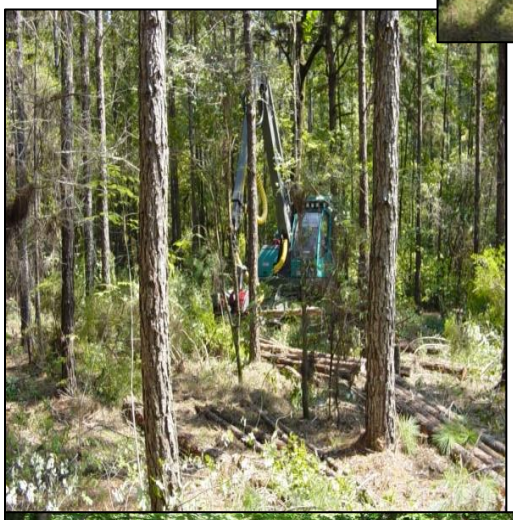
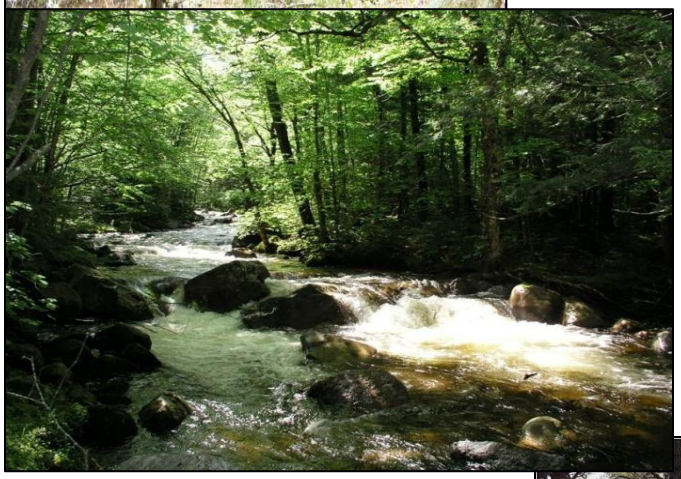
Report to Congress on Cooperative Forestry Assistance Act and Other USDA Programs That Benefit Private Forests



September 30, 2011

USDA



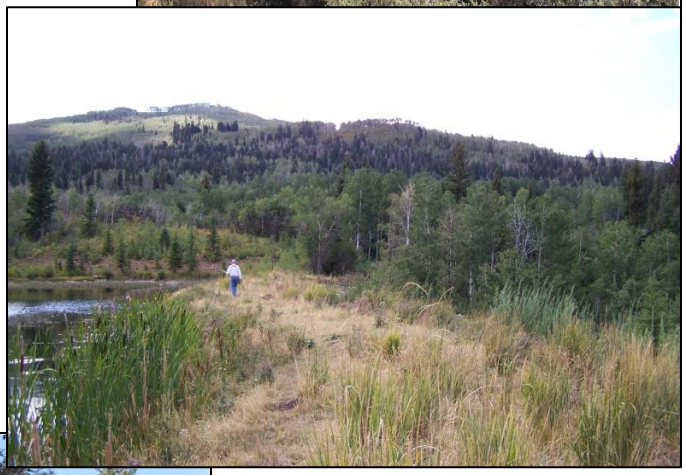


Table of Contents

Executive Summary

The Food, Conservation, and Energy Act of 2008 (2008 Farm Bill) recognized the value of private forest lands and amended the Conservation, Forestry, and Energy Titles to better address privately held forest resources. The Cooperative Forestry Assistance Act was amended to establish three national priorities for private forest lands—conserve working forests, protect forests from threats, and enhance public benefits from forests. The amendment also required this report to Congress describing, (1) how funds were used under the Cooperative Forestry Assistance Act and other U.S. Department of Agriculture (USDA) programs to address these national priorities and, (2) the outcomes achieved in meeting the priorities on private lands from 2008–2011.

The Forest Service, the primary forestry agency of the USDA, has taken the lead in developing this report, highlighting accomplishments of the Forest Service and its delivery partners, as well as other USDA programs that provide benefits to private forest lands and their owners. USDA carries out a broad range of private forestry programs that span research, education, landowner assistance, inventory, technology transfer, detecting and suppressing forest pests, fire planning, emergency response, agroforestry, and land protection.

The contributions of the programs delivered through the Forest Service and the other USDA agencies working with private forests have been significant to attaining the national priorities for private forest lands. Since the 2008 Farm Bill was enacted, over $2 billion has been invested by the Forest Service, over $190 million by the National Institute of Food and Agriculture, over $160 million by the Natural Resources Conservation Service (NRCS), over $1.059 billion by the Farm Service Agency (FSA), over $125 million by Rural Development, and over $11 million by the Agricultural Research Service to address the three national priorities.

From 2008 through the first half of 2011, the Department has directly assisted 789,500 forest owners by providing technical assistance, mostly in the form of preparing management plans. Two million landowners participated in USDA supported educational programs. Over 4 million acres of land received forestry and conservation enhancements through cost-share practices, utilizing $189 million from USDA programs with a match of at least $93 million in non-Federal investments. Over $840 million was spent for forestry-related land retirement through the Conservation Reserve Program and an additional $61.3 was spent for emergency restoration and recovery through the Emergency Forest Conservation Reserve Program. Almost 400,000 acres of trees were planted under the Conservation Reserve Program since 2008.

The forest research and inventory work carried out between 2008 and 2010 resulted in approximately 194 reports or studies and the maintenance of an ongoing inventory that covers the nation's forests. Much of this research is transferred to private forest owners and the professionals who provide services to them resulting in on the ground implementation. During this time period, the Forest Service has spent over $760 million in doing this important scientific work and transferring the knowledge gained.

Agencies and partners work together to make it easier for forest landowners to receive coordinated assistance. The Forest Service awards grants to State forestry agencies. The State forestry agencies work with NRCS, conservation districts, the extension service and the private sector to provide timely and effective technical assistance to landowners. These and other conservation partners

serve on State Forest Stewardship Coordinating Committees chaired by State Foresters as well as local working groups and State Technical Committees chaired by the NRCS State Conservationist.

State Forest Resource Assessments and Strategies (Forest Action Plans) were prepared in response to the 2008 Farm Bill and are serving to guide forest conservation and protection efforts within each State and territory. Forest Action Plan priorities are being addressed through Federal, State, local and individual landowner efforts. Fire, insect and disease, forest fragmentation, and other threats have been identified and efforts continue to address these problems. From 2008 to 2010, $170,626,000 was spent on insects and diseases and $15 million was spent to address hazardous fuels and complete community wildfire protection plans. The projects completed by the Forest Legacy program from 2008 through the first half of 2011 have protected 638,450 acres from fragmentation and conversion to nonforest uses, with a Federal investment of $195 million and a non-Federal match of $500 million.

There has been a lot of success, with a lot of work remaining, by USDA and its partners. The programs are working, and are working together in a more coordinated fashion. Private forests comprise the majority of our nation's forests and their importance and benefits to people continue to increase as do the threats facing them.

Introduction

Private forest lands have tremendous public value. Of the 751 million acres of forest land in the United States, more than 56 percent—423 million acres—is privately owned. There are more than 11.3 million owners of 1 acre of forest or more, with 5.3 million owners of 10 acres or more. Private forests supply nearly 30 percent of the water we drink. Private forests are the source of over 90 percent of our domestically-produced forest products. Billions of dollars of economic activity and hundreds of thousands of jobs depend on the country's private forests. These lands, and the trees and other vegetation that grow there, are essential in providing clean air, habitats for fish and wildlife, and a place to get in touch with nature. Forests and trees are mitigating the effects of climate change in ways that benefit people.

Yet, private forests face many threats to their health and very existence. Current growth trends are showing a steady loss of forests due to development. Private forest continues to be fragmented into smaller parcels, which makes managing the forest a greater challenge. State Forest Resource Assessments and Strategies (also referred to as Forest Action Plans) identified land use conversion and forest fragmentation as major issues in most states.

Insects and diseases continue to attack and damage forests and trees. Some of the most damaging outbreaks are from non-native invasive species that can kill even vigorous and healthy trees. Wildfire damages both public and private forests, and this is made worse through drought, past management, and tree mortality from insects and diseases. Private owners lose both their financial investment as well as part of their family heritage when a damaging wildfire occurs. The public loses the benefits the forest provided and may be directly affected if their water supply is harmed by sediment and mudslides.

The changes faced by private forests and their owners are important to the public as well as the landowners. The public receives many benefits, both direct and indirect, from private forests and they have an interest in promoting the conservation and sustainable management of this resource. USDA has longstanding relationships with forest owners and through a variety of coordinated programs, partnerships, and efforts, the Department is helping to educate and assist the people who own the forest and the communities that encompass these lands. The Department reaches thousands of forest owners with information and assistance to help them identify and then meet their forest management and conservation goals. Conserving forests is not a private land or public land issue, but a common challenge to be addressed at the individual landowner, local, State, regional, and national levels.

The authors of the 2008 Farm Bill recognized the value of private forest lands and amended the Conservation, Forestry, and Energy Titles to better address privately-held forest resources. The Cooperative Forestry Assistance Act was amended to establish three national priorities for private forest lands—conserve working forests, protect forests from threats, and enhance public benefits from forests. The amendment also required this report to Congress describing, (1) how funds were used under the Cooperative Forestry Assistance Act and other USDA programs to address these national priorities, and (2) the outcomes achieved in meeting the priorities on private lands from 2008–2011.

The Forest Service, the primary forestry agency of the USDA, has taken the lead in developing this report, highlighting accomplishments of the Forest Service and its delivery partners, as well as other USDA programs within the Farm Service Agency, Rural Development mission area, National Institute of Food and Agriculture, Agricultural Research Service, and NRCS that provide benefits to private forest lands.

Through this report, the Forest Service and other USDA agencies will share accomplishments that assist the private stewards of the Nation's woodlands manage and sustain their lands. The State Forestry agencies put forth diligent efforts in developing Statewide Forest Resource Assessments and Strategies (Forest Action Plans) to identify and prioritize State forest management goals across all ownerships. This sets the stage for integrated investment decisions that are based on identified high-priority needs and opportunities and use a range of USDA programs and private investment.

Undoubtedly, forest landowners benefit from programs and resources that help ensure forests and their benefits can be sustained for future generations. The public also derives benefits from private forest lands and supports their protection and management through public investments. The unique power of the Federal programs mentioned in this report is their ability to leverage funds and expertise from State forestry agencies, forest landowners, local governments, and both the private for-profit and not-for-profit sectors. As a result, the Federal investment in private forestry provides value to the American people far in excess of its cost.

This report is organized by the three national priorities, with the various USDA programs described under each priority. The programs listed first cut across all three priorities and are relevant to each one. The other programs more closely align with one of the priorities and are described by program and agency. Additional information is contained in the appendices.

Every effort has been made to confine the data to private forests and the time period since passage of the 2008 Farm Bill. Due to the fiscal year accomplishment cycle, data for 2008 is included, some of which predates passage of the 2008 Farm Bill. Some agencies, such as Rural Development, do not distinguish between public and private forests in reporting their accomplishments; therefore, their data includes some investments in forest resources derived from public forests.

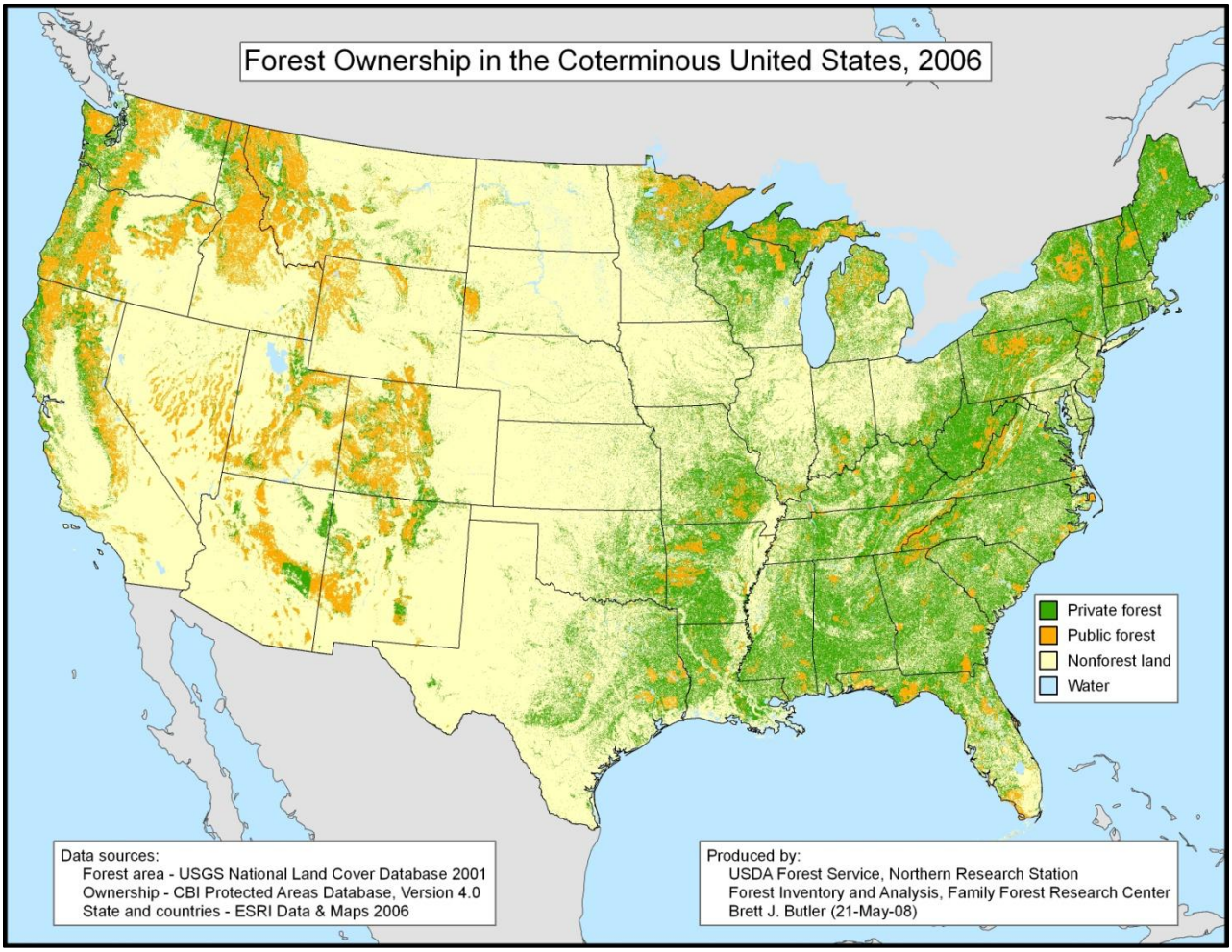


Figure 1: Eastern forests are predominantly private and western forests are predominantly public. Industrial forests are concentrated in Maine, the Lake States, the lower South, and the Pacific Northwest regions.

Who Owns America's Forests?

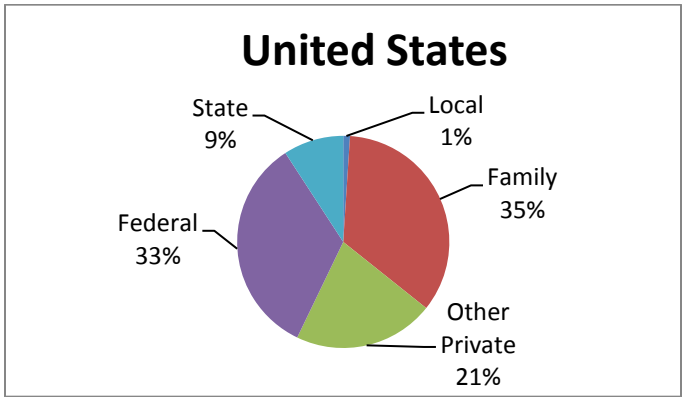


Figure 2: Area of forest land in the United States by ownership, 2006.

