



NASF Foundation fellow Rena Johnson



TREES AND FORESTS: AMERICA'S CRITICAL GREEN INFRASTRUCTURE



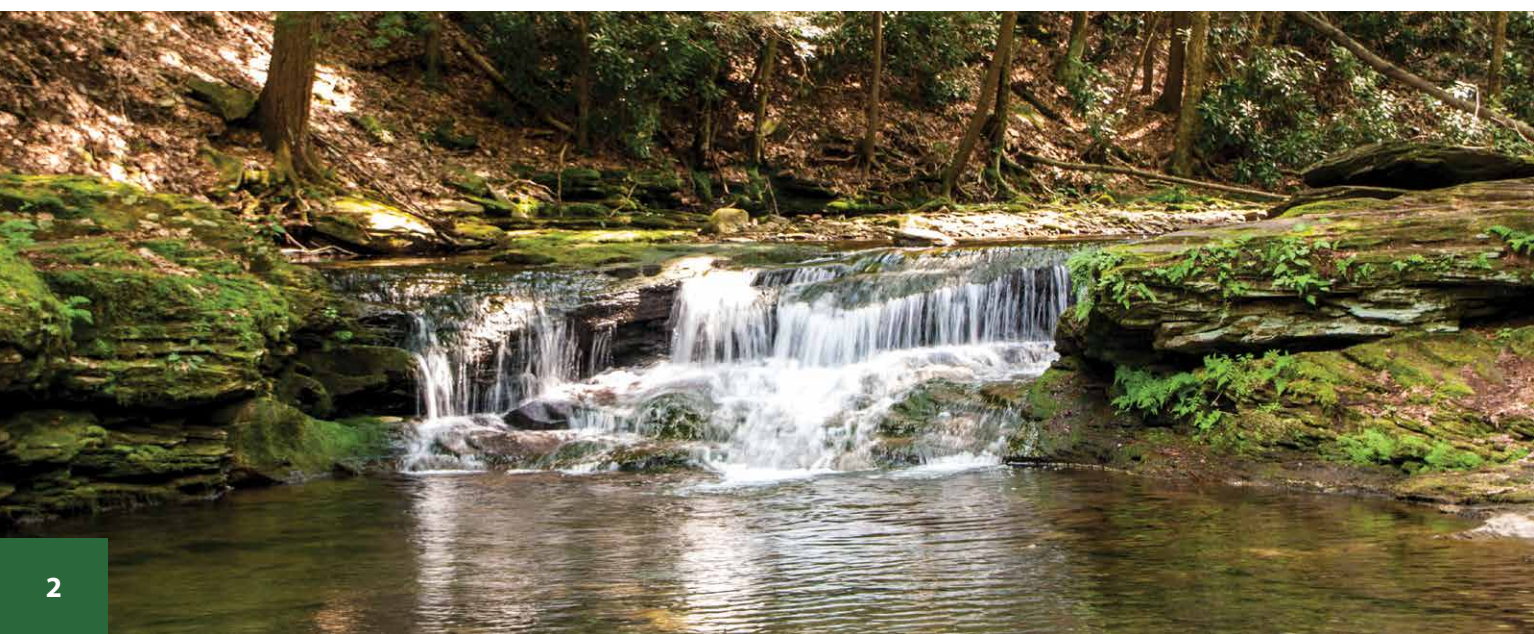
2016 State & Private Forestry Report

Published by the National Association of State Foresters and the USDA Forest Service

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Grace Witzler for the Council of Western State Foresters



In the forestry title of the 2008 Farm Bill, leaders in Congress identified three national conservation priorities for America's forests:

- Conserve and manage working forest landscapes for multiple values and uses;
- Protect forests from threats;
- Enhance public benefits from trees and forests.

In 2010 the State Foresters delivered statewide assessments and strategies for forest resources to help advance this nationwide effort to protect and sustain healthy forests. Known as the Forest Action Plans, collectively these documents represent a strategic roadmap for America's forests.

The Forest Action Plans are state-specific documents that help direct limited resources to priority areas where they are needed most and offer proactive strategies to conserve, protect and enhance the trees and forests upon which we all depend.

America's Forest Action Plans have reached their five year anniversary, and this report illustrates their power to ensure efficiencies, create stronger partnerships, and deliver more "bang for one's buck" when it comes to investing in priority landscapes. Forest Action Plans should continue to be consulted when making decisions about forest resources.

In 2015, each Forest Action Plan was carefully reviewed by the State Forester and in some cases these strategies and

assessments were revised to reflect changing conditions. This report analyzes the results of that five year anniversary review.

The state forestry agencies, along with federal partners at the USDA Forest Service, share a long history as stewards of America's forests and work across boundaries to address mutual challenges. State Foresters deliver programs through the Forest Service's State and Private Forestry Program to address national priorities. And 2016 marks a major milestone; 10 years ago the process began to redesign the State and Private Forestry Program, and the importance of the resulting strategic changes and what they mean for the future of forestry is clear.

Trees and forests form a major portion of the green infrastructure of this country. Actively and sustainably managed forests bolster local economies, improve human health, and bring communities closer together. This report illustrates specifically how trees and forests filter our air and water, serve as places for recreation, provide habitat for wildlife, and produce wood products and job opportunities.

However there are challenges ahead, including a need for improved technology and strong forest markets, increased capacity and training to address wildfire risks, more cross-boundary work, and support for diverse ecosystem services. With good analysis, planning, and partnerships, the benefits of the Forest Action Plans will ensure that trees and forests—a crucial part of America's green infrastructure—will prosper in the years to come.

EXECUTIVE SUMMARY



State forestry agencies and their federal partners including the USDA Forest Service are dedicated to working together to achieve national-level conservation and economic goals that are outlined in the Forest Action Plans.

The 2016 State & Private Forestry Report summarizes the review of the most recent information prepared by state forestry agencies to address these goals, including recent accomplishments as well as plans for the future. This analysis and summary report helps demonstrate the value of investment in state and private forestry programs as well as articulate future challenges and priorities based on 2015 Forest Action Plan progress reports provided by the state and territorial forestry agencies of the United States.

This report includes highlights of accomplishments from several states as well as a vision for the future of forestry. More than 50 new documents totaling more than 1,000 pages of information were reviewed to identify key accomplishments and emerging trends.

For example, to conserve America's working forest landscapes, from the South we hear about thousands of acres of longleaf pine restoration; in the Northeast programs are supporting songbird habitat management; and in the West collaborative partnerships are implementing fuels reduction projects to protect water resources and communities living in the wildland-urban interface (WUI).

State and federal partnerships are protecting forests from harm by preventing and mitigating the threat of wildfire, including risks within the WUI where communities are built alongside forested areas. Cooperative partnerships are also combating the threat of invasive pests and a full range of tree disease issues, which are illustrated in more detail in this report.

To enhance public benefits derived from trees and forests, the state agencies and their partners are implementing projects to protect urban and community forests and connect people to trees and forests. There are also extensive education and engagement efforts around water quality and tree planting initiatives, and a continued commitment to the monitoring and achievement of best management practices (BMPs).

This report on state and private forestry activities illustrates just a few of the accomplishments, new initiatives, and on-the-ground impacts that are a result of more than five years of Forest Action Plan implementation. The states that are highlighted in this report demonstrate a commitment to collaborative initiatives, including cross-boundary, landscape-scale, and multi-state projects. The states also demonstrate the importance of balancing long-term goals and objectives with the short-term needs and emergency actions for which many state forestry agencies are responsible, including responses to devastating wildfires, attacks from invasive species, and catastrophic events like hurricanes and flooding.

While these efforts help states achieve national goals outlined in Forest Action Plans, work to conserve, protect and enhance America's forests did not begin with the state strategies and assessments referred to in this report. The state forestry agencies, along with partners at the USDA Forest Service, have a long history as stewards for these natural resources. The period of 2010-2015 which is covered in this review is just the latest chapter in that history.

Looking ahead to the next five years of forestry, the state forestry agencies identified the following key themes and areas of opportunity:

- Technology, Inventory and Markets
- Wildfire and the Wildland-Urban Interface
- Forest Health
- Urban and Community Forests
- Landscape-Scale Partnerships Across Boundaries
- Ecosystem Services

These issue areas articulate future challenges as well as opportunities for growth, new partnerships, and landscape-scale, cross-boundary projects. The Forest Action Plans provide a valuable structure that supports national priorities for forests and enables quality information gathering, periodic stakeholder consultation, and on-the-ground results that demonstrate the value of investments in state and private forestry programs. All Americans greatly benefit from these collective efforts.



CONSERVE WORKING FOREST LANDSCAPES



NWAF Foundation fellow Leslie Robertson

Trees and forests are a critical part of America's infrastructure, and conserving working forests for future generations is a high priority for the forestry community. Trees filter our water and air, provide habitat for wildlife, grow our economy through job creation, and supply wood products and places to recreate. The Forest Action Plans help guide the actions of state forestry agencies as they work to reduce the rate of conversion of forested landscapes to other uses such as development, and inform decisions about which landscapes should be conserved as working forests to optimize public benefits for years to come.

Conserving America's forests is a complex challenge, and many programs work in tandem to meet the goals outlined in the Forest Action Plans. For instance, the Forest Stewardship Program (FSP) works to provide America's 22 million private forest landowners with the information and knowledge they need to sustainably manage their forests. The program's technical assistance services, administered through state forestry agencies, support sustainable forest management and in turn help provide forest products, wildlife habitat, clean water and air, renewable energy and opportunities for recreation.

