

# SUSTAINING THE NATION'S FOREST AND RANGELAND RESOURCES FOR FUTURE GENERATIONS

**RREA**  
2018-2022



RENEWABLE RESOURCES EXTENSION ACT STRATEGIC PLAN FOR THE STATE FEDERAL PARTNERSHIP

Sustaining the Nation's Forest & Rangeland Resources for Future Generations  
RREA Strategic Plan for 2018–2022

August 2018

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## REVISITING THE PURPOSE OF THE RENEWABLE RESOURCES EXTENSION ACT (RREA)

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*In creating the RREA, Congress called on each state to “provide useful and productive educational programs for private forest and range landowners and processors, and... users of forest and rangeland renewable resources.”*

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In June of 1978, Congress passed the Renewable Resources Extension Act (RREA) “to provide for an expanded and comprehensive extension program for forest and rangeland renewable resources.” The first appropriation from Congress was in 1982. Given that more than three decades have passed since this initial legislation was enacted by Congress, and due to considerable new challenges and pressures on government, academic, and stakeholder finances, as well as on global environmental conditions, it is important to revisit the original intention of the RREA. The following excerpts clearly articulate Congress’s intention:

- *the extension program of the Department of Agriculture and the extension activities of each State provide useful and productive educational programs for private forest and range landowners and processors and consumptive and nonconsumptive users of forest and rangeland renewable resources, and these educational programs complement research and assistance programs conducted by the Department of Agriculture;*
- *to meet national goals, it is essential that all forest and rangeland renewable resources (hereinafter in this Act referred to as “renewable resources”), including fish and wildlife, forage, outdoor recreation opportunities, timber, and water, be fully considered in designing educational programs*

Further, USDA and State directors of Cooperative Extension are called on to implement **enhanced educational programs on renewable resources that do the following:**

- *enable individuals to recognize, analyze, and resolve problems;*
- *disseminate the results of research;*
- *transfer the best available technology;*
- *give special attention to small, private non-industrial forest landowners;*
- *provide continuing education programs; and*
- *deliver a comprehensive education program for landowners and managers, public officials, and the public, with particular emphasis on youth.*

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*States should develop a single comprehensive and coordinated renewable resources extension program in which land-grant university roles are well-defined.*

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Examples of programming included, but were not limited to, meetings, short courses, workshops, tours, demonstrations, publications, news releases, and radio and television programs.

In addition, state directors and heads of Extension programs were tasked to develop “a single comprehensive and coordinated renewable resources extension program in which the role of each eligible college and university [land-grant] is well-defined.”<sup>1</sup> Key to this process are consultation and agreements with Extension professionals and key state and federal organizations. The overall purpose of RREA clearly stated a commitment to *promote policies and practices that enhance the health, vitality, productivity, economic value, and environmental attributes of the forest [and range] lands of the United States.*

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<sup>1</sup> Renewable Resource Extension Act of 1978. <http://bit.ly/2M9POkV>



# CONTRIBUTIONS OF RREA TO COOPERATIVE EXTENSION PROGRAMS

The Renewable Resources Extension Act is administered by the National Institute of Food and Agriculture (NIFA), an agency of the United States Department of Agriculture (USDA). The Congressional appropriation provided to RREA is allocated on a formula basis to 73 land-grant institutions and leveraged through numerous partnerships to enhance Cooperative Extension programming, particularly for private owners and managers of forests and rangelands.

RREA is unique among the capacity programs at NIFA in that it is a blended program of capacity and competitive funding. Most of the funding is awarded directly to the states as capacity funds, but a small amount is used every year for the competitive RREA National Focus Fund Program (NFF). The goal of the NFF program is to enhance the sustainability of the nation’s forest and rangeland resources through the development of innovative programs that can be delivered at regional and national scales. These projects maximize the capacity, reach, and impact of the Cooperative Extension System – Extension Forestry and Rangeland Programs and result in Extension programs that span state boundaries in order to share expertise to address common problems.

Two previous strategic plans (2005 and 2012), each based on input from RREA funding recipients, provided context on trends affecting the condition of forests and rangelands, as well as guidance on stakeholder needs to address those trends. Table 1 provides documentation of RREA-supported programming achievements for the years 2012–2016:

Table 1: Summary of Quantitative Indicators Compiled by RREA<sup>2</sup>

Number of educational events conducts	Number of private landowners, managers, and public land users who implemented or adopted a new practice or management program	Number of direct and indirect contacts who increased awareness or knowledge	Number of forest and rangeland acres impacted
5,760	73,749	13,252,089	52,491,229
Number of new jobs created	Number of new forest, rangeland, or fish and wildlife income-generating businesses created or expanded	Estimated number of dollars earned or saved by forest, rangeland, and fish and wildlife income-generating business	
3,153	1,148	2012–2016 Total 269,315,698	Annual Average 53,863,140

The 2018-2022 plan builds on the accomplishments and impacts that resulted from earlier plans, while recognizing new and growing pressures from various sectors, such as these:

- Continued reductions in federal and state funding for renewable natural resources programs.
- Growing uncertainty about changing climate conditions—a trend also emphasized in the 2016 *Update to the 2010 Resources Planning Act (RPA) Assessment*.<sup>3</sup>

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*RREA is unique in NIFA in that it is a blended program of capacity and competitive funding.*

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*RREA programming achievements include the adoption of new management practices by more than 73,000 landowners and managers.*

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*Continuing threats to forest and rangeland ecosystems and services include changing climate conditions, pest infestations, and land fragmentation.*

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<sup>2</sup> Data provided by USDA NIFA RREA.

<sup>3</sup> USDA Forest Service. 2016. Future of America’s Forests and Rangelands: Update to the 2010 Resources Planning Act Assessment. Gen. Tech. Report WO-GTR-94. Washington, DC. 250 p.

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*Cooperative Extension translates science into useable, practical, and relevant information that people use to improve their lives and/or livelihoods.*

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- Threats to forest and rangeland ecosystems such as native and invasive pest infestations, wildfire, drought and other extreme weather events, and increased stress on groundwater supplies.
- Land development resulting in the fragmentation of forest and rangeland ecosystems that threatens water resources, wildlife habitat, livestock production, forestry enterprises, or outdoor recreation, or that increases the wildland–urban interface (WUI) or the threat of wildfire to communities.

At the same time, increasingly sophisticated technologies are changing the way people learn and access information, thus necessitating a greater focus on alternative teaching and training methods and increased attention to more nuanced evaluation and monitoring.

The good news is that the Cooperative Extension System is well-positioned to address these issues directly with key stakeholders. For more than 100 years, Extension educators have been effectively distilling research results and providing unbiased scientific information and useful technologies to the public. As the Extension Committee on Organization and Policy (ECOP)<sup>4</sup> states,

*Cooperative Extension is a unique network that links local and campus-based Extension professionals from land-grant universities – along with federal, state and local partners – to residents of more than 3,000 counties/parishes/villages in all 50 states, District of Columbia, and U.S. territories. [Cooperative Extension] translates science into formats that people use to improve their lives and/or livelihoods.*

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*Between 2012 and 2016, local economies received a little over \$13 for every \$1 RREA invested.*

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## RREA FUNDING AND STATE DISTRIBUTIONS: REALITIES, POTENTIAL, AND NEEDS

The FY 2017 RREA appropriation was \$4,060,000, or about 13.5% of the authorized funding level of \$30,000,000. More than 92% of these funds are distributed to eligible institutions<sup>5</sup> based on a formula considering a number of variables.<sup>6</sup> The additional 8% of funding supports RREA National Focus Fund Projects. In fact, the RREA program has been underfunded since it was signed into law in 1978. Despite this, the program has shown that capacity-building for Extension forest and rangeland programs results in valuable changes. Between 2012 and 2016, the annual average return in value of RREA programming to local communities was \$53,863,140 (Table 1). Thus, every \$1 invested in RREA contributed a little over \$13 to local economies.<sup>7</sup> If funded at the full authorized level, imagine what an additional \$25,940,000 would do for enhancing Extension forestry and rangeland programs at that expected return in value to local and state communities.

