and whether a forester was involved with the harvest to determine the demographics where BMPs are being implemented and whether Extension instructional programs for loggers through the Master Logger program, for private landowners through county forestry associations and for continuing education programs of forestry professionals are influencing BMP implementation.

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3. The Arizona Rainfall Roundup: Integrating Environmental Monitoring and Citizen Science -*Michael A. Crimmins*, Arizona Cooperative Extension & Dept. of Soil, Water and Environmental Science, Tucson, AZ

University of Arizona Cooperative Extension is leading a new effort to bring climate science directly to the people of Arizona and the broader southwest United States. The new Climate Science Applications Program (CSAP) within Arizona Cooperative Extension works to develop and coordinate outreach activities and applied research between the climate research community at the University and a wide group of climate science user groups throughout the Southwest. CSAP has formed a strong partnership with the Arizona Master Watershed Steward program to integrate state of the art climate science into a broader curriculum of interdisciplinary watershed science. Beyond just classroom lectures, Stewards are trained in field methods to monitor the interactions between climate variability and watershed processes. This poster highlights initial programmatic efforts to train Stewards how to monitor rainfall, report and interpret data through an online data management system. Rainfall monitoring is the initial step in integrating Stewards into multiple watershed monitoring efforts.

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4. EduVenture: Environmental Educational Adventures for Youth – *Greg Hickey*, University of Georgia, McIntosh County Cooperative Extension Service, Darien, GA

Environmental and natural resource education in McIntosh County is achieved through participation in the EduVenture program. For nine summers the programs focus has been to educate and expose youth to Agricultural, Industrial and Historical places. Components include hands-on exploration during site visits creating a field based learning atmosphere. Interaction between youth and the site's rangers, naturalists, docents, guides and volunteers is an integral part of the program. Curricula takes the form of journals provided with questions the youth answer from information provided; exhibits viewed and through question and answer sessions.

Youth have explored ecosystems from sea level to over 10,000 feet through visits to National Parks, National Forests and World Heritage Sites. Public and private land reclamation sites have been toured. Youth see how problem's associated with population pressure necessitate learning to be good land stewards. Underground eco systems have been explored through cave visits. Water quality and shortage issues caused by both nature and man have been studied. Clean energy sites have been visited inclusive of hydro electric, geothermal and wind power generation. Industrial site tours include underground coal mines, phosphate strip mines, underground salt mines, evaporative salt mines and the largest open pit mining operation in the world. Youth learn how some company's are trying to become more environmentally friendly.

The EduVenture has taken one hundred-fifty six youth participants from the Atlantic Coast to the far west and from the Mexican Border to Canada. Youth participants share their experiences with youth back in the county. Approximately 700 youth are exposed to the experiences, cultures, sites and images of this program through the sharing process. Participants environmental awareness has been raised and they are taking an

active role in local communities. Collaborating organizations include; McIntosh County Board of Education, Board of Commissioners, Family Connection Collaborative and Rotary.

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5. Enhancing Volunteer Stream Monitoring Training and Education using DVD and Video – Kristine Stepenuck, University of Wisconsin-Extension, Madison, WI; Peggy Compton, University of Wisconsin-Extension, Platteville, WI; Kristopher Wright and Russell Hill, University of Wisconsin-Platteville, Platteville, WI

Water Action Volunteers (WAV) is Wisconsin's statewide volunteer stream monitoring program, coordinated by the University of Wisconsin-Extension in partnership with the Wisconsin Department of Natural Resources. WAV volunteers attend a daylong training to learn the protocols for monitoring six parameters. On post-training evaluations, monitors have frequently indicated their desire for additional training and/or support on their first site visit following training, since there are many details to remember. This is generally not possible due to the large number of program participants and limited staff members.

A DVD was developed to provide a refresher demonstration of the protocols for the six stream monitoring parameters. A companion DVD containing background information on watersheds, stream ecology and macroinvertebrates was added to increase the volunteers' knowledge and understanding of streams and to enhance their monitoring experience. Beginning in the spring and summer of 2006, this DVD set will be provided to volunteers at the WAV training sessions. In addition, in the coming months select sections of it will be posted to the WAV website, and utilizing video-streaming technology, volunteers without access to the DVD set will be able to review procedures before monitoring.

The poster includes (1) an explanation of the purpose for creating the DVD set; (2) an outline describing partnerships and resources needed to create this type of educational resource; (3) an overview of the steps necessary to complete such a project; and (4) a description of the methods used for evaluating the DVDs' effectiveness in helping to enhance and sustain a volunteer-based monitoring program. During the poster session, we will provide a demonstration of portions of this technology-based teaching tool which can be provided to volunteers to help sustain and enhance a volunteer-based program.

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6. Developing a Handbook Summarizing the Use of Livestock as a Tool in Noxious Weed Management Programs in the Western United States - Jason Davison, Ed Smith, University of Nevada Cooperative Extension; Linda Wilson, University of Idaho

Researchers and grazers have long known that livestock grazing can be used as a tool to manage some noxious weeds. This knowledge however, has not been collected, summarized and shared in a useful format with other interested parties.

University of Nevada Cooperative Extension specialists, collaborating with a University of Idaho weed scientist, assembled, summarized, and distributed "state-of-the-art" knowledge concerning livestock grazing as a noxious weed control tool in nine western states. The information was compiled using a literature review and interviews with weed researchers, managers, and grazing management practitioners. The information is presented in a binder consisting of color photos, descriptions of each weed and guidelines for using grazing as a management tool. The handbook was distributed to every Cooperative Extension and Natural Resources Conservation Service office in the targeted states. The handbook is also being presented at numerous venues in the targeted states and will be available at the conference.

An evaluation process will consist of a telephone survey of end users at six months and one year after the handbook is distributed. The evaluation data will include estimates of: 1) usefulness as a resource to CE, NRCS and others; 2) degree of use of the handbooks by the end users; 3) changes in awareness by CE and NRCS personnel; 4) increases in knowledge concerning livestock use as a weed management tool by; and 5) increases in the willingness to use or the actual use of livestock as a weed management tool that can be attributed to the handbook.

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7. The Woods in Your Backyard - *Jonathan Kays*, Maryland Cooperative Extension, Keedysville, MD; James Finley, Penn State Cooperative Extension, State College, PA; Adam Downing, Virginia Cooperative Extension, Madison, VA

The Mid-Atlantic region has seen significant increases in parcelization resulting in a dramatic increase in forest properties with fewer than 10 acres and landowners with mostly non-timber objectives. Forest stewardship programs are usually targeted to forest landowners with more than 10 acres, and little professional forestry assistance is available for smaller landowners.

Extension foresters in Maryland, Pennsylvania, and Virginia received funding from the US Fish & Wildlife Service and Virginia Department of Forestry to develop a program entitled, "The Woods in Your Backyard." The basic components of the program are a self-assessment manual and workbook that helps people make informed decisions that ensure clean water, viable populations of native wildlife, recreational opportunities, and forest health. It was designed for use with small forest or nonforest properties under 10 acres and provides a model for all Northeast land grant universities, county agencies and forest extension programs.

The main publication is a manual with a step-by-step process (using a case study) that includes detailing objectives, drawing a map, inventory and planning activities, and includes a focus on converting lawns to forest. It is assumed a professional forester will not be involved in this process. A separate workbook with two case studies has also been developed.

State level in-services will train county extension agents, master gardeners, and forest volunteers on how to use the material to present at the local level. Exit surveys conducted following the seminars will assess delivery methods and content.

This presentation will discuss the status of the project.

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8. A Community's Response to Catastrophic Wildfire - *Alix Rogstad*, University of Arizona Cooperative Extension, Tucson, AZ and Lindy Brigham, Trees for Mt. Lemmon

The village of Summerhaven is located on a sky island at approximately 7,800 feet elevation on Mt. Lemmon in the Santa Catalina Mountains of southeastern Arizona. Between 17 June and 15 July 2003, the Aspen Fire burned over 84,000 acres in the Coronado National Forest and adjacent private property. The resulting landscape in Summerhaven consisted of a mosaic of moonscape and unburned areas. About 150 structures survived the fire out of approximately 500, and the community spirit was at an all-time low.

Disturbed landscapes have a higher potential for the establishment of invasive species. Therefore, there was a concern about natural re-establishment of native vegetation within burned areas. The University of

Arizona Cooperative Extension – Fire Education Program partnered with Trees for Mt. Lemmon to develop a seed mixture of indigenous plants that were distributed to landowners for fire-impacted properties. The seed mixture included a variety of 13 native plant species (grasses, legumes and forbs), which helped to maintain the genetic integrity of the area. Seed packets were distributed to property owners regardless of whether their property was directly impacted by the fire, and community volunteers participated in seeding common areas within the village. Ocular surveys were conducted following seeding treatments to determine percent germination and to assist in future rehabilitation planning.

Property owners who received seed packets became personally involved and contributed to Summerhaven’s vegetation recovery. Additionally, by educating landowners about the implications and consequences of planting non-native plant species, the probability of invasive plants becoming established was reduced.

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9. Pros and Cons of Wood as an Energy Source for North Carolina Business and Institutions - Ross L. Andrews, Dennis Hazel, Robert Bardon, North Carolina State University, Raleigh, NC

The most recent Forestry Inventory and Analysis (FIA) data for North Carolina documents the continuing trend towards forest fragmentation, urbanization, and development of forest stands with low-value trees often of small diameter. The abundance of relatively low-value forest biomass in North Carolina, the concern of wildfire hazards, rapidly increasing fossil fuel prices, softening pulpwood markets, divestiture of forest industry land holdings and processing facilities, and other factors have resulted in renewed interest in energy from forest biomass. There are emerging technologies in industrial processes, space heating, cooling, and electric power generation that promote the use of wood energy systems. However, issues such as wood procurement and other obstacles remain less well studied and understood compared with technology. The objective of this study is to determine the constraints and successes of wood procurement from a group of businesses and institutions throughout the state using wood as an energy source. This data will provide the basis for the development of future educational programs aimed at increasing the use of low quality woody biomass for energy production. This poster will discuss the development of the survey used in the study, the results of the survey and the implications in the development of the educational programs.

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10. Successful Watershed Management Partnerships in Missouri's Ozark and Prairie Regions - Dan Downing, University of Missouri, Columbia, MO

The key to developing sustainable systems is through the establishment of acceptable strategies and structures. This means in areas where the vast majority of the natural resources are under private ownership, the strategies and structures must be acceptable to the private landowner to have any chance of success and long-term sustainability.

Successful management strategies give major consideration to private property rights. In the realm of watershed management, the organizational structures must: encourage input from, decision making by, ownership in, implementation by, and resources from the private land owner as well as the local agency representatives. After all in most cases the water and watersheds are viewed as “community property” even though private individuals pay the taxes and derive their livelihood from the land.

This presentation will offer an in-depth look at case profiles of successful watershed management partnerships in Missouri’s prairie and Ozark regions. It will include a case profile of one effort in Northern Missouri’s row crop region, and one effort in part of the Ozark National Scenic Riverways, operated by the U.S. park service.

11. Extension Programming Supporting Family-Owned, Non-Timber Enterprises - Gary W. Graham, Ohio State University Extension, Wooster, OH, Randall B. Heiligmann, School of Environment and Natural Resources, The Ohio State University, Columbus, OH, and P. Charles Goebel, Ohio Agricultural Research and Development Center, Wooster, OH

It is estimated that the maple syrup industry contributes \$5 million dollars annually to Ohio's economy and is an important component to Ohio's non-timber forest products industry. In 2005 Ohio was ranked the fourth highest in total maple syrup production in the United States. Most of these maple syrup producers are small family-owned operations that are served by The Ohio State University Extension (OSU Extension) system. Even after 90 years of service by Ohio State University (OSU) Extension, little information is available concerning the Ohio maple syrup industry. Through a survey we evaluated the effectiveness of OSU Extension educational programming designed to improve sugarbush and sugarhouse management. The instrument was administered at the three 2004 Ohio Maple Days workshops sponsored by OSU Extension and the Ohio Maple Producers Association. The primary aim of this research was to investigate the association among production factors and demographic characteristics of the Ohio maple syrup industry and examine the influence of OSU Extension programming on the industry. Most survey respondents indicated that after attending past maple syrup workshops they implemented changes that were relatively simple and inexpensive; however, most indicated they are interested in learning more about technologies that increase production and maple syrup quality.

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12. Damage to Loblolly, Slash, and Loblolly Pine from Hurricane Katrina: Implications for Southern Forest Landowners - Glenn Hughes, Mississippi State University Extension Service, Purvis, MS

Hurricane Katrina roared through Mississippi on August 29, 2005. This poster reports on hurricane damage suffered on two separate tracts each containing loblolly, slash, and longleaf pine planted in 1985 and thinned about 4 years ago. Plots were established and information was collected on tree diameter, damage, product before and after Katrina, and merchantable height before and after Katrina.