In 2000 and 2005, researchers surveyed nonindustrial private forest owners who had received FSP assistance in the form of land management plans. The studies found that more than 80

percent of respondents had started implementing their plans and nearly 70 percent had spent some of their own money to implement their plans.¹

The National Woodland Owner Survey of 2002–2006 showed that family forest owners who have received assistance in the form of a management plan are 2.7 times more likely to harvest timber on their land, thus creating jobs in rural areas and producing wood products we use every day. Healthy forests require strong markets for these wood products. Financial assistance for biomass research, development and project implementation are enabling states and their partners to actively and sustainably manage forests.

The Forest Legacy Program provides critical assistance to states, private landowners, and partner groups to conserve working forests through easements and fee acquisitions. The program plays a fundamental role in keeping forests as forests, so that the next generation of Americans can appreciate and benefit from these landscapes.

In partnership with the states, the USDA Forest Service works collaboratively with Alaska Native Corporations and tribal communities for mutually beneficial outcomes. On-the-ground accomplishments related to these critical programs are detailed in the following section.

¹Butler, Brett et al. "Effectiveness of Landowner Assistance Activities: An Examination of the USDA Forest Service's Forest Stewardship Program." *Forestry* 112.2 (2014): 187-97.

PROVIDE LANDOWNER ASSISTANCE AND PREVENT FOREST LOSS

MISSISSIPPI

Longleaf pine is ideal for producing high-valued poletimber, which is worth 30 to 40 percent more than sawtimber. Longleaf pine is native to south Mississippi and is more resistant than other pine species to insects such as the southern pine beetle and diseases such as annosus root rot and fusiform rust. The species is also less susceptible to damage from hurricanes than other southern pine species. Unfortunately, the state's longleaf pine forests have been reduced by 90 percent since 1935, mainly due to conversion to other land uses and forest types. Under the Mississippi Longleaf Landowner Outreach initiative, workshops were conducted in 2012 and 2014 to provide training about longleaf pine management. The workshops engaged a total of 112 landowners representing 30,000 acres of forestland. Since 2010, Mississippi has restored an additional 1,200 acres of longleaf on private lands, and 1,250 acres on state lands.

MAINE

In a series of videos called "Profiles in Woodland Stewardship", the Maine Forest Service has documented the key elements of good stewardship, such as developing and maintaining a written forest management plan or implementing practices such as timber harvesting. These profiles cover all types of woodland owners across the state, from private families, to non-profits, as well as public and quasi-municipal organizations.

OHIO

Building on the priority forest landscapes identified by the 2010 Forest Action Plan, the Ohio Division of Forestry completed a competitive grant project funded by the USDA Forest Service that developed two landscape stewardship plans in key urbanizing areas of Ohio. Both plans emphasize the importance of small woodlots and support their management for multiple benefits. Educational resources were developed, including a website, and four demonstration sites, where landowners can learn how to maximize and sustain the woodland benefits on their property.

MISSOURI

As part of the state's effort to inform landowners about better forest management, Missouri and five other states launched a Call Before You Cut (CBYC) program in the Spring of 2009. The program aimed to reach landowners considering a timber sale. CBYC provides a toll-free number where they receive information about forest management and the best ways to conduct a successful timber harvest. As of November 2015, 2,450 landowners controlling over 273,000 acres of forestland contacted Missouri CBYC. In 2014 a new aspect of CBYC was added, offering a free initial site visit from a professional forester.

To date 92 landowners owning over 10,000 acres have taken advantage of the free site visit.

VERMONT

As part of a long term goal of integrating timber and songbird habitat management, the Vermont Department of Forests, Parks, and Recreation and its key partners established the Foresters for the Birds initiative in 2008. The project included forester trainings, habitat assessments, and demonstration harvest as well as workshops. Over 200 foresters have participated in trainings, collectively managing more than one million acres. More than 1,000 people have attended tours. Nine states are currently implementing Foresters for the Birds programs.

MASSACHUSETTS

With 71 percent (1.2 million acres) of Massachusetts' forests in the hands of owners that are 55 or older, the state has worked to help these family forest owners with the long term decisions they will make with their land. Through the Estate Planning Outreach component of the Working Forest Initiative, more than 1,000 landowners owning more than 50,000 acres of land have been reached through educational programs since 2010. As a result, three landowners have donated conservation land totaling 252 acres, and more than 15 landowners with a total of 1,750 acres have committed to conserve their land and are currently working with land trusts and conservation agencies to do so. Additionally since 2010, 1,039 landowners received woodland enhancement plans and 87,331 acres of land were enrolled in long-term sustainable management under the Forest Stewardship Program.



Glenn Mizel/Forestry.com for Western State Foresters

MICHIGAN

Since 1991, Michigan has served nearly 5,350 landowners and developed plans for almost 875,000 acres under the Forest Stewardship Program. On average, the program has added 215 new plans each year, covering 34,320 acres annually. Since 2013, the number of private-sector foresters in the program has doubled, with 125 professional foresters offering services to Michigan's 400,000 family forest owners. In addition to offering core services like timber sale administration and tree planting, many of these foresters have helped clients enroll in property tax programs, forest certification, or conducted ecological restoration activities.

ARIZONA

The Arizona Department of Forestry and Fire Management assisted the City of Flagstaff in producing a long term comprehensive forest management plan for 2,310 acres of city-owned property. This forest will be managed as open space where recreation and public educational goals are a high priority. Observatory Mesa is directly adjacent to the City of Flagstaff, and home to the historic Lowell Observatory, where the dwarf planet, Pluto, was first observed in 1930. In addition to providing a unique opportunity for the public to connect with the forest, the recent Forest Stewardship Program plan guides forest management on Observatory Mesa and has enabled the City of Flagstaff to reduce wildfire and forest health risks on over 600 acres within the wildland-urban interface.

OREGON

The Department of Forestry educates landowners and nurseries about the use of various seed types for reforestation using one-on-one contacts, short articles, email, presentations, and websites. The agency also manages the Oregon Seed Bank, acquiring high quality and high genetic gain forest tree seed lots for the benefit of small woodlot owners. Through the Seed Bank the agency has provided landowners and nurseries with high quality, high genetic gain forest tree seed, and offered a wide variety of seed for sale to more than 40 private nurseries in the Pacific Northwest.

TENNESSEE

The Tennessee Forest Legacy Program has provided a long standing safety net in Tennessee from conversion to non-forestry uses through conservation easements. During the 2011-2015 period, The Tennessee Department of Agriculture Division of Forestry (TDF) closed on the North Cumberland Conservation area/Emory River Forest Legacy tract of 5,247 acres that protects reintroduced elk herds, a significant portion of cerulean warbler habitat, Indiana bat habitat, and the headwaters of the Emory River, a watershed that supplies water for more than 30,000 Tennesseans. The TDF also implemented the Fiery Gizzard Conservation Easement on 3,282 acres that helps protect the Fiery Gizzard Trail which was called one of the top 25 hiking trails in the United States by Backpacker magazine.

WISCONSIN

Since 2010, Wisconsin has more than doubled the number of acres of working forest easements, bringing the total to 224,000 acres. These efforts help preserve the integrity of forestlands in perpetuity, prevent forest fragmentation and promote the sustainable use of the state's forests.

MAINE

On June 11, 2013 the Forest Legacy Program of Maine concluded a three-and-a-half-year effort to protect a 12,046 acre property in the Sugarloaf area. The property in Carrabassett Valley holds three of Maine's highest mountain peaks as well as a 10-mile stretch of the Appalachian Trail. Support came from the Forest Legacy Program, the Land for Maine's Future Program, the Town of Carrabassett Valley and over 100 private donors.

RHODE ISLAND

Under the Farm Forest and Open Space Act (FFOS), Rhode Island has engaged 535 participants and protected 35,705 acres of forestland as of 2015. The Forest Legacy Program has also been a tremendous success with over 22 active participants and 3,583 acres permanently conserved. Working with Rhode Island Statewide Planning and local municipalities, model ordinances have been developed to minimize forest cover and fragmentation, specifically during site planning. Over 17 towns have adopted innovative land development ordinances and two towns have adopted Transfer of Development Rights.



Grace Mitzeler for the Council of Western State Foresters



NVCF Foundation/Reid W. Leslie/Forestry.com

MICHIGAN

Michigan's Crisp Point Land Acquisition project placed 3,810 acres of forest land in the eastern portion of Michigan's Upper Peninsula under fee simple interest. Strategically located in the middle of state forest land and directly adjacent to a completed Forest Legacy Program project, Crisp Point provides critical habitat for game and endangered species, as well as recreation opportunities in scenic forest land along the Lake Superior shoreline. The Crisp Point Acquisition ensures that the shoreline will remain undeveloped.

MASSACHUSETTS

In 2011 the Brushy Mountain Forest Legacy Program Project was completed, conserving 3,486 acres of forest land. The conservation restriction on the property guarantees public access for passive outdoor recreation including organized nature walks, hunting, fishing, and hiking. The Commonwealth was also given access to conduct rare species and natural community research.

CALIFORNIA

CAL FIRE's Usal Redwood Forest conservation easement added 49,576 acres under the Forest Legacy Program and is the largest working forest conservation easement in the state.

IDAHO

Through two conservation easements, nearly 10,800 acres of productive forestland in the McArthur Lake Wildlife Corridor are being maintained as working forests. The corridor is a national, state, and local conservation priority area, critical for the survival and recovery of several threatened and endangered species, most notably grizzly bears.

KANSAS

Through a mixture of conservation easements and fee simple agreements, the Kansas Department of Wildlife and its partners have actively managed and protected more than 1,000 acres in the I-70 Metro Corridor priority landscape. This area serves as protected habitat for the redbelly, smooth earth snake, and other threatened or rare species.