To more fully understand the impact of funding levels on Extension forest and rangeland programs, the 2018–2022 strategic planning team included a question in a national survey asking Extension specialists and educators to consider how they would use an

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<sup>4</sup> ECOP, Association of Public and Land-Grant Universities. 2017. National Extension Handout. <http://bit.ly/2MM9tsd>.

<sup>5</sup> See full list of eligible institutions on page 29.

<sup>6</sup> The RREA distribution formula considers the geographic extent, ecosystem productivity, economic contribution, and population for each state.

<sup>7</sup> Calculated by dividing the average annual return on investment between 2012 and 2016 (\$53,863,140) by the annual appropriation of \$4,060,000.

additional \$10,000 for their programming. Respondents were able to select up to three options from a list of six. The top three responses were program delivery (64%), hiring personnel (57%), and technology use (50%). Evaluation (32%), professional development (27%), and publications (25%) were a lower priority.

These results suggest the majority of natural resource Extension educators feel program delivery, including the means to build program-delivery capacity such as hiring support personnel and investing in technology, is underfunded. An increase in funding of \$10,000 to each of the 198 natural resource Extension educators who responded to the survey would cost \$1,980,000; and this money, according to the survey, would be invested directly into building capacity in Extension forestry and rangeland programs. Using national estimates (13:1 ratio), this would result in a \$25,740,000 return to local and state communities, in addition to improved management of forests and rangelands.

The 2012–2016 strategic planning team proposed the development of a new funding model for RREA that contained both a formula-funded base program and a flexible, grant-based strategic incentives program. They also provided a funding plan to grow the RREA program to meet increasing and changing needs of Extension renewable natural resources clients. While the strategic, grant-based incentives program was adopted, there was no increase in the funding for RREA following the recommendations of the previous strategic plan. However, the need to increase funding for RREA remains relevant and vital to improving the capacity of natural resource Extension programs at both 1862 and 1890 land-grant institutions. The following table depicts how the RREA program should grow to meet the increasing demands for Extension forest and rangeland programming in order to address the pressing issues faced by forest and rangeland owners and managers.

Table 2: Funding Model for RREA (adapted from 2012–2016 RREA Strategic Plan)

Fiscal Year	Base	Strategic Initiatives	Total
2018	6,000,000	6,000,000	12,000,000
2019	9,000,000	9,000,000	18,000,000
2020	11,000,000	11,000,000	22,000,000
2021	13,000,000	13,000,000	26,000,000
2022	15,000,000	15,000,000	30,000,000

To achieve full authorized funding of \$30 million annually, the RREA program needs stakeholders who benefit from the program to advocate for increased funding. With this updated strategic plan as a guide, state Program Directors can inform employees, Extension professionals, and advisors who are supported by RREA funding about the goals of the program and their critical role in fulfilling its purpose. Ensuring that all RREA programming, including announcements, handouts, publications, and presentations, is appropriately identified is then of considerable importance. Such acknowledgement should take the form of the following statement for formula funds and strategic initiative grants:

*"This work is supported by the Renewable Resources Extension Act Program [grant no. XXXX-XXXXX-XXXXX/project accession no. XXXXXXX] from the USDA National Institute of Food and Agriculture."*

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*Since the beginning of level funding of \$4 million in 2004 the value of the dollar has declined by 33%, thus that \$4 million is worth only \$2.68 million today.<sup>8</sup>*

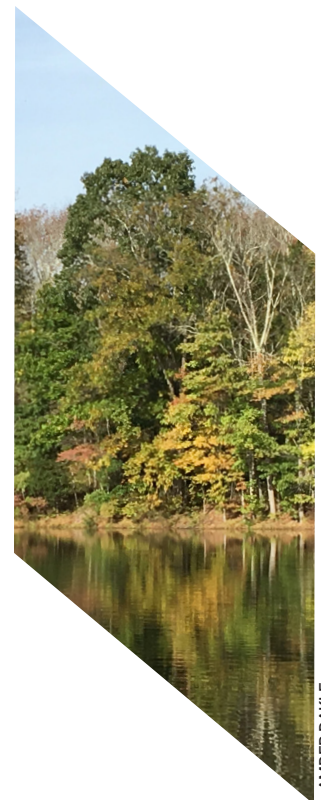
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*Stakeholders at all levels are called on to advocate for a fully funded RREA program that will enhance and extend the reach of Cooperative Extension throughout the country.*

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<sup>8</sup> Data provided by USDA NIFA RREA.

## RREA MISSION

The RREA Program expands the capacity of natural resource Extension educators to deliver current, relevant, research-based programs to help forest and rangeland owners, communities, policymakers, and the public make informed decisions in areas of critical importance to the ecological, social, and economic well-being of the nation.

## VISION FOR 2018 AND BEYOND

The RREA program is funded at the full authorized level and recognized as essential for bringing science-based information to forest and rangelands owners and to the people who use those lands, through innovative learning practices that lead to informed management and use decisions and to improved lives and livelihoods.

## CORE VALUES

**2018 Core Values (reconfirmed and adapted from 2012 statement):** This RREA strategic plan is guided by the principle that natural resource Extension programs are an efficient stimulant to well-managed forests and rangelands, and that these lands benefit society, sustain ecosystem processes and services, create economic opportunities, and meet the individual needs of those who own, manage, and/or use these lands.

## INTRODUCTION TO THE 2018–2022 RREA STRATEGIC PLAN

In the United States, more than half of the nation's forest<sup>9</sup> (441 million acres) and rangelands<sup>10</sup> (393 million acres) are privately owned. Recognizing that the sustainability of the nation's forest and rangeland resources largely depends on the actions of the millions of private forest owners, farmers, ranchers, and land managers, this next RREA strategic plan focuses on these critical stakeholder groups. However, this plan also suggests a renewed commitment to serving the needs of audiences noted in the original legislation, as well as those who were identified in the national survey as emerging audiences, including policymakers, the interested public, and youth.

<sup>9</sup> USDA. 2015. Who Owns America's Trees, Woods, and Forests? Results from the U.S. Forest Service 2011-2013 National Woodland Owner Survey. USFS: Northern Research Station. <http://bit.ly/2JW6BLI>

<sup>10</sup> US Forest Service. 2017. Rangeland Management webpage. <http://bit.ly/2MDpwIY>





This plan confirms a unified mission and vision for natural resource Extension programs funded by the RREA. It also provides insights into emerging technologies, shifting preferences for communication and learning, and changing demographics and audiences, and confirms the need to demonstrate value and cost-effectiveness for the use of federal tax dollars. In addition, the plan suggests strategies for improved evaluation, teaching methods, program delivery, and the incorporation of new technologies into programming. At the core of this plan is a description of nine critical issues, including goals, actions, and potential performance measures, that Extension professionals, administrators, and stakeholder groups identified as most relevant to natural resource management efforts.