Loblolly pine suffered catastrophic wind damage, with only 16% of the trees classified as undamaged after Katrina. 75.9% of all loblolly surveyed were snapped. The extent of damage resulted in an unmanageable stand. Slash pine suffered less damage than loblolly pine, with 52.4% of the trees classified as undamaged. The bulk of the damage, as with loblolly pine, was in snapped trees. Longleaf pine suffered the least damage of all species, with 64% of trees surveyed classified as undamaged. Unlike loblolly or slash, leaning trees comprised the greatest type of damage across both sites. Snapped trees were the least frequently encountered type of hurricane damage. Although longleaf sustained the least damage, it has its own share of risks and problems that landowners should consider.

Factors contributing to the differences in damage are discussed, as are economic and management implications for forest landowners.

Hurricanes are part of our past, present, and future. This analysis illustrates increased risk with loblolly pine in south Mississippi, particularly after it has been thinned. This study will help landowners as they plan and implement reforestation projects on their property in the wake of hurricane Katrina.

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13. Living with Wildfire: Homeowners' Firewise Guide for Arizona – *Christopher Jones*, University of Arizona, Globe, AZ, Alix Rogstad, Univ. of Ariz., Tucson, AZ, Stephen Campbell, Univ. of Ariz., Holbrook, AZ, David Peters, Bureau of Land Management, Tucson, AZ, Dustie Aylor, Forest Service, Springerville, AZ, Clifford Pearlberg, Ariz. State Land Dept., Phoenix, AZ, Arthur Elek, Forest Service, Sierra Vista, AZ, and Wendell Peacock, Bureau of Indian Affairs, Phoenix, AZ

This peer-reviewed publication is an update and adaptation of the Living with Fire publication created by the University of Nevada Cooperative Extension and Sierra Front Wildfire Cooperators in 1998. It is an interagency collaboration of the Arizona Firewise subcommittee of the Arizona Interagency Coordinating Group. It involved the combined efforts of the Arizona State Land Department, USDI Bureau of Indian Affairs, USDI Bureau of Land Management, USDI National Park Service, USDA Forest Service, USDI Fish and Wildlife Service, USDA Natural Resources Conservation Service, University of Arizona Cooperative Extension and Arizona Fire Chiefs Association. The revision of the seven-year old publication emerged from the subcommittee's vision of building in concepts such as Survivable Space and Firewise Zone Landscaping, as well as to update the document's appearance and organization. Its purpose is to provide a quality outreach tool to increase public awareness concerning Firewise concepts and to encourage and facilitate the implementation of Firewise practices by property owners, neighborhoods and communities. Living with Wildfire is a twenty-page color booklet that addresses topic areas important to homeowners in the Wildland Urban Interface: wildfire crisis situation; fire behavior, including human environment and various Arizona vegetation types; detailed recommendations for creating survivable space, including landscape management zones, a checklist and a summary; emergency and evacuation guidelines; and frequently asked questions. Federal partners and other members have provided approximately \$49,000 to print 178,000 copies in both tabloid and booklet format. The publication was widely distributed throughout Arizona in 2005 and 2006.

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14. Pond Appeal: Stormwater Retention Pond Maintenance Education— *Janet Bargar*, University of Florida/IFAS Indian River County Extension Service, Vero Beach, FL; Dan Culbert, University of Florida/IFAS Okeechobee Extension Service, Okeechobee, FL; Ken Gioeli, University of Florida/IFAS St. Lucie County Extension Service, Ft. Pierce, FL

Stormwater retention ponds are required in most residential developments in Florida to handle all stormwater runoff generated by the community. The purpose of these ponds is to decrease flooding potential and remove pollutants from stormwater runoff before it enters the aquifer, lake, river, or estuary. However, many residents that live along a pond are not familiar with how to properly maintain it. A lack of knowledge may result in ponds that have eroding slopes, algal blooms, or invasive aquatic vegetation, which may lead to inefficient treatment of stormwater runoff, a reduction in flood protection, and excessive use of pesticides. This situation led the Indian River County agent to initiate developing a program with other Florida extension agents that would educate residents how to properly maintain stormwater ponds. The objectives of the program were to teach residents how to improve water quality by implementing best management practices and provide participants the tools to apply recommendations in their pond. An introductory workshop was created that gave an overview of a variety of topics that included the purpose of stormwater ponds, planting appropriate aquatic plants, aquatic insects, landscaping near the pond, and property value considerations. Two additional workshops were developed that covered additional pond management issues in depth. The effectiveness of the program was evaluated by pre- and post-tests, evaluations, and surveys. Approximately 90% of the participants had an increase in knowledge and a majority of participants had a favorable opinion of the program.

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15. Agricultural Assessment of a Coastal Watershed for a Regional Stormwater Management Plan - Cara Muscio, Rutgers Cooperative Research and Extension of Ocean County, Toms River, NJ; Bill Sciarappa and Brian Hulme, Rutgers Cooperative Research and Extension of Monmouth County, Freehold, NJ

Wreck Pond, which discharges to the Atlantic Ocean, has been identified on the Governor's Coastal Initiatives list for the role it plays in degraded water quality at area beaches. The Wreck Pond Brook Regional Stormwater Management Committee (RSWMP) has been formed from a variety of organizations working in cooperation to characterize the watershed and improve water quality. Rutgers Cooperative Research & Extension performed an agricultural assessment of the Wreck Pond Brook watershed for the RSWMP Committee. A GIS land use analysis was used to highlight farm parcels likely to influence stream water quality. Landowners of these parcels were mailed an informational survey about agriculture practices and manure management. In addition, a nutrient study was designed to provide supplementary data that will be used to characterize areas of enrichment. The results of this work will be used in conjunction with fecal source tracking, hydrological data, and water quality information gathered from other participants to provide a complete analysis of the watershed. This characterization will be used to plan and apply best management practices to improve water quality in the watershed and at area beaches. Future education and outreach on manure management and farming practices are planned in cooperation with area landowners.

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16. After-school Forest Education - Janet Nagele, Oregon State University Extension Service, Oregon City, OR; Jon Mayer, Oregon Department of Forestry, Lyons, OR

This poster will introduce an After-school Forest Education program developed and implemented in Clackamas County, Oregon. The program involved 60 fourth and fifth grade students from two rural schools over an eight week period. A partnership between the local Extension office 4-H Youth Development Program and Oregon Department of Forestry was formed to promote, develop, implement and evaluate the program. Evaluation data shows that the program was extremely successful in meeting both organizations' objectives. In addition, classroom teachers claimed that the program was successful in helping students pass the state science exam and that scores were significantly higher with students who participated in the program compared to those that did not. The poster will review partner organizations roles, funding, school promotion and participation, program development, and evaluation method and results.

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17. Introducing a New Biological Control Agent to Utah Land Managers - Matt Palmer, Utah State University Cooperative Extension, Ephraim, UT; *Craig Poulson*, Utah State University Cooperative Extension, Delta, UT; and V.C. Parent, Utah State University Cooperative Extension, St. George, UT

Tamarisk or Saltcedar (*Tamarix ramosissima*) is an invasive, exotic weed that has over-run thousands of acres of riparian area in the Western United States. Since its introduction to the U.S. from Asia in the late 1800's, as an ornamental shrub, it has displaced willows, cottonwoods and other native species along waterways at an estimated 44,000 new acres each year. Tamarisk degrades riparian habitat and consumes large amounts of water reducing the availability for rural and urban uses. Both mechanical and herbicide treatments are extremely costly and must be constantly maintained. However, there is some hope. About 4 years ago the United States Department of Agriculture- APHIS received permission to release a biological control for tamarisk. The Saltcedar leaf beetle (*Diorhabda elongata deserticola*) was released in 2001 at a site on the lower Sevier River near Delta, Utah. Since the release the numbers of beetles have exploded to the point that by the fall of 2005, an estimated 1000 acres of Tamarisk near the release site was completely defoliated. To assist landowners and weed departments in learning about and distributing the Saltcedar leaf beetle, we held a biological control of Tamarisk workshop and tour in Delta. After 4 hours of instruction and 3 hours of tour and demonstrations, participants from all over the state are prepared to transport the

Saltcedar leaf beetle to Tamarisk infested streams throughout the state. This will greatly reduce the cost of Tamarisk control while increasing water quantity and improving wildlife habitat in Utah and surrounding states.

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18. Arizona's Master Watershed Steward Program - Jeff Schalaus, University of Arizona Cooperative Extension, Prescott, AZ; Robert Emanuel, D. Young, University of Arizona Cooperative Extension, Tucson, AZ; S. Pater, K. McReynolds, University of Arizona Cooperative Extension, Willcox, AZ; R. Radden, University of Arizona Cooperative Extension, Prescott, AZ; and J. Riggs, University of Arizona Cooperative Extension, Willcox, AZ

The Arizona Master Watershed Steward (MWS) Program is designed to prepare, educate and train volunteers who can provide knowledge, leadership, and service in the protection and monitoring of local watersheds. The MWS Program was first presented in Prescott, Arizona in fall of 2001. In 2003, Arizona MWS received \$350,000 from the Arizona Department of Environmental Quality (ADEQ) to develop a statewide curriculum guide and establish a statewide Arizona MWS program. A statewide MWS Coordinator was hired and the curriculum guide was published in February 2006. MWS courses have been offered in Benson (1), Bullhead City (1), Cottonwood (1), Flagstaff (1), Globe (1), Phoenix (1), Prescott (3), Tucson, (1), Safford (1), and Sierra Vista (1). The training course has a minimum of 10 four-hour sessions and two daylong field trips. Topics covered are: hydrology; climate; geologic processes; ecology; human impacts; water quality; land uses and cultural effects; mapping and GIS; water law, and water resources management. Principles are taught using lecture/discussion format with hands-on activities that reinforce subject matter. Instructors typically include: Extension specialists, agents, and staff; agency professionals, and other authorities. MWS trainees become certified after contributing 40 hours of volunteer service. A total of 202 volunteers have completed the course and contributed 2,500 hours of volunteer service. Volunteer projects have included: organization of local water conferences and watershed groups, water quality monitoring, noxious weed management, riparian area monitoring, educational events, climate monitoring, rangeland monitoring, well water testing, and restoration projects.

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19. 4-H Fishing Camps: A Natural Resource Education Tool for Youth - Justen Smith and Jolene Christian, Utah State University Extension, Farmington, UT

Fishing is a wholesome activity for youth of all ages. Fishing also provides a way to educate youth on the conservation of natural resources. The 4-H Youth Program is an optimal mechanism to educate youth about the fun of fishing and natural resource education. The 4-H program in Davis County, Utah, in partnership with the Utah Division of Wildlife Resources, has implemented 4-H fishing camps for the past two years. These 4-H fishing camps teach urban youth, ages 6-18, how to fish along with the importance of conserving our valuable natural resources. Youth participating in the fishing camps meet for two hours, one day a week, for eight weeks during the month of June. The first thirty minutes of camp consists of a presentation given by invited guests with subjects ranging from water chemistry to aquatic invertebrate identification. The remaining ninety minutes are devoted to fishing. During the time the youth are fishing, instruction is given on proper casting techniques, knot tying, baiting hooks, identifying bait that should be used for different species of fish, and aquatic safety. The last day of the camp is devoted to having a "fish fry" and awards ceremony. Results from evaluations given to youth participants show that as a result of fishing camp, families are fishing together more often, youth have a greater understanding of their natural resources, fishing methods have improved, and other outdoor activities have become more frequent.

20. Battling the Bug - OSU's Role in Emerald Ash Borer Education - *Kathy Smith*, Ohio State University Extension, Columbus, OH; *Amy Stone*, Ohio State University Extension, Toledo, OH; Randall Heiligmann, Ohio State University, School of Natural Resources, Columbus, OH

Ohio's forest resource is under attack. The emerald ash borer (EAB), an exotic wood borer, has killed millions of ash trees in Michigan and is in Ontario, Ohio and Indiana.

USDA's objectives include detection, regulatory control, and outreach. In Ohio, these objectives are being pursued under the leadership of the Ohio Department of Agriculture (ODA). 15,000 detection trees will be set statewide with the purpose of identifying outlier infestations. EAB is an exceptionally difficult insect to detect, and movement of infested materials is compounding the problem in all three states.

Our clientele includes woodland owners, urban and rural landowners, municipalities, foresters, arborists, SWC districts, Extension personnel, garden centers, campgrounds, Master Gardeners and government officials. Furthermore, it is broken down into two categories – those inside and those outside of the quarantine. In order to achieve the outreach education program goals a wide variety of methodologies have been applied. The challenges include communicating useful and timely information to the clientele and coordinating this information from various sources and agencies involved with this project.

This presentation will explore the delivery model that evolved within OSUE to address EAB. It will identify the clientele that needs information, the kind of information required and its sources, and the methodologies used to deliver it. Effectiveness of these will be discussed. Challenges in coordinating and delivering accurate information in an effective manner will also be covered. The EAB delivery concept is broad and could be applied to other natural resources threats across North America.