National Priorities for Private Forest Conservation

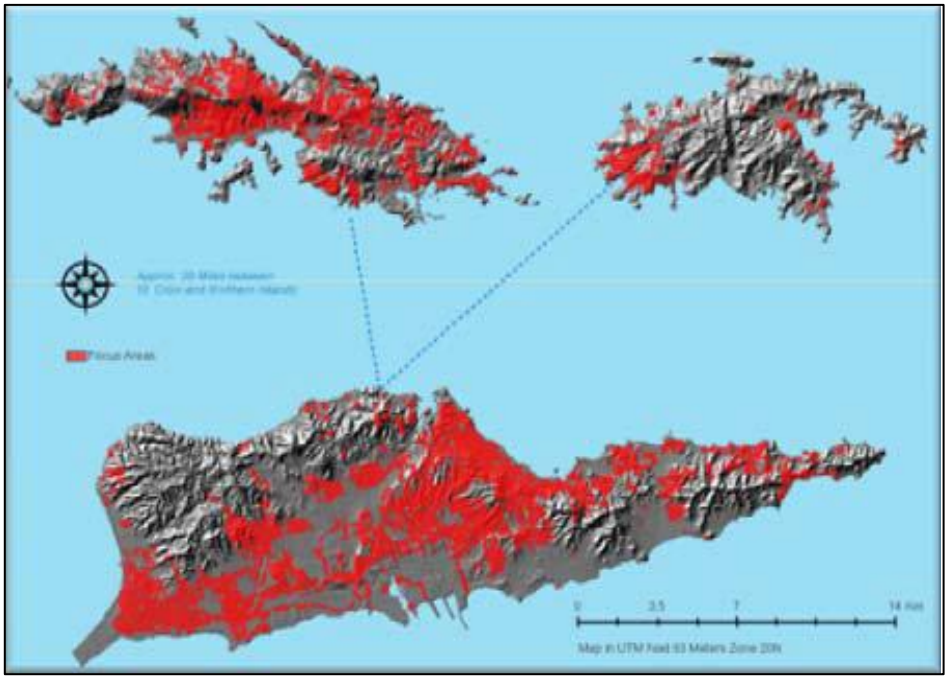
Encompassing more than one-half of the vast landscape of America's forests, private forest lands provide public benefits such as clean air, clean water, soil conservation, wildlife habitat, outdoor recreation, climate change mitigation, and thousands of forest products. In order to continue to provide these benefits, the U.S. Congress developed three national priorities for private forest conservation demonstrating the value of public investment in private forest lands.

1. Conserve Working Forests

"(1) Conserving and managing working forest landscapes for multiple values and uses."
(Food, Conservation, and Energy Act of 2008, Sec. 8001)

What is the job of a "Working Forest?" From New England to the Pacific Islands, the working forests of the United States and its territories protect air and water quality, provide forest products, offer recreation opportunities and wildlife habitat, and deliver a host of public benefits.

Millions of forested acres have been lost due to land-use changes, leaving them fragmented, parceled, or gone forever.

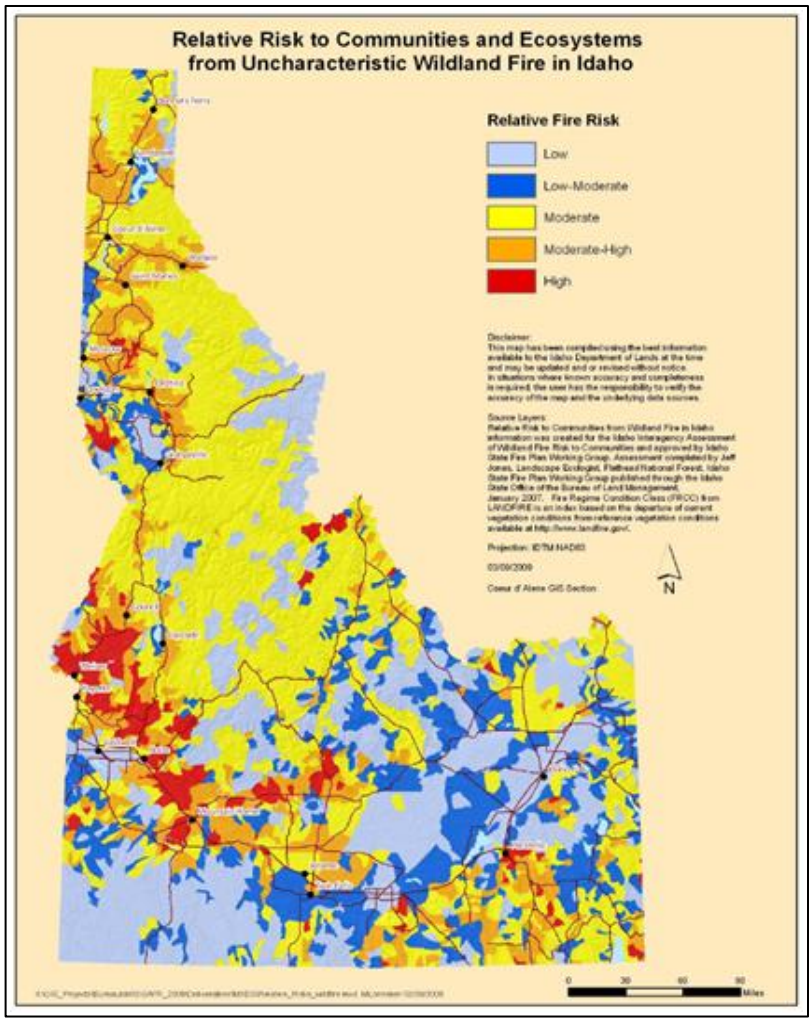


Conservation efforts seek to reduce the rate of conversion of forested landscapes to other uses and influence decisions about which should be conserved as working forests to optimize public benefits for current and future generations.

Figure 3: U.S. Virgin Islands' urban forest management priority areas. Source: U.S. Virgin Islands Forest Resources Assessment and Strategies: A comprehensive analysis of forest-related conditions, trends, threats, and opportunities.

2. Protect Forests From Threats

''(2) Protecting forests from threats, including catastrophic wildfires, hurricanes, tornados, windstorms, snow or ice storms, flooding, drought, invasive species, insect or disease outbreak, or development, and restoring appropriate forest types in response to such threats."
(Food, Conservation, and Energy Act of 2008, Sec. 8001)



The myriad pressures on America's forests result in decreased forest health, productivity, and functionality. Forest threats like wildfire, insects, disease, and invasive species abound with no respect of property lines or jurisdiction.

To protect forests from harm, many landowners and agencies work together in a coordinated fashion at the Federal, State, and local levels.

Figure 4: Relative Risk to Communities and Ecosystems from Uncharacteristic Wildland Fire in Idaho Source: Idaho State Assessment of Forest Resources (SAFR) pg. 19

3. Enhance Public Benefits From Forests

''(3) Enhancing public benefits from private forests, including air and water quality, soil conservation, biological diversity, carbon storage, forest products, forestry-related jobs, production of renewable energy, wildlife, wildlife corridors and wildlife habitat, and recreation."
(Food, Conservation, and Energy Act of 2008, Sec. 8001)

The values of trees and forests are both easily measured and difficult to quantify. These values often resonate with people and have great personal meaning. Clean air and water, energy conservation, wildlife habitat, recreation opportunities, climate change mitigation, and job creation and economic development are some of the essential public benefits that come from both public and private forests. Private lands are a key component of efforts to help foster a collective commitment to environmental stewardship and underscore how essential trees and forests are to our quality of life.

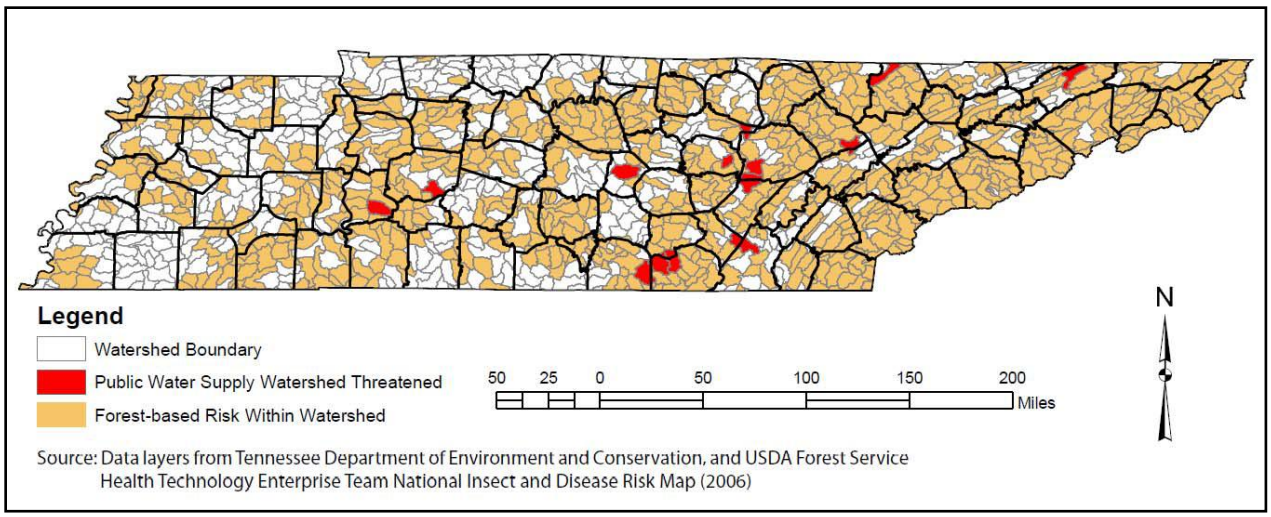


Figure 5: Tennessee's Stewardship priority areas
Source: Tennessee Forest Resource Assessment and Strategy: A comprehensive forest resource assessment and strategy to address the forest-related conditions, trends, threats, and opportunities in Tennessee, p. 12.

Description of How Funds Were Used To Address Priorities

Since the Food, Conservation, and Energy Act of 2008 has been enacted, over $2 billion has been invested by the Forest Service, over $190 million by the National Institute of Food and Agriculture (NIFA), over $160 million by NRCS, over $155 million by the Farm Service Agency (FSA), over $125 million by Rural Development, and over $11 million by the Agricultural Research Service to address the three national priorities.

In addition, almost 11 million acres were put under management plans, treated, or protected through Forest Service programs, and over 9 million acres through NRCS and FSA programs. Over 2 million landowners were assisted or educated through Forest Service programs. Rural Development reports that over 19 trillion BTUs of energy are projected to be generated from funded Wood to Energy projects in fiscal years 2008-2010.

The following section of the report will highlight various agency programs and how they are used to address the national priorities.

Statewide Forest Resource Assessments and Strategies (Forest Action Plans)

The 2008 Farm Bill set into motion a landmark endeavor by requiring all U.S. States and territories to complete assessments of forests within their boundaries and to develop prioritized strategies to address identified threats and opportunities. Each State Forest Action Plan identified landscape areas where national, regional, and State resource issues and priorities converged. State Forestry agencies submitted their plans to the Forest Service, who approved them, on behalf of the Secretary of the USDA, in June 2010.

Forest Action Plans:

- Identify and provide an analysis of present and future forest conditions, trends, and threats across all ownerships.
- Identify any areas or regions of that State that are a priority.

- Identify any multistate areas that are a regional priority.
- Incorporate existing forest management plans, including State wildlife actions and community wildfire protection plans.

All States had flexibility in the approach they used, but they all identified priority issues and areas, using the best available data, to focus program delivery and engage with partners and stakeholders. These State plans were then synthesized into regional summaries, guided by the three national priorities of conserve, protect, and enhance. To view individual plans, visit the National Association of State Foresters Web site at http://www.forestactionplans.org/.

National Joint Forestry Team

Comprised of representatives from the Forest Service, NRCS, State Foresters and Conservation Districts, this group started to form prior to the 2008 Farm Bill. These organizations represent the local, state and Federal agencies that provide the majority of government-based technical assistance to forest landowners. With passage of that landmark legislation for private forests, the team was formally chartered, and a Memorandum of Understanding was developed to focus efforts on implementing the forestry components of the 2008 Farm Bill and eliminating barriers to doing so. The objectives for the Joint Forestry Team are to:

- Develop a single approach for the delivery of USDA forestry assistance to the public, respecting the different needs and situations of the States.
- Collaborate on resource inventory and monitoring, outreach and education, markets for ecosystem services and products, and watershed assessment and planning.

The 12-member team holds periodic joint leadership meetings with the leaders of the four member organizations to provide an ongoing forum for the leaders from NRCS, Forest Service, the National Association of State Foresters, and the National Association of Conservation Districts to coordinate efforts at a national level. The Joint Forestry Team also works to keep the private forestry assistance message in front of its member organizations and to coordinate with other partners to accomplish specific goals related to private forestry.

Agency Programs That Provide Support across All National Priorities

Many agencies and associated programs within USDA accomplish work that crosses all of the national priorities of conservation, protection, and enhancement of private forest lands. These agencies and their accomplishments are listed below, followed by programs that align more strongly with one priority.

Forest Service

State and Private Forestry

The State and Private Forestry (S&PF) program of the Forest Service has a long history of cooperation with State forestry agencies. The role of S&PF and its component staffs, is to provide Forest Service expertise and financial assistance to State Forestry agencies and other partners. Working through partnerships, funding is leveraged, and State and private sector employees provide the direct on-the-ground assistance to landowners and communities to manage, maintain, and improve their forests and green spaces. This is a cost-effective solution to national needs for renewable products, energy, and environmental benefits that mitigate climate change impacts. The individual programs comprising S&PF are listed under the appropriate headings of Conserve, Protect, or Enhance.

American Recovery and Reinvestment Act (ARRA)

Many of the projects funded under ARRA provided benefits to private lands. $250 million was made available for work on non-Federal lands from Longleaf Pine restoration and fire mitigation in several southern States, to community wildfire protection. Several of these examples can be found in the Outcomes section of this report. Following is a brief summary of accomplishments.

ARRA Accomplishments on Non-Federal Lands			
	FY 2009	**FY 2010**	**Total**
Biomass Utilization (green tons removed)		138,882	138,882
Acres treated to reduce the risk of catastrophic wildfire	61,409	70,985	132,394
Hazardous Fuels reduction projects on non-Federal Lands	310	537	847
Number of priority acres treated for invasive and native pests on non-Federal lands	81,408	30,089	111,497

Figure 6: ARRA Accomplishments

Forest Service Research and Development

Forest Service Research and Development (R&D) plays a broad role in providing information and support of private forest lands. The individual programs comprising Forest Service R&D are listed under the appropriate headings of Conserve, Protect, or Enhance.

The following are highlights of the R&D programs that are being accomplished across the three national priorities.

Forest Inventory and Analysis

Initially authorized by the Forestry Research Act of 1928, the Forest Inventory and Analysis (FIA) program was updated by the Forest and Rangeland Renewable Resources Research Act of 1978. FIA has more than 80 years of strong forest inventory partnership with the Nation's State forestry

agencies, universities, nongovernmental organizations, and other partners. FIA is Federally funded under the Forest Service, R&D, and S&PF budget lines and additionally operates with partner-contributed funds that comprise 10 percent of overall annual inventory funding.

FIA provides the only comprehensive field-based inventory of all forest ownerships for each of the 50 States and U.S. affiliated islands, including the Commonwealth of Puerto Rico, the U.S. Virgin Islands, American Samoa, Guam, the Republic of Palau, and the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, and the Republic of the Marshall Islands. FIA basic forest inventories have been conducted since 1928; questionnaire surveys of all primary wood-using facilities in the United States have been conducted since 1947; questionnaire surveys of the management objectives and value of forests of over 10 million private forest landowners in the United States have been conducted since 1978, and field measures of forest health indicators have been conducted since 1989. This data, based on rigorously tested and scientifically sound inventory procedures, has historically underpinned routine FIA State and national assessment reports and now provides a solid foundation for the Forest Action Plans.