At the same time, during the process of updating the plan, the potential continued loss of expertise was identified as a crucial issue, not only in terms of business enterprises but also in the changing leadership among forestry and rangeland professionals. In the coming years, the need for enhanced Extension programming will be even more important as current natural resource leaders retire and the next generation of professionals take their places or, even more significantly, due to the potential loss of positions through attrition. Increased mentoring and professional development programs will be vital, and meeting information needs through ubiquitous and emerging technologies to disseminate, inform, and teach will be essential.

Finally, the 2018–2022 strategic planning team believes that forest and rangeland Extension professionals will find this document useful in developing the enhanced programming made possible through RREA support. Indeed, the plan is designed to be informative about current trends and issues on a national basis while recognizing regional and local differences, and to provide guidance on programming strategies.

# RREA

## 2018-2022

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*In the coming years, loss of natural resources expertise due to retirements and attrition is viewed by many as an emerging critical issue.*

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## CRITICAL ISSUES

Building on the priority areas described in the two previous RREA strategic plans, the following nine critical social, ecological, and economic issues were identified as current priorities for Extension programming by survey respondents.<sup>11</sup> Though individual issues may vary in importance by region, the nine critical issues detailed in this document were ranked highly throughout the country. These issues do not exist in isolation, rather they are exceedingly complex and interconnected. Understanding connections between the different critical issues can help create programming solutions that span multiple issues and a variety of stakeholder needs. To assist stakeholders in making informed decisions, RREA programs should assess current and future local needs related to these issues and within the context of the RREA mission (as stated previously), as well as those, such as climate variability, restoration, and land conversion and fragmentation, that do not neatly fit into any one category but rather cut across multiple issues.



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<sup>11</sup> The critical issues below are organized in alphabetical order.

# ECOSYSTEM SERVICES

## Issue:

Demand for goods and services from our nation's forests and rangelands has always been present, though primarily in the form of commodity or market outputs. In recent decades, the focus has shifted to other uses now termed ecosystem services, such as recreation, non-game wildlife, biomass for energy, soil conservation, clean air and water, pollinators, and many others, in addition to traditional market goods.

## Background:

Managing our nation's forests and rangelands for the many ecosystem services requires novel approaches to multiple use management. Finding the appropriate mix of trade-offs is difficult as many of these ecosystem services do not generate a direct economic value and are not traded in the marketplace. As such, while forests and rangelands owners and managers could produce a variety of ecosystem services for their own personal satisfaction, there is little economic incentive to do so since they cannot be compensated. Another complicating factor is that different ecological states in a landscape produce different amounts of these goods and services. While healthy and functioning forests and rangelands are expected to provide more goods and services when considered in total, the actual mix depends on which ecosystem services society needs and wants more. Research-based information and education about those relationships and trade-offs is critical for making management decisions that do not always lead to increased returns to the landowner or manager. At the same time, educational programs aimed at consumers of those ecosystem services are key to developing an understanding of the importance of those nonmarket services to the health of the forests and rangelands and how they interact with community well-being.

## Goal 1:

Assist forest and rangeland owners and managers in actively managing their lands with knowledge of forest and rangeland ecosystem processes and how specific management strategies produce different combinations of ecosystem services.

## Actions

- Assess the level of knowledge of land owners, managers, and the public about ecosystem services.
- Assess the needs of forest and rangeland owners and managers at the national, regional, and local levels to determine the direction and extent of educational programs, resource limitations, and emerging issues.
- Develop educational programs that teach interactions of structure, function, and values of privately and publicly owned forests and rangelands.
- Develop educational programs that teach the effect of land-use and management actions on forest and rangeland ecosystems and resource values.
- Develop educational programs that teach science-based management strategies for addressing diverse societal demands for ecosystem services.

HIGHLIGHTED PROGRAM

**Global Rangelands** is a collaboration between 19 land-grant universities providing an online database for rangeland information including resources about ecosystem services.

The Rangelands Partnership.  
<https://globalrangelands.org>

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## Goal 2:

Assist forest and rangeland users in understanding the role different ecosystem services have on community well-being.

### Actions

- Implement educational programs to develop basic understanding of ecosystem services and how they are tied to forest and rangeland management.
- Develop educational programs on how ecosystem services can support rural communities and the people that live in them.
- Provide education on how different ecosystem services respond to climate variability and how to mitigate those responses.

### Performance Indicators

- Number of people gaining awareness and knowledge about ecosystem processes.
- Number of people gaining awareness and knowledge about how management practices can affect the number and mix of ecosystem services.
- Number of people in targeted rural communities who have increased understanding of ecosystem services.
- Number of people trained to measure quantity and mix of ecosystem services produced from a given landscape.
- Number of people changing management approaches.

## FISH AND WILDLIFE HABITAT

### Issue:

Fish and wildlife are public resources found on private, tribal, and public lands. Because more than half of the nation's forests and rangelands are in private ownership, the actions taken by private landowners have critical bearing on the nature, type, and extent of fish and wildlife habitat.

### Background:

Fish and wildlife are public resources that provide individual and societal benefits such as recreational opportunities, food and other products, and economic opportunities. Fish and wildlife impact the environment by affecting plant communities and influencing ecological processes and functions. They are indicators of forest and rangeland health. Fish and wildlife populations are directly linked to climate variability and to the management of habitats on forests and rangelands. Sustainable management of forests and rangelands results in improvements in natural biodiversity, increased wildlife and fish populations, decreased listings of endangered species, and fewer human-wildlife conflicts such as property and agricultural crop damage and wildlife-borne diseases that threaten domestic livestock and human health and safety. Educational programming that focuses on the sustainable management of fisheries and wildlife resources on forest and range lands seeks to impart methods to inventory, monitor, and manage species and their habitats while considering climate variability and balancing trade-offs. Extension professionals can provide landowners and managers with information and tools associated with managing for different species and outcomes.

**Building for Birds** is an online evaluation tool that addresses forest fragmentation and bird conservation in urban and rural areas. It serves to help the public understand habitat fragmentation by providing decision makers with a way to evaluate different development scenarios and understand how each scenario may affect habitat for different species of forest birds.

*Building for Birds.*  
University of Florida, IFAS  
Extension. <http://wec.ifas.ufl.edu/buildingforbirds/web/home.html>



### Goal:

Ensure that private landowners and natural resource professionals have the best available information about fish and wildlife resources to make informed decisions about habitat management in forest and rangeland ecosystems.

### Actions

- Partner with state fish and wildlife agencies and others to develop educational programs to help implement State Wildlife Action Plans.
- Develop educational programs for landowners and natural resource professionals focusing on fish and wildlife habitat management.
- Provide educational programs on how fish and wildlife are responding to climate variability and on possible strategies to mitigate its negative effects.
- Develop and implement peer-to-peer and citizen science programs to engage landowners in stewarding fish and wildlife resources.

### Performance Indicators

- Number of people with increased awareness and knowledge about the benefits, methods, and opportunities for fish and wildlife habitat improvement.
- Number of people who implemented at least one fish and wildlife habitat management practice.
- Number of forest and rangeland acres managed using an integrated and comprehensive resource management plan.
- Number of forest and rangeland acres of wildlife habitat improved.

## GENERATIONAL SUCCESSION AND OTHER LAND-OWNERSHIP CHANGES

### Issue:

Uncertainty about the future transfer of family forest or rangeland enterprises is becoming more commonplace. Increasingly, family natural resource enterprises are struggling with plans for succession to the next generation – whether the next generation is within the family or simply the next owner.