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21. Teaming Up to Develop Native Savanna and Oak Woodland Conservation & Restoration Educational Programming - *Brad Withrow-Robinson*, Oregon State University Forestry Extension, McMinnville, OR; *Jock Beall*, *Chantel Jimenez*, *Ken Neithammer*, U.S. Fish and Wildlife Service, Willamette Valley National Wildlife Refuge Complex; *Amanda Sater*, Oregon State University Forestry Extension, McMinnville, OR; and *Steve Smith*, U.S. Fish and Wildlife Service, Willamette Valley National Wildlife Refuge Complex

Here in the Willamette Valley of Oregon, there is increasing interest in conserving and restoring native oak woodlands, savannas and prairies. Once maintained by Native American burning practices, these communities have nearly disappeared in the 150 years following European settlement with ensuing urban, agricultural and forestry development and the disuse of fire as a management tool. In this working landscape, the idea of sustainability needs to spread beyond the practices and boundaries of farms, towns and forests to include the conservation of once dominant prairie and savanna communities.

Education can play an important role explaining both the *why* and *how* of conservation and restoration management. Oregon State University (OSU) Forestry Extension and the U.S. Fish and Wildlife Service (USFWS) are collaborating to develop educational programming about conservation and restoration of local oak and grassland communities in the Willamette Valley. The project takes advantage of on-going restoration activities at Baskett Slough National Wildlife Refuge and other sites to create much-needed educational infrastructure. We have made significant progress in the development of an integrated educational program. Starting with an Educational Framework we began developing and delivering three broad components: Youth and Community Programming, Landowner Programming, and Demonstration and Study Plots.

This collaboration provides a unique and timely opportunity. The USFWS is the agency most experienced in restoring these local habitats, and is often the lead on many private lands projects. OSU is the state's Land Grant University, with great experience and capabilities in natural resource education. This merger of restoration and educational activities allows us to illustrate long term management practices used in prairie and woodland conservation and restoration, expand and apply knowledge gained in an adaptive manner and extend these practices to the private lands that dominate the Valley landscape.

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22. The Woodland Fish and Wildlife Educational Group in Oregon and Washington - Donald Hanley, Washington State University; James Reeb, Oregon State University; Ron Shay, Oregon Department of Fish and Wildlife (retired)

The Woodland Fish and Wildlife Group (WFWG) produces publications on fish and wildlife species and their habitat for family forest owners in Oregon and Washington. The WFWG was initiated in 1988 to provide management information so private forestland owners could incorporate fish and wildlife interests into their management actions. WFWG publications range from overviews of existing fish and wildlife opportunities on woodland properties to specific publications concerning techniques for managing individual species and their habitat. It is the intent of the cooperative group to produce publications that will be both practical and comprehensive.

This successful collaborative has produced 20 publications since its inception. Over the past 17 years, over 60,000 publications have been distributed in the two states and beyond. Publications are distributed as hard copies via the Extension Services in Washington and Oregon and electronically via the Internet from the WFWG website (www.woodlandfishandwildlife.org).

The cooperative group is composed of 16 agencies and organizations from the two states. Financing comes from funds donated by the participating organizations and writing of the publications is done on a voluntary basis. Representatives provide leadership and direction to the publication efforts with thrice yearly meetings. WFWG elects a President for a two-year term and hires a part-time Executive Director to help with logistical efforts.

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23. Using Deep Row Incorporation of Biosolids to Grow Hybrid Poplar on Gravel Spoils: A Unique Agroforestry Application - Jonathan Kays, University of Maryland Cooperative Extension, Keedysville, MD; Gary K. Felton, University of Maryland Cooperative Extension, College Park, MD; Eric Flamino, ERCO, Inc.

Deep row incorporation of biosolids on gravel reclamation sites is an alternative land application method that solves many problems associated with surface application. It presently involves the placement of biosolids at application rates of 171-294 dry tons per acre into trenches on a gravel spoil that are then covered with overburden, eliminating odor problems and maintaining biosolids in a fairly stable, anaerobic environment. The site is then planted with hybrid poplar trees, the roots of which provide a natural recycling system that utilize the biosolids over a six-year period.

Developed by ERCO, Inc., deep row incorporation with trees has been used commercially since 1983 on one site in the world with no adverse water quality impacts – a 100-acre gravel spoil in southern Maryland. Some gravel spoils in the area (10,000 acres +) are potential sites for application and regional biosolid utilization.

The University of Maryland developed a public-private partnership that designed and implemented a three-year, \$350,000 research and extension project with ERCO, Inc in 2001. The objectives were to determine the effect of different biosolid application rates on water quality around deep rows on a gravel mine spoil, determine the contribution and nutrient removal made by trees at different densities, complete a economic analysis, and educate state and local environmental professionals and citizens about the use of deep-row incorporation.

After 3 years of replicated research, deep row incorporation is not releasing nitrate into the water supply and the trees are growing at rates characteristic of fertilized plantations. This presentation will share results and implications for regulation and expanded implementation.

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24. The Living River Corridor as a Component of a Sustainable Watershed - *John Cobourn*, University of Nevada Cooperative Extension, Incline Village, NV; *Steve Lewis*, University of Nevada Cooperative Extension, Gardnerville, NV

The concept of a sustainable watershed is often cited as the goal of successful integrated watershed management. True integrated watershed management must consider water quality, water quantity, wildlife habitat, and flooding problems in an integrated fashion. Setting a goal of sustainability requires the ability to foster communication and coordination among many stakeholders. It also requires an unflinching willingness to look into the future and predict the consequences of our actions on communities and the resources that sustain them.

When a community is growing, and a river flows through it, today's land use decisions will have important consequences for residents in the future. In developing river valleys, agricultural landowners are often faced with the pressure to sell for urban and residential development. But river channels don't just flood over their banks; they can also change course and wash away property and even structures close to their banks. Because of this risk, some communities have set aside wide corridors that are dedicated to open space and agricultural land use. From geomorphic, public safety, wildlife habitat, water quality, and long term infrastructure cost perspectives, establishing a "living river corridor" is a good step toward a sustainable watershed. Case studies show that while such a river corridor can be accomplished, the process for doing so usually requires a strong, inclusive watershed group, public education, and finding ways to compensate property owners for creating conservation easements near river channels.

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25. Gaining Ground in Sustainable Practices - *Ron Daines*, Western Sustainable Agriculture Research and Education, Logan, UT

The Sustainable Agriculture Research and Education program, or SARE, is one of the key entities promoting agricultural systems that are economically, environmentally and socially sustainable. Western SARE, one of four regions in this USDA program, provides competitive grants in research and education and professional development to develop a baseline of knowledge and to extend that knowledge to its ultimate audience – the Western farmer and rancher. To enhance this traditional system, Western SARE began 11 years ago to fund competitive grants for farmers and ranchers themselves, the idea being that producers conducting their own research and educating other producers with their successes could have an equally profound impact on agricultural sustainability. Critical to the success of these Farmer/Rancher grants has been the technical advisor, an ag professional typically with extension or the Natural Resources Conservation Service, who helps the grant recipient producer through the testing of an idea or practice. This

distinctive, collaborative system has borne ripe fruit with successes that not only have improved the grant recipient's sustainability but have also been shared with other producers, providing a geometric expansion of new knowledge about sustainable agriculture on the ground. Indeed, the natural resources that support a considerable portion of the West's agricultural economy have been positively influenced by these Western SARE Farmer/Rancher grants.

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26. Application of the Florida Master Naturalist Coastal Module in Natural Resources Extension

Programming - *Sheila Dunning*, Scott Jackson, Chris Verlinde, Andrew Diller, Marella Crane, and Marty Main, University of Florida, Institute of Food and Agricultural Sciences, (UF/IFAS) Extension, Crestview, Florida

The Florida Master Naturalist Program (FMNP) is a non-formal educational program for adults, created to introduce citizens to Florida's unique ecosystems. The program consists of three study modules: Wetlands (2001), Coastal (2003), and Uplands (2005), developed by the Department of Wildlife Ecology and Conservation. Objectives: FMNP seeks to create competent environmental educators capable of imparting sound knowledge and inspiration through developed interpretive skills. Methods: FMNP instructors received centralized administrative orientation for each module. UF Office of Conferences handled the responsibilities of program registration and evaluation. In 2003, the Coastal Ecosystems module was presented in 27 classes throughout Florida. Each class received 40 contact hours of instruction provided through PowerPoint and video presentations, field trips, and final group projects. A total of 440 individuals completed course graduation requirements. A program evaluation survey was conducted with 236 respondents. Survey participants were questioned using a qualitative scale of "Fair", "Poor", "Good", "Very Good", and "Excellent". Additional participant information was also collected. Results: Ninety-six percent of respondents rated the overall quality of the module as either "Excellent" or "Very Good". Course materials and supplemental field trips were rated high. Students represented diverse motivations and backgrounds. Participation was grouped into the following categories: Ecotourism 21.12%; Volunteer 30.17%; Teacher/CEU 6.03%; Professional Improvement 19.40%; and Personal Interest 23.28%. Instructors report that final projects provided new resources supplementing local natural resource education efforts. As of May 2005, approximately 150 certified instructors representing 85 different environmental organizations have trained over 1,500 naturalists, which have contributed over 14,000 volunteer hours each year. Conclusion: FMNP provides a turnkey framework for Extension Agents involved in natural resources programming to work collaboratively across interdisciplinary lines with both colleagues and external field experts.

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27. Streamside Gardening: Evaluation of a New Teaching Module for OSU Extension - *Linda McMahan* and Brad Withrow-Robinson, Oregon State University Extension Service, McMinnville, OR

Oregon State University Extension has taken a lead in developing a variety of educational programs for watershed health in the state. We have recently begun a new *Streamside Gardening* module for homeowners who live and garden near streams. We offered the program as a pilot in the fall of 2003, with nine participants. We chose a format of two consecutive 6-hour Saturday sessions. The first session was in-door class instruction on landscape, native plants, stream dynamics and biology. The second day was outdoors, and featured hands-on planting and evaluation activities. We used several methods to evaluate the effectiveness of this pilot, to inform us if this program should be continued and if so, how it should be revised. The first was the DOTS (Delta Over Time) method, where participants were asked to characterize their own level on knowledge and motivation to make changes. A second form of evaluation asked each participant to draw a picture of their property and make notations throughout the workshop about changes

they intend to make. Development and peer evaluation included colleagues in watershed, horticulture, and forestry programs. Finally, we developed a six-month follow-up survey. Overall, the evaluation of the pilot program indicates that *Streamside Gardening* was effective in teaching residential property owners how to enhance stream function and biology. Our in-class DOTS evaluation showed statistically significant levels of learning and of an increase in motivation. The peer review was extremely complementary and provided additional assistance in redesigning the sessions. The drawings and follow-up questionnaires provided useful insight for program planning although did not provide conclusive results. We will continue to develop, deliver and evaluate the program with funding through a watershed grant from the Oregon Watershed Enhancement Board.

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28. Discovering Hydrology at Kartchner Caverns State Park - Kim McReynolds and Susan Pater, University of Arizona, Cochise County Cooperative Extension, Willcox, AZ

Kartchner Caverns, located in southeastern Arizona, is the state's newest and most popular state park. Kartchner Caverns attracts some 200,000 persons per year from across the state and around the world. Visitors are well-educated and highly motivated to learn about earth sciences in general, and in particular, about the role of water in shaping caves and recharging the basin's aquifers. At the same time, many local residents have become more interested in understanding the relationship between the health of the watershed and the long-term viability of the adjacent San Pedro River. This situation presented an educational opportunity to increase their hydrologic literacy. Greater public awareness of water resource concerns and the need for conservation of these resources are expected outcomes.

The University of Arizona (UA) Cooperative Extension, UA Sustainability of semi-Arid Hydrology and Riparian Areas (SAHRA) Center and Arizona State Parks jointly created an interactive kiosk display at Kartchner Caverns, along with a DVD for sale to the public, and a companion website <http://www.sahra.arizona.edu/kartchner/>. Through all three media types individuals can experience the hydrology of Kartchner Caverns State Park: how water created the cave spaces and formations, how water enters the cave today, how it continues to shape the caverns, the water cycle of the San Pedro Basin, and the key role of water in the history and evolution of Kartchner Caverns and the San Pedro River Basin. Usage data is being collected on both the Caverns kiosk and the website, and sales of DVDs is tracked.

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29. Natural Resource Sustainability - A Strong Element in Ohio's Water Quality Programs - Dana Oleskiewicz, Ohio State University Extension, Wooster, OH and Robert McCall, Ohio State University Extension, Findlay, OH

Water quality is the focus of several, very successful, Ohio State University (OSU) Extension projects. The main objective is to promote the idea that our water resources must be sustainable for the health and well being of our communities and future generations.

Such as, the Ohio Watershed Network provides networking connections within the Ohio watershed community through a listserv, website, and various other resources, such as those provided by the OSU Extension Watershed Team with expertise in engagement and education, fundraising, watershed planning, organizational development, and volunteer monitoring.

The Ohio Watershed Academy offers on-line training to Watershed Coordinators, their colleagues, and those interested in learning about community-based watershed management. Curriculum topics assist

watershed groups in becoming more effective and sustainable so that water protection efforts are long-term and successful.

The Ohio Watershed Leaders workshop is an annual retreat for watershed professionals and citizens to learn, network, and unwind from daily work pressures. The Overholt Drainage School provides information on agricultural water management to contractors, sanitarians, technicians, farmers, engineers, consultants, and others interested in drainage issues.