ARIZONA

In partnership with The Nature Conservancy, the Arizona Department of Forestry and Fire Management implemented easements on four private properties along the San Pedro River. These properties were secured in perpetuity, thus protecting critical riparian Arizona habitat. This area is host to dozens of avian species, some of which are threatened or endangered. Increasing development, changing land uses, changing climate, and habitat fragmentation in the area put these species at great risk.



2016 Alaska Advanced Firefighter Academy staff

ASSIST NATIVE ORGANIZATIONS ON TRIBAL AND ALASKA NATIVE CORPORATION LANDS

MINNESOTA

Minnesota has the most natural wild rice habitat in the lower United States. In addition to the spiritual and cultural significance to the Ojibwe tribes, wild rice provides food and shelter for many fish and wildlife species. In fact, more than 17 wildlife species of greatest conservation need in Minnesota depend on wild rice lakes as habitat for reproduction or foraging. Since 2012, a partnership among the Department of Natural Resources, Board of Water and Soil Resources, local Soil and Water Conservation Districts, and Ducks Unlimited has worked to protect shallow wild rice lakeshore habitat on critical lakes. This partnership has succeeded in permanently protecting 10 miles of shoreline, amounting to more than 1,200 acres. In addition, public access has been provided on over 400 acres.

ARIZONA

As part of their extensive collaboration on a variety of forest efforts, the Arizona Department of Forestry and Fire Management's Tribal Outreach Specialist organized multiple events and meetings to share information with local communities. These included a riparian restoration workshop organized by the Colorado River Indian Tribes and the Department which highlighted riparian restoration work done on the Ahakkav Tribal Preserve. It also enabled the Colorado River Indian Tribes to learn more about Arizona's Cooperative Forestry programs.

The State Forestry's Utilization Forester also provided information to the Navajo Nation Forestry Department which recently

acquired a portable saw mill. State Forestry staff also provided local contacts to help the White Mountain Apache Timber Company restart the saw mill on the Fort Apache Reservation. Reopening of the mill provides employment for tribal members and a market to offset the costs of forest treatment projects.

The state has also worked with the Iskashitaa Refugee Network (IRN), a non-profit organization that works with refugees from 20 countries who have been resettled in Tucson. The IRN has helped to educate the community about edible forest products found within the community.

ALASKA

The Advanced Wildland Firefighting Academy is made possible by the Alaska Division of Forestry's (DOF) partnerships with Native organizations and the Bureau of Indian Affairs. The academy, structured like a wildfire incident, is supported by State Fire Assistance funds and relies on two fire training DOF staff positions.

In 2016, the academy trained 24 cadets in the use of portable pumps and water, wildland fire chainsaw use, helicopter protocol, using maps and GPS for basic land navigation, air operations, leadership skills and safety. After two grueling weeks, the cadets' hard work was rewarded with a University of Alaska Fairbanks occupational endorsement in wildland fire science and employment with fire suppression agencies and cooperator crews sponsored by Native organizations.

GROW FOREST MARKETS, BIOMASS AND OTHER WOOD PRODUCTS

GEORGIA

The Georgia Forestry Commission's Forest Utilization and Marketing program has updated the state's Primary and Secondary Industry Directories. These were used at two International Woodworking Fair tradeshows in Atlanta. The program has also completed an estimated 100 resource reports for potential industries and investors over the last five years. Since 2010, six new pellet mills and two new biomass electricity plants have been established in Georgia.

MISSISSIPPI

Biomass Harvesting Guidelines are being developed in partnership with Mississippi State University and are expected to be completed in 2016. The Mississippi Development Authority- Energy and Natural Resources Division has also utilized Forest Inventory and Analysis (FIA) data to complete an analysis of woody biomass in Mississippi.

MINNESOTA

The Minnesota State Wood Energy Team was one of the first in the nation to be funded through the USDA Forest Service and strategically targets high potential commercial and institutional facilities for modern wood heat energy systems. One of the best facilities has been Deep Portage, a Minnesota non-profit residential environmental education and outdoor recreation center providing opportunities for more than 10,000 children and adults each year. The center is spread across 6,307 acres of glacial hills, lakes, rivers and bogs in northern Minnesota. Deep Portage uses three wood hot water boilers to heat 56,000 square feet of facility space. As Deep Portage is surrounded by forest, obtaining wood as a fuel source is not an issue, and less than 100 cords is used in an average winter. As of 2016, more than 65,000 gallons of propane have been replaced by using biomass and cost savings have amounted to over \$70,000.

WISCONSIN

Wisconsin's timber sales from state lands totaled more than \$11.7 million in 2014, up 25 percent from only two years before in 2012. The record numbers highlight the value of the timber that can be sustainably harvested from state lands while also indicating the need for continued forest management to maintain healthy and diverse wildlife populations, protect key watersheds, and provide opportunities for public recreation.

CALIFORNIA

The California Greenhouse Gas Reduction Fund (GGRF) has provided \$17.8 million for urban forestry in California for fiscal year 2014-15. This is more than double what was received in any previous year from any funding source. Created from

cap and trade proceeds, the GGRF has also provided support for reforestation, fuels management and biomass utilization. A previously awarded project in central Humboldt County completed treatment on over 300 acres and generated 5,000 dry tons of biomass.

NORTH DAKOTA

The state completed a feasibility study and began utilizing a wood-fired hot water heating system for the Bismarck Parks and Recreation District Indoor Aquatic Wellness Center. Wood chips are used to heat the Public Works building, and two wood waste biomass projects have been implemented in the community of Bismarck to date. In addition, following the historic floods of 2011, a "Flood-Affected Woody Biomass Utilization Technical Workshop and Demonstration" was held at the United States Department of Agriculture—Agricultural Research Service's Northern Great Plains Research Laboratory in Mandan, North Dakota.

WYOMING

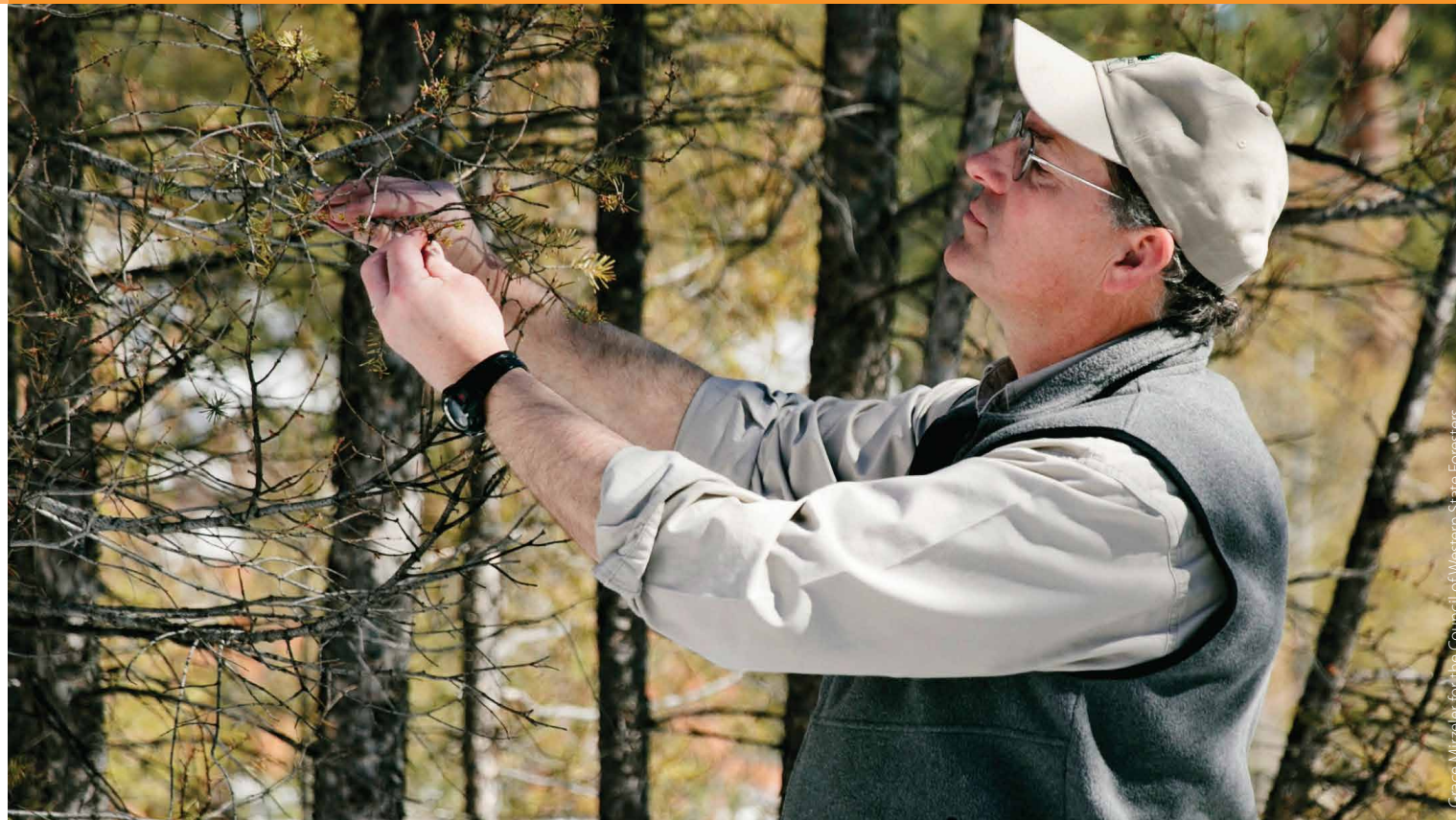
Timber harvest has been an important management tool in Wyoming, particularly when dealing with the mountain pine beetle epidemic that has ravaged over 4.4 million acres of forests throughout the state in the past decade. Between 2010 and 2014, saw timber harvest levels on Wyoming state trust lands have averaged 1,215 acres and 3.58 million board feet annually, but showed an increasing trend. This was largely due to reopening of one large and two moderate sized sawmills. Additionally, pre-commercial thinning continued to be an important management component on state trust lands, which averaged 512 acres annually over the past five years. Thinning is important to maintain proper stocking levels and encourage healthy forests, and provides sustainable revenues in the future.