### Background:

The aging of current forest and rangeland owners managing their own natural resource-based business, combined with changing opportunities and expectations of the next generation of landowners, has created an urgency for many families to seek creative strategies for succession to maintain working landscapes. While there may be a younger person involved in day-to-day operations, family members that would typically inherit and take over the business are increasingly pursuing other career options. This lack of interest in forest and rangeland inheritance may lead to parcelization of land holdings and to a fracturing of rural and suburban communities. At the same time, land may go to new owners with less knowledge and experience in managing the land and little connection to the communities those lands historically served. This lack of familiarity with land management can have ecological and economic consequences that affect the land, community, and local government. Economic constraints, public land policy uncertainties, and unclear expectations also contribute to difficulties in the generational transfer of lands.

**Your Land, Your Legacy** helps landowners make decisions about the future of the land and helps families have the important conversations about continuing to care for the land.

*Deciding the Future of My Land: Your Land, Your Legacy.*  
UMass Amherst.  
<http://masswoods.org/legacy>



Even when there is interest in the family operation from the next generation, there is a need for a well-thought-out succession plan that includes management and ownership issues. This process may take place over many years and require the cooperation of people representing various stakeholder groups. “The succession steps involve planning, selection and preparation of the next generation, transition in management responsibilities, [and a] gradual decrease in the role of the previous managers.”<sup>12</sup>

### Goal 1:

Enhance the decision-making ability of ranch and forest landowner families for generational succession by providing information on and facilitating communication about such planning options as conservation easements, community-based natural resources management (i.e., strategies for enhancing conservation outcomes while also seeking to improve rural livelihoods), or other non-traditional succession models.

### Actions

- Provide an array of planning and decision-making tools families can use to determine and implement successful generational transfer of land and natural resource-based businesses.
- Provide avenues for improving awareness, increasing communication, and strengthening strategic planning skills within the family operation.
- Build partnerships and facilitate communication among land conservation and trust organizations and forest and rangeland owners and organizations.

### Goal 2:

Train and link interested parties in collaborative partnerships that will augment generational transfer of forest and rangeland enterprises.

### Actions

- Provide landowners with information about resources and assistance available from agencies and organizations.
- Provide a mechanism (meetings, workshops, fairs, websites, social media) for disseminating succession information from agencies and organizations to landowners.

### Performance Indicators

- Number of people attending meetings or workshops.
- Number of requests for new or existing land transfer materials.
- Number of landowners who implemented at least one new practice to ensure the retention of current land uses.
- Number of acres protected from conversion to ensure retention of current forest and rangeland uses.



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**Heirs Property Program** helps landowners navigate the process to remove the heir property designation, allowing increased economic opportunities from the land.

*Heirs Property Program. Florida Agricultural and Mechanical University. (This website is under construction)*

HIGHLIGHTED PROGRAM

<sup>12</sup> Taylor, Bill, ed. 2010. Succession in the Family Business; Enterprising Rural Families, An Online Newsletter, January 2010, volume VI, issue 1. <http://bit.ly/2lbbXgm>

# INVASIVE SPECIES

## Issue:

Non-native, invasive plants, animals, insects, and pathogens are establishing and spreading throughout the nation's forests and rangelands. Most of these introductions are undesirable, since they can destroy valuable cultivated agricultural and forest crops; displace native species; and disrupt healthy, functioning ecosystems.

## Background:

Nearly 6,300 species of non-native plants, animals, insects, and pathogens have been introduced to North America in the 500 years since European settlement. Often non-native species are intentionally introduced for commercial production, landscaping, pest control, or land conservation, but once established they frequently result in negative economic and environmental consequences. To address the challenges associated with invasive species, investment in research and development of Integrated Pest Management (IPM) strategies is essential. Further, support of educational outreach efforts for landowners, managers, regulatory authorities, and the general public is equally essential to insure implementation of proper IPM strategies that will slow the introduction and spread of invasive species in North America. Cooperative Extension can help landowners and managers restore the ecological integrity of the nation's forest and rangeland ecosystems negatively affected by invasive plants, animals, insects, and pathogens.

## Goal 1:

Increase the capacity of landowners, managers, and professionals to assess the threat of invasive species; develop Integrated Pest Management Plans; and implement effective invasive species management and control strategies to protect the nation's forest and rangeland ecosystems.

## Actions

- Develop appropriate educational materials to assist with identification and management of invasive species using appropriate Integrated Pest Management strategies.
- Provide educational programs for natural resource managers and end-user groups such as forest owners, farmers, and ranchers who use appropriate Integrated Pest Management strategies.
- Encourage applied research coupled with Extension education efforts to increase the capacity for early detection and management of invasive species.
- Enhance linkages between researchers and Extension professionals to ensure that current research is relevant to invasive species management issues and the exchange of knowledge is efficient and effective.
- Facilitate collaboration among federal, state, and county land management agencies and private range and forest owners in the implementation of appropriate Integrated Pest Management plans that may cross multiple federal, state, county, and private boundaries.

## Goal 2:

Increase the awareness of the general public, K-college students, and community groups of the threat of invasive species and provide means for their interaction and participation in monitoring and controlling invasive species.



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**Backyard Bark Beetles** is a nationwide Citizen Science program that introduces the public to forest insect, tree health, and invasive species. It includes a protocol for child-friendly trapping of bark and ambrosia beetles in any yard, an interactive website, and educational resources on pest ecology and impact.

*Backyard Bark Beetles. University of Florida, IFAS Extension. [backyardbarkbeetles.org/](http://backyardbarkbeetles.org/)*

HIGHLIGHTED PROGRAM

## Actions

- Provide appropriate educational materials for these audiences.
- Develop and/or participate in partnerships to increase the capacity of educational outreach efforts to respond to invasive species issues.
- Encourage participation of these audiences in invasive species identification and monitoring activities.

## Performance Indicators

- Number of forest and rangeland owners and managers who become aware of or knowledgeable about the impacts of non-native, invasive species on their lands.
- Number of forest and rangeland owners who actively control non-native invasive species.
- Number of assessments made and number of acres of forests and rangelands monitored for actual and potential invasion by undesirable species.
- Number of invasive species management and control programs developed or implemented.
- Number of educational programs, applied research projects, public awareness campaigns, and demonstrations of management and control strategies established by local and statewide partnerships.
- Number of acres of restored forest and rangeland ecosystems where invasive species are being managed, controlled, reduced, or eliminated.

# LANDOWNER ENGAGEMENT

## Issue:

More than half of the forests and rangelands in the United States are under private ownership. Thus, engaging landowners with natural resource professionals in decisions about their land is essential for addressing resource management concerns from forest health to local economies.

## Background:

Uninformed management decisions, or a lack of management decisions, can lead to unhealthy ecosystems. Landowner engagement occurs at different scales between small- and large-ownership acreages. Messages to landowners and calls for action need to address changing demographics and the values and attitudes of the current owners and future generations. Landowner engagement is ultimately about landowners understanding the value of the resource. Well-planned management leads to healthy forests and rangelands and increased financial stability. Recognizing the importance of approaching landowners from their needs and interests, Extension professionals should listen to landowners' issues and concerns, provide relevant resources (information, people, and programs), and promote decisions that improve the health and productivity of forests and rangelands. As landownership changes hands to the next generation, Extension professionals should strive to provide access to Extension resources in new and innovative ways.

## Goal 1:

Ensure that landowners have the best tools and information to make informed decisions regarding their natural resources and land stewardship.

**Reading the Range** is a collaborative program involving ranchers, range Extension Specialists, and agency personnel that aims to increase rangeland monitoring as a standard operating procedure on Arizona ranches by providing examples, called demonstration ranches, and technical assistance.