FIA Program Activity Summary for FY 2008–2010

- As of 2010, all 50 States have annualized inventory activity, and all affiliated islands have periodic inventory activity with 30 percent of all program work accomplished through cooperative grants and partner funding.
- Since 2008, FIA has engaged through cooperative grants with 33 universities and 77 other partners, including States, to accomplish the annual inventory mission.
- Since 2008, an average of 47 partners, predominantly States, have contributed $6.9 million annually, to leverage the FIA program to gather additional information for local needs.
- FIA measured an average of 19,600 forest field plots, annually (9-percent quality checked), and remeasured the one-millionth tree.
- FIA published 5-year reports and provided online inventory data less than 2 years old for 90 percent of the States and affiliated islands.
- FIA published results of its third private woodland owner study and conducted hundreds of primary mill surveys, fuelwood surveys, and logging utilization studies.
- FIA published an average of 194 reports and articles each year (peer-reviewed) and provided annual business reports to demonstrate program progress and accomplishments.
- FIA processed more than 400 spatial data requests and 85,000 online data requests annually.
- FIA provided foundation forest inventory data to all 50 States and U.S. affiliated islands for the Forest Action Plans.

FIA Program Finances, 2008–2010

Category	Avg. annual 2008–2010	FY 2010
	Million dollars	
Forest Service Appropriation (R&D)	62.7	66.9
Forest Service Appropriation (S&PF)	4.6	4.9
Components:		
Research grants	3.4	3.9
Data collection grants	7.9	8.3
Information grants	1.8	1.8
FS Inventory & Program Expenditures	54.2	57.8
Additional Contributions from Partners	6.9	7.5

Figure 7: FIA Finances

See Appendix A for additional FIA Data, Services and Reports that support the 2008 Farm Bill.

Long-Term Silviculture, Forest Management, and Productivity Research

Forest Service R&D long-term silviculture, forest management, and productivity research provides the knowledge base for sustainable forest management; guidance about risks, consequences, and benefits associated with diverse courses of action; and management options, strategies, systems, and practices applicable to private lands. Forest Service R&D and its partners carry out an extensive research program to develop and improve forest management options, systems, and practices. These studies are often designed to answer specific local or regional management questions. This research forms the science foundation for much of forest management in the United States and throughout the world. These long-term experiments are a valuable resource for addressing unanticipated questions that may be totally unrelated to the original reason for establishment. For example, studies of genetic variation are clearly critical in developing silviculture, restoration, and management strategies for a changing climate. Studies of management effects on soil productivity and forest development will be invaluable in understanding and developing sustainable forest biomass energy options—both key to maintaining a sustainable forest resource and viable economic opportunities. Funds allocated to this work from fiscal year (FY) 2008 to FY 2011 have averaged approximately $43 million per year.

Air Quality Protection and Enhancement

Smoke Emissions and Behavior: The Forest Service R&D Fire Consortia for Advanced Modeling of Meteorology and Smoke (FCAMMS) are research groups located at five regional research stations that focus on providing real-time, high-resolution meteorological simulations for fire weather and smoke dispersion tools. In 2010, a new Air Quality Portal has been added to the Wildland Fire Decision Support System (WFDSS-AQ), which was developed to provide centralized access to the latest air quality tools being developed by FCAMMS scientists in collaboration with State & Private Forestry (which funded much of the portal). WFDSS-AQ is an experimental product that was tested during the 2010 western wildfire season, and the tools were applicable to prescribed fires and eastern wildland fires as well. In 2008, funding for Forest Service watershed, air, and soil research was $35,400, but decreased to $30,600 in 2009.

Critical Loads Study and Application: Critical Loads (CL) represent a scientifically accepted approach to link ecosystem effects to deposition loading and are tied to atmospheric concentrations and emissions of pollutants. The Forest Service, along with other agencies/academics that conduct CL research in the United States, are loosely coordinated through the NADP-CLAD (National Atmospheric Deposition Program's Critical Loads for Atmospheric Deposition Science Subcommittee). NADP is a collaboration of Federal, State, Indian Nations, nongovernmental organizations, and academic institutions to measure atmospheric deposition of various pollutants on a national scale. CLAD is currently spearheading a joint effort to consolidate the critical loads data and protocols developed under various agencies/universities into regional/national scale critical loads data layers or maps for aquatic and terrestrial acidification and nutrient nitrogen excess. Both Forest Service R&D and the Air Program of the National Forest System (NFS) have played a key role in this project. This effort has three goals: (1) develop consistent regional/national-scale critical load values, (2) identify gaps and issues with consolidating data from multiple agencies and organizations, and (3) develop U.S. critical loads maps for atmospheric pollutants. This information can assist private land managers in assessing their risks to pollution and provide them time to make appropriate management decisions.

Long-Term Watershed, Hydrology, and Soil Research

The long-term research on the benefits of water and aquatics for private forests includes an understanding of timing of snowpack release on water availability for forest growth and downstream flow, the effect of forest species on water storage and evapotranspiration, the effect of management practices on sediment transfer and downstream water quality, and the effect of road commission and decommission on long-term sediment transfer to streams. In partnership with universities, nongovernmental organizations, and industry, research on ecosystem processes in Forest Service Experimental Forests and Ranges provides long-term baselines to (1) evaluate increasing climate change effects and the influence of invasive species habitat destruction and (2) develop restoration methods to increase watershed condition rating. Such information assists landowners in maintaining water-quality standards and gives them an understanding of the potential of climate change on the health of their aquatic and terrestrial ecosystems.

Genetic Resources

Forest Service genetics research provides important information to forest owners with regard to issues surrounding the management of forests. Work on breeding disease and insect resistance into forest trees (5-needle pines, elms, Douglas-fir, loblolly pine, and others) is applicable to all who plant such species. Research on the genetic improvement of wood quality will help all landowners grow trees of greater value. The tools developed for seed movement, with and without considering climate change, are providing all forest managers with information and tools to ensure the establishment of well-adapted forests both now and in the future.

Climate Change

Climate change research results are being used by private landowners to actively manage their forests to improve ecosystem health; sequester more carbon; and create forests more resilient to stresses such as drought, air pollution, invasive insects, diseases, and fires. Forest Service R&D helps educate private landowners to detect and understand the impacts of climate change on plants and animals and on water quality and availability, as well as to provide them with technology for restoring ecosystems, where necessary, after large-scale disturbances. Forest Service research on

climate change mitigation helps private forest landowners understand their potential to offset a portion of America's annual carbon emissions through management measures. Management options include maintaining forests and other ecosystems that store carbon and implementing management practices that improve ecosystem resilience to stresses such as drought in order to be more efficient at storing carbon. Forest Service research supports the development of markets for carbon offsets and is developing alternative pathways to sequester carbon through use of small-diameter woody biomass in wood products; finding ways to use woody biomass to heat homes, generate electricity, and power cars; and by promoting tree growth in urban areas to take up carbon and to provide shade and greenery. R&D-developed carbon accounting tools such as Carbon OnLine Estimator (COLE), Forest Vegetation Simulator (FVS) and CarbonPlus Calculator support private landowner engagement in both the voluntary carbon market, as well as Federal landowner assistance programs that include a carbon component.

Forest Service R&D works to better understand land use and management choices made on private lands. Research analyzes private land-use patterns, including forest conversion at the wildland-urban interface. By examining the efficacy and interest to participate in programs that incentivize sustainable forest stewardship, R&D work informs the design of programs and policies that aim to conserve working forest lands by supporting private forests. Funds allocated to this work were as follows: for FY 2009—$26.365 million; FY 2010—$31.857 million; and FY 2011—approximately $28.357 million.

Bioenergy and Biobased Products Research

Our Nation's forests comprise a sustainable, strategic asset in achieving and enhancing U.S. energy security, economic opportunity, environmental quality, and global competitiveness. Woody biomass is a sustainable alternative feedstock for producing fuels and substitutes for fossil fuel-intensive products. A sustainable, renewable bioenergy and biobased products sector is a growing source of green jobs in the U.S. economy. Forest Service R&D can help create these jobs both in the short term, through research execution, and in the long term, as results are demonstrated and deployed and the economic sector develops. The creation of a sustainable bioindustry producing biofuels and bioproducts on a significant scale is critically dependent on the following: having a large, sustainable supply of biomass with appropriate characteristics at a reasonable cost; cost-effective and efficient processes for converting wood to biofuels, chemicals, and other high-value products; and useful tools for decision-making and policy analysis. The R&D bioenergy and biobased products research program is focused on delivering value in these three areas. Funding allocated for this research was $12.25 million in FY 2008 and averaged $12.95 million annually for FY 2009-2011.

Forest Service Research Partnership with the U.S. Geological Survey on Climate Change

The Forest Service's R&D collaborates with the U.S. Geological Survey (USGS) to study effects of climate change on aquatic ecosystems in the Pacific Northwest and the Southeastern United States. In 2010, the USGS and the Forest Service joined forces to study how aquatic systems in the Southeast and the Pacific Northwest are responding to climate change. These multiyear projects, with a total budget of $1 million are led through a partnership between the Forest Service Pacific Northwest Research Station, the Southern Research Station of the Forest Service, and the USGS Southeast and Northwest Area Offices. Researchers are increasing the understanding of climate effects on water temperature and biota in freshwater streams. Scientists are combining climate and

hydrologic models to provide a better understanding of climate effects on freshwater fish and water quality and quantity.

Pacific Northwest Research Station

The Northwest project certainly contributes to the three national priorities. In many cases in the Pacific Northwest, the Forest Service manages the headwaters, but other ownerships—primarily private industrial, agricultural, or private nonindustrial—manage the lower reaches. The water temperature coming into the lower reaches generally needs to be as cold as possible for fisheries. In the Coast Range, the rearing habitat for species like Coho salmon is almost completely private or State-managed lands. On the east side of the Cascade Range, there are a variety of ownerships, and this research contributes to knowledge needed for riparian zone management that is critical to fisheries as well, regardless of ownership.

The knowledge that is generated is transferred to all land managers, and so, contributes to the management of private lands for forest conservation. This research also contributes to understanding what is happening in the Bureau of Land Management Oregon & California "checkerboard" lands where ownership is half public and half private on an every-other-section basis.

Southern Research Station

The Southern Research Station is conducting research to understand how climate change will affect water quality and supply from forested southern watersheds. Mountain forests are the primary source of clean, cold-cool water for most of Southeastern United States. Nearly all downstream uses, including drinking water and other municipal uses, recreation, agriculture, and habitat to support major portions of the South's world class aquatic species diversity depend on continuous supplies of water from forested watersheds. In the South, where less than 12 percent of all forest lands are under public management, private forest lands play a critical role in maintaining the supply and quality of water.

Forest Service scientists are expanding their traditional "place-based" water research across large areas, including other public and private forests. Research on water supply and quality at the landscape-scale must include the role of private lands. Southern Research Station scientists currently manage a network of more than 200 air and water temperature sensors distributed across high-elevation, headwater watersheds from Maryland to Georgia. Most of these sensors either lie on or are immediately adjacent to private forest lands. Data from this network are being used to identify how specific forest attributes (canopy coverage, land use, elevation, etc.) influence one of the primary features of water quality—temperature. The primary goal is to identify characteristics of streams and surrounding lands that are most associated with cold or cool temperatures. The ability to predict which streams are most likely to maintain desirable characteristics will help managers and landowners set conservation priorities and suggest actions such as changes in land use that will mitigate or buffer the effects of a changing climate.

Of necessity, the knowledge acquired will be transferred across the spectrum of users—from public land managers to the general public. Mechanisms are in development to inform private forest landowners of the importance of their lands in terms of water values, in addition to traditional forest values.

USDA National Agroforestry Center (http://www.unl.edu/nac/)

With its origins in the 1990 Farm Bill, the USDA National Agroforestry Center (NAC) is a longstanding partnership among Forest Service R&D and S&PF and the NRCS. NAC's mission is to accelerate the application of agroforestry through a national network of partners.

Between FY 2008–2010, the Forest Service and NRCS made the following investments in NAC:

	FY2008	FY 2009	FY 2010
Forest Service: R&D	$832,000	$894,000	$924,000
S&PF			
-Forest Stewardship	$470,000	$423,000	$423,000
-Urban & Community Forestry	$65,000	$58,000	$58,000
-S&PF other			$170,000
Total Forest Service	$1,367,000	$1,375,000	$1,575,000
NRCS	$283,000	$283,000	$243,000
Total Funding all Sources	$1,650,000	$1,658,000	$1,818,000

Figure 8: NAC Investments

During FY 2008–2010, through research, technology development, tools, training, and outreach activities, NAC provided useful products and services nationwide to support the application of agroforestry on agricultural lands, including private forest lands. NAC's key customers are the natural resource professionals who work directly with farmers, ranchers, woodland owners, Tribes, and communities.

The following is a brief summary of NAC's research and technology transfer outputs:

NAC Outputs	FY2008	FY 2009	FY 010
Research			
-Publications	65	15	25
-Presentations	59	40	37
Technology Transfer (Number of products distributed) -Working Trees brochures	213,850	28,073	15,673
-Conservation Buffers Guide	n/a	3,372	1,590

Figure 9: NAC Outputs

Another expression of the importance of agroforestry to the conservation and enhancement of agricultural lands, including working forest landscapes, is the acreage on which agroforestry practices have been applied during FY 2008 to 2010. These activities are reported in this document under three NRCS programs (Environmental Quality Incentives, Wildlife Habitat Incentives, and

Conservation Stewardship); the Farm Service Agency's Conservation Reserve Program; and the Forest Service's Forest Stewardship Program.

USDA Agroforestry Strategic Framework

In January 2010, the Forest Service and NRCS, in partnership with the Agricultural Research Service, the National Institute of Food and Agriculture, the Farm Service Agency, and two key agroforestry partners—the National Association of State Foresters and the National Association of Conservation Districts—established an Interagency Agroforestry Team (IAT) (http://www.unl.edu/nac/iat.htm) to develop a USDA-wide strategic framework for agroforestry. The purpose of the strategic framework is to (1) increase USDA and partner awareness and support for agroforestry as a means to implement the USDA Strategic Plan (2010–2015); and (2) identify the most important future USDA emphasis areas for agroforestry research, development, and technology transfer. Implementation of the new strategy is expected to result in an expanded, science-based application of agroforestry nationwide, which will improve the conservation and management of agricultural lands, including private forest lands, and enhance the economic, environmental, and social benefits from those lands.

To gain stakeholder input to the development of the strategic framework, the IAT agencies/organizations jointly sponsored an Agroforestry Roundtable Workshop, May 25–26, 2010, in Washington, D.C. Approximately 90 stakeholders representing landowner and conservation organizations, Tribes, universities/extension agencies, State agencies, regional councils, industry, and other USDA/Federal agencies, as well as Forest Service regions/stations/area participated in the workshop. The USDA Agroforestry Strategic Framework, Fiscal Year 2011-2016 was approved by the Secretary of Agriculture in June 2011. The document can be found at the following link, http://www.usda.gov/documents/AFStratFrame_FINAL-lr_6-3-11.pdf

Agricultural Research Service (ARS)

USDA ARS Dale Bumpers Small Farms Research Center (Booneville, AR)

Research studies on converting marginal pastureland to loblolly pine-based alley cropping (agroforestry) to increase farm sustainability included:

- Tree planting designs, forage-tree combinations, and pine straw harvesting practices that optimize ecosystem productivity in space and time.
- The impact of cultural practices and management on forage physiology, yield, botanical composition, and tree growth.
- Spreadsheet model developed to predict timber and nontimber production and profitability across a production cycle.

The following findings were made concerning the conversion of marginal pastureland to loblolly pine-based alley cropping (agroforestry):

- Pine seedling growth was increased significantly by weed control during the first year after planting.
- Pine seedling survival and growth were significantly reduced when seedlings were planted into pastures grazed continuously by cattle up to 21 months after transplanting.
- A simple spreadsheet model was developed to demonstrate the potential financial benefit of harvesting pine straw and timber from overstocked pine stands. Harvesting pine straw

(marketed as ornamental mulch) nearly doubled net present value of a 1,500 trees/ha farm compared to no pine straw, and substantially reduced years to break even at less than 1,500 trees/ha.
- Neither pine tree growth nor pine straw yield respond to nitrogen fertilization in overstocked pine stands.
- Tillage (ripping and trenching) for planting annuals significantly reduces tree diameter and height.

Research studies on hardwood-based specialty crops and browse for diversifying small farm profitability options included:
- The impact of cultural practices and management on growth and profitability of pecan and black walnut trees.
- The impact of cultural practices on yield of health-promoting constituents in shiitake mushrooms (multi-story cropping).
- The potential of nontraditional, multiuse tree legumes as browse for small ruminants (silvopasture).