NASFI Foundation Fellow Lesley Robertson



PROTECT FORESTS FROM THREATS



Grace Mizeler for the Council of Western State Foresters

A healthy forest does not happen by chance. Now more than ever, forests require protection from a growing list of threats, including catastrophic wildfires, insect attacks and disease outbreaks. These threats negatively impact watersheds and wildlife habitat, and the economic livelihoods of those who depend on healthy forests. Through the Forest Action Plans, states synthesize the best thinking of local experts to proactively address these threats and reduce the risk of their impact. Since wildfire and forest pests know no boundaries, this work must be completed across all ownership types to protect forests from harm.

In the United States, today's wildfire seasons are on average 78 days longer than in the 1970s and are projected to grow hotter, more unpredictable, and more expensive in the coming years. State Foresters are responsible for wildfire protection on two thirds of America's forested lands. The State Fire Assistance and Volunteer Fire Assistance Programs provide crucial financial and technical assistance to states and local fire departments for wildland fire prevention, detection, and suppression. In addition to helping ensure that the nation's first responders are prepared, the program

provides funding to complete hazardous fuels treatments designed to protect local communities in the wildland-urban interface and mitigate the risk of future wildfires.

Wildfire conditions can be exacerbated by forest insect attacks and disease, not to mention the stressors these pests place on individual and community forest health. A 2012 USDA Forest Service forest health assessment estimated that 81 million acres of forested land were at risk for insect infestation and disease.² To address these risks, the Forest Health Management Program on cooperative lands leverages state efforts to restore forest landscapes and improve their long-term health and resilience. This includes directly fighting the spread of tree-killing insects such as the emerald ash borer, southern pine beetle and Asian longhorned beetle. The program also offers technical support and funding assistance to states for prevention, detection, and control of nationally harmful insects, pathogens and invasive plants impacting both urban and rural forests. Projects are based on the highest national priority needs.

On-the-ground accomplishments related to these critical programs are detailed in the following section.

² United States. USDA Forest Service. 2013–2027 National Insect and Disease Forest Risk Assessment. By Frank J. Krist et al. 2014. Web.

RESTORE FIRE-ADAPTED LANDS AND REDUCE THE RISK OF WILDFIRE IMPACTS

GEORGIA

Since 2010, a computerized system has been utilized to electronically issue burning permits, providing the opportunity to quickly search for individual permits or for batch searches that summarize burning activities by year, acres, and type. The system supports an average of 750,000 burn permits in Georgia per year. Additionally, since 2010, 140 county-wide Community Wildfire Protection Plans (CWPPs) have been completed.

OKLAHOMA

Oklahoma Forestry Services has expanded a number of programs and services during the past five years in order to better protect the forest from threats. This includes an increased focus on the National Cohesive Wildland Fire Management Strategy, two Governor's conferences on wildland fire preparedness, a new interactive website that provides wildland fire information, and public outreach related to the threat of invasive species through the Don't Move Firewood campaign.

MISSISSIPPI

The Mississippi Forestry Commission partnered with the Mississippi Department of Wildlife Fisheries and Parks to manage the "Fire on the Forty Program". The program targets biologically significant areas to develop "habitat patches" in close proximity to one another so that less mobile wildlife, such as bobwhite quail and rabbits, could potentially travel between managed patches. Identifying focal areas also helps local biologists use resources more efficiently and increases the likelihood that neighboring landowners become interested in prescribed burning. To date approximately 63,000 acres have been successfully burned in these key areas.

KENTUCKY

In 2014 Kentucky launched its new arson bloodhound program and public awareness campaign. As of 2016 the bloodhounds have been used on more than 20 suspected wildland arson cases in southeast Kentucky. The program has been featured in news stories and the added public awareness may be contributing to the lower than average arson fires in counties where the bloodhounds are working.

TEXAS

Over the past five years, the Texas A&M Forest Service (TFS) developed the Texas Wildfire Risk Assessment Portal (TxWRAP), a web-based GIS application that allows local governments and the public to identify and map wildfire risk throughout the state. TFS uses information and reports from TxWRAP to develop CWPPs. During CWPP development, TFS mitigation specialists identify potential treatment areas on public lands where critical

fuels reduction projects could be performed (by TFS mitigation staff and wildland firefighters) to help improve community protection and generate enthusiasm for additional, locally-led efforts.

TFS also developed online wildfire reporting systems for fire departments and agency resources. These systems provide improved fire occurrence information for short-term planning and also feed into the national dataset for further analysis.

TFS has delivered critical fire department assistance programs such as the Rural Volunteer Fire Department Assistance Program (\$12.8 million annually) and Texas Intrastate Mutual Aid System (\$1 million annually). TFS also administered a state/local equipment donations program and two federal property programs Federal Excess Personal Property Program and the Firefighter Property Program. Collectively these grant and equipment programs provide about \$20 million per year in grants and equipment to Texas fire departments. As a result of the success of TxWRAP, TFS led the effort to expand this functionality across the southern region (SouthWrap).



Texas A&M Forest Service



Photo: MASF Foundation/Willow Leslie Robertson

WEST VIRGINIA

Between 2010 and 2015, 190 Wildland-Urban Interface assists were made, 10 new CWPPs were prepared covering 3,172 acres, and five state facility plans were revised covering 21,495 acres. Hazard mitigation projects were conducted with four communities and four communities performed prevention projects. There has been a 20 percent reduction in the number of fires and acres burned over the time period compared to the 10 year average. In total, wildfire suppression training has been provided to 3,500 individuals and about 1,300 prevention programs were presented to more than 250,000 individuals.

MASSACHUSETTS

Over the past five years, the Department of Conservation and Recreation's Forest Fire Bureau (DCR Fire) has been a leader in developing one of the strongest prescribed fire partnerships in the northeast. DCR Fire has averaged over 450 municipal, state and federal firefighters trained in all aspects of wildland fire and fire management per year. Staff also collaborated with state lands managers to contract the creation of four comprehensive fire management plans on four significant DCR state forests and reserves and prescribed fire needs on over 28,000 acres of state owned lands. Acres treated per year have continued to increase as DCR, Massachusetts Fish and Wildlife and nonprofit partners continue to build capacity in experience and qualifications. Over the last five years, an average of 800 nonfederal acres have been treated with prescribed fire. This is an important tactic for a forest threat such as wildfire, a force which does not stop at property lines.

IDAHO AND MONTANA

With assistance from National Cohesive Wildland Fire Strategy funds, adjacent Idaho and Montana communities have collaborated to create a coordinated strategy that mitigates risk to the area. To date, four demonstration sites have been created to highlight fuel reduction work around homes, Island Park has been accepted into the National Fire Adapted Communities Network, 28 educational workshops have been held, and 19,235 acres have been treated through thinning, hazardous fuel reduction, noxious weed control and planting. An additional 475,536 acres have also been inventoried and assessed to guide future work.

UTAH

In response to the severe 2012 wildfire season, the State of Utah developed the Catastrophic Wildfire Reduction Strategy (Catfire) in 2013. Reducing catastrophic wildfire requires attention to three interdependent goals: Restore and Maintain Landscapes; Fire Adapted Communities; and Wildfire Response. These goals have been embraced throughout the development of the state's Catfire strategy. More than 190 CWPPs have been completed in Utah.

PENNSYLVANIA

The Pennsylvania Bureau of Forestry has incorporated prescribed fire as a forest management tool and has increased acreage burned with prescribed fires each year over the last five years. In 2015, 36 projects were implemented and over 1,000 acres were treated with prescribed fire, including the largest project to date of approximately 340 acres. Most prescribed burning on state forest land has been used as part of silviculture systems to promote oak regeneration and reduce competition.

MINNESOTA

The 15th Annual Wildfire Academy was held in 2015 with over 950 participants. The Incident Management Team worked with over 30 attendees from as far away as Ohio and North Carolina. The week of training featured 27 nationally certified courses in wildland fire planning, operations, logistics, finance, dispatch and leadership. The Academy was hosted by Itasca Community College and jointly managed by Advanced Minnesota and the Minnesota Incident Command System. Twenty-eight fire departments were represented in the student body along with federal agencies, tribal entities, state governments, counties, conservation organizations, and other firefighters.

NEVADA

In order to maintain the desired conditions for prescribed fire, declining aspen stands on state and private lands in the mountain ranges have been treated to reduce high levels of fuel, remove encroaching conifers, and sanitize diseased trees. To date, 200 acres of aspen stands in Lake Tahoe State Park have been treated to improve regenerating and expanding aspen clones and remove coniferous understories. Nevada is planning for future prescribed burns for other locations within Lake Tahoe State Park and in the University of Nevada's Whittell Forest.

NEW MEXICO

Following a successful pilot program in 2013, Governor Susana Martinez signed into legislation a new wildland firefighting program in 2014 with the goal of providing United States Armed Forces veterans with the training and opportunity to fight wildland fires. The Returning Heroes Program (RHP) increased the state's firefighting capacity and contributes to the Cohesive Strategy of safe, effective, efficient wildland fire response. RHP crews have been utilized across the West for the last three years. Since the program's inception, the Division has employed 130 veterans.