Finally, the Ohio Clean Marinas Program is a proactive, Ohio Sea Grant partnership designed to encourage marinas and boaters to use simple, innovative solutions to keep Ohio's coastal and inland waterway resources clean. This program assists operators in protecting the resources that provide their livelihood — clean water and fresh air.

Together, these OSU Extension projects are a strong force in advancing the concept of and stewardship needed for sustainable water resources throughout Ohio.

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30. Using Simulation to Analyze the Effects of Increasing Small Logs into a Sawmill's Raw Material Mix - James E. Reeb, Charles C. Brunner, James W. Funck, Olivia Pinon, Maxence Salichon, Oregon State University, Corvallis, OR

Past forest management practices in the Western United States have resulted in forests containing dense stands of small-diameter timber. Much of this material has insufficient value to offset harvesting costs. However, to sustain and manage the forest and protect it from fire, insects and disease, small-diameter timber must be utilized. The study's objectives were to understand the effects of increasing the percentage of small-diameter logs into an existing sawmill's log mix. Using a discrete-event simulation computer model, we were able to run many different "what if" scenarios.

Increasing the percentage of small-diameter logs will result in a 10 to 15 percent decrease in the mill's production. Experiments indicated that simply increasing the speed of the existing primary log-sawing machine (EDLF) did not significantly increase production because other downstream machine centers were at or close to process capacity. Before increasing the EDLF production rate, the management would also need to address the limited processing capacity of downstream machines.

Suggested improvements ranged from machine center upgrades to log yard sorting strategies. For example, when the gang edger's processing rate was increased, there was a 6% increase in production with the mill's current log mix. However, when more small logs were included in the raw material mix, the model showed a 15-17% increase in production when both the EDLF and the gang edger were sped up. These examples illustrate how discrete-event simulation experiments are helping management make better decisions.

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31. Water Outreach Education: Choosing Best Education Practices for Your Target Audience - Elaine Andrews, Kate Reilly, Environmental Resources Center, University of Wisconsin, Madison, WI

Incorporating best education practices (BEPs) into outreach strategies is critical for achieving water management goals. The new National Extension Water Outreach Education website, <http://wateroutreach.uwex.edu>, provides water resource professionals with *best* practices – education techniques and approaches that have been tested and found successful.

The success of natural resource management strategies is strongly linked to how effective we are at getting stakeholders to adapt new attitudes and behaviors. Education research offers tested theories and principles for how to get people to think critically about new issues and/or to effect change. For instance, education research indicates that an important element for assuring successful outreach or education initiatives is to identify one or more target audiences and to determine audience goals, needs, and interests. Water Outreach Education resources provide tips for assessing audience needs and recommendations for BEPs that research has shown to be effective with specific audiences.

To call an education practice a *best education practice* is to say it is better than all other practices to which it has been compared using some standard or criterion of comparison. This poster will focus on the results of the meta-analysis process we developed and executed to make those comparisons for selected water-related audiences. We reviewed thousands of papers, identified through an extensive search of education, environmental, natural resource, and resource management journals and journal databases. Procedures were developed for organizing relevant studies into useful categories and summarized results. Ultimately we found 96 papers that met our research criteria and provided BEPs for 14 target audiences such as farmers, households, and decision-makers.

In addition, the poster will:

- Define the BEPs for specific audiences.
- Provide information on how to apply this information to your water education initiatives.
- Illustrate where to find resources on the National Extension Water Outreach Education website, <http://wateroutreach.uwex.edu>.

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32. Rescuing America's Most Historic Bayou and Lake through Extension - Mark Schexnayder, LSU AgCenter, Metairie, LA; Brian Leblanc, LSU AgCenter, Hammond, LA

The water quality of Louisiana's historic bayou St. John and Lake Pontchartrain is one of the focuses of the Louisiana Sea Grant's Marine Extension Program (MEP). Efforts are underway to restore the Bayou and connecting Park lagoon complex through a series of projects and initiatives aimed at restoring the functionality of the Bayou St. John complex. The Bayou starts and returns to Lake Pontchartrain by way of the City Park lagoon system. Because of this, each water body is dependent on the next. Until last year, there was no concerted management plan based on community agreed upon goals. A plan has been developed and put in place; action items and goals defined, and the MEP has helped the managing agencies access grant monies to address the problems.

In addition to the goal of providing quality fishing and improved water body access for urban and suburban citizens, the program also is designed to increase water quality in tributaries of Lake Pontchartrain Basin. The MEP recently began to focus some of its resources and programming on improving water quality in the northern basin tributaries realizing that the quality of these waters have significant impact on the recreational potential of our estuarine and freshwater areas in the southern basin. Agricultural enterprises in the northern basin such as forestry, and beef and dairy farms are listed in the 303d list as significant contributors to non-point source pollution that enter Lake Pontchartrain. Additionally, that region has over 40,000 individual home septic treatment systems with most being located in heavy clay soils where infiltration of effluent is minimal. The MEP operating in this region works with foresters, farmers, and suburban land owners to mitigate these and other sources through public education, BMP demonstrations, and research to develop new or more effective BMP technologies.

33. Training Environmental Stewards from Mountains to Ocean: A Water Quality Training Curriculum - B. Gaolach, T. Zimmerman, A. Grotta, P. Racette, and S. Kantor, Washington State University King County Extension. Renton, WA

King County, Washington is a prime example of the difficulties posed by managing water resources in an urbanizing area that encompasses diverse land-uses such as forestry, agriculture, rural lifestyles, and urban living. To educate the public on these issues, Washington State University King County Extension (WSU-KCE) has long utilized a “train-the-trainer” model. Volunteers are trained in sustainable resource management and are then able to reach a larger segment of the public than Extension staff alone can reach.

Our volunteer training programs cover a range of land-use topics including natural areas, gardening, forestry, and livestock ownership. Each program concentrates its message on sustainable resource stewardship for its intended audience, resulting in topic overlap in the area of water quality. However, volunteers in one training program may not be exposed to the specific issues covered in other training programs. With a more integrated approach, volunteers could provide a complete watershed picture to the individuals they work with.

Our goal is to train all volunteers as “natural resource stewards”. To foster this integrated training, we have developed curriculum entitled, *Training Environmental Stewards: Integrating Water Resources Education from Mountains to Ocean*. The objective of this project was to develop a core water quality volunteer training curriculum to teach sustainable land-use practices that reduce human impacts in the Pacific Northwest. Extension Faculty members have developed this curriculum in cooperation with regional experts, and with funding from USDA-CSREES. It has been piloted in several WSU Extension programs and is available for use throughout the Pacific Northwest.

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34. A New Approach to Riparian Area Education in Arizona - George Zaines, University of Arizona, Tucson, AZ; Kim McReynolds, University of Arizona, Wilcox, AZ; Jim Sprinkle, University of Arizona, Payson, AZ; Jeff Schalau, University of Arizona, Prescott, AZ; Barbara Hutchinson, University of Arizona, Tucson, AZ; Mary Nichols, USDA Agricultural Research Service, Tucson, AZ; Robin Grumbles, University of Arizona, Kingman, AZ; Christopher Jones, University of Arizona, Globe, AZ

Riparian areas occupy less than 2% of the Western United States. Their importance is disproportionate to the small area they occupy because of their many ecological functions and multiple uses. Riparian areas provide recreational amenities, habitat and travel corridors for wildlife, support livestock grazing, and influence water quality and quantity. However, most riparian areas in the United States have been over-used in the past and are degraded compared to their original condition. Lack of information on the status of riparian areas has limited effective management, though a comprehensive assessment should be implemented. In Arizona, as in many other states, there is a need for science-based educational workshops and web-based information to help the public increase their knowledge of the importance, function and management of riparian areas. Educational workshops were conducted in several counties of Arizona and focused on: 1) the definition, importance and characterization of riparian areas 2) hydrologic, geomorphic, climatic, and biological processes in riparian areas, and 3) human alterations to riparian areas. The web-based educational module was developed drawing on the materials and resources used in the educational workshops. Using multi-media web applications, learners were presented with successive steps introducing both theoretical and practical information about riparian areas and methods for affective management.

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35. Sustainable Conservation of Alligators in Louisiana - *Mark G. Shirley*, Louisiana Cooperative Extension Service, LSU AgCenter, Abbeville, LA; Ruth M. Elsey, Louisiana Department of Wildlife and Fisheries, Rockefeller Wildlife Refuge, Grand Chenier, LA

Many people equate conservation, which can be defined as the wise use of a resource, with preservation, which connotes no use or at best, a “hands off” management approach. Extension professionals can use the alligator resource in Louisiana as a good example of how the consumptive use of a wildlife resource can be sustainable and offer protection to both the species and the environment.

Conservation of the American alligator (*Alligator mississippiensis*) in Louisiana involves the annual harvest of wild alligators and the collection of eggs to support the farming program. The management of this renewable resource is based on biological information gathered over many years, particularly with respect to population dynamics, behavior and habitat requirements. The long term, sustainable use of the resource is insured through the strictly regulated harvest of more than 30,000 animals during the September harvest season and the collection of more than 350,000 eggs each summer. A percentage of the juvenile alligators are returned to the habitat to compensate for the high natural mortality of young alligators. The skins of wild and the farm raised alligators are used for leather products worldwide. Alligator meat provides an additional value and research is currently evaluating other products of medicinal or biochemical significance derived from the alligator. The commercial value provides the economic incentive to carefully manage the alligator resource which directly benefits landowners, harvesters and farmers. More importantly, it provides the incentive and, in many cases, the funds to maintain the alligator’s wetland habitat. The loss of wetlands, especially Louisiana’s coastal wetlands, threatens not only alligators but a host of other wetland dependent species and resources.

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36. Hands on Environmental Science Experience for Youth - *David Francis*; Utah State University Extension 4-H, Logan UT

To meet the need for hands on experiences in environmental science for youth in the Boy Scouts of America, Utah State University Extension 4-H developed an intensive 6 hr. workshop designed to teach youth about environmental science. Over 350 youth ages 11-17 youth have participated in the workshop since it began in the September 2001. The program is taught utilizing a botanical garden to serve as a “living laboratory” to explore ecosystem relationships and conduct experiments.

Program elements include youth conducting experiments in acid rain, oil spill clean up methods, and the greenhouse effect. Learning games teach youth about endangered species, carrying capacity and recycling. Throughout the experience youth document their findings in an “Environmental Science Field Guide”.

The program activities are aligned to meet the requirements for youth interested in completion of the Environmental Science merit badge. However, the activities are not scouting specific, making the program a resource for educators interested in teaching youth ages 11-17 interested in environmental science.

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37. The Barn Owl: Farmer's Friend, Teacher's Pet - *Richard N. Raid* and Jason Martin, University of Florida, Everglades Research and Education Center, Belle Glade, FL

Prodigious rodent predators, the common barn owl (*Tyto alba*) serves as a model system for instructing youth and the general public about symbiotic relationships that frequently exist between the environment and agriculture. In the Everglades Agricultural Area of south Florida, rodent pests annually inflict millions of dollars in crop losses to vegetables, sugarcane, and rice. For decades attempts were made to control

rodent populations through the sole use of chemical rodenticides. However, rodenticides can be costly and may pose risks to non-target species. With sustainable rodent control as the ultimate goal, University of Florida extension specialists have encouraged agricultural producers in south Florida's Everglades Agricultural Area to erect barn owl nesting boxes on agricultural lands. Due to a paucity of suitable natural nesting sites, the nesting boxes are quickly colonized. The boxes have successfully enhanced populations of these magnificent raptors and a number of growers report that they no longer even use chemical rodenticides. But perhaps the greatest beneficiaries of the UF Barn Owl Project are students and teachers. Owl pellets, regurgitated masses containing the undigested remains of rodents and other owl prey, are routinely collected from barn owl nesting and roosting sites. Typically containing bones, fur, and exoskeletons, these Barn Owl Project by-products are heat-sterilized to provide hands-on lessons in predator/prey relationships. A favorite with students of all ages, barn owl pellets provided by UF personnel are eagerly dissected and the prey identified, providing a perfect example of how man and wildlife species may benefit one another. However, the lessons do not stop there. Students and adult volunteers enthusiastically support the project by assisting in the construction of nesting boxes. The personal involvement facilitated by the Barn Owl Project provides participants with a sense of contribution and accomplishment, a perfect companion to the educational lessons.

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38. Wildlife Management Conferences Making Impact – *Chris Zoller*, Ohio State University Extension, New Philadelphia, OH

The *Eastern Ohio Wildlife Management Conference for the Private Landowner* has been conducted since 2000 in response to a growing clientele who are interested in managing property for wildlife. In April 2004 all past conference participants were surveyed using a mailed questionnaire to determine: 1) what management practices they had implemented; 2) what types of wildlife for which they were managing their property; 3) if any other agencies had been contacted for assistance managing their property; and 4) how much participants saved as a result of attending the conference.

More than 300 questionnaires were mailed and a 65% response rate was achieved. Highlights of the findings include: respondents completing woodland improvements, the development of wildlife food plots, and soil testing. Participants also reported seeking additional advice and recommendations from a number of wildlife and natural resource related agencies and organizations.