The following finding were made concerning the cultivation of hardwood-based specialty crops and browse for diversifying small farm profitability:
- Rootstock seed source is an important consideration for successful establishment of grafted black walnut plantings, and the choice of scion cultivar might influence early transplant survival.
- Landowners seeking to establish black walnut plantings for nut production should consider using container stock of grafted cultivars selected for improved nut quality.
- Either black locust or mimosa could provide moderate quantities of high-quality, rotationally grazed forage (leaves) for goats during summer months when herbaceous forage may be in short supply.

ARS allocated funds of $870 thousand per year between 2008 and 2010.

USDA ARS Appalachian Farming Systems Research Center (Beaver, WV)
Research studies on silvopastures, by thinning second growth mature forests and establishing forages and by planting trees into traditional pastures included:
- The ways water and solar radiation are partitioned and utilized in systems with different configurations;
- Forage and animal performance in silvopastures;
- The impact of trees on pasture nutrient cycling and retention, particularly in relation to the large tannin input into the system from many tree species; and
- The out-flowing water quality from silvopastures compared to forest and traditional open pasture by tracking both nutrients and microbial parasites.

Silvopasture was found to:
- Provide approximately 60 percent of the forage dry matter compared to conventional pasture (on a per-acre basis). If the woodland on currently productive Appalachian farms was converted to Silvopasture, it would be equivalent to bringing 8.4 million acres of pasture

into production. If farms now idle were brought into production, the total would be over 11 million acres;
- Improve soil filtration of fecal pathogens compared to conventional pasture, resulting in less pathogens entering surface water systems;
- Leach far less nitrate than conventional pasture;
- Release more dissolved organic matter in runoff water versus conventional pasture. This finding could point to major positive impacts on human and environmental health as dissolved organic matter can complex with toxic waterborne compounds (e.g. metals, endocrine disruptors, herbicides, and pesticides), thus reducing or eliminating their toxic effect;
- Be much more efficient in utilizing solar radiation in silvopasture than in open sunny sites;
- Be as nutritious for animals as conventional pasture; production performance was commensurate;
- Require different grass management practices than conventional pasture to maximize sustained productivity; and
- Produce more forage when trees are planted in north-south rows than if they are uniformly thinned to allow comparable midday solar radiation levels.

ARS allocated funds of $2.4 million per year between 2008 and 2010 (inclusive).

USDA ARS Hydrology and Remote Sensing Laboratory (Beltsville, MD)

The lab assesses the role of forested wetlands in mitigating nutrient pollution in agricultural ecosystems and develops new remote sensing tools to map and monitor forested wetlands.

Wide-scale forested wetland hydrology has been difficult to study with conventional remote sensing methods. LIDAR (Light Detection and Ranging – a radar-like process involving lasers rather than microwaves) intensity data was found to map wetland inundation to >96 percent accuracy and predicted wetland location in the landscape. The ability to accurately map and monitor wetlands in agricultural landscapes should greatly improve watershed and regional assessments of wetland ecosystem impacts on water quality.

Between 2006 and 2010:

- ARS allocated funds of $325,000
- NRCS contributed funds of $300,000

USDA ARS National Laboratory for Agriculture and the Environment (Ames, IA)

The lab assesses the nutrient cycling in alley cropping systems receiving poultry litter (1999 to present):

- ARS allocated funds of $15,000 per year.
- NRCS and Forest Service contributed funds of $30,000 per year.

The lab investigated the soil carbon sequestration beneath shelterbelts (2004–2006):

ARS allocated funds of $10,000 per year.

A 35-year-old pine-cedar tree windbreak in eastern Nebraska was found to have significantly more soil organic carbon (SOC) in the top 15 cm of soil than adjacent crop fields. The rate of additional

carbon stored in the soil and in the leaf litter on the soil surface was comparable to carbon sequestration rates for conversion of cropland to no-tillage. Isotopic analysis at the Nebraska site and at an afforested woodlot in western Iowa indicated that SOC accumulation was the result of slow decomposition of woody materials as compared to crop residues.

The lab studied the changes in soil carbon and nutrients when trees are planted on marginal cropland (2006–2008):

- ARS allocated funds of $5,000 per year.
- Leopold Center for Sustainable Agriculture contributed funds of $8,000 per year.

USDA ARS Southeast Watershed Research Laboratory (Tifton, GA)

For more than 30 years, the lab has conducted research to understand the role of riparian forest buffers in agricultural landscapes and to evaluate riparian forest buffers as an agroforestry practice. This work includes:

- Studying the nutrient and sediment retention by unmanaged riparian forests in the Southeastern Coastal Plain and developing management guidelines for riparian forests as buffers (1980–1990). Funding sources include USDA ARS, the National Science Foundation, and the University of Georgia.
- Testing of management guidelines for multiple-zone riparian forest buffers and NRCS and Forest Service specifications for the Riparian Forest Buffer Conservation Practice (1990-2000). Funding sources include USDA's ARS USDA Cooperative State Research, Education, and Extension Service (CSREES), and the University of Georgia.
- Testing of restoration guidelines for multiple-zone riparian forest buffers to control nutrients from dairy lagoon and swine lagoon runoff and overland flow (1990–2000). Funding sources include USDA ARS, USDA CSREES, and University of Georgia.
- Evaluating the transport of pesticides in managed and restored riparian forest buffers (1990–2000). Funding sources include USDA's ARS, the U.S. Environmental Protection Agency, and the University of Georgia.
- Developing, testing, and implementing a process-based simulation model of multiple-zone riparian forest buffers (Riparian Ecosystem Management Model) (2000-present). Funding Sources include USDA's ARS and multiple cooperators.

The SWAT (Soil and Water Assessment Tool) model was used to simulate the effects of upland conservation practices commonly adopted in the Little River Experimental Watershed (LREW) on erosion and nutrient control. These effects were also compared to the impacts of the riparian forest buffers currently in the LREW. Simulation results indicate that the current level of riparian forest cover in the LREW may be the single greatest contributor to nonpoint source pollutant reduction.

It was determined that > 1.98 billion liters of ethanol per year (at 270 liters per Mg dry matter and 33 Mg ha^{-1} yr^{-1} dry matter) could potentially be produced if high-productivity perennial grasses were planted into zone 3 of riparian forest buffers that are adjacent to agricultural lands within 40 km of 11 case study cities in the coastal plain of south Georgia. These results demonstrate the potential for substantial production of bioenergy feedstocks from forested riparian conservation buffers without competing for cropland.

ARS allocated funds between 1990 and 1999 of $1,344,823.
ARS allocated funds between 2000 and 2010 of $965,896.

National Institute of Food and Agriculture

NIFA's unique mission is to advance knowledge for agriculture, the environment, human health and well-being, and communities by supporting research, education, and extension programs in the Land-Grant University System and other partner organizations. NIFA does not perform actual research, education, and extension but rather helps fund it at the State and local level and provides program leadership in these areas. NIFA forest programs expand the knowledge of forest ecosystems, train future forestry professionals, and put research-based management practices into action through extension activities.

Renewable Resources Extension Act Program (RREA)

The Renewable Resources Extension Act Program (RREA) provides for expanded and comprehensive extension education programs for forest and rangeland renewable resources management and sustainability targeting forest and range land, forest products utilization, fish and wildlife, recreation, environment, and public policy. Authorized at $30 million, RREA has been appropriated at roughly $4 million per year between 2008 and 2010. This funding is allocated to 72 land-grant institutions based on a State's forest and rangeland resources (productivity, economic contribution, and employment) and State population. Additionally, approximately $300,000 per year is awarded to land-grant institutions to carry out National Focus Fund projects. These projects (1) have national or regional relevance, (2) build capacity in the Cooperative Extension System to better serve forest and range landowners, or (3) develop new and innovative activities that can be replicated at other institutions. Examples include the Wood-Energy Extension Community of Practice and the Forest Resource Education for Municipal Officials. See Appendix B for a compilation of RREA data.

McIntire-Stennis Research Program

The production, protection, and utilization of the forest resources depend on strong technological advances and continuing development of the knowledge necessary to increase the efficiency of forestry practices and to extend the benefits that flow from forests. Authorized at $150 million, the McIntire-Stennis Research Program has been appropriated at roughly $27 million per year between 2008 and 2010 and is allocated to institutions with a forest-related research program. The focus of research must relate to the following: (1) Reforestation and management of land for the production of crops of timber and other related products of the forest; (2) management of forest and related watershed lands to improve conditions of waterflow and to protect resources against floods and erosion; (3) management of forest and related rangeland for production of forage for domestic livestock and game and improvement of food and habitat for wildlife; (4) management of forest lands for outdoor recreation; (5) protection of forest land and resources against fire, insects, diseases, or other destructive agents; (6) utilization of wood and other forest products; or (7) development of sound policies for the management of forest lands and marketing of forest products.

Small Business Innovation Research

Research focuses on the development of environmentally sound techniques to increase utilization of materials and resources from forest lands, increase productivity of forest lands, improve tree pathogen and insect control techniques, reduce ecological damage from forest operations, reduce wildfire risk, improve wildfire control, and increase the utilization of wood. Between 2008 and 2010, NIFA funded forestry-related small business innovation research projects at an average of $1.7 million per year.

Biomass Research and Development Initiative (Section 9008)

This is a joint program between NIFA and the U.S. Department of Energy, mandated in the Energy Title of the Farm Bill. The purpose of this program is to explore (1) feedstocks development, (2) biofuels and biobased products development, and (3) biofuels and biobased products development analysis for the sustainable development of bioenergy. Funding for this program in FY 2008 was $25 million, FY 2009—$28 million, and FY 2010—$30 million. Examples of activities funded include research on forest residue availability, alternative forest product market creation, and biofuel development from woody feedstocks.

The Biomass Research and Development Initiative (BRDI) (Section 9008 of the Farm Bill) requires that funded projects integrate all three legislatively mandated technical areas. These areas include (A) feedstocks development, (B) biofuels and biobased products development, and (C) biofuels and biobased products development analysis. Two forest-related projects have been awarded for FY 2010:

- **Domtar Paper Company, LLC**, Fort Mill, South Carolina, $7,000,000. This 3-year project will work to build a demonstration plant using two technologies to convert low-value byproducts and wastes from paper mills into higher-value sugar, oil, and lignin products.
- **Forest Service**, Rocky Mountain Research Station, Missoula, Montana, $5,309,320. This project will develop an integrated approach to investigate biomass feedstock production, logistics, conversion, distribution and end use centered on using advanced conversion technologies at existing forest industry facilities.

Agriculture and Food Research Initiative (formerly National Research Initiative)

The purpose of the Agriculture and Food Research Initiative (AFRI) is to support research, education, and extension work by awarding grants that address key problems of national, regional, and multistate importance in sustaining all components of agriculture. AFRI focuses on six priority areas: plant health and production and plant products; animal health and production and animal products; food safety, nutrition, and health; renewable energy, natural resources, and environment; agriculture systems and technology; and agriculture economics and rural communities. In FY 2011, this includes Foundational Program Request for Applications (RFA) to continue building a foundation of knowledge critical for solving current and future societal challenges. Additional RFAs further address AFRI priority areas in five societal challenge areas: Childhood Obesity Prevention, Climate Change, Food Safety, Global Food Security, and Sustainable Bioenergy.

Agency Programs That Provide Support to Specific National Priorities

Many agencies and associated programs within USDA accomplish work that aligns more strongly with one priority under conservation, protection, or enhancement of private forest lands. These agencies and their accomplishments are listed below under the appropriate national priority.

CONSERVE WORKING FORESTS

Forest Service, S&PF

Forest Legacy Program

Family forest owners and timber companies are facing increasing pressures to sell, subdivide, and develop their land. Through the Forest Legacy Program (FLP), the Forest Service works with States, private forest landowners, and other conservation partners to protect environmentally important forests that are threatened with conversion to nonforest use, by acquiring conservation easements and making fee-simple purchases. The program provides financial incentives to private landowners to conserve their forest. The conservation of forests through the FLP protects outdoor recreation opportunities, fish and wildlife habitat, water quality, and resource-based economies.

The Forest Service continues to allocate funds to projects that address national conservation priorities and contribute public benefits. The FLP accomplishments by fiscal year are indicated in the table below.

Private Acres Protected Under the Forest Legacy Program			
Year	Acres Protected	FLP Contribution	Total Project Cost
2008	194,987	$47,560,820	$188,661,190
2009	176,471	$60,280,087	$125,582,325
2010	136,960	$52,662,373	$133,612,972
2011	130,032	$34,539,129	$52,686,248

*Contribution data as well as 2011 acres were pulled from the Forest Legacy Information System database on 06/21/2011

Figure 10: Forest Legacy Program – Private Acres Protected

Community Forest and Open Space Conservation Program

The Community Forest and Open Space Conservation Program provides assistance to local governments, Indian Tribes, and eligible nonprofit organizations to assist in acquiring forest land that has been identified as a national, regional, or local priority for protection. This land would provide environmental, economic, and community benefits such as public recreation and

forest-based educational programs. The projects will be selected through a competitive process and will require eligible entities to provide a 50-percent cost-share match.

The Forest Service completed Tribal consultation and public comment on the proposed rule for the Community Forest and Open Space Conservation Program on March 7, 2011. The agency is seeking to publish the final rule in September 2011 and award the first projects in FY 2012.

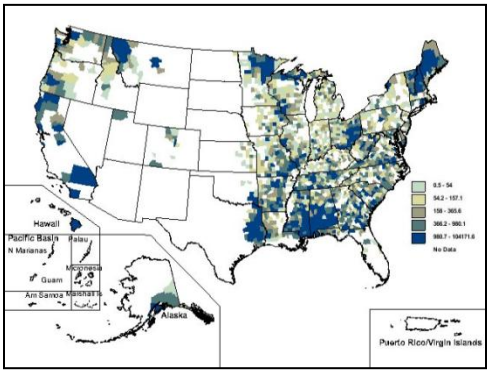
Natural Resources Conservation Service

Natural Resources Conservation Service Support for Healthy Forests

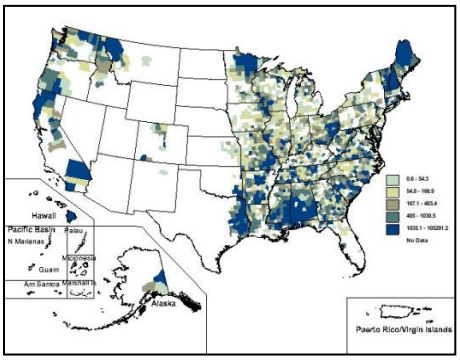
NRCS provides technical and financial assistance to private landowners and land managers who voluntarily agree to apply conservation practices on their land for conservation and improvement of natural resources. NRCS has defined a long-term combined objective for forest land in its national strategic plan. The expected outcome of healthy forest lands is that they are productive, diverse, and resilient and provide a wide range of ecosystem services. From 2008 through the first half of 2011, about 5.6 million acres of private forest land have received conservation treatment through NRCS assistance.

Forest Conservation Systems Applied

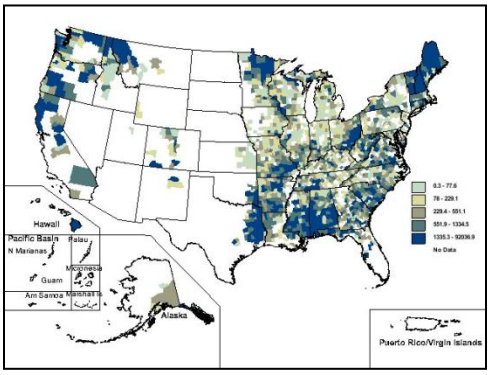
FY 2008: 1,326,923 acres



FY 2009: 1,494,419 acres



FY 2010: 1,904,918 acres



First Half FY 2011: 915,900 acres

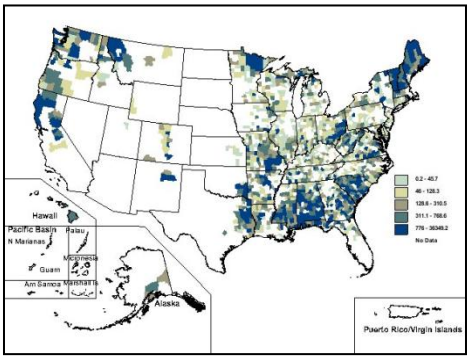


Figure 11: NRCS – Acres of Conservation Treatment

NRCS field office staff and partners provide conservation planning and application assistance to forest owners for a variety of conservation practices, including tree/shrub establishment, tree/shrub site preparation, forest stand improvement, firebreak, fuelbreak, and several other practices. NRCS conservationists and foresters in field offices also provide direct technical assistance in five agroforestry practices: windbreaks/shelterbelts, riparian forest buffers, alley cropping, silvopasture, and multistory cropping.