OREGON

Under the Volunteer Fire Assistance (VFA) Program, the Oregon Department of Forestry (ODF) provided funding to build the capacity of rural fire departments to respond to wildland fire events. Funds were available for equipment including protective gear and personal training. The VFA programs provided an average of \$200,000-\$350,000 annually to rural fire protection districts. ODF has worked closely with landowners of rangeland in eastern Oregon and the Board of Forestry to develop Rangeland Protection Associations (RPA). There are now 20 RPAs throughout eastern Oregon. During the 2015 session, the Oregon Legislature adopted new laws to continue assisting and helping fund RPA development.

KANSAS

Between 2010 and 2015, the Kansas Forest Service provided assistance in prescribed burning of 11,280 acres of public land and private land. Many of these acres lay within the wildland-urban interface and served as an illustration of the benefits of fuel reduction to life safety and property survivable in the event of a wildfire. Additionally, through the combined efforts of the Office of the State Fire Marshal, State Weather Data Library at Kansas State University, and Kansas Forest Service, fire reporting through the National Fire Incident Reporting System has become much more complete and accurate. Acting on this information and in cooperation with the National Weather Service, the state has begun to align high fire occurrence and weather patterns to provide pre-burn information to landowners.

ARIZONA

As part of the National Fire Protection Association's Firewise Communities Program, the Arizona Department of Forestry and Fire Management has actively empowered neighbors to work together to reduce their wildfire risk. Using a five-step process, communities develop an action plan that guides their residential risk reduction activities, while engaging and encouraging their neighbors to become active participants in building a safer place to live. Over the past five years, Arizona State Forestry has conducted 27 Firewise Assessor courses, certifying approximately 410 citizens and firefighters throughout Arizona, and presented Firewise and fire prevention principles during 75 events, reaching approximately 10,000 Arizona citizens.

In addition, from July 2010 through June 2015, the Department acquired over \$6 million in federal excess equipment to aid state and local agencies in wildfire suppression efforts. Over this period, 152 pieces of equipment were acquired. Sixty-six of these were vehicles that were converted for fire response.

REDUCE THREATS FROM FOREST INSECTS AND DISEASE

GEORGIA

To minimize negative environmental and economic impacts of cogongrass in the south, a multi-agency team was established in 2015 among the USDA Forest Service, Customs and Border Protection, Georgia Ports Authority, and the Georgia Forestry Commission to inspect for noxious weeds entering the Port of Savannah on refrigerated containers. During the peak season for Peruvian onions, for example, more than 100 of these containers enter the port each week, many of which carry noxious weed seeds including cogongrass. Over the next two years, surveys will identify the species of weed, viability of seed, and catalog the seeds to the molecular level to identify the point of origin. If successful, the pilot program will be introduced into ports around the United States.

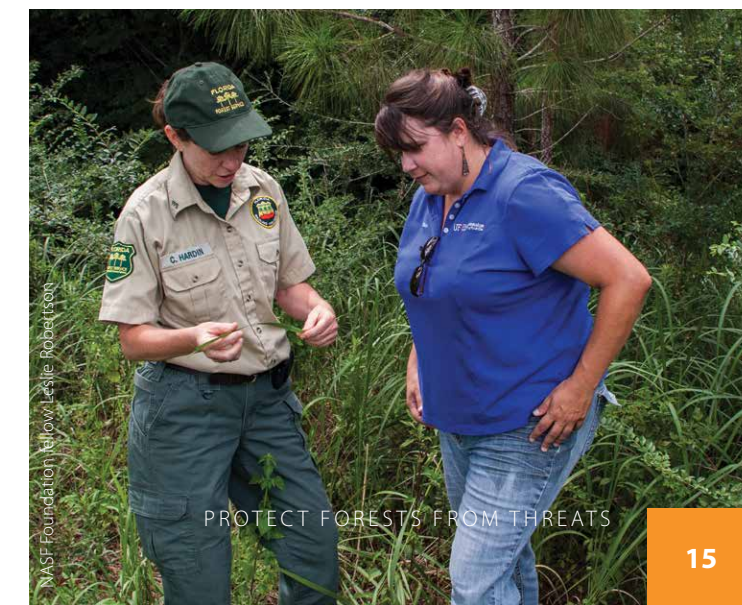


Photo: MASF Foundation/Willow Leslie Robertson

PROTECT FORESTS FROM THREATS

MISSISSIPPI

The Mississippi Forestry Commission is engaged in addressing Southern Pine Beetle activity. Through annual aerial flights over 316 spots have been detected on private lands since 2010 and the Southern Pine Beetle thinning efforts have treated 18,309 acres and provided 40 outreach programs. The “Don’t Move Firewood” campaign has been promoted widely in the state to help address the threat of invasive species. Efforts with Kudzu control have also treated 2,121 acres, assisting 126 private landowners. The Cogongrass program began in 2010 and has assisted 2,134 landowners on 4,175 acres with a total of 29,261 spots treated.

KENTUCKY

The Kentucky Division of Forestry, teamed with the Kentucky Division of Abandoned Mine Lands, Appalachian Regional Reforestation Initiative, and the American Chestnut Foundation, to reestablish 15,000 American chestnut and other hardwood seedlings on a 16-acre coal mine site within the Appalachian Forest Priority Area.

The Division also established a suppression program to coordinate multi-agency projects to help combat the hemlock woolly adelgid. One of the most significant threats to Kentucky’s forests, it occurs across 28 counties in eastern Kentucky and will have major ecological and environmental impacts on forest health. Since 2010, the program treated over 100,000 hemlock trees.

MINNESOTA

Since 2008, the Forest Pest First Detector Program has trained 1,121 volunteer detectors, including 411 from 66 out of 87 Minnesota counties. First Detectors use a step-by-step process to identify signs and symptoms of invasive forest pests. Volunteers from Minnesota, Wisconsin, Iowa, North Dakota, and South Dakota have attended workshops.



Grace Mirzeler for the Council of Western State Foresters

OHIO

The Ohio Department of Natural Resources’ Division of Forestry encourages invasive plant control by working with Ohio’s Cooperative Weed Management Area, the Appalachian Ohio Weed Control Partnership, and on private land through its Service Forestry Program and other outreach events. For instance, an infestation of Asian longhorned beetle (ALB) was identified in southwestern Ohio in 2011. To reduce the impact of removals, landscape trees have been provided to landowners who have had trees removed as a result of the beetle eradication program.

The Division has worked to tackle other known forest insects and diseases. From 2010 to 2015, more than 10,200 ash trees were removed and 4,800 new trees have been replanted in 74 communities throughout Ohio. Additionally, 1,100 hemlock trees have been treated to control hemlock woolly adelgid and nearly 2,400 biological control beetles have been released on infested trees since 2013. More general treatment of 1,500 acres of invasive plants on state and partner lands was also funded in 2015 by a Joint Chiefs Collaborative Oak Management Project.

MASSACHUSETTS

The Department of Conservation and Recreation’s Forest Health Program is a major partner in the effort to eradicate the ALB in Worcester County, Massachusetts. Building on past efforts that eradicated a smaller infestation in the Boston/Suffolk County area, the project utilized federal and state funding to survey and remove infested trees thus protecting the residual forest which is susceptible to the spread of this invasive pest. Reforestation efforts were also implemented in Worcester County, focusing on areas with depleted canopies due to removal of infested trees. Since 2010, nearly 18,000 trees have been replanted within the ALB regulated area.

WYOMING

The Wyoming Living Snow Fence program planted a total of over 107,030 linear feet of snow fences in the last five years. This amounted to an installation and future maintenance savings of nearly \$1.375 million since 2010. The Wyoming Department of Transportation (WYDOT) was a primary partner in this effort.

NEW MEXICO

Since 2010, New Mexico’s State Forestry Division and the Forest Stewards Guild have teamed up with motivated landowners to apply Western Bark Beetle Initiative funding on 44,200 acres. With financial support from the Forest Service’s Region 3, state forestry timber management staff have worked with landowners to develop thinning and restoration projects for these lands. Landowners were reimbursed for forest thinning treatments that increase resilience to insects, diseases, and high intensity wildfires. These treatments also improved water quality and wildlife habitat and helped prevent losses and costs associated with catastrophic wildfire and post-fire floods.



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OREGON

For 68 years, the Department has cooperated with the USDA Forest Service in conducting an annual aerial survey of Oregon forestlands for insect, disease and abiotic damage. In 2014, the Department conducted a special aerial survey for the invasive forest weed, gorse. Gorse has many traits undesirable to both agriculture and forestry operations in western Oregon: it can quickly out shade and kill conifer seedlings; it is an undesirable forage species that can quickly invade and dominate pastures, and constitutes a wildfire hazard due to its propensity to burn. The survey covered 300,000 acres in Coos and Curry counties and mapped 6,230 acres of gorse. The purpose of the survey was to document areas of rapidly growing populations so as to prioritize where response was needed.

KANSAS

Working closely with the Secretary of the Kansas Department of Agriculture (KDA), the Kansas Forest Service assisted with the establishment of a statewide quarantine in 2010 to prevent and suppress the spread of Thousand Cankers Disease in walnuts. The primary high-risk areas of concern occur in central and eastern Kansas where walnut is common and the accidental spread of the disease by humans is a concern. Five sites were monitored for a 60-day cycle at transportation hubs, parking areas, wood debris collection points, camping sites and wood utilization businesses.