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Poster Session II

Tuesday, May 16, 2006; 6:00 - 8:00 pm

Note: Presenting author(s) *italicized*

39. Applying Behavioral Principles in Natural Resource Management - *Roger Banner* and Fred Provenza, Utah State University, Logan, UT

Animals adapt to changes in social and physical environments every day of their lives. The question is do people want to be a part of that process. For those understanding behavioral principles, the potential is great. Rather than developing and transferring “technology” packages, we aim to change the way people understand and use behavior to manage ecosystems. We want people to realize the power of behavior to transform systems ecologically, economically and culturally. The environment, interacting with an individual’s genetic makeup, results in experiences with specific consequences to the individual. Though *in-utero* and early experiences are especially critical, genome-environment interactions continue throughout life. Experiences shape individuals neurologically, morphologically, and physiologically. When an animal engages in a behavior, the consequence may be positive or negative causing the behavior to be repeated or avoided. Understanding that an animal’s habitat and food preferences are shaped, not genetically predetermined, allows managers to shape animals for specific management objectives.

Managers understanding how behaviors are formed can shape animals to meet even seemingly opposing management goals. By pairing nutritional supplement with high animal concentration, the digestive consequences of less preferred plants such as sagebrush can be positive. Such intense and selective grazing of sagebrush can increase animal preference for sagebrush, decrease mature sagebrush dominance and increase plant biodiversity, positively impacting species such as sage grouse. Conversely, proper timing of grazing and increased livestock density can decrease competitive ability of grasses and forbs in favor of sagebrush, which is critical for mule deer winter habitat.

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40. Developing an Online Database of Ordinances Regulating Non-Industrial Private Forestlands - Robert Bardon and *Brandon King*, North Carolina State University, Raleigh, NC

As counties develop and municipalities grow the application of local land use regulations to land within those jurisdictions is expanding as well. Sustaining working forests over the long term on lands within these quickly expanding urban/rural interface areas is difficult where conflicts between rural and urban uses and attitudes may also result in increased regulation of forestry practices. Continuing forest management on private forestlands is then difficult for both landowners and foresters who are often unaware of local regulations and thus face fines or other penalties when forestry practices are conducted in violation of these local ordinances. To make them aware of these ordinances and regulations, NC State University Extension Forestry has developed a website to collect, analyze, and publish an online database of regulatory and other information that pertains to forest management on private forestland. This site serves private forestland owners, forestry consultants, cooperative extension personnel, local government officials, and others responsible for consulting and advising private forest landowners regarding forest management activities that occur within various county or municipal jurisdictions that have regulatory authority over such practices. Users of the site can search by municipal or county jurisdiction to obtain information on local ordinances as well as state and federal laws and regulations as they pertain to forest management. Users can also obtain general contact information for local departments or agencies that are responsible for interpreting and enforcing local regulations. The authors will present information on project development and implementation, including sources of data used for this project.

41. The Role of the WVU Extension Service in Forestry Education and Technical Assistance for Private Forestland Owners - *Larry Campbell, David W. McGill*, Chad Pierskalla, Kevin Saunders, West Virginia University Extension Service, Morgantown, WV and West Virginia University Division of Forestry and Natural Resources, Morgantown, WV

We surveyed West Virginia Extension Service personnel to illuminate the type and quantity of forestry-related assistance and information they provide in the state. Just over three-quarters (76%) of the questionnaires we mailed out were returned. Completed questionnaires totaled 162; about a third (32%) of the respondents indicated they never receive forestry-related questions. Of those receiving forestry questions at least “a few times a year”, 72 percent answered at least some of the questions themselves. Those that did answer forestry questions answered an average of 24 percent of incoming questions. A large percentage (76%) of forestry questions were referred to other individuals or organizations.

The most frequently asked questions related were related to tree health. Tree health (35%), followed by timber management (18%), where to get assistance (11%), and tree identification were the most common questions.

Most Extension personnel (70%) provide no direct forestry services. Sixteen percent, however, provide forest site visits and discuss opportunities with landowners and 2 percent offer estimates of the value of forest resources; none provide forest management plans. Most respondents (76%) had no forestry training. Only one percent had college-level forestry degrees. Others had taken forestry courses (10%), attended workshops (8%), or have become familiar with forestry topics in other ways (3%).

WV Extension Service personnel provide relevant information to local landowners and facilitate service to them by referrals, despite infrequent direct forestry technical assistance. Thus they provide an important linkage for landowners searching for information and technical assistance to support the management of their forestlands.

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42. USDA's New Initiative in Agricultural Water Security: Opportunities for Natural Resources Extension - *James P. Dobrowolski* and Michael P. O'Neill, USDA-CSREES, Washington, DC

On June 5, 2003, Interior Secretary Gale A. Norton and Agriculture Secretary Ann M. Veneman signed a Memorandum of Understanding (MOU) aimed at promoting improved water management and rapid response to emerging water supply shortages in the West. In response to the MOU, greater demand for water worldwide, and increasing susceptibility of rural landowners to mounting pressures for more water to urban and urbanizing areas, Dr. Rodney J. Brown, Deputy Under Secretary for USDA Research, Education, and Economics (REE) hosted a listening session on Agricultural Water Security in Park City, Utah, September 9-10, 2004. Agricultural Water Security (AWS) describes the need to maximize the efficiency of water use by farmers, ranchers, rural and urbanizing communities, thus ensuring water volumes allocated for domestic water consumption, ecosystem services, recreation and aesthetics while meeting the requirements for food and fiber production. Ninety leading researchers, educators, practitioners, and managers involved in water supply, management, distribution, education, outreach and use came to explore new opportunities and help to determine the relevance of USDA's efforts in AWS—and to develop a basis for an expansion of USDA programs that takes full advantage of partnerships with other Federal and State agencies. Outcomes of the Listening Session included efforts to assess the current capabilities of the USDA-

REE agencies, Agricultural Research Service (ARS), Cooperative State, Research, Education and Extension Service (CSREES), Economic Research Service (ERS), and National Agricultural Statistics Service (NASS) to determine the USDA program needs that might be fulfilled by a coordinated USDA effort for Agricultural Water Security; determine the gaps in existing knowledge; identify strategies and opportunities that will advance USDA efforts and provide products and solutions to USDA customers, stakeholders, and partners; and identify commonalities among the topical themes and describe some of the necessary steps to move USDA toward national programming in Agricultural Water Security. Steps since the listening session included: 1. USDA REE and ENR (Environment and Natural Resources Division) meet to coordinate around the six theme areas, 2. We created an opportunity for new partners and new funding—Request for Applications (RFAs) have changed for NRI Water and Watersheds, Agricultural Plants and Environmental Adaptation, and 406 National Integrated Water Quality Program (NIWQP), and 3. We leveraged activities towards new opportunities with groups that may have been adversaries to USDA in the past.

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43. Keeping Extension Sustainable and Relevant for the 21st Century - David Drake, University of Wisconsin, Madison, WI; *Ben West*, Mississippi State University, Mississippi State, MS

The Smith-Lever Act of 1914 established the Cooperative Extension Service for the purpose of “diffusing among the people of the United States useful and practical information on subjects relating to agriculture, home economics, and rural energy”. Since then, much has changed. Just over 92 million individuals lived in the United States in 1910, with 31% of the population employed as farmers. As of 2005, America’s population had increased to nearly 297 million people, with only 3% of the population earning a living on the farm. More telling, about 80% of America’s population now lives in a suburban/urban environment. Currently, the Cooperative State Research, Education and Extension Service lists 11 areas of national emphasis, with focus areas ranging from agriculture to economics and commerce to technology and engineering. Furthermore, there are numerous programs offered at the state and county level under each of the 11 national emphasis areas. At a time when baseline funding to support the Extension system is threatened with extinction, we need to critically think about how to maintain Extension’s sustainability and relevance well into the 21st Century. For example, are Extension personnel spread too thin, trying to be all things to all people? Instead, might Extension be more effective shrinking the number of program areas offered and focusing limited resources. Should Extension be more fee-based than it currently is? Are we doing an adequate job of marketing Extension and the services and products offered? Companies like Ford vehicles and Kraft foods spend millions of dollars annually on market research and brand identification. As uncomfortable as it may be to critically examine ourselves, we need to ensure that Extension is as relevant and important today and into the future as it was at the time the Smith-Lever Act was passed.

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44. Non-Industrial Private Forest Landowner versus Home Center Retailer Attitudes and Perceptions Regarding Forest Certification - Michael A. Dunn, Louisiana State University Agricultural Center, Baton Rouge, LA; *Glenn Hughes*, Mississippi State University Extension Service, Purvis, MS; Richard P. Vlosky, Louisiana State University, Baton Rouge, LA; and Priyan Perera, Louisiana State University Agricultural Center, Baton Rouge, LA

Forest certification continues to generate promise, discussion, and debate. Just how forest certification occurs can be a contentious issue. The major certification systems focus on large ownerships, whether industry, government, or non-governmental organizations. These systems include the Sustainable Forestry Initiative (SFI), Forest Stewardship Council (FSC), and International Organization for Standardization (ISO 14000). Certification systems oriented toward non-industrial, private forest landowners (NIPFs) include the Tree Farm and the Green Tag programs

We present the results of two mail surveys pertaining to forest certification. The first was a survey of 1,000 randomly selected NIPFs each in Louisiana and Mississippi. The second was a survey of the top 500 home retail centers in the United States.

The landowner survey sought to determine how well NIPFs understand forest certification as well as the amount of money they may (or may not) be willing to spend to become certified. The home center survey sought to ascertain these retailers' perceptions of current and future forest certification trends, as well as certification systems deemed "acceptable" to them both now and in the future. This perspective is critical so that landowners have access to all possible markets for their forest products.

Investing in forestland is a long-term enterprise, and helping NIPFs plan for the future is a long-standing goal of Extension. These surveys better frame certification-related issues from the perspectives of both the forest landowner seeking to sell timber and the retailer looking for the best way to market and sell the products that originate on private forestland.

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45. The Sustainable Agriculture Research and Extension Center (SAREC): A Model of Opportunity for the Modern Land Grant System - Jim Freeburn, University of Wyoming/Western SARE, Torrington, WY

A new research center called SAREC (the Sustainable Agriculture Research and Extension Center) has just been established in southeast Wyoming. With an *emphasis on natural resource management and systems agriculture*, SAREC affords extension professionals a new opportunity for collaborative research and education endeavors. SAREC encompasses more than 3,800 total acres; with nearly 400 acres of irrigated cropland and pasture, approximately 1,500 acres of rain-fed cropland. Native rangeland, improved pasture and riparian areas along the North Platte River comprise the remainder. Extension professionals are using this diverse natural resource base for an array of activities related to sustainable agriculture. Among the new projects at SAREC are research efforts on organic crops (50+ acres), oilseeds for biofuel production and cutting-edge grazing systems that integrate a diversity of forages. Crops produced at SAREC include wheat, corn, sugar beets, dry edible beans, millet, alfalfa, barley, oats, sunflowers and a variety of alternative crops. Wildlife also abounds at SAREC. Game species include mule deer, whitetail deer, pronghorn antelope, pheasants, wild turkeys and a variety of waterfowl. There are also numerous important nongame animals found at SAREC.

Most projects at SAREC are able to demonstrate the strength of integrated agricultural systems. Persons attending this session should leave with a new appreciation for taking a holistic approach to agricultural research and education.

Extension professionals attending this session will head home with a new appreciation for opportunities at Land Grant Research Centers. With a focus on agricultural practices that are environmentally friendly, economically viable and socially acceptable, SAREC is a model of opportunity for other states. Attend this session and see how an emphasis on agricultural systems has strengthened research and educational programs, grant opportunities and public support for the University of Wyoming. We hope the outcome of your attendance is a closer link with the research centers in your state and an integrated effort by extension field educators and research centers.

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46. Web Based Youth Programs - Duane Friend, University of Illinois Extension, Springfield, IL

The use of Extension web based education materials for youth has expanded dramatically in the last few years. Teachers and students are given a trustworthy resource that can be used as a supplement to textbook material or as a stand alone project.

University of Illinois Extension has developed a series of web based natural resource programs. Several sites will be highlighted.

Adventures of Herman the worm <http://www.urbanext.uiuc.edu/worms/> provides basic biology principles told through a guided study of the worm.

A Walk in the Woods <http://www.urbanext.uiuc.edu/woods/> is designed for third through fifth grade students to gain an appreciation of nature.

Trees are Terrific <http://www.urbanext.uiuc.edu/trees1/> is designed to help young children (5–8 years of age) gain an appreciation of trees, observe trees in their every day lives and develop an interest in learning more about trees.

Weather One <http://www.urbanext.uiuc.edu/weather/> discusses several areas of weather: clouds, seasons, air pressure, winds, global warming, and violent weather for 4-7th grades.

All Star River Explorers <http://www.urbanext.uiuc.edu/rivers/> is designed to introduce students in 3rd-5th grades to the basics of hydrology, and increase their understanding of how rivers are formed and their importance in our lives.