*Reading the Range.* University of Arizona Cooperative Extension. <https://youtu.be/N-ZGJjed7p0>

HIGHLIGHTED PROGRAM



**Empowering Citizen Engagement In Invasive Species Management Program** gives community members tools for effectively communicating with those who influence ecosystem management and resource allocations about invasive species using flipped classroom education and normative messaging.

*Empowering Citizen Engagement in Invasive Species Management. University of Minnesota Extension, <https://z.umn.edu/empoweru>*

### Actions

- Identify target audience motivations and socio-demographic factors. Develop and deliver outreach and education programs that address local natural resource concerns, while reaching a larger, more diverse audience.
- Adopt new technology and program delivery models that engage landowners in various locations and methods.
- Develop or participate in partnerships that increase the educational reach of sustainable land management messages and resources with new audiences.
- Use longitudinal evaluation of participants' use of resources, program participation, and changes in management.

### Performance Indicators

- Number of direct contacts who increased awareness or knowledge of the benefits and opportunities of forest and rangeland stewardship practices (i.e., sustainable vegetation, water, and/or animal management).
- Number of events or programs using new outreach tools and technologies to engage landowners.
- Number of forest or rangeland stewardship plans initiated, supported, or developed.
- Number of forest or rangeland landowners and managers who implemented at least one new forest or rangeland stewardship practice, participated in additional programs, or engaged with other resource professionals.
- Number of acres on which forest management or rangeland management was improved.

## PUBLIC AWARENESS AND YOUTH ENGAGEMENT

### Issue:

Forest and rangeland resources are important to the economic and environmental well-being of both urban and rural communities in the provision of a broad array of ecosystem services.<sup>13</sup> However, the public's knowledge and in-depth understanding regarding production, sustainability, and the links between ecosystem services and social well-being are limited.<sup>14</sup>

### Background:

The complexities of production, processing, marketing, distribution, financing, and development of agricultural commodities, including forest and rangeland resources, may be little understood by the general public. As more people live in urban areas, there is a disconnect between the public's perception of forest and rangeland resource benefits and their connection to individual lives and livelihoods. Similarly, children may grow up without an attachment to the land or any direct experience with food and fiber production. Providing opportunities for increased awareness of natural resources issues can lead to more informed action. Therefore, public engagement is critical for creating a shared

<sup>13</sup> Norwak, David J.; Stein, Susan M.; Randler, Paula B.; Greenfield, Eric J.; Comas, Sara J.; Carr, Mary A.; Alig, Ralph J. (2010). Sustaining America's urban trees and forests: A Forests on the Edge report NRS-62.

<sup>14</sup> Norgaard, Richard B. 2010. Ecosystem services: From eye-opening metaphor to complexity blinder. *Ecological Economics* vol. 69, pp. 1219–1227.



understanding of, and support for, sustainable use and management of the nation's forests and rangelands. Extension programming can play a vital role in providing key information to the public, including youth and their parents, about forest and rangeland activities. Building strong relationships among Extension, schools, government agencies, and other organizations will lead to even greater positive impacts.

**Goal 1:**

Engage youth and adults about the importance of forest and rangeland resources, particularly how forest lands and rangelands affect rural and urban communities and the need to use science-based information when making decisions about these resources.

**Actions**

- Provide environmental education programs for both rural and urban populations about the importance of healthy forest and rangeland ecosystems.
- Develop relevant, research-based educational materials for communities and landowners, secondary education teachers, and natural resources professionals that promote awareness of the economic, social, and environmental benefits of forests and rangelands.
- Develop educational and social marketing materials aimed specifically at the public and youth to raise awareness of complex forest and rangeland ecosystem dynamics.
- Conduct programs that introduce principles of forest and rangeland ecology and management as part of the science, technology, engineering, art, and mathematics (STEAM) curriculum.
- Develop or utilize existing environmental education lesson plans, such as Project Learning Tree, that align with 4-H and pre-school through 12th grade curriculum, agriculture and natural resources literacy programs, and other educational standards.

**Performance Indicators**

- Number of environmental education programs available to the public that promote and draw attention to the value of healthy forests and rangelands.
- Number of new audiences reached by developing and distributing educational and social media marketing materials.
- Number of public groups requesting workshops, program materials, or collaboration with Extension professionals.
- Number of youth trained or programs conducted in collaboration with 4-H, pre-school through 12th grades, agriculture and natural resources literacy programs, citizen science, or other youth educational programs.



AMBER DALKE

# RURAL COMMUNITIES

## Issue:

Rural communities are often dependent upon healthy forests and rangelands for their economic and social well-being. At the same time, those same forests and rangelands are dependent upon economically and socially vibrant rural communities.

## Background:

Natural resources derived from the nation's forests and rangelands provide a variety of goods and services demanded by people. Healthy forests and rangelands are expected to provide more of those goods and services across the landscape while maintaining resiliency. Rural economies may depend upon commodities such as timber and forage. People may also look to the land for hunting, fishing, camping, hiking, biking, open space, aesthetics, clean water and air, and other ecosystem services. Many rural communities would like to diversify their economies but may be limited by location, resources, or other factors. Determining the relationship between healthy forests and rangelands and vibrant rural communities, and how the health of those communities affects the natural world, is essential for the social, economic, and ecological sustainability of those systems. Education of both rural and urban populations about those relationships is essential for good management and wise use.

## Goal 1:

Work with rural communities to enhance local economic development through a focus on forest and rangeland industries and the workforce needed to support those industries.

## Actions

- Partner with local, state, regional, and national economic development groups to assist forest- and rangeland-dependent communities to identify appropriate industries for development (i.e., sawmills; slaughterhouses; and value-added companies that process outputs from primary production, such as furniture or food).
- Collaborate with K-12; community colleges; colleges and universities; and local, state, and federal agencies on workforce development.
- Work with forest and rangeland industries on adapting to various sources of risk and uncertainty such as climate change and extreme weather events.

## Goal 2:

Create a stronger relationship between healthy forests/rangelands and the social and economic bases of rural communities.

## Actions

- Develop educational programs that connect the relationship between healthy forests and rangelands with socially and economically vibrant rural communities.
- Develop educational programs on economic impact data, models, and programs and how that information can be used by rural communities.
- Develop educational programs on how food, fiber, and other ecosystem services derived from healthy forests and rangelands support local communities and how local communities can enhance their production and use.



JOHN TANAKA

**HIGHLIGHTED PROGRAM**

**Kentucky Forest Sector Economic Contribution** contains economic contribution estimates, prior estimates, links to data sources and methods, as well as additional information related to the economic importance of Kentucky's forest resources.

*Kentucky Forest Sector Economic Contribution. University of Kentucky. <https://forestry.ca.uky.edu/economic-report>*

## Performance Indicators

- Specific indicators such as: (1) poverty rates of the general population and, specifically, children, (2) income inequality, (3) sources of income, (4) employment diversity, (5) agriculture or natural resource industry structure, (6) employment by industrial sector, (7) land tenure, land use, and ownership patterns by land size classes, (8) population pyramids and change, and (9) years of education.<sup>15,16</sup>
- Number of educational programs conducted that focus on rural community economic and social development related to how forests and rangelands are managed.
- Number of people informed about rural community issues and solutions related to forests and rangelands.

## WATER AND WETLANDS

### Issue:

Development and land conversion, water rights concerns, poor management, and climate variability are impacting water and wetland resources that are integral to healthy ecosystems and human existence. Within the context of forest and rangeland ecosystems, water and wetlands provide recreational and economic benefits, as well as habitat for fish and wildlife.