A secondary area in western Kansas was also monitored after the disease was recently detected in an adjacent part of Colorado. In

western Kansas a sentinel site program monitors 20 traps from May through October. The program was launched in 2009 in partnership with KDA-Plant Protection and Weed Control and continues to date.

AMERICAN SAMOA

American Samoa, the only territory of the United States south of the Equator, is located in the Pacific Ocean about 2,500 miles south of Hawaii. The spread of exotic invasive plants is an enormous threat to the territory’s native rainforest. In 2012, a pilot mapping project was conducted and the use of geographic information system (GIS) and remote sensing technology improved the forestry team’s ability to identify locations of invasive species.

ARIZONA

The Arizona Department of Forestry and Fire Management partners with the USDA Forest Service to survey millions of acres of Arizona’s forestland from the air. Aerial Detection Surveys provide land managers and the public with information about landscape-level forest and woodland health conditions. Experts survey one to three million acres annually, and USDA Forest Service personnel survey an additional six to eight million acres of Arizona forest land. When forest health issues were identified, Forest Health staff offer this information to land managers locally. Countrywide data can also be accessed online, helping local land managers make more informed decisions.



ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS



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Whether they are cleaning the nation's water, sequestering carbon, or providing welcome shade, trees really are the key to healthier communities. Through the Forest Action Plans, states target their resources to enhance these public benefits, educate citizens about the importance of healthy trees and forests, and help grow the next generation of natural resources stewards.

Conservation education projects range from teacher tours to Project Learning Tree educator workshops and often include partnerships with forestry schools and forest industry companies.

More than 50 percent of the nation's drinking water originates from forested landscapes, and state forestry agencies are working with partners to safeguard this valuable resource. Each state develops and implements best management practices (BMPs) for silvicultural activities. State forestry BMPs programs are highly diverse to reflect the wide range of forested landscapes and unique state characteristics found throughout the country. These programs are highly effective at protecting water quality.

The USDA Forest Service's Urban and Community

Forestry Program offers critical assistance to communities to establish and manage their trees and forests. The program helps keep community green infrastructure healthy and productive, which directly benefits the more than 220 million urban-dwelling Americans while also providing landscape-wide benefits to our shared water, air, and wildlife resources.

A healthy tree canopy improves quality of life in many ways. For example, research indicates that the presence of trees can significantly reduce rates of asthma and other respiratory diseases. There are even reports of reduced neighborhood crime rates as a result of vegetative cover. In the United States alone, urban trees store more than 708 million tons of carbon. This is equivalent to the annual carbon emissions from about 500 million automobiles! The Urban and Community Forestry Program has allowed for a network of locally managed trees and forests that contribute to clean air and water, improved economies, health and community pride.

On-the-ground accomplishments that enhance public benefits from trees and forests are detailed in the following section.

+ PROTECT WATER QUALITY AND QUANTITY

GEORGIA

Since 2012, the state Water Quality Program has conducted 423 best management practices (BMPs) education presentations, 103 BMP field demonstrations, 569 BMP Assurance Exams, and 523 BMP Compliance Survey Inspections.

TENNESSEE

The Tennessee Division of Forestry partnered with Nashville metro government and local non-profit organizations to implement a "Clean Water from Urban Forests" project that planted native trees on public and private properties along streams in eight priority watersheds. The project involved 2,800 volunteers, who spent 7,700 hours in planting 28,000 trees on 30,400 feet of buffer. In a separate riparian forest buffer initiative led by the National Resources Conservation Service, 30,004 acres were planted with trees under the Wetlands Restoration Program from 2010-2014.

WEST VIRGINIA

Trees are an important feature of a healthy watershed. Riparian tree plantings buffer pollution of waterways from adjacent land, help trap erosion sediments, improve wildlife habitat and increase biodiversity. West Virginia's Chesapeake Bay Program works to enhance water quality in the eight Eastern Panhandle Counties of the state. Over the past five years, 30,340 forested feet (5.75 stream miles) have been planted, totaling more than 10,000 trees.

NEW YORK

With the help of volunteers, New York State's Trees for Tributaries program restored thousands of feet of streamside buffer by planting trees drawn from the Saratoga State Tree Nursery's

native stock. The Department of Environment and Conservation Division of Lands and Forests has worked to expand the program statewide and is currently active in the Hudson River Estuary, Mohawk River, Susquehanna River, Genesee River, and Lake Champlain watersheds.

ARIZONA

The Verde River watershed of central and northern Arizona is identified as a priority landscape and sustains the Verde River and its riparian forest. In Arizona, riparian forest is extremely rare at less than 0.5 percent of all land. Utilizing Landscape Scale Restoration funds, numerous Arizona Department of Forestry and Fire Management projects have been implemented within this valuable and threatened landscape to control invasive plants and support riparian forest restoration.



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+ IMPROVE THE TREE CANOPY

KENTUCKY

Almost half of Kentucky is forested, with another two million acres that have the potential to be reforested. In 2014, Kentucky's 20/20 Vision for Reforestation began with the goal to plant 20 million seedlings in 20 years. Over 1.1 million seedlings have been planted since January 1, 2014.

TEXAS

The Texas A&M Forest Service (TFS) has trained personnel to serve as Urban Strike Team leaders and developed a mobile app, Level 1 Tree Risk Assessment, to help perform visual tree assessments, map trees with obvious defects, and identify treatment options. TFS also completed the first ever urban Forest Inventory and Analysis (FIA) project in Austin. Data analysis is in

progress and a new online application summarizing the results is in development. Field crews are now measuring urban plots in Houston.

PENNSYLVANIA

Through the public-private partnership TreeVitalize, Pennsylvania has worked to restore and build capacity for urban tree cover, and educate citizens. In 2013, TreeVitalize became available to all counties. TreeVitalize has planted over 400,000 trees through the help of many partners and community volunteers. More than 6,000 citizens have also become TreeTenders® and in the process received extensive training and awareness building related to the importance of urban trees along with the tools to organize tree planting and maintenance projects in their own neighborhoods.

WEST VIRGINIA

Over the past five years, the Mountaineer Treeways program involved 100 communities and volunteer organizations and resulted in the planting of 10,858 trees.

NEW YORK

The Rensselaer Plateau Alliance worked with members of its community to find land and funding to establish a community forest. Their application to the USDA Forest Service Community Forest Program ranked number one in the country and received a grant for 50 percent of the purchase price. With a loan from The Conservation Fund, the RPA acquired the parcel in 2014. The community forest will serve as a demonstration forest and training site for chainsaw safety and best forestry practices. The Empire State Forest Products Association and New York Logger Training will begin using the Community Forest as a training site. The forest will be open to the public year round for recreational activities.

MISSOURI

After the destructive EF-5 tornado that tore through the communities of Joplin and Duquesne, the Missouri Department of Conservation utilized USDA Forest Service funding to help both towns address tree health issues. A Tree Recovery Coordinator was hired and worked to engage citizens and volunteer groups. The coordinator facilitated the planting of more than 10,758 trees and distribution of hundreds more trees to homeowners. More than 3,500 volunteers were coordinated to provide 21,000 hours of tree-related assistance to the communities. An additional 5,000 trees have been planted since 2013.

RHODE ISLAND

The Rhode Island Department of Environmental Management Urban and Community Forestry Program completed a statewide tree canopy assessment in 2014. The resulting information is delivered to participating communities to improve the understanding of their current tree canopy and work towards increasing or sustaining canopy levels. There are currently 21 of 39 municipalities within the state with an active and up-to-date shade tree ordinance. The assessment will be updated every five years to track canopy change.

MICHIGAN

The Michigan Department of Natural Resources Urban and Community Forestry program connected the Sustainable Forestry Initiative (SFI) State Implementation Committee with the Detroit nonprofit, The Greening of Detroit. Work with these groups and various other partners is designed to improve Detroit's urban forests and revitalize the city through tree planting projects. The program helps volunteers to identify and plant trees to enhance the quality of life in this urban environment.

The first year of this relationship resulted in 138 volunteers, 24 citizen foresters, and 10 Greening of Detroit staff working together to plant trees in the city. It was also an excellent opportunity for Michigan's SFI Implementation Committee to speak to the volunteers about the importance of sustainable forest management and the work SFI does throughout North America to ensure future forests for everybody. In addition, the Michigan SFI committee agreed to donate \$5,000 to The Greening of Detroit to support their ongoing citizen forester training program and helped sponsor the attendance of 120

Greening of Detroit Green Corps students to a first annual Green Corp/Michigan SFI tour in Grayling. This is truly a relationship of mutual benefit, and it helps expose audiences from both urban and rural areas of the state to issues of shared interest. Through the citizen forester program, volunteers planted between 4,000 and 6,000 trees annually.

KANSAS

Beginning in 2010 a nine-county wide forest inventory was conducted in partnership with the Kansas Forest Service, Mid-America Regional Council, the Davey Resource Group, and the Missouri Department of Conservation. Data from 340 randomly selected plots were analyzed using the USDA Forest Service's i-Tree modeling software and ecosystem service values assigned. This data has served to inform the decisions of local leaders, planners, and residents working to help reduce the conversion of forestland to development in an area projecting a conversion of 400,000 acres of forest land in the next 20 years.

+ EDUCATE THE PUBLIC

TENNESSEE

Under the *Play. Plant. Preserve.* tree planting cost-share program, Tennessee aims to ensure that all production of hardwood drumsticks and mallets produced at ProMark's Prospect sawmill are sustainable. The goal of the ProMark funded program is to provide an avenue for planting five trees for every one that ProMark uses on an annual basis. The project will help connect people to trees and music to engage them in environmental stewardship.