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47. 4-H Virtual Forest - D.L. Goerlich, Virginia Cooperative Extension, Halifax, VA; Jeff Kirwan, Virginia Tech, Blacksburg, VA, Carl Estes, Virginia Tech, Blacksburg, VA, Joe Hunnings, Virginia Cooperative Extension, Blacksburg, VA, Elaine Oliver, Virginia Tech, Blacksburg, VA, Jim Willis, Virginia Cooperative Extension, Lebanon, VA, Gabrielle Minnich, Virginia Tech, Blacksburg, VA, Josh Napier, Virginia Tech, Blacksburg, VA, Lex Bruce, Virginia Cooperative Extension, Blacksburg, VA, Jason Fisher, Virginia Cooperative Extension, Halifax, VA, and Karen Cronin, Virginia Tech, Blacksburg, VA

Key informant groups composed of foresters and forest landowners have continually expressed concern that “what is taught in the schools” about forestry and natural resources is often based on emotion and misinformation rather than science. Developed to address this need, 4-H Virtual Forest is an interactive, web-based learning experience that introduces forest management concepts to youth aged 9 through 13. The 4-H Virtual Forest website <http://www.ext.vt.edu/resources/4h/virtualforest> includes seven learning modules that cover the following subjects: land-use management, renewable resources, photosynthesis, tree identification, old-field succession, tree measurements, and timber harvesting. In addition, student and adult evaluations can be completed and submitted on-line. Research shows that, between home and school, 91% of six to 17 year old youth have access to the Internet. This indicates that, although not a substitute for hands on learning, the World Wide Web is a useful medium to present natural resources educational materials to youth. In initial marketing efforts, more than 9,500 teachers and extension personnel received notice of 4-H Virtual Forest via printed and on-line newsletters, and 25,000 full-color, animated bookmarks were printed and distributed to Virginia Cooperative Extension 4-H agents and Virginia’s public school teachers. 4-H Virtual Forest has since received national and international exposure. Web usage statistics show that--during the period from January 1, 2005 through December 31, 2005--4-H Virtual Forest received

419,051 successful requests from 9,111 distinct hosts. These hosts included users from 68 foreign countries.

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48. Results of Two Surveys Regarding Chronic Wasting Disease in Northeastern U.S. - Gary R. Goff and Tommy L. Brown, Cornell University, Ithaca, NY

With the 2005 discovery of captive and wild deer infected with Chronic Wasting Disease (CWD), NY State became the eastern most state to harbor this fatal disease of cervids. The potential impact of a state-wide outbreak of CWD prompted The NYS Department of Environmental Conservation (DEC) and Cornell University's Agricultural Experiment Station and Cooperative Extension (CCE) to initiate an educational program to ensure that key audiences have access to factual information regarding efforts to contain the disease, protect wild and domestic deer herds, and protect public health. One key component of the effort was a "rapid response phone survey" conducted by Cornell University's Human Dimensions Research Unit, designed to document the awareness level about CWD among hunters and other NY residents.

A variety of additional educational activities have been conducted collaboratively by state and federal agencies and organizations in 2005 to provide the public, landowners, and hunters with accurate, up-to-date information. The principal fact sheet, "Understanding Chronic Wasting Disease in NY State" (adapted from a Wisconsin publication), was co-edited by staff from CCE, DEC, and Cornell's College of Veterinary Medicine. CCE will publish another fact sheet that includes information from a yet-to-be-conducted survey of northeastern states on regulations and plans they have to prevent the spread of CWD into their states and contain the spread of the disease should it be found within their borders.

The results of the above surveys will provide conference attendees with insight on how they may start developing Extension partnerships and educational programs on CWD.

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49. Stakeholder Perceptions of Extension's Comparative Effectiveness Among Organizations Assisting Forest Owners in Washington State - Roje Gootee, David Baumgartner and Keith Blatner, Washington State University, Pullman, WA

The achievement of sustainability in private forest management requires ready access to reliable and relevant information. To assess stakeholder perceptions of the effectiveness of various organizations at providing guidance to forest owners, 134 one-on-one interviews were conducted in the state of Washington. Stakeholders included a broad spectrum of policy-makers, advisory panel members, regulatory agency administrators, private forest owners, tribal representatives, consultants, and interest group leaders. Extension services emerged as the provider most valued by family forest owners for practicality of land management solutions and perceived neutrality of political or social agenda. Extension foresters were believed to be the advisors best attuned to the "real world" issues of private forest ownership. They were also perceived to be the least likely to be influenced by potential bias in terms of political mandates or personal interests. Landowners placed higher levels of trust in educational information provided via extension services than in information generated by most other institutional sources. Availability of forestry extension services, however, was perceived as being severely limited by diminished funding and staffing.

Concern over diminution in extension availability was notably lower among many other stakeholder groups. Policymakers, advisors, agency employees, and interest group leaders were more likely to consider state forest and wildlife management agency programs an adequate substitute for extension services, despite the

fact that the private forest owner group expressed a strong preference for extension over other agencies as an information source.

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50. Understanding How Demographic Characteristics Influence Production Practices Within the Ohio Maple Syrup Industry - *Gary W. Graham*, Ohio State University Extension, Wooster, OH, P. Charles Goebel, Ohio Agricultural Research and Development Center, Wooster, OH, and Randall B. Heiligmann, School of Environment and Natural Resources, The Ohio State University, Columbus, OH

Maple syrup production contributes \$5 million annually to Ohio's economy and provides a supplemental income to many forest land-owners. Despite over 90 years of service by Ohio State University (OSU) Extension, little information is available concerning the Ohio maple syrup industry. The primary aim of this research was to investigate the association among production factors and demographic characteristics of the Ohio maple syrup industry and examine the influence of OSU Extension programming on the industry. In 2004, a detailed survey was sent to all known Ohio maple syrup producers (N = 761) with the goal of elucidating relationships among production factors and demographic characteristics. Eighty-one percent (N = 620) of the surveys were returned by active maple syrup operations. Specific industry characteristics examined were producer heritage (Amish, non-Amish or English), producer age, sap collection methods (bucket or tubing), attendance at OSU Extension educational programming, and the size of the sugaring operation based on total number of taps. Chi-square analyses revealed that there are important differences among demographic groups ($\alpha = 0.05$). For example, Amish producers in the state have significantly larger sugaring operations, utilize bucket collection systems rather than more advanced tubing systems, and are younger than their English counterparts. Amish producers are also less likely to attend OSU Extension programming than their fellow English producers, while those older English producers with large operations and tubing systems were more likely to attend. Results of this research will enable educators to develop programming to increase outreach and engagement efforts to currently underserved sectors of the Ohio maple syrup industry.

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51. Success in Conducting a Comprehensive Census of Natural Resources Based Clients - *Gary Graham*, Ohio State University Extension, Wooster, OH

Anytime you ask the public what they think you have to be prepared to listen. After 90 years of serving the Ohio Maple Syrup Industry, Ohio State University Extension Specialists conducted a comprehensive survey/census of the entire state's maple syrup industry to gain the producer's perspective, and to understand the industry demographics and current practices. This applied research is beneficial in planning programming conducted across the state for maple producers. Special care and techniques on approaching some audiences, like maple producers who want to keep their cashed-based supplemental income information private, are necessary to have success. Essentials of methods used to handle vast amounts of data, as well as non-responders, issues of privacy, interpreting industry practices, and demographics are needed prior to start and adjusted in progress to assure good results. In the end the analysis of census data provides the foundation for Extension personnel to develop programming to meet the current status of the industry, special needs and under-served audiences within the population being studied. Actual examples will be used to demonstrate the processes, techniques, and results of beneficial applied research of a natural resources based industry.

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52. Using External Revenue and Partnerships to Sustain an Extension Forestry Program - Angela S. Gupta, University of Minnesota Extension Service, Rochester, MN; *Mike Reichenbach*, University of Minnesota Extension Service, Cloquet, MN; *Eli Sagor*, University of Minnesota Extension Service, St. Paul, MN

Facing flat or declining budgets, many Extension systems are exploring innovative program delivery strategies. The University of Minnesota Extension Service recently adopted a regional delivery system in order to improve program effectiveness and address budget concerns. Minnesota's Woodland Advisor program offers one example of a successful Extension program that has been redesigned and delivered within the regional model. The "new" Woodland Advisor program has greatly increased external revenue sources, created new partnerships, and expanded delivery capacity by delivering more than 60 forestry education classes attended annually by nearly 700 persons.

The Woodland Advisor program structure has changed to focus on several key aspects including: flexible class content and schedules; developing electives based on program evaluations and other audience feedback; encouraging repeated participation and program growth; program marketing, and volunteer support. Revenue sources have been diversified to include partnerships, fees, grants, and sales. This combination of focused activity on key components of the program and relying on a variety of funding sources positions the program for continued growth in a changing fiscal environment.

The new program structure also improves Extension's ability to help forest landowners better manage their forestlands. Program leaders are implementing more business tools, such as developing a strategic plan, to help focus activities and identify areas of potential growth. The strategic plan included the development of a vision statement: *To be Minnesota's leading resource for citizens participating in forestry learning.*

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53. Assessing Outcomes of County Forest Landowner Short Courses in Mississippi - *Britton Hatcher*, Mississippi State University, Grenada, MS; Laura Grace, and Andrew Londo, Mississippi State University, Mississippi State, MS; and Timothy Traugott, Mississippi State University, Grenada, MS

Forestry is a significant contributor to the economy of Mississippi and the southern region of the United States. The state and region has enjoyed a half-century of forest products industry growth and prosperity, which has supported a high level of forest management. Key to the success of the forest industry in this region is the participation of non-industrial private forest landowners who own over 75% of Mississippi's forestland.

The Extension Forestry program at Mississippi State University has offered numerous short courses for private landowners during the past 20 years. Our efforts were targeted at providing information to these landowners that would help them manage their forested properties. Although evaluations have been conducted at the end of each program, no longer-term outcomes assessment of these courses has been conducted to determine the efficacy of these programs. We conducted a pilot study to develop a protocol for longer-term outcomes assessment of one particular short course, "Profitable Marketing and Harvesting of Timber". This program is one of the best attended of the 11 short courses offered by the department. A detailed questionnaire was developed and sent to all of the people who had attended this program in three Mississippi counties between 1987 and 2003.

Response rates were reasonably good (44%). All respondents indicated that the course was beneficial, although they indicated a variety of reasons for attending the course including increasing their timber marketing knowledge, improving their forest management skills, and simply to learn more about their land.

A deeper analysis of the data indicates that there are unexplored opportunities for future extension programming. Most respondents had owned their land for more than 20 years and were retired. This knowledge can be used to develop and enhance new programs, for this audience as well as for the next generation of landowners.

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54. What's New in the World of Remotely Sensed Data? - *Amy Hays*, Texas A&M University, Austin, TX; *Barron Orr*, University of Arizona, Tucson, AZ; *Sandy Prisloe*, University of Connecticut, Haddam, CT; *Phil Rasmussen*, Utah State University, Logan, UT

Do you have deer in your cornfields? Bugs in your cotton? Alga on your coastlines? Invasive plants in your watersheds? If you answered yes to any of these questions, then you need to find out how new technologies in remote sensing (RS) can help you. The applications of geospatial technologies are playing an ever-increasing role in conservation and natural resources management. Advances in the science and technology behind remote sensing are making it more practical to conduct large-scale inventories and provide monitoring and evaluation of natural resources. Specialist around the country are involved with using remote sensing in natural resource inventory, change analysis, vegetation detection, watershed delineation/water management, sediment or algae plumes in water, woodland management, thermal water temperature, coastal management, habitat preservation, and much more. There are many new (and enhanced old!) aerial and satellite solutions being used around the country that can provide critical information about the landscape. This poster provides a sample of what types of data are available for use, how to use them, and some of the technical aspects of these data. Several Geospatial Extension Specialists will be present to answer questions. Be the first on your block to know what LIDAR, MODIS, QuickBird, AVHRR, NAIP and many others can do for you!

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55. The National Research Initiative - It's Not Just for Research! - *Diana Jerkins*, Michael Bowers, and Eric Norland, USDA Cooperative State Research, Education and Extension Service, Washington, DC

The science of sustainability and the approaches to funding research, education and extension programs have gained increased attention at USDA Cooperative State Research, Education, and Extension Service. The agency's flagship competitive grants program, the National Research Initiative (NRI), has developed funding opportunities that take an integrated approach to the discovery and transfer of new knowledge. Thus, the NRI is a source of competitively awarded funds to support combined research, extension, and/or educational projects.

This poster will provide information about the NRI Request for Applications (RFA) Integrated process and provide examples of funded projects that have incorporated extension activities as a major component of the proposals. NRI programs that are accepting Integrated proposals will be shown and provide information on current focus areas that support integrated funding.

Poster materials will include information about where and how to learn of NRI funding opportunities, proposal forms and processes.