Agroforestry practices applied between 2008 and 2010

Forest Conservation Practices	2008	2009	2010	Total
Alley Cropping (acre)	259	252	42	553
Multistory Cropping (acre)	110	76	26	212
Riparian Forest Buffer (acre)	68,649	29,265	26,834	124,748
Silvopasture Establishment (acre)	205	374	353	932
Windbreak/Shelterbelt Establishment (feet)	8,650,733	6,605,850	6.554,914	21,811,497
Windbreak/Shelterbelt Renovation (feet)	440,138	315,347	448,841	1,204,326

Figure 12: NRCS Agroforestry Practices

Forestry practices applied between 2008 and 2010

Forest Conservation Practices	2008	2009	2010	Total
Forest Management Plan—Written (no.)	na	75	1565	1,640
Forest Slash Treatment (acre)	8,429	18,041	25,019	51,489
Forest Stand Improvement (acre)	395,794	351,128	494,901	1,241,823
Forest Trails and Landings (acre)	5,315	10,287	13,677	29,279
Fuel Break (acre)	1,820	2,633	1,877	6,330
Prescribed Forestry (acre)	59,423	126,730	87,728	273,881
Road/Trail/Landing Closure and Treatment (feet)	na	3,700	2,200	5,900
Tree/Shrub Establishment (acre)	183,399	117,292	152,948	453,639
Tree/Shrub Pruning (acre)	13,729	12,941	12,111	38,781
Tree/Shrub Site Preparation (acre)	125,625	104,161	117,719	347,505

Figure 13: NRCS Forestry Practices

NRCS provides financial assistance to private landowners to implement forestry- and agroforestry-related practices through Farm Bill and discretionary conservation programs. Assistance is also provided for multiyear and permanent easements to conserve forest land to meet program goals. NRCS determines many of its priorities and ranking processes for conservation assistance (including forestry) at the State-level, through the State Technical Committee. The State Technical Committee and local work groups play an important role in developing and providing recommendations to the NRCS State Conservationist regarding the implementation of NRCS conservation programs. The following are the major financial assistance programs assisting forest landowners.

Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) offers financial and technical help to assist eligible participants with management practices on their lands; family forest land is eligible, and forest management is an eligible practice.

Wildlife Habitat Incentive Program

The Wildlife Habitat Incentive Program (WHIP) offers technical and financial assistance for landowners to establish and improve fish and wildlife habitat; family forest land is eligible, and forestry practices are encouraged. WHIP funds are helping improve the health of America's forest land and wildlife habitat, largely through reforestation (site preparation and tree establishment), wildlife thinnings, and improved species composition and balance (forest stand improvement). The increase in 2010 reflects two targeted initiatives, Longleaf Pine Ecosystem Restoration and New England/New York Forestry, where additional WHIP funds were provided to 16 states in the initiative areas to accelerate forest conservation.

Financial Assistance Program	2008	2009	2010	Total
Environmental Quality Incentives Program	$30,610,000	$35,688,000	$50,896,000	$117,194,000
Wildlife Incentive Program	$8,048,000	$10,214,000	$19,370,000	$37,632,000

Figure 14: NRCS Financial Assistance

Source: NRCS Protracts Data

PROTECTING FORESTS FROM THREATS

Forest Service, S&PF

Cooperative Forest Health Protection

Forest Health Protection provides technical and financial assistance to Federal, State, and Tribal entities to prevent, control, and manage insects and disease that are causing harm to America's forests. Specifically, they work with partners to survey forests for pest conditions; direct and implement measures to prevent, retard, or suppress unwanted native and nonnative insects, pathogens, and plants affecting trees and forests; and develop technologies and processes to aid in the survey and management activities.

The Forest Health Monitoring (FHM) Program is a cooperative program that annually maps areas of tree mortality and other damages on lands of all ownerships, detected by specially trained aerial observers in Federal and State land management agencies. Analysis of trend data for the last decade indicates a significant upward trend in tree mortality since 2000, with highest levels reached in 2003 (12.8 million acres) and 2009 (11.8 million acres). This increase was largely due to bark beetle activity in the West following severe regional droughts in combination with susceptible forest stand conditions. Mountain pine beetle and other native conifer bark beetles have killed an increasing number of trees throughout the West since 2007. These outbreaks are most widespread in dense, aging lodgepole pine forests that dominate the mountains of Colorado, Wyoming, Montana, Idaho, and Utah.

In collaboration with States, Tribes, and other Federal Agencies, an annual report is published and sent to Congress describing the "Major Forest Insect and Disease Conditions in the United States." Much of the data for the report is obtained from the aerial surveys described above.

A national risk assessment by the FHM program identified areas where more than 25 percent of the trees are expected to die within 15 years, due to insects and pathogens. More than 27 million acres of State, county, and private forest lands are at risk to increased activity by forest insects and pathogens, including bark beetles of western conifers, oak decline, southern pine beetle, root diseases, and gypsy moth. This assessment is being used to develop broad prevention strategies for the major forest insects and pathogens threatening the forests of the United States.

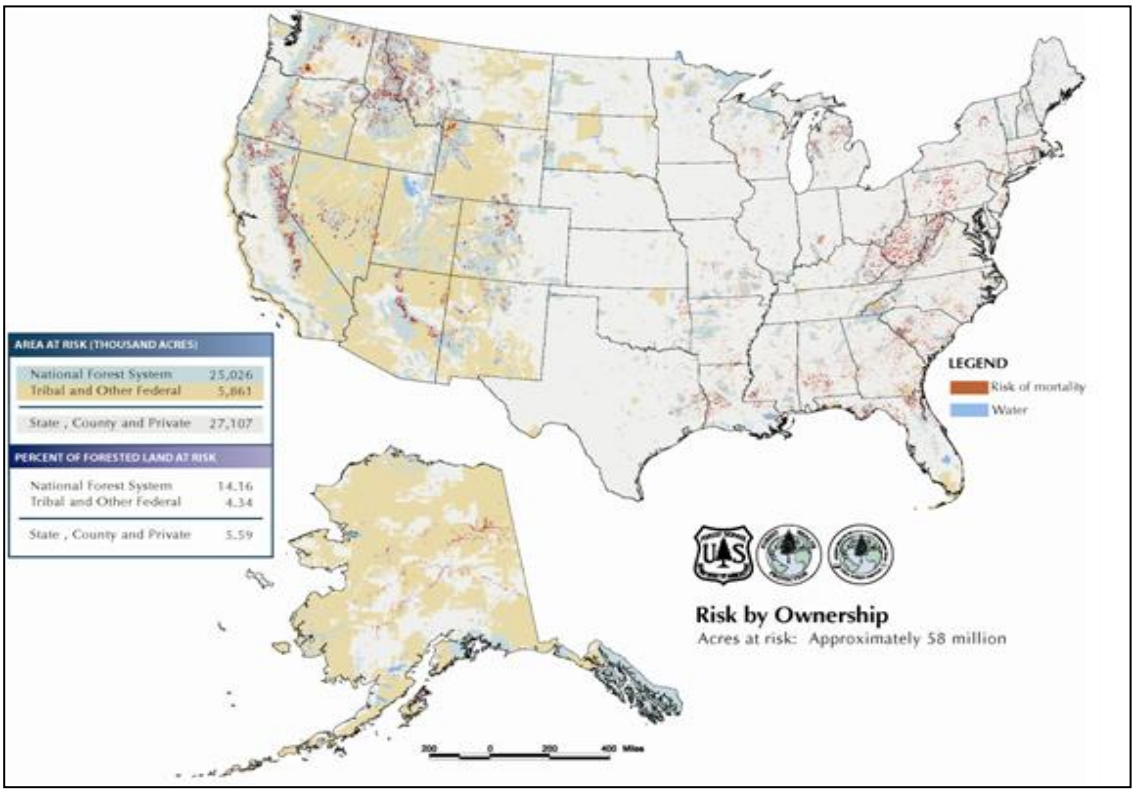


Figure 15: Areas with potential risk of greater than 25 percent tree mortality due to insects and diseases

From FY 2008 to FY 2010, the Forest Service treated native pest species on 450,437 acres and nonnative invasive species on 2,083,354 acres of State and private lands. Treatment areas for native pests such as the southern pine beetle and western bark beetles focused on the highest priority large-scale watersheds. The southern pine beetle prevention program works with States to reduce the risk of beetle outbreaks by active management and thinning of high-risk forests. Priority treatments for nonnative invasive pests focused on slowing the advancing front of gypsy moth on State and private lands from North Carolina to Wisconsin. The program continued to protect critical forest ecosystems from established nonnative insects and diseases, such as Port Orford-cedar root disease, white pine blister rust, hemlock woolly adelgid, and invasive plants. These

funds also continued to mitigate the threats of relatively new invasive pests such as the emerald ash borer, sudden oak death, and thousand cankers disease.

Targets are based on the average unit costs over the past 5 years, current year funding, and the risk to forests. The program allocates funds based on pests posing the greatest risks, e.g., mountain pine beetle, southern pine beetle, and gypsy moth. The acres accomplished may vary from year to year even with similar funding levels, due to changes in pest conditions, treatment methods, and lower unit costs, as well as inclusion of integrated acres protected during projects funded whose main purpose was other resource management objectives, such as hazardous fuel treatments. Also, final accomplishments include acres protected as a result of projects funded under the American Recovery and Restoration Act (ARRA).

Most of the recent Forest Action Plans identified insect and disease issues as one of the top priorities facing their State.

Funding and Accomplishments

Forest Health Management on Cooperative Lands*			
	(dollars in thousands)		
	FY 2008	**FY 2009**	**FY 2010**
Annual Appropriations	$54,400	$56,220	$60,001
Acres treated- Invasives	979,771	808,512	657,400
Acres treated- Native Pests	122,106	110,276	157,550

***Cooperative lands are State, municipal, and private lands. This table combines the BLIs of SPCH and SPS5, which are usually shown separately. National Fire Plan accomplishments and funding on cooperative lands are shown here. FY 2010 accomplishments include ARRA, but previous years do not.**

Figure 16: Forest Health Management

Highlights

Thousand Cankers Disease (TCD)

A newly emerging (2008) insect/disease complex named Thousand Cankers Disease (TCD) has been identified as a potential threat to the Nation's walnut resource. This disease is now confirmed in Arizona, California, Colorado, Idaho, New Mexico, Oregon, Tennessee, Utah, and Washington State. In 2011, TCD was confirmed as the latest new find in Virginia. Both the Tennessee and Virginia finds are considered significant since they both occur well within black walnut's native range. Forest Health Protection (FHP) has led the development of a multi-agency framework which informs land managers on TCD and has routed the document to the National Plant Board for their concurrence and co-signature, along with APHIS and the National Association of State Foresters. A TCD Steering Committee has been established, and monthly conference calls bring together subject matter expects to update and provide dialog on the latest survey and management developments regarding TCD. Forest Health Protection (FHP) has been responsible for the development of outreach pest alerts, TCD survey guidelines, and data capture to heighten awareness and determine the extent of TCD distribution.

Sudden Oak Death (SOD)

FHP continues to work closely with state partners through its support of SOD containment efforts in California and Oregon. The Forest Health Monitoring Program within FHP began conducting annual detection surveys through its National Stream Baiting Program in 2006, and is currently working in 17 states. This survey is voluntary and administered in collaboration with state forestry or other natural resource agencies and supporting laboratories with funding, training, and logistical assistance. The goal of stream baiting is to detect SOD as early as possible in order to reduce its movement outside the regulated areas. Lessons learned in California and Oregon are considered beneficial to successfully manage the negative impacts of *P. ramorum* should it establish in the east. In addition, FHP continues to support outreach and education and is completing a multi-agency framework to provide current management information for landowners not yet dealing with the disease.

White Pine Blister Rust (WPBR)

The long-term sustainability of high elevation ecosystems in the presence of the WPBR will depend on the level of genetic resistance in the populations and the ability of the trees to grow, reproduce, and reforest an area after disturbance. The majority of whitebark pine occurs on Forest Service managed lands, and Forest Health Protection continues to implement important conservation actions, including developing and planting white pine blister rust-resistant seedlings and cone collection for conservation of species at risk. FHP continues to work with outside groups such as the White Bark Pine Ecosystem Foundation and American Forest to address this disease.

Southern Pine Beetle

The Southern Pine Beetle (SPB) Prevention and Restoration Program is a proactive strategy to minimize the impact of the South's most devastating native pest. The Forest Service Forest Health Protection program has cooperated with States and National Forests to reduce the risk of SPB on more than 800,000 acres since 2003. More than 8,000 forest landowners have received cost-shared assistance. In 2008, managers began using 30-meter resolution SPB hazard maps to prioritize projects to optimize Forest Service financial assistance to achieve the greatest landscape-level impact.

Emerald Ash Borer

The Forest Service is working with land management agencies to help forest landowners and communities mitigate the impacts of Emerald Ash Borer (EAB). The Forest Service Forest Health Protection program continues to work with State, university, and nongovernmental partners to support the popular informational Web site: http://www.emeraldashborer.info/, develop and distribute brochures and identification material, engage Master Gardeners and citizens in building awareness of EAB, and to develop a Web-based EAB University. Forest Health Protection and partners continue to search for effective biocontrol agents. Restoration efforts continue as well.

Hemlock Woolly Adelgid

The hemlock woolly adelgid has severely impacted eastern hemlocks throughout the south and east. This adelgid can be found in both native forests, as well as urban areas. In urban areas, hemlock woolly adelgid is easily controlled with numerous insecticides. On large trees where complete coverage with foliar sprays is impossible, insecticides can be injected into the stem or in the soil near the base of the tree. In forests, treatment options are limited because of access and the cost of treating individual trees. Establishing a complex of natural enemies may be the only realistic

solution for managing adelgid populations. To date, the focus has been on predators that favor hemlock woolly adelgid and coevolved in Asia and the Pacific Northwest. In addition to biological control, other research and technology development areas include hemlock woolly adelgid resistance, silviculture, survey methods, hemlock woolly adelgid with other hemlock pests, and technical transfer. States and universities are an integral part of this research and study.

Gypsy Moth

The gypsy moth is a major forest pest in North America, since its introduction in the mid-1860's; it has become established in 19 states and the District of Columbia. A slow-the-spread strategy has been quite effective; it is slowing gypsy moths spread by more than 70 percent from the historical level of 13 miles per year to 3 miles per year. The slow-the-spread, suppression, and eradication programs could not be successful without the cooperation and collaboration with states, universities and other Federal agencies. Chemical and biological control both have proven to be affective, most recently, the virus, *Entomophaga maimaiga,* has been quite effective in keeping gypsy moth populations in check.

Mountain Pine Beetle

The most recent mountain pine beetle epidemic started in the early 2000's, causing mortality to trees on millions of acres of forested lands throughout the West. Much of the affected land is managed by the Forest Service or other Federal agencies, but state and private land holdings are not spared. Recently, this insect is causing more than 70 percent of all mortality recorded from insects or diseases in the forests of the U.S. Every year, hundreds of thousands of acres are treated with chemicals and pheromones to protect trees from this beetle. Due to warmer winters, the beetle is moving upward in elevation, killing high elevation five-needle pines such as the iconic bristle cone and whitebark pines.