LOUISIANA

More than 48 percent of Louisiana's land area is forested, and trees are Louisiana's number one agricultural crop. The Louisiana Department of Agriculture and Forestry is working to educate the public on the value of forests to the state. Engagement has ranged from presentations to school age children to field days with forest landowners. Employees also serve as members, advisors, and officers for numerous organizations across the state. In this capacity they provide information about how properly managed forests and landscapes protect water quality, reduce storm water runoff, conserve energy, and enhance economic development.

WISCONSIN

Wisconsin's school forest program is approaching 90 years old. The number of registered school parcels, as well as the overall number of acres, has steadily climbed. Since 2010, an additional 67 parcels have been added, totaling over 2,300 acres of forest classroom. A timber harvest on the Goodman-Armstrong Creek school forest property provided a unique, large-scale education opportunity for 250 students from six surrounding school



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districts. The event integrated lessons in sustainable forest management with a fundraiser to support the Children's Miracle Network. Proceeds were donated to charity and students were introduced to an array of forestry focused topics. The Whitnall School District, in Greenfield, has integrated their school forest as a classroom for 2,500 students, 175 staff and the community. The forest provides lessons in tree species identification, tree planting, growth, invasive species, and many other topics.

OHIO

Project Learning Tree (PLT) in Ohio is sponsored by the Ohio Department of Natural Resources Division of Forestry. PLT-Ohio developed an educational poster set showcasing six priority forest issues by using ideas generated in the professional development education workshops, with the help of an Ohio EPA Environmental Education Fund grant. The posters have been used by over 1,000 youth leaders and educators as well as natural resource professionals throughout the state.

MISSOURI

The Missouri Department of Conservation Forestry Division launched a new promotional and educational campaign called Trees Work. The campaign was designed to increase communication and outreach efforts to help understanding of the benefits that trees, woodlands, and forests provide. The campaign has received national and state recognition. In 2015, a statewide survey showed a 13 percent increase in Tree's Work messaging awareness. The "Without Trees..." posters have been displayed in hundreds of places throughout Missouri. The artists used woodblocks made from Missouri cherry trees, recycled ink, and locally-made paper. Each poster is carefully hand-printed and captures the look and feel of how trees work.



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FUTURE AREAS OF FOCUS, NEED, AND OPPORTUNITY



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In reviewing the Forest Action Plans in 2015, the state forestry agencies provided insight about areas of focus, emerging need and opportunity through 2020. Across the states, several key themes are apparent. The following issues are likely to draw an increasing amount of attention in the coming years:

- Technology, Inventory and Markets
- Wildfire and the Wildland-Urban Interface

- Forest Health
- Urban and Community Forests
- Landscape-Scale Partnerships Across Boundaries
- Ecosystem Services

Each of the identified future areas of focus presents challenges as well as opportunities for growth, new partnerships, and landscape-scale innovation.

TECHNOLOGY, INVENTORY AND MARKETS

The use of modern technologies to manage information, collect data, and conduct analysis is a critical need across the states. These technologies can improve efficiencies, enhance analysis, and support better communication and decision-making. Investments in enhanced forest inventory are an essential function, including support for the Forest Inventory and Analysis (FIA) Program which is managed by the Research and Development organization within the USDA Forest Service. These efforts directly support market opportunities, including existing markets that rely upon high quality and up-to-date information as well as emerging markets that rely upon assurances of sustainability.

KEY RECOMMENDATIONS RELATED TO TECHNOLOGY, INVENTORY AND MARKETS:

- provide support for **improved technologies**, including information security, aerial photography, parcel data, remote sensing, and automatic vehicle location;
- continue to **enhance forest resource inventory** to support high quality and greater accuracy in data as needed for emerging forestry and renewable product opportunities; and

- increase application of **technology to support sustainable forest product markets** and to understand and manage shifting environmental stresses to protect the health of our forest resources and enhance benefits to landowners and the public.

Information management and analysis is a critical function in all aspects of natural resource management—from wildfire responses to invasive species and from timber harvesting to

habitat restoration. New technologies are critically important for ensuring timely, accurate, and high quality information and data are available and effectively used in these situations. America's forests provide an incredible range of products and services and too often we see state agencies forced to utilize outdated information management systems and antiquated technologies. The future of our forests will require improvements in technology which will support our inventory systems and the ability to facilitate the development of market innovations.

WILDFIRE AND THE WILDLAND-URBAN INTERFACE

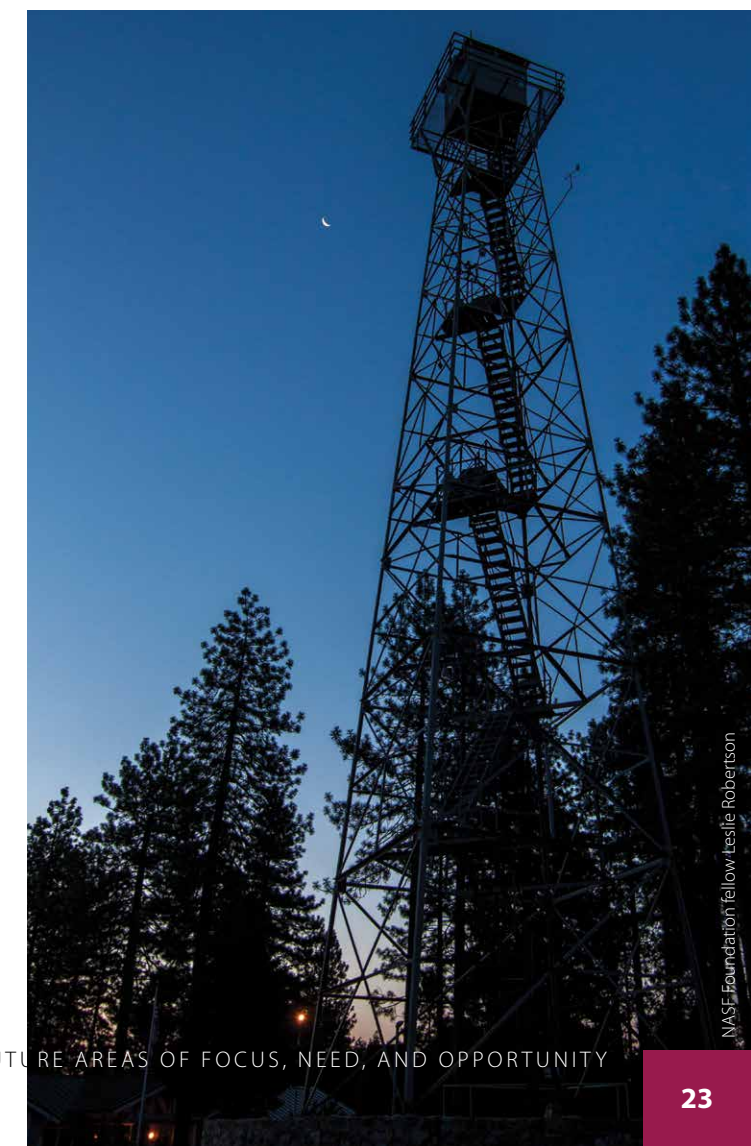
Wildland fires have shaped American landscapes for millennia and can provide many ecological benefits including the maintenance or improvement of wildlife habitat, a reduction in non-native plants and pests, removal of undergrowth that prevents regeneration of desired native species, and soil nutrient enrichment. However, for a number of reasons, many communities and natural areas are at risk for catastrophic wildfire and several experience year-round challenges related to wildfire. As they face these challenges, states and their partners are using innovative and collaborative approaches to reducing the risks, including fuel reduction efforts, preventive prescribed fire activities, and biomass utilization programs. This is an area of future focus in many parts of the country and will require cross boundary partnerships. Effective wildfire response systems require assessment and planning, prevention, mitigation, and recovery.

KEY RECOMMENDATIONS RELATED TO WILDFIRE:

- utilize the best available **wildfire risk assessment data**;
- build capacity for **wildfire plan updating**;
- **provide training** to maintain or increase skills;
- continue effective use of **prescribed fire** in prevention and mitigation activities; and
- enhance systems for addressing **post-fire recovery** related to watershed protection, reforestation, and ecosystem restoration.

Urban sprawl and the continued development of rural landscapes have resulted in challenges for protecting natural resources, ecosystems, homes, businesses, infrastructure and people from wildfire. An increased rate of development and expansion into natural areas, including forests and rangelands, has created a land use often referred to as the wildland-urban interface (WUI). The WUI is not a specific place, but rather a descriptive term that applies to geographic locations where human development abuts or intermingles with fire prone (and/or fire-dependent) ecosystems. Nowadays, it's always wildfire season somewhere in the United States. As a result, it is

increasingly important to identify and mitigate wildfire risks on public and private properties within the WUI in order to protect homes, businesses and lives in the event of a wildfire. Since it is not possible or desirable to prevent or put out all wildfires, it is important for WUI residents, communities and landowners to be aware of the risks that wildfires pose and become educated and engaged in measures they can collectively and independently enact prior to a wildland fire event. Advanced preparations can help ensure a safer and more rapid response should a wildland fire threaten their community.



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FOREST HEALTH

There are significant forest health concerns in several areas of the United States. Efforts to manage and prevent forest health threats are fundamental to caring for the nation's forest resources. The threats are widely varied—from insects and diseases to invasive species and others. Forest health is also impacted by changes in land use.

KEY RECOMMENDATIONS RELATED TO FOREST HEALTH:

- address **forest health and land use change** due to agricultural and urban land conversion and development;
- shift the response to **mountain pine beetle** toward a new phase of restoration and resiliency;
- strengthen partnerships and continued efforts to address **invasive species**;

- build **early detection and rapid response** capacity.