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56. The Virginia Tech Forestry Outreach Program and Website (FORSite) – Jeff Kirwan, John Seiler, and Michelle Prysby, Virginia Tech Department of Forestry, Blacksburg, VA

The Virginia Tech Forestry Outreach Program and website (FORSite) was started to meet a national need for K-12 science education, especially in the middle school years, and to increase general understanding of forest management concepts in the public at-large. Since 1998, the program has reached over 17,000 middle and high school students with face-to-face educational programs, and attracted an additional 20,000 visitors to its website. The program combines undergraduate student presentations to schools with interactive web content about natural resources. Selected undergraduate students in the Virginia Tech College of Natural Resources develop presentations on specific learning standards and give that presentation to schools during the fall semester. In addition, they prepare a web-based lesson on the same topic that can be viewed year-round, and becomes a permanent addition to the website, <http://www.fw.vt.edu/dendro/forsite/contents.htm>. Some presentations involve scientific investigations performed by middle-school students who then report their results and conclusions over the web. Undergraduate student performance is based on teacher evaluations of their presentations, success in communicating and scheduling with teachers, and their web site contribution.

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57. Using the Web to Facilitate Extension Program Delivery and Management - *Scott Leavengood*, Oregon State University, Corvallis, OR

Needs Assessment; Program Development/ Delivery/ Evaluation; Documenting Impact – These phrases are well-known to Extension professionals. Successful Extension professionals must conduct all these activities in a time of shrinking resources and increasing demand. Maintaining a website can be seen by Extension professionals as ‘just one more thing to do’ on top of already full schedules.

While recent reports have shown that natural resource clientele still prefer ‘traditional’ modes of communication (face-to-face or telephone) over email or websites, it is becoming increasingly difficult to use traditional modes to reach a diverse, dispersed, and busy clientele. Equally challenging is finding the time and resources to periodically evaluate clientele needs and to assess program impact. However, there are several ways the web can be used to facilitate Extension program delivery and management.

The presentation will highlight use of the web to improve the effectiveness and broaden the reach of Extension faculty. Methods used include putting presentations, publications, and directories of manufacturers and service providers on-line. Other approaches include the use of forms for program registrations and for tracking usage of educational materials and conducting user surveys. The use of Webstats services to rank clientele prioritization for specific educational efforts will also be presented. A case example describing the use of all of the methods along with the results of a follow-up survey will be presented.

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58. The National Geospatial Extension Program: Applications, Impacts, and Opportunities for Natural Resource Management Professionals - Nathan Mattox, University of Missouri, Columbia, MO; Amy Hays, University of Texas, Austin, TX; John McGee, Virginia Tech, Blacksburg, VA; John Nowatski, North Dakota State University, Fargo, ND; *Barron Orr*, University of Arizona, Tucson, AZ; Sandy Prisloe, University of Connecticut, Haddam, CN; Phil Rasmussen, Utah State University, Logan, UT; Karisa Vlasek, University of Nebraska, Omaha, NE; and Nathan Watermeier, Ohio State University, Columbus, OH

The National Geospatial Extension Program is a partnership between the USDA, NASA, and NOAA. Currently 14 states have adopted the geospatial extension program model.

In each participating state, a Geospatial Extension Specialist (GES) acts as a knowledge broker, or the two-way conduit between research, applications development and practice. The specialists builds on existing Earth science capabilities, which include Earth observations from space, modeling and systems engineering, geographic information systems (GIS), the global positioning system (GPS) and spatial decision support systems (SDSS).

Specialists interact directly with a variety of constituents, including extension agents, specialists, and administrators, local communities, state government agencies, and federal agencies working in programs in each respective state. Each state maintains a relatively unique focus, or area of interest which may include local and regional land use planning, precision agriculture, invasive species monitoring and mitigation, and range lands, conservation planning, endangered species monitoring, and water quality related assessments. This panel presentation will provide examples of application areas from several member states.

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59. Demystifying GPS, GIS and Cooperative Extension - Douglas McLaren, University of Kentucky, Lexington, KY

Two recently developed technologies, GPS (Global Positioning System) and GIS (Geographic Information System), are decision making tools that can support the work of resource managers, professional and lay persons.

The question raised by state Cooperative Extension Services is, “What is the resource landowner doing to keep pace with these new technologies?” The knowledge gap related to the use of these technologies is high for the resource owner who has neither the time nor proficiency to use these software programs. The question asked by the landowner is, “Are these technologies worth my time and effort required to learn to use them?”

Kentucky’s Cooperative Extension forestry department is addressing this issue is by providing short one day sessions designed to help landowners evaluate the technologies of GPS and GIS. The landowners are introduced to user-friendly, easy to use software programs rather than to more sophisticated and time consuming programs. These one day sessions explain what GPS and GIS programs are and what they can do for the landowner.

After completing the day long program, many landowners realize that they have a desire to tackle the next level of these two technologies. Others recognize that their needs would be best served by professional resource managers who can assist them in making the necessary decisions.

Users of the Cooperative Extension’s trainings are assisted in understanding GPS and GIS technologies. Through this program resource owners are taught how to determine the various levels of “ability” while maintaining their resources’ “sustainability.” =

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60. Perceptions of Woody Biomass Guide Community Outreach Program - *Martha Monroe*, Richard Plate, Melissa Palmer, Lauren McDonell, University of Florida, Gainesville, FL

Concerns about energy security and climate change are helping communities reconsider an age-old solution to their energy needs – wood. In many parts of the South, waste wood can be collected from storm damage, tree trimming, land clearing, road building, and harvesting operations. In some areas, plantations of short-rotation woody crops and alternatives to a declining pulp market could also be directed toward energy production. Whether or not a community accepts wood as an energy source, however, is largely dependent upon perceptions and outreach materials.

An extension program based in Florida is assessing community perceptions and public understanding of wood as an energy source to inform the development of outreach materials and community involvement processes. After an initial literature review, we conducted interviews in two communities using a 3CM process (Cognitive Concept Content Mapping) to understand how people categorize information about using wood for energy. Then we conducted a survey of residents in the wildland-urban interface in 14 counties in the South. Initial findings and recommendations will be reported.

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61. Using Practical Tools and Techniques to Create Sustainable Communities - *Myra Moss*, Ohio State University Extension, Findlay, OH; William Grunkemeyer, Ohio State University Extension, Wooster, OH

Extension community professionals working with organizations, groups, public leaders and residents are often challenged to facilitate consensus in the midst of strongly held differences in values and goals. Those passionate about preserving the environment are often at cross purposes with those promoting economic growth and vitality. Some concerned with issues of diversity and equity feel left out of the power structure and resource stream. Although often expected to, it is difficult for Extension professionals to broker understanding in an environment of perceived mutually exclusive goals. But, by incorporating awareness and understanding of sustainability into educational programs and by applying innovative tools and techniques that help to build community sustainability, Extension professionals can assist communities in understanding sustainable concepts and discovering their shared, balanced vision.

Participants will obtain information regarding innovative tools and techniques that have been successfully used to formulate sustainable community plans in Ohio. Innovative planning approaches focus on: 1. Practical methods that help residents understand and develop interconnections and linkages between the environmental, social and economic sectors of their community, 2. How communities can build an inclusionary governance and visioning process supportive of sustainable development, 3. Helping residents to think long term, stretching their vision to future generations, 4. Assisting communities and organizations to build multi-dimensional indicators that are effective in guiding and evaluating success toward reaching sustainability goals. The outcome will be that Extension professionals will obtain information on these sustainability tools and techniques in order to incorporate them into their applied educational efforts.

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62. Educating Extension Professionals in Sustainability - *Robert Newhall*, Utah State University, Logan, UT

The Western Region Sustainable Agriculture Research & Education Program (Western SARE) is one of four regional centers that administers a competitive grant program under USDA's Cooperative State Research, Education and Extension Service oversight. A major thrust of its activities is the adoption of sustainable practices "on the ground." To accomplish this, Western SARE has for three years incorporated into its Farmer/Rancher grants program the Professional + Producer Grants. These grants seek to empower

agricultural/natural resource professionals to apply directly for research and educational funding dealing with sustainable topics with producers on their own land/operations. This provides an opportunity for these professionals (many of whom are County Extension Educators/Agents) to enhance their own professional development training in sustainability. These grants have proved successful in training both professionals and landowners in new sustainable ideas, practices and techniques. By providing this avenue for professional development, the Western SARE program aims to provide unique training opportunities to continue the adoption of sustainability on the land, with the people who work it and in the communities that support them.

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63. Taking "Productive Conservation" to Homes and Farms Across the Nation - *Jim Ochterski*, Cornell Cooperative Extension SCNY Agriculture Team, Montour Falls, NY; *Rebecca Hargrave*, Cornell Cooperative Extension of Chenango County, Norwich, NY

The concept of “productive conservation” implies utilizing local natural resources to achieve an economical and ecological win-win situation. Windbreaks and buffers that generate income through decorative woody florals, livestock pastures that foster grassland bird habitats, and non-timber hardwood forest crops exemplify this intriguing balance. Productive conservation integrates many of Extension’s core areas of research and outreach in natural resources and modern agriculture.

County and campus Extension offices nationwide have an opportunity to make productive conservation a compelling flagship program in Extension natural resources. As a programmatic focus, it can place Extension education at the intersection of farm profitability, natural resource management, and non-farm land management. Productive conservation is Extension's link between our traditional agriculture base and the proliferation of non-farm rural landowners, many of whom are reluctant to actively manage their property. This poster will describe and compile a list of the current productive conservation program efforts being made in New York. Additionally, the poster will identify what makes productive conservation marketable to farmers and non-farm rural landowners, to forest and wildlife researchers, and to funders as well.

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64. Sustaining the Wood Processing Industry in Pennsylvania: An Assessment of the Educational and Training Needs of the Wood Processing Industry Personnel in North Central Pennsylvania - *Timothy Pierson*, Penn State Cooperative Extension-Central Region, Smethport, PA; *Mark Douglass*, Penn State Cooperative Extension-Central Region, Brookville, PA

A coalition of educational entities including: Penn State DuBois- Continuing Education, Jefferson County-DuBois Area Vocational Technical School and Penn State Cooperative Extension- Central Region conducted a survey of the secondary wood processing industry in ten contiguous counties located in central Pennsylvania. The purpose of the survey was to identify the educational needs of the secondary wood processing industry. The survey was adapted from statewide census surveys of the forest industry completed in Virginia, Minnesota and Oregon by Smith, Bowe, Massey and Hansen reported in 1997 and 1999. The adapted survey focused on the importance, knowledge and educational need regarding a list of 37 jobs, skills and competencies associated with secondary wood processing and the best method for delivering information and training. Product pricing, safety regulations, quality and process control, plant management and finance, and sales abilities were identified as the top five areas of overall importance. This corresponds very closely to findings in other states. Plant management and finance, product pricing, motivating personnel, sales abilities and process improvement were the top five ranked educational needs for all

companies. However, there were significant differences in the educational need ranking by company size and company type. The most preferred methods for receiving information or training were Training on-site, Videos, One-day workshop, Personal visits, and Training manuals. Workmen's compensation, domestic economy, government regulations, skilled labor force availability and timber harvest restrictions were identified as the top five outside factors impacting operations of wood products companies. Global competition was identified as the greatest barrier or challenge to marketing products now and in the next five years. It is likely that the educational need rankings and training method preferences may apply to secondary wood processors elsewhere.

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65. Healthy Forests Need a Healthy Forest Products Industry: Helping Value-Added Companies Increase Their Manufacturing Efficiency - *James E. Reeb*, James W. Funck, Charles C. Brunner, Oregon State University, Corvallis, OR

A productive and profitable forest products industry is necessary for sustainable forests. Forest products firms located in countries with lower labor costs and less stringent health, safety and environmental laws are competing against U.S. companies. Those U.S. companies that do not become very efficient at what they do will go out of business. The objective of this study was to research how processing efficiency at a value-added wood products firm would change by switching from traditional manufacturing to lean manufacturing, specifically by using work cells. The current plant operation was modeled using discrete event simulation. The model was then modified to include cell manufacturing to assess any added efficiencies. Work cells have been found to reduce lead time, work in process, and to enhance communication on the shop floor. Batch size, part travel time, and the ratio between value-added and non-value-added time were assessed during the study. Each of these measures of efficiency improved after switching to manufacturing cells.

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66. New Technology For Extension Work in Watershed Management - *Bill Sciarappa*, Rutgers Cooperative Extension, Monmouth County, Freehold, NJ; *Cara Muscio*, Rutgers Cooperative Research and Extension, Toms River, NJ

Agricultural and Resource Management Agents face several major environmental issues related to land use and water supply. Such concerns include agricultural, residential, industrial and open space needs, water quantity/quality for irrigation and recreation, non-point source pollutants, stormwater runoff, healthy food, and drinking water supplies. Many important streams, rivers and tributaries are rated as moderately to severely impaired by the Department of Environmental Protection. These important waters draw from lands used by rural, urban and suburban populations, farms, golf courses, parks, state forests, light industry, commercial fisherman, commercial boaters and recreational activities.

New tools and technology can help agents collect environmental data, coordinate key organizations, organize scientific knowledge, and disseminate facts about agricultural, municipal and home gardener contributions to non-point source pollution. Examples of these new tools and technology include bacterial source tracking techniques, digital multi-parameter probes, GIS-GPS, digital communication services, smart classrooms, E-mail and on-site demonstrations of new best management practices for farms, forests and towns. Extension can help lead this comprehensive approach in developing best management solutions throughout the watershed.