### Background:

Wetlands and riparian areas are part of the larger forest and rangeland ecosystem; they clean water, mitigate floods, and recharge groundwater. Land management and climate changes directly affect water resources, which ultimately impact the productivity of the land resource. Land management decisions that dramatically change or reduce land cover can contribute to degraded water quality and quantity. Development or conversion of land from natural systems changes local hydrologic cycles. The availability of water, particularly in the western U.S., greatly impacts the ability to manage forest and rangeland resources, particularly riparian corridors, wetlands, and fisheries. Changes in precipitation patterns directly affect water resources and exaggerate the impacts of degraded land resources. Therefore, although management of land resources occurs at an ownership level, the impacts to water and wetlands needs to be examined at the landscape or watershed level to holistically address potentially impacted water resources. Effective educational programming can be used to inform decisions about the protection, conservation, and management of forests and rangelands that positively impact wetlands and water resources. The goals of these decisions should be to improve water quality and quantity, and provide recreational and economic opportunities for individuals and communities while protecting watersheds, and providing fish and wildlife habitat.<sup>17</sup>

**Integrated Riparian Weed Management** provides multidisciplinary information aimed at addressing weed management concerns in riparian corridors, by teaching best management practices through field site visits to help land managers improve riparian health and agricultural productivity.

*Integrated Riparian Weed Management. University of California, Cooperative Extension Siskiyou County. (No website available)*

HIGHLIGHTED PROGRAM

<sup>15</sup> Mitchell, John E. (ed.). 2010. Criteria and Indicators of Sustainable Rangeland Management. Laramie, WY: University of Wyoming Extension Publication No. SM-56. 227 p.

<sup>16</sup> Roundtable on Sustainable Forestry. 2014. What Are Montréal Process Criteria & Indicators?

<sup>17</sup> Artificially created water impoundments, whether created through construction, soil removal, berm creation, or damming a waterway, and their management (aquatic weed control, fishing stocking for recreation or aquaculture, etc.), are not components of RREA-supported programming.



### Goal 1:

Encourage intentional management of forests and rangelands to improve water and wetlands quality and quantity.

### Actions

- Develop and deliver outreach and education programs about the interdependence of healthy riparian and wetland ecosystems and healthy forests and rangelands.
- Adopt technology and program delivery models to demonstrate the role of forests, rangelands, water, and wetlands to a healthy ecosystem.
- Evaluate how changes in forest and rangeland management impact water resources.
- Work in partnership with communities and stakeholders to create landscape-level plans (across ownerships) that address water, wetlands, and forest/rangeland challenges.

### Performance Indicators

- Number of forest and rangeland landowners and managers who increased awareness or knowledge of the importance of wetland resources.
- Number of public land managers and private landowners and managers who implemented at least one wetland resources management practice or best management practice for water resources.
- Number of new acres under management for water and wetland resources on private land.

## WILDFIRE PREVENTION AND MANAGEMENT

### Issue:

Across the nation the risk of destructive wildfire is increasing at alarming rates as community development moves into and beyond the Wildland Urban Interface (WUI) and the frequency and duration of fire weather increases with climate variability. Wildfires threaten lives, destroy property, and disrupt agricultural production. Wildfires also alter the ecological functioning of native forests and rangelands as they increasingly occur beyond the natural ranges of frequency, intensity, and size due to both historical land use policies and novel climatic conditions.

### Background:

Fire has been an important natural ecological process within much of the nation's forests and rangelands for centuries. Plant and animal species in most North American forests and rangelands evolved with fire, and many of these species are dependent on fire to reproduce and grow. However, fire suppression efforts that began in earnest in the early 1900s have increased fuel loads, thereby upsetting the historical fire return intervals and intensities under which many of these ecosystems evolved. The resultant changes in plant community composition and ecological function, combined with high frequencies of human-caused ignitions, increase the risk of catastrophic wildfire events. Research and Extension education continues to be essential to increasing the understanding of the impacts of these altered conditions on the ecology of the nation's forests and rangelands,

#### Oregon Citizen Fire Academy

is a collaborative education and service program designed to increase the outreach capacity of fire agencies and, ultimately, to maintain and enhance fire-adapted communities. The goals are to increase implementation of defensible space and fuels reduction in dry forest ecosystems and to build human capacity to deal with wildfire through education and volunteer service.

Oregon Citizen Fire Academy.  
Oregon State University,  
Forestry & Natural Resources Extension.  
<https://extension.oregonstate.edu/citizen-fire-academy>



and communicating the management strategies that can reduce the potential for catastrophic wildfire events. In addition to ecological changes and impacts, increasing human encroachment into the Wildland Urban Interface (WUI) puts life and property at risk. Elected and appointed public officials need to understand the ramifications of public policy that permits the encroachment of residential and commercial development into highly flammable ecosystems. Home and land owners need to be educated about the risks of wildfire when living at the WUI.

**Goal 1:**

Engage WUI communities with research-based information on wildfire risk-management strategies.

**Actions**

- Develop relevant, research-based educational materials for WUI communities, home and land owners, and natural resource professionals on wildfire risk assessment, development of fire adapted communities, use of defensible space, and strategies in the maintenance of structures and property (e.g., fuels reduction) to minimize loss during wildfire.
- Provide educational programs (i.e., workshops, field days) for professional natural resource managers, public and appointed officials, and home and land owners on wildfire risk-management strategies.

**Goal 2:**

Increase the capacity of community, county, and state emergency preparedness/civil defense authorities to (i) assess, communicate, and respond to wildfire risks in WUI communities; (ii) adopt community-development policies, codes, and ordinances that protect WUI communities from wildfire; and (iii) communicate agency and community needs to relevant decision- and policymakers.

**Actions**

- Engage community, county, and state emergency preparedness and civil defense authorities with relevant, research-based information on wildfire risk assessments and wildfire management strategies for WUI communities.
- Work collaboratively with community, county, and state emergency preparedness/civil defense authorities and community organizations to identify knowledge gaps; deficiencies in community development policy, codes, and ordinances that protect WUI communities from wildfire; and modes of emergency response (community evacuation plans, fire department response times, distances, and routes, etc.).

**Goal 3:**

Participate in applied wildfire ecology research and outreach efforts to develop knowledge of the impacts of wildfire on forest and rangeland ecology and to create management strategies to minimize the potential for catastrophic wildfire events.

**Actions**

- Engage and collaborate with researchers on applied, integrated projects investigating the ecology of wildfires on forest and rangeland ecosystems.
- Develop appropriate management strategies that reduce wildfire risks, restore ecological function, and mitigate the negative consequences of catastrophic wildfires.