Asian Longhorned Beetle

The Asian longhorned beetle was first reported to be infesting trees in Brooklyn and Amityville, New York in 1996. Since then, it has spread to other areas of New York City, New Jersey, Massachusetts, and, most recently, Ohio. Since this is a Federal quarantine pest, the Animal Plant Health Inspection Service (APHIS) has the primary lead in managing the Asian longhorned beetle. The Forest Service continues to partner with APHIS, states, and other organizations to assist with awareness efforts, studies to best control and manage this pest, improve survey techniques, and facilitate replanting trees that were removed as a result of the Asian longhorned beetle.

Oak Wilt

Oak wilt is present throughout much of the Central and parts of the Eastern United States. The disease is prevalent in both rural and urban environments and causes the greatest economic damage in urban areas, where oaks are considered high-valued shade trees. Central Texas continues to experience significant cases of oak wilt. In 1988, the Texas Forest Service (TFS), the USDA Forest Service, Forest Health Protection (USFS/FHP) and others initiated the Texas Cooperative Oak Wilt Suppression Project. For over 20 years, this project has been managing the oak wilt problem through unique partnerships and local cooperation. Project goals focus on increasing public awareness about oak wilt, identifying and mapping active oak wilt infection centers, and partnering with landowners to contain oak wilt spread. More than 2 million dollars of Federal cost shares have been delivered to participating landowners since 1988 as an incentive to treat expanding oak wilt

centers. To date, the Texas Suppression Project has installed more than 3.4 million feet (648 miles) of trenches to control 2,466 oak wilt centers. Of these, 2,156 centers (87 percent) were cost shared with $2.1 million of Federal funds. An economic analysis has documented that the $9.2 million of Federal, state, city, and private funds invested in the TX Suppression Project have yielded an average benefit/cost ratio of 6:1 and saved Texas communities an estimated $55 million in tree removal, replanting, and fungicide costs. Forest Health Protection continues to further support these types of oak wilt suppression efforts in other states such as MN and WI to contain the disease.

Forest Service Research and Development (R&D)

Forest Management and Science

Forest Service R&D worked in collaboration with the Food and Agriculture Organization of the United Nations to develop the Guide to Implementation of Phytosanitary Standards in Forestry that will help private forest owners protect their woodlots, as well as their markets, by teaching them how to reduce the risk of getting and spreading pests, how to find out about import requirements of trading partners, and even how to influence the development of new standards so that they do not impose unnecessary economic burdens.

Invasive Species

Forest Service R&D provides the scientific information, tools, and methods needed by forest managers and the public to protect State and private forests from high-priority invasive species and from native insect and disease outbreaks. Our science findings help to:

- Identify new and priority species, their thresholds, spread patterns, and potential impacts.
- Develop detection and monitoring protocols.
- Develop and evaluate management treatments and assess their long-term efficacy and effects on the ecosystem.
- Develop tools to rehabilitate forest and rangeland ecosystems, prevent re-invasion, and regain long-term multiple uses and values.

Forest Service R&D scientists work both independently and with a broad range of partners to provide scientific knowledge and new technologies for sustainable management of the Nation's forests. Each year, farmers, ranchers, and private woodland owners; corporations and investors; and public land managers and policymakers make decisions based on these results. A total of approximately $34-37 million per year is authorized for invasive species research in the Forest Service's appropriation.

Insects and Disease

Bark Beetles

The Forest Service's R&D is conducting critical research with Federal and State partners to guide management; determine the magnitude of problems; understand the interrelationships between ecosystem health, bark beetles, and multiple disturbances; and improve the control of bark beetles. Current research efforts focus on:

- Defining and valuating the relative impacts of bark beetles and defining and validating the value of bark beetle research using discounted cash flow analysis and real options techniques.

- Understanding the unintended impacts of prescribed fire and other treatments used to reduce future wildfire impacts on subsequent levels of bark beetle-caused tree mortality and to alter fuel complexes and subsequent fire behavior.
- Evaluating the effects of tree density, fire suppression, livestock, and lower elevations on bark beetle tree mortality in the Southwestern United States.

Tools provided in FY 2010 include antiaggregation pheromones that can be used to mitigate coniferous forest mortality due to bark beetle infestations, models that evaluate changes in fire behavior over time and among forest types, and climate change models that correlated bark beetle outbreaks with shifts in temperature and precipitation and host tree vigor. Approximately $2.5 million per year is provided for this work.

Hemlock Woolly Adelgid

The Hemlock Woolly Adelgid (HWA) continues to pose the single greatest threat to the health, sustainability, and future of hemlock as a forest resource in eastern North America. The Forest Service is implementing a strategic plan focusing on expanded management, research, and technology development. In a cooperative effort with States, conservation organizations, national forests, and other Federal agencies, the Forest Service is working to mitigate the impacts of the HWA within the 17 affected States. The current research focuses on:

- Fine-tuning and evaluating chemical controls for HWA.
- Evaluating and releasing predatory beetles to help reduce HWA populations.
- Evaluating the genetics of HWA and its natural enemies to better direct management of HWA.
- Developing hybrid and potentially resistant lines of hemlocks that can be used to restore the ecosystems impacted by HWA.
- Evaluating the impacts of HWA on arthropod communities.
- Evaluating the factors that affect HWA spread and potential range.
- Identifying silvicultural options for reducing hemlock vulnerability to HWA.

Key accomplishments include discovering and introducing predators for HWA biological control, developing chemical control treatments, and developing hybrid hemlocks that are resistant to HWA. Approximately $1.9 million per year is provided for this work.

Emerald Ash Borer

The Emerald Ash Borer (EAB) is a nonnative beetle from Asia that was discovered in southeast Michigan and neighboring parts of Ontario, Canada, in July 2002. EAB attacks all species of ash and kills trees of various sizes and condition. Forest Service research has made considerable advances in understanding the biology of EAB and in developing detection and management tools including:

- Development of models for flight performance and rate of spread and attractive lures for trapping and detection;
- Recommendations for use of insecticides to protect landscape trees and guidelines for regulatory treatment;
- Discovery, evaluation, and release of parasitic wasps for biological control;
- Development of transgenic methods for engineering resistant trees and hybridization of North American and Asian ash trees to evaluate EAB preference and tree resistance.

Working under a grant from the Nature Conservancy, a group of scientists, including several R&D scientists, recently predicted that over the next 10 years, the economic impacts of the EAB will exceed $34 million per year for the Federal Government, and it will exceed $760 million per year for local governments. This is in addition to removing street trees and reducing hazards to parks and powerlines and finding a way to dispose of the debris. Finally, impacts will exceed $310 million per year for homeowners who have to remove and replace dead trees.

Currently, the Forest Service is leading a multiagency pilot project in Michigan to develop and evaluate a strategy to reduce EAB populations and slow the progression of ash mortality (Slowing Ash Mortality (SLAM) Project). If successful, this strategy may be part of a comprehensive approach to manage EAB infestations and slow their natural spread.

Approximately $1.4 million per year is provided for this work.

Sudden Oak Death

Researchers at the University of California–Davis have identified several registered fumigants and heat treatments that are effective for eradication of the sudden death oak pathogen from nursery soil. Lack of an effective treatment for soil has been a major stumbling block in cleaning up infested nurseries. Preventing spread of the pathogen via nursery stock is critical to containing the epidemic within the currently infested 15 west coast counties. The research was funded via a grant from the Forest Service's competitive Sudden Oak Death Research Program. Approximately $2.1 million per year is provided for this work.

Ailanthus

Ailanthus altissima, a rapidly growing invasive nonnative tree, is spreading into many forested landscapes in the eastern United States and displacing native plants. To gain a better understanding of how landscape disturbances affect Ailanthus distribution, Forest Service scientists partnered with the Ohio Department of Natural Resources Division of Forestry to develop aerial mapping techniques for finding infestations. This technology will be used as a cost-effective and efficient monitoring tool to remove invasive plants across large forested areas. Approximately $200,000 per year is provided for this work.

Longhorned beetle

Development of an operationally effective trap has been a goal of the Asian longhorned beetle (ALB) eradication program since the first individual ALB was found in New York in 1996. A trap that can demonstrate the presence of low densities of ALB in an area is critical to detecting and eliminating infestations and can also provide positive confirmation of successful eradication. The Forest Service's R&D was part of an interagency and university effort that developed the traps for ALB. Approximately $200,000 per year is provided for this work.

Forest Health Indicators *(http://www.fia.fs.fed.us/program-features/indicators)*

Since 1989, the FIA program has monitored a suite of forest health indicators (Stolte et al. 2002), including crown condition (Schomaker et al. 2007); lichen communities (Will-Wolf 2010); ozone injury (Will-Wolf and Jovan 2008); down woody material (Woodall and Monleon 2008); tree damage, vegetation diversity, and structure (Schulz et al.. 2009); and tree mortality and soil

condition (O'Neill et al. 2005). Researchers and policymakers use indicator information about forest soils, down woody debris, and tree biomass to estimate carbon budgets and to model the potential for carbon sequestration under different management scenarios. The fire management community is using the forest structure and down woody debris data to identify areas at highest risk of catastrophic fire and opportunities for preventive treatments. Land managers use understory vegetation data to track increases of invasive species. Many partners use FIA data on ozone injury, lichen community composition, tree damage, and tree crown condition to report, as required by several international treaties, on overall forest health and probable impacts of air quality and acid deposition.

Forest Service, S&PF

State Fire Assistance Program

The State Fire Assistance (SFA) program (formerly Rural Fire Prevention and Control) has been funded annually since 1911 to provide technical and financial assistance to States to help improve wildfire protection capabilities. The SFA program assists in increasing firefighting capacity by providing training and equipment and technical assistance to fire organizations at the State and local level. It supports activities in the wildland-urban interface where the greatest population is affected and focuses on hazard-mitigation projects targeted to reduce property loss, lessen fuel hazards, and increase public awareness and citizen-driven solutions in rural communities. It also supports important education and public information activities, such as the FIREWISE workshops, and Smokey Bear information and education campaigns.

State Fire Assistance Accomplishments			
	Fiscal Year		
	2008	**2009**	**2010**
Personnel trained (e.g. agency, other state, career fire service, volunteers)	39,928	43,099	37,105
Fire management plans, risk assessments, or equivalents completed	2,184	6,318	2,973
Communities directly assisted with management plans, risk assessments, or equivalents	5,960	5,565	1,524
Prevention or education programs conducted or implemented	16,668	16,922	48,026
Communities directly assisted by education programs conducted or implemented	13,182	9,230	8,525
Hazardous fuels reduction or mitigation projects conducted	8,149	6,743	3,499
Communities directly or indirectly assisted by hazardous fuels reduction or mitigation projects	7,802	2,306	3,334
Acres treated to reduce hazardous fuels (direct Federal grant only)	292,804	179,544	156,804
Acres treated to reduce hazardous fuels (leveraged through Federal funding)	165,028	335,055	290,504
Acres treated by mechanical means with by-products utilized	17,300	30,473	9,552
Communities assisted not previously accounted for under SFA	1,927	3,199	2,419
Communities at Risk (CAR)* covered by CWPP** or equivalent	4,629	5,567	5,757
CAR, at reduced risk	10,563	10,211	3,576
Communities at reduced risk	1,759	1,816	3,085

*"Communities-at-risk" refers to communities that at are at risk from destruction or damage from wildfire.
**''Community wildfire protection plan'' means a plan that is collaboratively developed to identify and prioritize areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect a community(s) and essential infrastructure and recommends measures to reduce structural ignitability throughout the community(s).

Figure 17: State Fire Assistance Accomplishments

		State Fire Assistance*		
		2008	**2009**	**2010**
Annual Appropriations (thousands)		$80,572	$90,000	$110,397

* Includes National Fire Plan

Figure 18: State Fire Assistance

Community Fire Protection Authority (formerly known as "Steven's Funds")

The Community Fire Protection Authority provides funding for hazardous fuels treatments on private lands that are adjacent to NFS lands. Funds may only be used for hazardous fuels work. Over the last several years, S&PF, Fire and Aviation Management has used this authority to make up to $15 million of hazardous fuels funds available annually for treatments on non-Federal lands adjacent to NFS lands. In FY 2008, 16,000 acres were treated; in FY 2009, 33,000 acres were treated; and in FY 2010, over 40,000 acres were treated. These treatments reduced wildfire risk to the non-Federal lands and reduced wildfire risk on Forest Service lands from fires originating on private property.

Forest Service, R&D

Wildland Fire and Fuels Management

Forest Service R&D Wildland Fire Research conducts research at five Forest Service research stations and two laboratories. In collaboration with Forest Service Fire and Aviation Management, Forest Service R&D established a national Wildland Fire Management Research, Development, and Application Program at the National Interagency Fire Center (Boise, Idaho). During the last three years, approximately $23.8 million per year was allocated for wildland fire and fuels research, and $8 million per year was allocated for the collaboration on the Joint Fire Science Plan in the Forest Service's research appropriation.

Fire and resource managers on national forests, on other public and private lands, and in other countries use many products developed by Fire R&D. Fire R&D provides support for land managers and policymakers in four key areas.

Fire Planning

Models and other quantitative tools help fire managers analyze effects of wildfire, implement prescribed fire, integrate with other resource areas (e.g., wildlife), and coordinate suppression activities.

Decision Support for Fire Management

Decision support tools—including improved fire behavior monitoring and prediction and the costs and benefits of alternative actions—help managers decide how to respond to wildfires.

Fuels Management and Ecosystem Restoration

New information and quantitative tools help managers implement treatments that reduce hazardous fuels to protect natural resources in fire-prone landscapes and reduce fire severity and smoke near local communities.

Restoration of Ecosystems

Improved knowledge of the effects of management and land use on forest, shrubland, and grassland ecosystems is used to guide long-term planning for vegetation conditions and landscape patterns, while providing for sustainable production of ecosystem services.

Fire is frequently in the public eye—large wildfires occur every summer, and the length of the fire season is increasing as the climate warms. In response to this increased social focus, the Forest Service works with local communities and a wide range of stakeholders to implement a science-based strategy for managing fire and fuels. Forest Service fire scientists work with fire and fuels managers on national forests and other Federal lands and on Tribal, State, and private lands to address information needs through long-term field research, software development, and on-site consultation. This science-management partnership is critical for rapid implementation of new discoveries and continued improvement in fire and fuels management.

Reducing the loss of ecosystem services and economic values in large wildfires is a priority for our Nation, as few as one percent of all wildfires account for 98 percent of the area burned. It is critical

to understand, plan for, and effectively manage large fires. Scientific documentation from wildfires is being used to plan for future large fires.

Planning considers fuel conditions, natural resource values, risk factors in local communities (e.g., homes and other structures), smoke production, and potential suppression activities.

Fire R&D contributes to all components of the planning process through its research program and collaboration with national forest resource managers. To ensure the quality and relevance of fire research across the United States, managers conduct ongoing evaluations of current issues, review scientific products, and coordinate with other scientific disciplines

Farm Service Agency

USDA Farm Service Agency's (FSA's) Emergency Forest Restoration Program (EFRP) provides payments to eligible owners of NIPF land in order to carry out emergency measures to restore land damaged by a natural disaster. Congress appropriates funding for EFRP.

FSA's State and county committees and offices administer EFRP. Subject to availability of funds, locally elected county committees are authorized to implement EFRP for all disasters except drought and insect infestations, which are authorized at the FSA national office.

The supplemental appropriations act of 2010 provided $18 million in funding for EFRP for expenses resulting from natural disasters that occurred on or after January 1, 2010.

FSA published regulations implementing EFRP on November 17, 2010. The FSA also provided handbooks and other guidance to State and county offices on December 6, 2010, allowing county offices to begin accepting applications through new Web-based software.

In January 2011, FSA and the Forest Service finalized an interagency agreement to facilitate technical assistance for EFRP.

As of July 28, 2011, over $15 million in EFRP funding has been allocated to Alabama, Arkansas, Georgia, Idaho, Minnesota, Mississippi, New Hampshire, Ohio and Vermont (see attached table for more details). FSA maintains a reserve of approximately $1 million for errors, omissions, and appeals and has allocated $1.8 million for technical assistance provided by the Forest Service. As of the same date, FSA had received approximately $49 million in unfunded requests for EFRP assistance from Alabama, Georgia, Mississippi, North Carolina, Tennessee, and Virginia due to tornadoes, Arkansas for drought, and Massachusetts and Ohio for June tornados.