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67. Interactive Internet Experiences with Watershed Concepts: Targeting Youth, Elementary and Middle School Educators - *Dr. Tabitha Madzura and Deepa Mani*, Missouri Watershed Information Network (MOWIN), University of Missouri-Columbia, Columbia, MO

Water is costly to purify and transport, impossible to substitute - and essential to food production, economic development, plant and animal life. In the United States over 250 million people depend on rivers, lakes, streams and ground water supplies for their drinking water. Approximately 184 water bodies are listed on Missouri's 2002 303 (d) List for Impaired Waters and require immediate restoration to designated uses. Many streams suffer from low water volume, organic enrichment, siltation and polluted runoff. There is need to address surface runoff, groundwater, sediment, in-stream nutrients, wildlife and fish populations from the perspectives of researchers, state and federal conservationists, local citizen-based watershed groups, natural resource interest groups, landowners, farmers, young children plus local officials. MoWIN proposed to develop and disseminate interactive watershed information web sites for use in schools (grades 4-8) in five Missouri watersheds. Objectives included: providing information to encourage participation in watershed stewardship; increasing knowledge and understanding about watersheds and facilitating development of skills to identify and prevent nonpoint source pollution.

Web site topics included history, agricultural activities and statistics, human impact on the environment, recreational resources, non-point source pollution and prevention, plant and animal life plus water quality information: <http://outreach.missouri.edu/mowin/Project31903/webtools.html> and water-related interactive websites <http://outreach.missouri.edu/mowin/Project31903/interacmowin.html>.

Science teacher workshops and hands-on interactive activities were designed and implemented 2004-2006 to disseminate this information. Compact disks (CDs), brochures and fliers were additional instructional materials made available to parents, students, teachers and youth leaders. Evaluations were positive and requests for additional materials were overwhelming. Dissemination of this information continues through after school programs, teacher conferences, watershed festivals and other youth related forums and programs.

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68. The Landscape Management System: A Tool To Evaluate Alternatives For Sustainable Forest Management - *James B. McCarter*, University of Washington, Seattle, WA

The Landscape Management System (LMS) is an evolving set of computer software tools that allows the user to evaluate alternative management approaches on forested landscapes. LMS integrated forest inventory information, growth & yield models, visualization, and analytical tools into an easy to use Microsoft Windows® application. LMS provides a variety of analyses to evaluate the impacts of management decisions on visual aspects, carbon storage, wildlife habitat, fire risk, growth & yield, volume production, financial analysis, and more.

Sustainable management of forested landscapes aims to ensure that outputs from the forest meet current and future needs and are compatible and consistent with the goals of the landowner and society at large. Implementation of sustainable management is often complicated when landowners do not have clear targets or indicators for determining sustainability. Many of the currently developed indicators are current outputs from the various tables within LMS; however a number of indicators cannot be computed by LMS because they are administrative in nature. Additional output tables are easily developed in LMS to provide information and analysis of additional indicators as they become available.

Management plans can easily be developed using LMS to provide quantitative analysis of changes in forest condition with growth, management, and disturbance. By combining the quantitative analysis with the administrative aspects of the management plan a more effective evaluation of the impacts of alternative

management approaches can be done. Improved assessment of the impact of our management decisions provides for improved management plans leading to more effective and sustainable management of our forested natural resources.

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69. Title III and Natural Science Youth Education - Janet Nagele, Oregon State University Extension Service, Oregon City, OR

This poster will introduce conference participants to Federal Title III funds available through County Commissions and a variety of youth natural science programs that were implemented in Clackamas County, Oregon by 4-H staff over a four year period using Title III funds. Programs highlighted will include: after-school natural science programs, summer school programs, residential camps with a natural science focus, teacher natural resource and curricula training, and traditional 4-H club programs. Many programs reached new audiences including Hispanic families and at-risk youth. Program evaluation methods, results and impacts will also be shared. As of August 2005, future federal approval to allocate additional funds for another five years is pending. We should have a final decision by conference time and will share funding status and how to apply for new Title III funds if available.

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70. Forest Landowners and the Internet: A Review of Existing Sites and Recommendations for Development of an Effective Extension Web Presence - Eli S. Sagor, University of Minnesota Extension Service, St. Paul, MN

The internet is becoming an increasingly important medium for Extension programming. Producing high-quality internet resources to support Extension programming requires major investments of both time and money. In order to maximize the impact of internet investments, the University of Minnesota Extension Service has conducted a review of internet resources targeting the nonindustrial private forest (NIPF) owner audience.

The purpose of the review was to learn from the experiences and experiments of those already active with internet-based Extension (or similar) programming. Research staff conducted click-through reviews and structured interviews with the managers of 32 different websites targeting NIPF owners. Reviewed sites were divided into eight categories (*e.g.* geographic information, virtual tour, portal, etc) based on site content, technologies used, and objectives.

Budgets ranged from just over zero to hundreds of thousands of dollars per year. Some sites focused on fostering local communication, others on organizing vast and detailed information into a more accessible format, others on guiding users through complicated decisions. Owners of reviewed sites include commercial, educational, and agency, and nonprofit organizations.

This poster will provide a brief overview of the research results. It will close with practical recommendations to guide the development of Extension internet resources targeting NIPF owners. Recommendations address financial, technical, maintenance, and other issues relevant to Extension professionals planning future internet-based programming.

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71. Evaluation of a Table Top Exhibit For Natural Resources Education With Youth - Amy L. Carrozzino and *Sanford S. Smith*, Pennsylvania State University, University Park, PA

Research with youth, ages 9-12 years old, evaluated the effectiveness of a free-standing, table-top exhibit entitled “Threats to Pennsylvania’s Wildlife”. A short written survey assessed the use of the exhibit in conveying the three major threats to wildlife in Pennsylvania, specifically: habitat loss and destruction, pollution, and the spread of invasive species.

Participating students, in both exhibition and classroom settings, were randomly assigned to one of two experimental groups- the first group received a pre-survey covering basic knowledge about threats to wildlife in Pennsylvania, and then completed a similar post-survey after viewing the exhibit. The alternate group simply viewed the exhibit and completed a post-survey identical to those taken by the first group. The two-group method allowed for adjustment of the instrument effect.

Survey analysis compared student demographics, place of residence, and survey setting with knowledge gained. Results demonstrate that table top exhibits are useful in conveying information and facilitating learning; however the effectiveness of exhibits as teaching tools in these two settings is influenced by many factors.

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72. CFEGroup.org - On the Forefront of Continuing Education Training - *Eric Taylor*, Texas A&M University, Overton, TX; *C. Darwin Foster*, *Melanie Kirk*, Texas A&M University, College Station, TX

As Extension professionals, it is important to incorporate technological advancements into our programs in order to remain relevant to our constituents, compete with their busy personal and professional schedules, and to remain at the forefront of all education efforts. Perhaps at no other time in the history of Cooperative Extension has this statement been more significant than it is now because adult learners have become more discriminating about choosing their continuing education opportunities than ever before. They have significant time and cost constraints and increasingly rely upon distance education and technology-enhanced learning for the information and/or training they seek. To compete, Extension professionals need to employ the “speed-to-market” philosophy and virtual educational opportunities. For these reasons, the Texas Cooperative Extension Forestry Unit has partnered with other forestry professionals and computer information specialist to developed a web-based “store front” for continuing forestry education opportunities. During this talk, we will present the CFEGroup.org website, discuss its goals and objectives, and review its capabilities. We will look at the account management capabilities within CFEGroup.org designed to assist foresters and other natural resource professionals with tracking and reporting of Continuing Education Units (CEUs) required by various professional societies and agencies. We will closely examine module development terms and concepts and how module design fulfills the face-to-face time requirements set by various CEU granting organizations and agencies. Lastly, we will discuss opportunities for collaborative module development.

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73. National Network for Sustainable Living Education (NNSLE) – *Nancy Peterson* and *Richard Stone*, University of Florida, Gainesville, FL

The National Network for Sustainable Living Education is an emerging initiative designed to address wasteful resource consumption in the United States. Created by a group of ANREP members in 2004, its mission is to “improve the quality of life and reduce environmental degradation by fostering new consumption patterns and sustainable lifestyles through CSREES Extension programs.”

NNSLE's goals are to provide a network for the exchange of conceptual information; partner with organizations which serve similar clientele; develop core curricula for a variety of audiences; integrate existing programming with a national sustainable living education program; ensure top quality research-based education; and encourage rigorous and consistent program evaluation.

Currently, 17 resource professionals from eight land-grant universities and three administrators from CSREES are active members. Natural resources Extension professionals are encouraged to join the network.

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74. Take Action! The Past, Present and Future of Sage-grouse Conservation Planning in Utah – *Sarah G. Lupis*, Terry Messmer, Todd Black, Utah State University, Logan, UT, S. Nicole Frey, Southern Utah University, Cedar City, UT, Joan Degiorgio, The Nature Conservancy, Salt Lake City, UT, Dean Mitchell, Utah Division of Wildlife Resources, Salt Lake City, UT

Utah has a long history of local conservation planning for sage-grouse populations. The San Juan County Gunnison Sage-grouse Local Working Group (SWOG) was formed in 1996 and completed a local conservation plan in 2000; the Parker Mountain Adaptive Resource Management Local Working Group (PARM) was established in 1998 and has been a model for sage-grouse conservation planning throughout the state. In July 2006, most of Utah's 11 adaptive resource management local working groups will have completed local conservation plans for sage-grouse that address the unique issues affecting their respective areas. Each local working group is made up of diverse stakeholders including landowners, state and federal agency personnel, and nongovernmental organizations. This effort was achieved through the use of neutral facilitation provided by Utah State University Extension and The Nature Conservancy's Conservation Action Planning (CAP) process. We discuss how neutral facilitation and the CAP process contributed to the successes and challenges faced along the way and the future of local sage-grouse working groups and in the state of Utah.

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75. Reaching out to New Clientele: Natural Resource Extension through Master Naturalist-type Programming - *Robert Emanuel*, University of Arizona Cooperative Extension, Tucson, AZ; *Maria Ryan*, University of Nevada Cooperative Extension, Las Vegas, NV; M. Main and G. Allen, University of Florida IFAS Extension, Immokalee, FL; W. Albrecht, University of Arizona Cooperative Extension, Flagstaff, AZ; and A. Rager, University of Minnesota Extension Service, Morris, MN

Dramatic demographic change across the U.S. is forcing Cooperative Extension to adapt its natural resources programming to a more urban, suburban, or exurban clientele. Many states are developing or delivering natural history programs under the umbrella of the Master Naturalist model. In 2003, a national-level organization was formed to assist these programs. The mission of the National Master Naturalist Alliance is to promote awareness and citizen stewardship of natural resources through science-based education and community service. Among the many state programs, there are 13 states in which Cooperative Extension is involved in Naturalist-type programming. Naturalists seek to better understand the natural world, while providing a bridge for communication between academic, land management, and scientific institutions on one side and the general public on the other. Audiences are extremely varied, including land managers, immigrants, children, educators, businesses, traditional agriculturalists, retirees, suburbanites and urbanites. Variations on naturalist training may encompass thematic approaches such as those focused around water resources, wildlife, geosciences, or conservation. Traditional extension programs, although still important, increasingly do not serve emerging, board-based communities. Livelihood-based communities are now being replaced with "lifestyle"-based communities such as "ranchettes" on subdivided ranchlands. Naturalist programming provides meaningful way to engage this

clientele. It can also decrease contention in formerly adversarial relationships between traditional clientele and land managers. Naturalist-type programming provides opportunities to extend natural resources research to our clientele, while building a better-informed, more organized and lower impact citizenry. This poster will highlight some successful examples in different stages of development in Arizona, Nevada, and Florida.

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76. Extending Animal Traction to the Classified Forests of the Republic of Guinea to Aid in Establishing Sustainable Forestry - *David W. Patterson*, University of Arkansas, Monticello, AR

The villagers around the classified forests of Guinea have been clearing forest land to plant crops and abandoning the land after it has ceased to be productive. To stop the forest depletion, a plan was developed to establish sustainable forestry on the classified forests and the national forestry agency and villagers have agreed to live under its guidelines. The plan included an allowable annual cutting limit which is strictly enforced.

The hope was to instill in the villagers a sense of value in the trees; thereby, resulting in less damage to the forests. It was felt that to maximize the value of each tree, all of its parts should be moved to the roadside for processing so that all of the resulting products can be loaded on passing trucks for transport to the cities.

The plan was to have the villagers use animal traction to move the wood to the roadside. The villagers did not know about animal traction; therefore, I was requested to train the forest technicians so they could train the villagers in using their cattle to move the wood from the forests. We had to design a small yoke for the small size cows they have and construct a wagon made of junk car parts to haul the wood. In one forest, the logs were bigger and we had to design a block and tackle to give the cows a mechanical advance in rolling the logs onto the wagon. After the process was demonstrated, the forest technicians were encourage to help in developing the outline for the training manual that was written for them to use in training the villagers.

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