SARAH NOELLE

## Performance Indicators

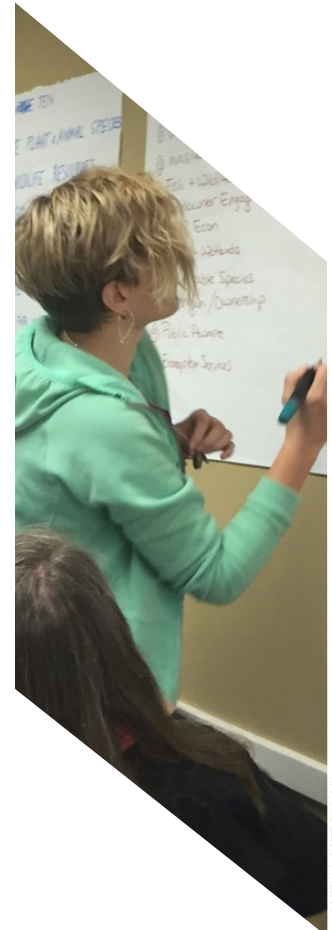
- Number of home and land owners at the WUI who increase awareness and knowledge about wildfire risks and adopt relevant wildfire risk-management strategies.
- Number of WUI communities that become engaged and actively work to maintain a “fire-wise” and “fire-ready” profile.
- Number of community members, emergency response agencies, and decision-makers that increase understanding of the impacts of wildfire on the ecology and management of forests and rangelands.
- Number of management strategies that are developed that reduce wildfire risks, restore proper ecological function, and mitigate the negative effects of catastrophic wildfires.
- Number of community, county, and state emergency response/civil defense authorities that adopt community development policies, codes, and ordinances that help protect WUI communities from wildfire.
- Number of regional leaders informed of wildfire management needs among responders, land managers, and communities.
- Number of increased project collaborations across and among response agencies, land managers, and communities
- Number of WUI communities that are adequately protected from wildfire.
- Number of forests and rangeland acres are restored to ecological function.



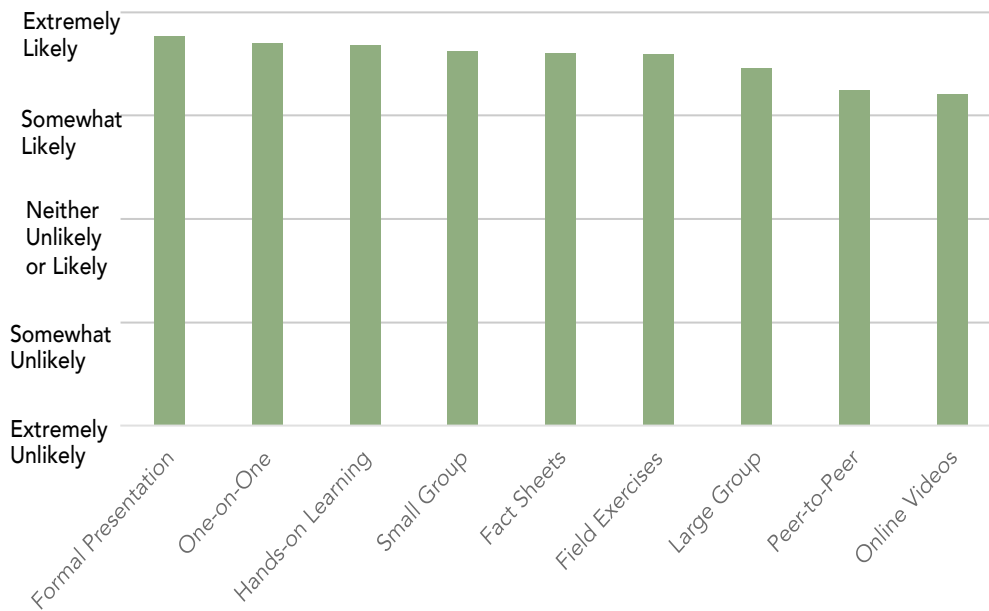
# PROGRAMMING CHALLENGES AND OPPORTUNITIES

## TEACHING METHODS

The primary role of Cooperative Extension is stakeholder education. Extension professionals employ a wide range of teaching methods to reach stakeholders. While traditional teaching methods remain prevalent, new modes of teaching such as online videos, peer-to-peer trainings, and distance learning are also recognized tools, indicating that Extension educators are aware of the importance of adjusting teaching methods to fit the needs of stakeholders and constraints on their resources (Figure 1). For instance, a teaching method gaining in popularity is a citizen science approach. Engaging non-professionals to gather data (i.e., invasive species mapping and wildlife counts) provides opportunities for real-life learning. To accommodate the variety of learning styles and preferences, and to improve retention, Extension educators will need expanded opportunities to gain awareness, knowledge, and experience in such instructional innovations, either through directed funding or sponsored professional development programs. Attention to innovations in teaching methods will enhance and improve service to stakeholders and strengthen Extension’s efforts in support of RREA goals.



SHEILA MERRIGAN



*While traditional teaching methods remain prevalent, new modes of teaching such as online videos, peer-to-peer trainings, and distance learning are increasing in popularity.*

Figure 1: Extension Educators’ Likelihood of Using These Teaching Methods in Next Five Years. <sup>18</sup>

<sup>20</sup> Partial survey results. Full survey results are available at: <https://globalrangelands.org/rreasp/>



CHRIS BERNAU

## TECHNOLOGY

Technology cuts across all issues and programming activities. A recent Extension report<sup>19</sup> discussed key trends, challenges, and developments for many newer technologies, as well as strategies for implementation. Each method has its advantages and disadvantages, usefulness for diverse learning strategies, and specific requirements in terms of connectivity and equipment. Each will have different implementation costs and require different timeframes for use. There may be opportunities for train-the-trainer programs within Extension or for incorporating these technologies into educational settings with stakeholders. Extension educators will have to determine whether a particular technology is appropriate for forest and rangeland programs.

With this as background, RREA-supported Extension educators will want to identify appropriate technologies, new and established, and determine how to use them effectively and efficiently to achieve desired learning outcomes. Survey results from Extension natural resource educators revealed a variety of preferred technologies (websites, telephones), while also indicating trends toward adopting newer strategies (Internet-based conferencing, social media, webinars) (Table 3). Adopting new technologies will require an investment in professional training and experimenting, but that training will help Extension educators reach out to broader and more diverse forest and rangeland audiences and stakeholder groups.

Table 3: Extension Professionals' Likelihood of Using Various Technologies During the Next Five Years.<sup>20</sup>

Do you plan to use this technology in your CE programming in the next five years?			
Technologies	Yes	No	Maybe/Unsure
Websites	93.3%	2.1%	4.6%
Telephones	76.4%	11.5%	12.0%
Online Meetings, Internet-Based Conferencing	76.2%	6.9%	16.9%
Social Media	75.8%	11.1%	13.2%
Webinars	70.0%	10.0%	20.0%
Video Platforms	69.3%	11.1%	19.6%
Stakeholder Contact Databases	64.4%	18.9%	16.8%
Geospatial Technologies	52.9%	25.7%	21.5%
Mobile Learning	47.8%	22.3%	29.9%

*Extension educators should identify appropriate technologies, new and established, and determine how to use them effectively and efficiently to achieve desired learning outcomes.*

<sup>19</sup> Freeman, A., Adams, S., Cummins, M. 2016. NMC Technology Outreach for Cooperative Extension 2016–2021: A Horizon Project Sector Report. Austin, TX: The New Media Consortium. <http://bit.ly/2lqGxd3>

<sup>20</sup> Partial survey results. Full survey results are available at: <https://globalrangelands.org/rreasp/>



## PROGRAM DELIVERY

Extension professionals develop program-specific content to provide learning opportunities for multiple audiences based on their needs and interests. In today's fast-paced, technology-driven, and information excess environment, Extension educators are challenged to deliver program content to accommodate different levels of access, learning styles, and information needs. Information dissemination, however, is not the same as education, an important difference recognized by Extension educators. Survey results from Extension educators revealed a variety of preferred teaching methods (workshops, field days, one-on-one trainings, conferences, and websites) while also indicating trends toward adopting newer strategies (social media, webinars, videos, and e-newsletters) (Table 4). Although traditional modes of content delivery are the most widely used, the data suggests there is interest in adopting alternative methods for delivering programs. This adaptability indicates that investment in professional training on new methods of program delivery will be beneficial and productive for natural resource Extension educators and, ultimately, for forest and rangeland stakeholders.