Including the $49 million of current need, a total of approximately $73 million in EFRP needs is anticipated this year. This includes an estimated $10 million from tornado damage in the southeastern States, and an estimated $5 million of demand from the upcoming hurricane season. Also included is an additional $9 million in potential demand from other disasters nationwide, including flood, hurricane, tornado, wildfire, and other types of natural disasters.

ENHANCE PUBLIC BENEFITS FROM FORESTS

Forest Service, S&PF

Forest Stewardship Program (FSP)

The Forest Stewardship Program (FSP) provides targeted technical and planning assistance to enable active, long-term forest management on important private forest landscapes. Landowners who implement Forest Stewardship Management Plans (FSP Plans) are in a much better position to participate in certification programs and access emerging markets, such as those for ecosystem services and carbon credits. They are engaged landowners who are much more likely to keep their forest in forest uses now and in the future. Since being authorized by the 1990 Farm Bill, the FSP has:

- Served as the primary, most extensive (in reach and scope) private forest owner assistance program in the United States.
- Successfully created and helped sustain a vast, effective network of forestry technical assistance providers and programs.
- Provided more than 325,000 comprehensive FSP Plans covering about 37 million acres nationwide. In FY 2009 alone, the program reached nearly 900,000 forest landowners through various education and assistance programs.
- Established strong and effective partnerships with State foresters, conservation districts, and many other partners to provide for broader forest landowner participation in USDA conservation programs.

Program Innovations

- ***Landscape-based assessment and planning.*** Through the geographic information system (GIS)-based Spatial Analysis Project, all States have identified where they need to focus outreach and technical assistance efforts in order to maximize forest resource outcomes. This work has prepared States well for successfully completing their State Forest Action Plans.

- ***Outcome-based accomplishment tracking.*** The FSP has successfully developed and released powerful plan-writing and spatial accomplishment tracking tools for field foresters and program managers capable of displaying and relating all S&PF activities to landscape priority areas and associated forest resource attributes. For more information, see http://www.fs.fed.us/na/sap/wdet/images/webdet.jpg.

- ***Field Monitoring Program.*** States are successfully implementing a nationally consistent and statistically valid field monitoring program, started in 2008. The monitoring program demonstrates FSP outcomes on the landscape by verifying that landowners are sustainably managing their forest lands.

- ***Targeted Technical Assistance.*** Providing cutting-edge assistance to partners, forestry professionals, and communities to enhance private forest management and conservation.
  - Reforestation, Nursery, and Genetic Resources Program (RNGR): RNGR provides assistance in native plant seed and seedling production to States, Tribes, communities,

and forestry professionals. RNGR activities focus on ensuring adequate supplies of high-quality seedlings for conservation and reforestation, planting methods that improve seedling survival and growth, and cost-effective production and planting techniques.

- USDA NAC: Supporting NAC, in partnership with USDA's NRCS. NAC accelerates the application of agroforestry through a national network of partners. As a result of NAC technical transfer work, private landowners are currently managing more than 1,025,000 acres in the Plains States, according to FSP plans.

- Peer-to-Peer Networks: Investing in efforts to develop and expand peer-to-peer landowner networks within landscape focus areas. This will result in the long-term management of significant landscapes—such as priority watersheds—and the conservation of strategically located and connected open spaces.

- ***Gateway to various incentives and assistance.*** The program is increasingly serving as a "gateway" through which landowners can gain access to a variety of assistance and programs, including USDA cost-share, State tax abatement, forest certification, and emerging ecosystem service and renewable energy markets. Demand for FSP planning assistance is expected to increase significantly because the 2008 Farm Bill expanded eligibility for many USDA conservation programs to include private forest landowners.

Focus Issues for FSP in 2011:

Roll-Out and Continue To Improve Spatial Tools

- Demonstrate and deploy spatial accomplishment tracking tools to States and partners.
- Complete next generation version of the tools to improve functionality and allow for broad applicability for all S&PF programs.
- Continue collaboration with NRCS and Rural Development to integrate databases, which will streamline forest landowner access to cost-share programs and allow for cumulative and integrated program performance assessment.

Landscape-Scale Stewardship Planning

- Continue to lead efforts to support the development and successful implementation of Forest Action Plans.
- Develop best practices and provide assistance to implement landscape-scale and multi-landowner planning.
- Utilize social marketing and peer-to-peer networking to effectively target program efforts in priority landscape areas.

Increase Landowner Opportunities for Participation in Biomass Energy, Certification, USDA Cost-Share Programs, and Ecosystem Services Markets

- Continue efforts to make FSP Plans the "on-ramp" to biomass energy markets and forest certification schemes.
- Streamline processes to increase private forest owner participation in cost-share programs through collaboration with other USDA agencies and the Joint Forestry Team.
- Continue to develop best practices and policies to ensure private landowner participation in ecosystem services and carbon offset markets.

	Forest Stewardship Program		
	FY 2008	FY 2009	FY 2010
Annual Appropriations (thousands)	29,532	27,000	29,369

Figure 19: Forest Stewardship Appropriations

Forest Stewardship Program Accomplishments			
	FY 2008	**FY 2009**	**FY 2010**
Number of landowners assisted	149,260	145,976	132,348
Number of landowners educated	723,155	569,968	229,959
Acres of nonindustrial private forest land that are being managed sustainably under forest stewardship management. (Annual)	1,888,904	2,076,447	1,805,353
Acres of nonindustrial private forest land that are being managed sustainably under forest stewardship management plans. (Cumulative)	18,737,799	18,582,449	19,592,387
Number of acres in important forest resource areas being managed sustainably, as defined by a current Forest Stewardship Management Plan. (Cumulative).	5,629,714	7,383,813	8,085,853
Acres in Important Forest Resource Areas covered by current Forest Stewardship Plans. (Cumulative)	8,088,291	8,559,798	9,180,010

Figure 20: Forest Stewardship Program Accomplishments

Landowner Assistance: Landowners who are known by program staff to have benefited in some significant and lasting way from FSP or Rural Forestry Assistance include:

- Landowners who receive individualized and repeated technical assistance and for whom some sort of case file is established and maintained.
- Landowners who have received assistance in the way of practice plans and management plans other than FSP plans.

Does not include:

- Landowners who simply attended a technical or training session without any follow-up.
- Landowners who were spoken to only once, such as over the phone, with no follow-up contact or later assistance.

Landowner Education: Landowners that have participated in a FSP or Rural Forestry Assistance sponsored educational workshop, course, or program designed to further enable them to sustainably manage their forest properties. Examples of such programs include landowner field days, timber tax seminars, estate planning workshops, silviculture courses, wildlife management seminars, and management plan writing workshops. This does not include landowners who have attended only program marketing or orientation seminars that provide programmatic and application information. Landowner education also does not include videos, newsletters, brochures, publications, or public educational broadcasts or media.

Forest Stewardship Plans (FSP Plans): Multi-resource management plans that meet the minimum standards and content requirements detailed in the FSP National Standards and Guidelines and have been approved by the State Forester or a suitable representative. Plans approved before October 1, 2005, must meet standard and content requirements detailed in first edition (1994) of the FSP National Standards and Guidelines. Plans written after October 1, 2005, must meet standard and content requirements detailed in second edition (October 2005) of the FSP National Standards and Guidelines. Plans written after March 1, 2009, must meet standard and content requirements detailed in third edition (February 2009) of the FSP National Standards and Guidelines.

Current Forest Stewardship Plan: An FSP Plan is considered to be current if it is within the effective period stated within the plan. If no effective period is stated or known, a Forest Stewardship Plan is considered to be current if it has been written, revised, or updated in the last 10 years. A Forest Stewardship Plan that explicitly covers a period of more than 10 years as required by a State-administered program is considered current as long as there is sufficient documentation and monitoring to indicate that it meets all State and Federal program requirements during the entire plan period. To provide consistency in national reporting and related funding methodology, States are encouraged to use 10 years as a standard effective period for FSP Plans. Exceptions based on specific needs and conditions should be stated within the plan.

Important Forest Resource Areas: These are the areas that are considered to be of high program potential—or priority—as assessed through the FSP Spatial Analysis Project (SAP), State Forest Actions Plans, or both.

Established Plan Monitoring Procedures: The intent of the FSP plan implementation monitoring effort is to reliably assess the extent to which current FSP plans are being implemented. National guidance was developed to get meaningful, statistically reliable results, while not placing an unreasonable additional burden on State partners. The monitoring of a randomly selected, statistically sized sample population of all current FSP plans is extended over a 5-year cycle. States must use the sample size equation that has been provided by the Forest Service or another statistically reliable method for determining a representative sample size.

A number of States have other programs, such as tax programs, which require plan implementation and include periodic site inspections. When a sampled property is inspected through such a

program, the results from the site inspection can be used for FSP Plan monitoring, without requiring another visit to the site.

Urban and Community Forestry Program

The Urban and Community Forestry (U&CF) program assists cities, suburbs, and towns across the country in improving the condition and coverage of community trees and forests. Active management of these assets secures the greatest economic, social, and environmental benefits for more than 80 percent of the Nation's population. The U&CF program delivers technical, financial, educational, and research assistance to communities in all 50 States, the District of Columbia, and 8 U.S. territories and affiliated Pacific island nations. Assistance is delivered to communities primarily through State forestry agencies with an expanding partnership network of local governments, community and professional organizations, universities, volunteers, and businesses.

Urban and Community Forestry Program Funding				
	(dollars in thousands)			
	FY 2008	**FY 2009**	**FY 2010**	**FY 2011**
Annual Appropriations	27,691	29,541	30,377	30,204

Figure 21: Urban and Community Forestry Funding

Program priorities emphasize delivering critical ecosystem services such as air and water quality, storm water management, energy conservation, greenhouse gas reduction, wildlife habitat, and improved human health and well-being, by increasing community tree canopy, improving urban forest management, and reducing impacts of land use change on State, municipal, and private forests.

The U&CF program has conducted an analysis of all the recently completed State Forest Action Plans to identify common trends, areas of focus, and innovative ideas for U&CF. This information will help direct national program priorities based on cross-agency and cross-program emerging opportunities.

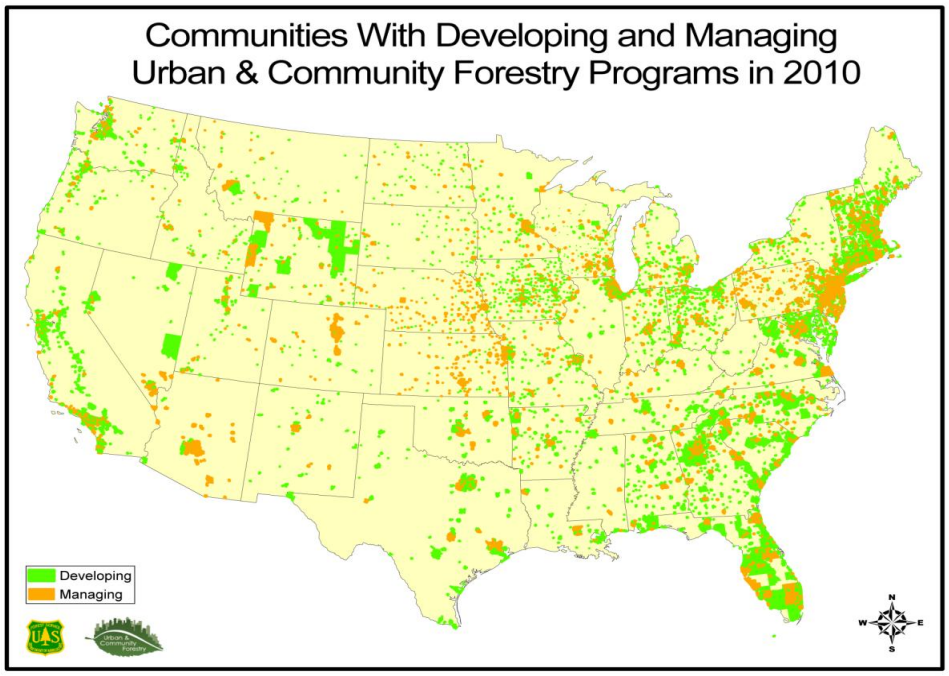


Figure 22: Communities assisted and their accomplishments for the conterminous United States in 2010.

In FY 2010, U&CF provided assistance to 7,102 communities, where 177 million people live. The population served by the program in FY 2010 represented more than 77 percent of the people living in communities with the potential to develop programs to plant, protect, and manage their urban and community trees and forests.

Program performance is recorded each year in a Community Accomplishment Reporting System database, based on State partners' accomplishments in assisting communities to achieve one or more of four criteria for their U&CF programs: (1) professional program staff, (2) tree ordinance, (3) urban forest management plan, and (4) local advisory or advocacy organization. Communities with managing U&CF programs (reaching all four criteria), or developing programs (reaching one to three criteria) increase the ability of the local, State and national U&CF program to achieve the program priorities listed above.

Urban and Community Forestry Program Community Accomplishments			
	FY 2008	**FY 2009**	**FY 2010**
Management Plans	3,929	4,172	4,350
Professional Forestry Staff	4824	5054	5034
Ordinances / Policies	7,555	7,689	7,935
Advocacy / Advisory Organizations	6,066	6,411	6,566

Figure 23: Urban and Community Forestry Accomplishments

Forest Service R&D and S&PF

Reforestation, Nurseries and Genetic Resources

The RNGR Program provides assistance in native plant seed and seedling production. RNGR activities focus on:

- Adequate supplies of reasonably priced, high-quality, genetically well-adapted seedlings for conservation and reforestation.
- Propagation and planting methods that improve seedling survival and growth.
- Cost-effective production and planting techniques.

Results Achieved

- Established successful partnerships with universities (Purdue, Oregon State, Indiana, Georgia, Hawaii, Idaho, Michigan Tech., and Washington State), Federal agencies (the USDA's NRCS and ARS; and the U.S. Department of the Interior's Bureau of Land Management and National Park Service), State agencies (Hawaii, Idaho, Indiana, Minnesota), and Forest Service nurseries.
- Developed a Cultural Plant Propagation Center at Moenkopi School near Tuba City, Arizona, and a cooperative project with the Hopi Tribe and the USDA's NRCS to restore Tribal lands by removing exotic invasive plants.
- Published The Woody Plant Seed Manual (in cooperation with Forest Service R&D); the final volume of The Container Tree Nursery Manual titled Seedling Processing, Storage, and Outplanting; and the two-volume Nursery Manual for Native Plants: A Guide for Tribal Nurseries.
- Published Forest Nursery Notes, Native Plants Journal (with Indiana University), and Tree Planters' Notes, delivering information and research results to the nursery and reforestation community worldwide.
- Established the RNGR site at http://rngr.net, which has the most extensive searchable/downloadable online collection of information on producing native plants.

Future Direction

- Maintain core technical assistance and technology transfer activities (periodicals, handbooks, proceedings, Internet sites, and facilitation of regional nursery meetings and the Intertribal Nursery Council). These activities use electronic distribution of information wherever possible to efficiently provide nursery managers and restoration specialists with timely and useful information not available elsewhere.
- Develop new tools, protocols, and relationships needed to address increasing complex forest ecosystem conservation and restoration challenges arising from invasive species introductions and global climate change. RNGR has a critical role in ensuring the supply of quality plant material from appropriate seed sources for government agencies and the general public and in assisting with germplasm preservation and redeployment as invasive organisms threaten native plant species with extinction.

Forest Service R&D and S&PF

Forest Products Laboratory Research and Technology Transfer

For almost 100 years, the Forest Products Laboratory's (FPL's) mission has been to use our Nation's wood resources wisely and efficiently, while at the same time keeping our forests healthy. The FPL's research results are applicable to all forest lands, regardless of ownership. In order to keep forests as forests, it is critical to provide efficient, high-value uses for the wood that is removed. Forest products research is vital to achieving those goals, thereby, ensuring retention of forest lands, particularly private forest lands.

Forest products research contributes to private forest lands by finding economic uses for logs coming from these private forest lands in many ways, including: (1) improving durability of wood products , (2) developing new uses for woody biomass that traditionally had no or little economic value, (3) providing cost-effective processes for producing liquid biofuels that emit fewer greenhouse gases than gasoline or diesel fuels, and (4) developing new processes that decrease energy use and greenhouse gas emissions from the production of solid wood and paper products.