In many ways forest health concerns are a continual management concern; however, several factors raise the likelihood that the risk will continue to expand in the future due to the landscape scale challenges that have been created by increased tree mortality rates in some regions. In addition, the threat from invasive species continues to expand due to global trade and travel that contribute to transporting insects and diseases around the world. Many states are working actively with partners on landscape scale restoration efforts as well as on enforcement efforts at ports and other points of entry to try to remain one step ahead of forest health threats.

URBAN AND COMMUNITY FORESTS

There are an estimated four billion urban trees in the United States with another 70 billion or so growing in the more broadly defined metropolitan areas. Urban landscapes are projected to grow from about three percent of land area in 2000 to more than eight percent in 2050, an area larger than the state of Montana. From a national perspective, the number of trees, and hence the volume of wood, removed annually from urban and community forests is significant (the removal can be due to land conversion, insect and pest damage, storm events, hazard trees and more). Removal estimates range from 16 to 38 million green tons per year.

The inclusion of urban and community forests, including urban wood utilization within the Forest Action Plans provides opportunities for enhancing the social benefits of trees as well as providing important environmental services. Effective planning and high-quality data best support the success and benefit of urban and community forestry programs.

KEY RECOMMENDATIONS RELATED TO URBAN AND COMMUNITY FORESTS:

- address **data gaps for urban and community forests**, including forest health data and high-resolution tree canopy data; and

- incorporate urban forest resources into community **stormwater management** plans.

Urban and community forests provide many benefits, including economic, environmental, and social improvements. The economic benefits include reduced heating and cooling costs, increased property values, and increased business activity. The ecosystem services provided include biodiversity, stormwater management, improved air quality, carbon sequestration, and a reduction in the urban heat island effect. The social benefits of urban and community forests include improved human mental and physical health, better academic performance, and crime reduction among other benefits. These assets are integral to sustaining thriving metropolitan areas, especially at a time when an increasing proportion of the world's population lives within cities. Robust and equitable urban and community forest management policies and tree planting incentives enable access to the many benefits urban and community forests provide.

PARTNERSHIPS ACROSS BOUNDARIES

The value of effective partnerships is a constant theme within the Forest Action Plans, and the use of tools such as the Farm Bill's Good Neighbor Authority help support innovation. Partnerships are essential to effective land management.

KEY RECOMMENDATIONS RELATED TO PARTNERSHIPS ACROSS BOUNDARIES:

- expand use of the **Good Neighbor Authority** as a valuable tool in helping to work across boundaries;
- leverage partnerships for increased use of the **Forest Legacy Program** and increased land protection; and
- use Forest Action Plans to direct funding and resources.

Many of the current and future partnerships for each state are focused on landscape-scale and cross-boundary goals and outcomes. These include public-private partnerships between states and a diverse array of conservation organizations and other stakeholders. Many state forestry agencies partner with neighboring states and other agencies to work across



boundaries on issues related to invasive species, habitat restoration, watershed protections and other key issues that require landscape-level thinking. This type of work is essential to address considerations related to wildfire, forest health threats, watersheds, the use of technology, and many of the other future areas of need that have been identified. Effective work on a landscape-scale is facilitated by the Forest Action Plans and the ability of partners to share plans, articulate priorities, and identify shared objectives that can be addressed through cross-boundary efforts. The priorities that each state identified often reach far beyond the lands that the state manages. To reach these larger goals it is important to be able to work with key partners while utilizing a landscape-scale approach.

ECOSYSTEM SERVICES

Ecosystem services can be defined in different ways, and are generally thought of as the benefits that people obtain from the interaction of plants, animals, and other elements of the environment through the process that occur in that environment. These services can include providing food, water, timber and fiber as well as regulating climate, mitigating floods, and cycling nutrients. Forests provide diverse ecosystem services, one of the greatest being the valuable water resource protections provided by forested watersheds. The continued effective use of Best Management Practices (BMPs) is essential to providing these services.

KEY RECOMMENDATIONS RELATED TO ECOSYSTEM SERVICES:

- maintain and increase the momentum behind **watershed restoration** initiatives;
- revise and update **BMPs manuals**, including completion of harvesting guidelines where appropriate; and
- continue to ensure **proper BMP implementation**, through ongoing education, inspections, and assurance exams.

The widespread and effective use of BMPs is a great success story for America's forest. As we look to the future, these efforts will need to continue as well as potentially expand to address concerns across the landscape. Innovations in watershed protection activities within our urban areas as well as across diverse rural landscapes can help complete the picture for water quality improvements. Another important ecosystem service from forests is carbon storage and climate regulation. These benefits also go beyond the forest to impact our communities and landscapes globally. As we look to the future areas of focus,

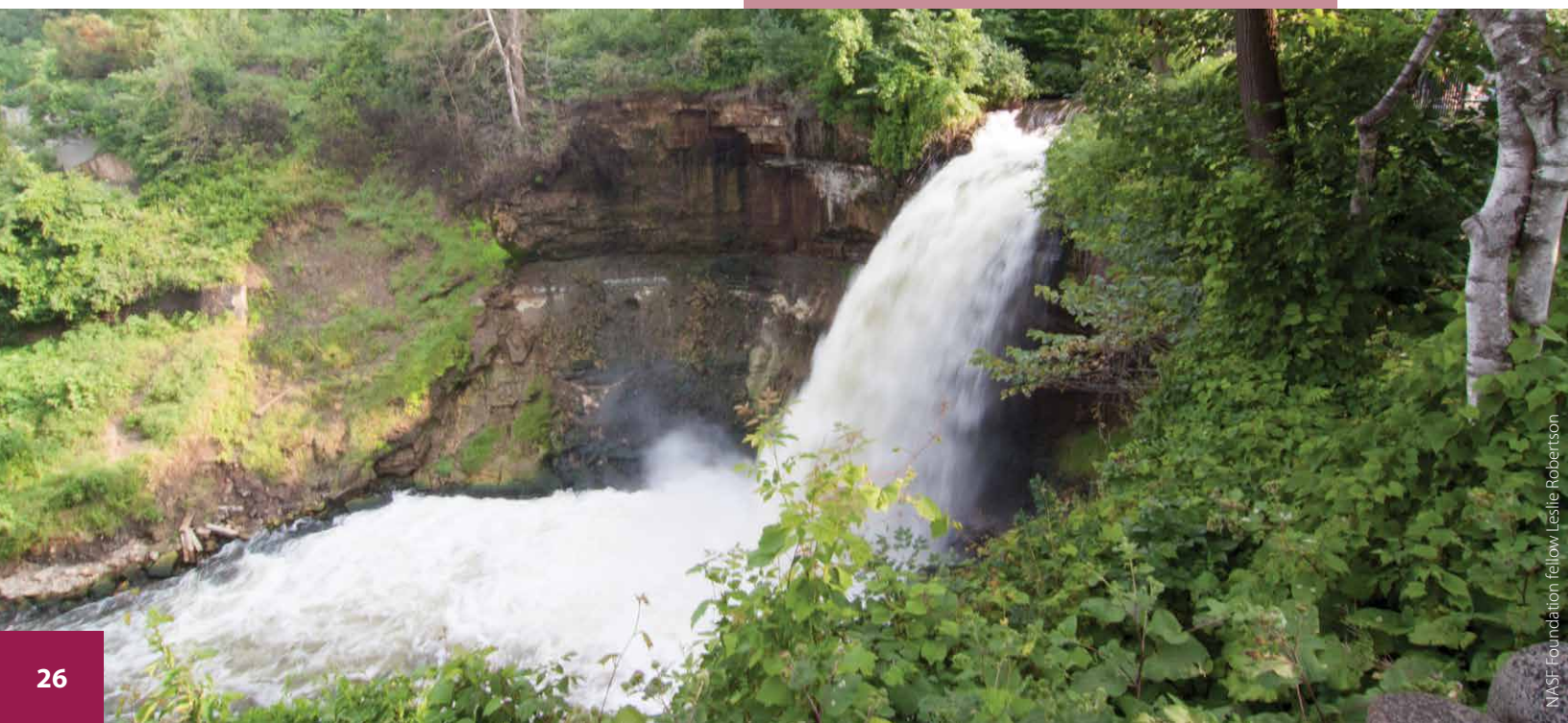
the needs and opportunities related to diverse ecosystem services will continue to grow.

To support the continued value of the Forest Action Plans, there are also recommendations for making future updates to the Forest Action Plans as efficient and effective as possible.

RECOMMENDATIONS TO SUPPORT FUTURE FOREST ACTION PLAN REVIEWS AND REVISIONS:

- Incorporate **more data layers** into the analysis of priority landscape areas. The current level of detail and data layers exclude much of the working rural land that can benefit from programs and services, including land that is critical for threatened or endangered species, highly erodible soils or land critical for conservation, or areas affected by the spread of invasive insects and diseases.
- Maintain **up-to-date information** from federal sources. Many programs and partnerships rely on federal data, such as the Timber Products Output (TPO) online data which are developed by the Forest Inventory and Analysis program. Regularly updated data allow programs to efficiently and effectively complete their work.

Each Forest Action Plan is unique to its state or territory and reflects significant public input and local expertise. Investing in and referring to the Forest Action Plans to protect forests is good for people, jobs and communities, now and in the future.



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A report by the National Association of State Foresters

Funding provided in part by the USDA Forest Service



Analysis of the Forest Action Plan national priority sections
conducted by Dovetail Partners



Writing and research assistance provided by Gregory Pilchak

Writing support provided by Daniel Hubbell

Report design by Barbara Sgouros