CARRIE BERGER

Table 4: Extension Educators' Anticipated Preferences for Program Delivery in Next Five Years.<sup>21</sup>

Did you use the following in your Cooperative Extension reporting in the last year?			
Methods	Yes	No	Maybe/Unsure
In-Person Workshop	98.5%	1.0%	0.5%
One-on-One	94.4%	13.6%	2.0%
Extension Conferences	94.4%	2.6%	3.1%
Websites	94.4%	2.1%	3.6%
Extension Bulletins	81.0%	8.3%	9.8%
Webinars	76.9%	8.7%	14.4%
Online Videos	75.3%	8.4%	16.3%
Email Newsletters	75.1%	12.7%	12.2%
Newspaper Articles	73.5%	7.7%	18.9%
Social Media	71.8%	13.9%	14.4%

*Emerging trends in program delivery include: social media, webinars, videos, online newsletters.*

<sup>21</sup> Partial survey results. Full survey results are available at: <https://globalrangelands.org/rreasp/>

## EVALUATION – MEASURING IMPACT AND REPORTING

As was the case with both previous RREA strategic plans, it is expected that criteria specified in the RREA Planning and Reporting Guide for FY 2017–2021 will be used to develop plans of work and to report program accomplishments and impacts. Additionally, suggested performance indicators are included in this strategic plan for each identified critical issue. NIFA considers measuring impacts and reporting as a critical piece of their support and recommends the allocation of 8–10% of each institution’s funding to program evaluation. Simple output data (i.e., number of classes held, number of field visits, etc.) is commonly used to validate the impact of funding support on programming and stakeholders. However, short-term outcomes (gaining awareness and/or new knowledge) combined with mid-term (behavioral changes) and long-term data (social, economic, and/or environmental), are necessary to gain a more in-depth understanding of impacts for a specific program. Survey respondents identified a variety of methods for conducting short-term evaluation (Table 5). Improvements in longer-term evaluation may be achieved through a more consistent application of the Logic Model approach. Furthermore, theories of change may provide additional insights.

*Theories of change depict a sequence of events leading to outcomes; they explore the conditions and assumptions needed for the change to take place, make explicit the causal logic behind the program, and map the program interventions along logical causal pathways.<sup>22</sup>*

Theories of change can be informed using tools such as Logic Models, results chains, and outcome models, and are the basis for identifying measurable outcomes and impacts.<sup>23</sup>

Survey respondents also indicated the need for improved support and clarification of the data collection format and process at the NIFA level. Ongoing efforts to provide RREA impact documentation to NIFA are critical to the continued funding of the RREA program. As such, the rigorous collection of impactful data is essential to tell the funding story. Institutions are called on to dive deeper into measuring the impact their programming has on changes in behavior and on the landscape within the scope of work. In addition, qualitative data should be collected for annual state “popular reports.” This will strengthen RREA’s annual accomplishments report for communicating program effectiveness to its funders, stakeholders, and other clients.

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*Improvements in longer-term evaluation may be achieved through a more consistent application of the Logic Model approach.*

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<sup>22</sup> Gertler, Paul. J., et al. 2011. Impact evaluation in practice. Washington, D.C.: The World Bank. <http://bit.ly/2tf340c>

<sup>23</sup> Videos and learning modals available on evaluation include a series from University of Minnesota (<http://bit.ly/2Aqn0Um>) and University of Wisconsin (<http://bit.ly/2mT2od0>)



Table 5: Methods of Evaluation Extension Professionals Used in the Prior Year.<sup>24</sup>

Did you use the following in your Cooperative Extension reporting in the last year?			
Evaluation Tools and Techniques	Yes	No	I don't know
Participation numbers	92.5%	2.5%	5.0%
Post-training survey	69.5%	22.1%	8.4%
In person paper surveys	59.9%	32.6%	7.5%
Usage statistics for web content	54.9%	35.9%	9.2%
Emailed surveys	49.2%	41.0%	9.8%
Logic model approach	45.2%	46.3%	8.5%
Retrospective post survey	43.7%	44.8%	11.6%
Pre-training survey	42.7%	48.7%	8.7%
Phone calls	36.1%	53.6%	10.4%
In person interview	33.3%	58.8%	7.9%

## CONCLUSION

As the only direct funding support for forest and rangeland Extension programming in NIFA, RREA provides increasingly important linkages among the research community, Cooperative Extension, and forest and rangeland owners and users. RREA has benefited Extension educators in a variety of ways:

- Providing additional resources to reach a greater number of stakeholders with enhanced programming;
- Expanding the adoption of new and improved management practices and plans for working landscapes; and
- Giving visibility to the vital need for maintaining the productivity and sustainability of the nation's natural resources.

The 2018–2022 RREA Strategic Plan provides direction for addressing many critical issues threatening forests and rangelands, and the people whose livelihoods depend on them. Continued and expanded support for and collaboration among the academic, landowner, non-government and government sectors is crucial for sustaining ecological processes, providing increased economic opportunities, and government sectors is crucial for sustaining ecological processes, providing increased economic opportunities, and offering the broader societal benefits derived from forest and rangeland resources. To achieve these ends, it is critical that RREA: (1) is funded annually at the full authorized level; (2) expands the number of advocates from stakeholders and Cooperative Extension leadership; and (3) increases marketing efforts to better showcase the important contributions RREA-supported programming makes to forest and rangeland stakeholders across the nation and to achieving the goal of sustainable natural resources.



SHEILA MERRIGAN

AMBER DALKE

<sup>24</sup> Partial survey results. Full survey results are available at: <https://globalrangelands.org/rreasp/>

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Alabama A&M  
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Auburn University  
Tuskegee University

## **ALASKA**

University of Alaska

## **ARIZONA**

University of Arizona

## **ARKANSAS**

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University of Arkansas at  
Pine Bluff

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University of Nebraska

## **NEVADA**

University of Nevada,  
Reno

## **NEW HAMPSHIRE**

University of New  
Hampshire

## **NEW JERSEY**

Rutgers, The State  
University of New Jersey

## **NEW MEXICO**

New Mexico State  
University

## **NEW YORK**

Cornell University

## **NORTH CAROLINA**

North Carolina A&T State  
University  
North Carolina State  
University

## **NORTH DAKOTA**

North Dakota State  
University

## **OHIO**

Central State University  
Ohio State University

## **OKLAHOMA**

Langston University  
Oklahoma State University

## **OREGON**

Oregon State University

## **PENNSYLVANIA**

Pennsylvania State  
University

## **PUERTO RICO**

University of Puerto Rico

## **RHODE ISLAND**

University of Rhode Island

## **SOUTH CAROLINA**

Clemson University  
South Carolina State  
University

## **SOUTH DAKOTA**

South Dakota State  
University

## **TENNESSEE**

Tennessee State  
University  
University of Tennessee

## **TEXAS**

Prairie View A&M  
University  
Texas A&M University

## **UTAH**

Utah State University

## **VERMONT**

University of Vermont

## **VIRGIN ISLANDS**

University of the Virgin  
Islands

## **VIRGINIA**

Virginia Tech  
Virginia State University

## **WASHINGTON**

Washington State  
University

## **WEST VIRGINIA**

West Virginia University  
West Virginia State  
University

## **WISCONSIN**

University of Wisconsin-  
Madison

## **WYOMING**

University of Wyoming

MARK THORNE



AMBER DALKE



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