The FPL has focused some of its research effort on characterizing small-diameter and thinning material off public and private forest lands to identify potential uses and provide technology that can help rural-based communities create successful businesses from managing their private forest lands. The FPL research projects are exploring the potential of the small-diameter roundwood as a structural material for uses such as bridges, boardwalks, trail structures, picnic shelters, storage sheds, and other rustic-type buildings. Other FPL research is finding other innovative ways to use underutilized woody biomass.

As the environmental and ecological problems increase related to the incursion of invasive species into native ecosystems, particularly private forest lands, new uses for these invasives could provide economic solutions. Using two especially problematic invasive species, salt cedar (Tamarisk ramosissima) and Utah juniper (Juniperus osteosperma), the FPL has investigated their use as fillers in biofiber-polymer composites.

State and Private Forestry, Technology Marketing Unit

Similar to the extension services provided by many universities, the FPL's Technology Marketing Unit (TMU) provides a broad scope of expertise in wood products utilization and marketing, technology transfer, and technical assistance, regardless of ownership. The TMU's mission is to promote the efficient, sustainable use of wood by transferring technologies developed by the FPL, other Forest Service research stations, universities, and other Federal laboratories.

The TMU works in collaboration with many different partners, particularly State forestry agencies, to identify opportunities for working with local governments, private landowners, rural communities, and forest industries. The breadth of their work includes forest products conservation, processing, manufacturing efficiency, marketing, recycling, and bioenergy. The technical assistance they provide includes publications, technical assistance visits, conferences, workshops, meetings, and just simply meeting with customers face to face or via phone.

The TMU also manages the Forest Service's Woody Biomass Utilization Grant program, which focuses on creating markets for small-diameter material and low-valued trees removed from forest restoration activities, such as reducing hazardous fuels, handling insect and disease conditions, or treating forest lands impacted by catastrophic weather events. These funds are targeted to help communities, entrepreneurs, and others turn residues into marketable forest products and/or energy products. Grants range in size from $50,000 to $350,000 and can be in place for up to 3 years. Over the past 6 years, requests have totaled $165 million in Federal funds. The Forest Service provided $30.1 million toward the projects. In the 6 years since this grant program started, 709 jobs have been retained or created, and more than 1.5 million green tons of woody biomass have been used for economic benefit.

Forest Service R&D

Science Education

In 2010, the Forest Service Washington Office teamed up with the Southern Research Station (SRS) and the Cradle of Forestry Interpretive Association to create a special monograph edition of the Natural Inquirer. The Natural Inquirer is a science education resource that presents contemporary Forest Service science to middle school students. The Natural Inquirer is correlated to National Science Education Standards and includes lesson plans and hands-on activities. "Show Me the Money" presents SRS research that evaluated the effectiveness of nine Farm Bill forestry incentive programs. Because the findings indicated that only 26 percent of southern landowners were aware of these incentive programs, the Natural Inquirer is trying something new: a pull-out flier for students to take home to their parents, describing these Farm Bill programs. The monograph will be available for teachers to order and use in the 2011–2012 school year. Orders can be made after July 10, 2011, at http://www.naturalinquirer.org.

Forest Service Patents Relative to Private Forests

Preserving and using our natural resources wisely is beneficial to all. Forest Service specialists and scientists have patented a number of technologies that enhance public benefits from private forests, the details of which have been documented in Appendix C. Included in this list is: a single tool for reforestation that eliminates compacted soil to allow for seedling growth, a quick way to provide better fire control by measuring the moisture content on the forest floor, a more cost-effective and environmentally friendly way to apply herbicides for weed control, a way to determine wood quality without cutting down trees, using soy adhesives as a healthier more cost-effective alternative to phenol in building materials, and improved biofuel production from woody biomass.

Natural Resources Conservation Service

Conservation Stewardship Program

The Conservation Stewardship Program (CSP) offers stewardship contracts to landowners who meet a certain threshold of land stewardship and agree to maintain and improve their land. Previously called the Conservation Security Program, it now includes family forests. Under the program, participants receive annual payments for conservation performance—the higher the performance, the higher the payment.

Nonindustrial private forests are eligible for the program, but are limited to just 10 percent of national CSP acreage. The enrolled forested acres in 2009 were 9.2 percent and in 2010 were 8.3 percent, for a total of 2.1 million acres.

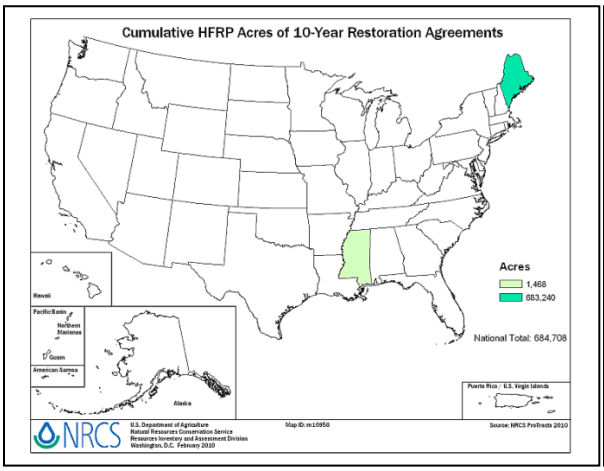
Forest land enrollments were particularly strong in the Southeast, where Alabama, Georgia, and South Carolina alone made up 27 percent of nationwide enrollments.

Most Common Forestry Activities Selected by Landowners (most to least)
Forest stand improvement for habitat and soil quality
Forest wildlife structures
Forest stand improvement, prescribed burning
Hardwood crop tree release
Forest stand improvement for soil quality
Wildlife corridors on forest land
Forest stand improvement pretreating vegetation and fuels
Restoration and management of rare or declining habitats on forest land
Conifer crop tree release
Patch harvesting
Most Common Agroforestry Activities Selected by Landowners (most to least)
Riparian forest buffer, terrestrial and aquatic wildlife habitat
Renovation of a windbreak or shelterbelt or hedgerow for wildlife
Multistory cropping, sustainable management of nontimber forest plants
Silvopasture for wildlife habitat

Figure 24: NRCS Conservation Stewardship Program Activities

Healthy Forest Reserve Program

The Healthy Forest Reserve Program (HFRP) is a relatively small program that uses conservation easements, both permanent and short-term, to protect and restore lands crucial for recovery of endangered species and for sequestering carbon dioxide. In exchange for entering into the program, landowners are protected from any future increases in regulations under the Endangered Species Act of 1973.



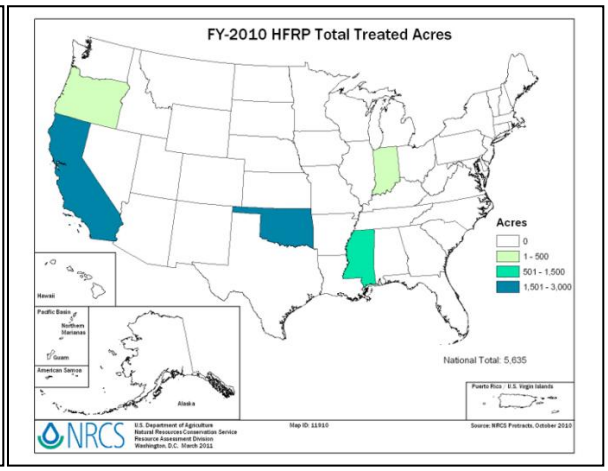


Figure 25: NRCS Healthy Forest Reserve Program

In 2010, only seven States had approved projects, though 13 States in total participate in the program. Those seven States permanently protected 2,836 acres of forest and are helping to restore an additional 2,747 acres over the next 10 years. The total cost for these projects was $6.4 million.

Wetlands Reserve Program

Wetlands Reserve Program (WRP) is not typically thought of as a forestry program, but WRP is an important tool for owners of forests, farms, and ranches to preserve and restore the portions of their lands that are in wetlands. Much like HFRP, this program uses easements and cost sharing of restoration costs to help protect the water filtration and wildlife habitat inherent in a wetland.

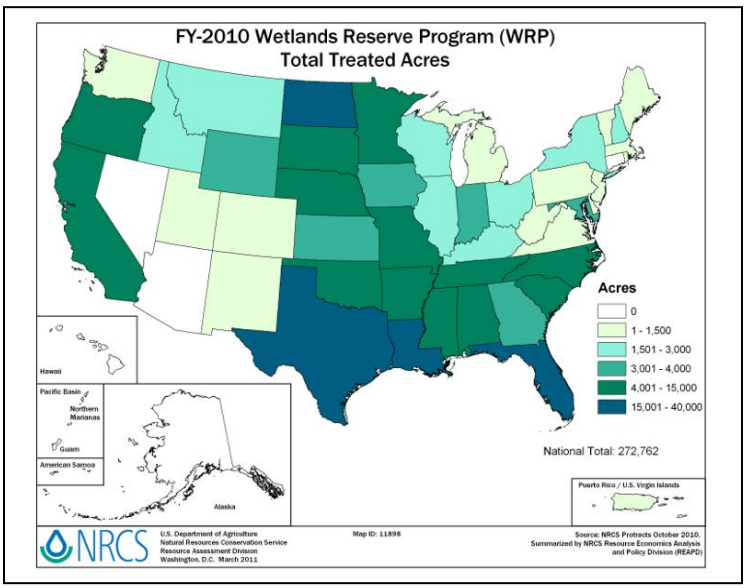


Figure 26: NRCS Wetlands Reserve Program Acres Treated

Last year, more than 272,000 acres of new projects were enrolled in WRP, and restoration was completed on nearly 130,000 acres of existing WRP projects. While no data is collected on the division of forested, prairie, or coastal wetland enrollments, the geographic distribution of the program (see map below) is indicative of the land type.

Cooperative Conservation Partnership Initiative

The 2008 Farm Bill began emphasizing the importance of partnerships and landscape-level planning in conservation. The Cooperative Conservation Partnership Initiative (CCPI) builds on this new focus by coordinating and leveraging funds from the EQIP, WHIP, and CSP programs to encourage conservation in key target areas. Through CCPI, 15 States now have targeted project areas in 26 areas. Over $2.9 million was allocated in 2010 for the program. See Appendix D for a summary.

Conservation Innovation Grants

Conservation Innovation Grants (CIG) is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging Federal investment in environmental enhancement and protection in conjunction with agricultural production. Under CIG, EQIP funds are used to award competitive grants to non-Federal governmental or non-\governmental organizations, Tribes, or individuals.

CIG enables NRCS to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the Nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with Federal, State, and local regulations. NRCS administers CIG.

Over $5.3 million was allocated from 2008 through 2010. See Appendix D for a summary of CIG.

Farm Service Agency

Conservation Reserve Program

The Conservation Reserve Program (CRP) is a voluntary program that provides annual rental payments and cost-share assistance to agricultural producers in return for establishing long-term cover on environmentally sensitive farmland. Producers enrolled in CRP establish long-term, resource-conserving covers to improve the quality of water, control soil erosion, and enhance wildlife habitat. In return, FSA provides participants with rental payments and cost-share assistance. Contract duration is between 10 and 15 years. CRP acreage is added by periodic general sign-ups that are subject to competitive ranking and selection and by ongoing continuous sign-ups for certain specific high-priority practices.

Continuous sign-ups are used for special initiatives such as theConservation Reserve Enhancement Program (CREP) and State Acres For wildlife Enhancement (SAFE). Enrollment is not competitive like general sign-up and does not use the Environmental Benefits Index. Participants must meet applicable eligibility criteria, and enrollment is limited to certain specific high-priority practices, such as riparian buffers and cropped wetland restorations.

Continuous sign-up initiatives encourage restoration of declining ecosystems, including longleaf pine, bottomland hardwoods, upland bird habitat (quail buffers), and cropped wetland restoration. Under CREP agreements, Federal/State partnerships implement projects designed to address specific environmental objectives. States generally provide 20 percent of funding. There are currently 44 agreements in 33 States. State Acres for Wildlife Enhancement (SAFE) is an initiative targeting at-risk and economically important wildlife species and habitats. Many CRP practices contribute to forest ecosystem conservation, including wetland restoration, creating riparian buffers, and the planting of trees.

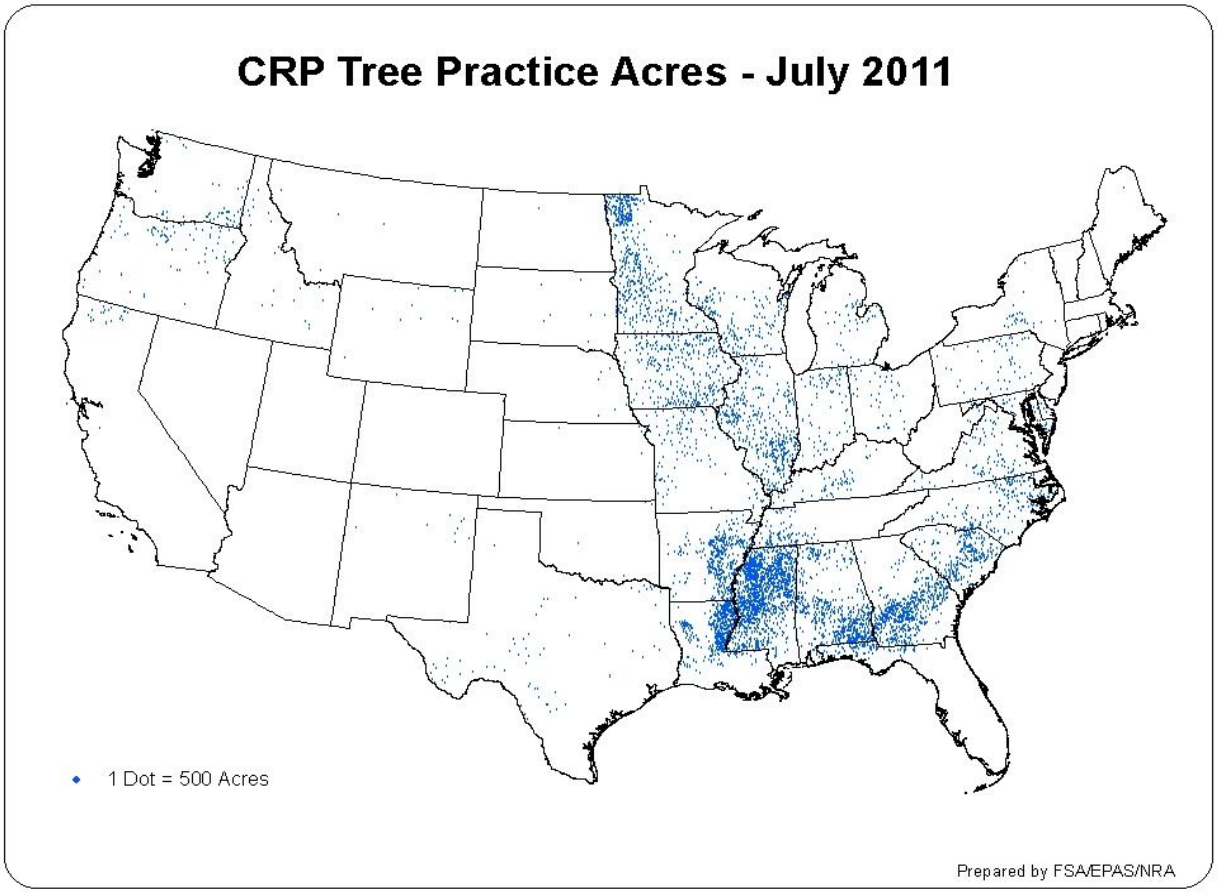


Figure 27: FSA CREP Program by State

Following is a summary of outlays pertaining to forest-related practices enrolled in CRP and EFCRP, which are administered by FSA:

CRP and EFCRP Forest Related Practice Outlays*				
	FY 2008	**FY 2009**	**FY 2010**	**FY 2011**
CRP forest related practices	$205.6 million	$209.6 million	$211.7 million	$216.3 million
EFCRP forest related practices	$11.8 million	$22.3 million	$15.8 million	$11.4 million

* For CRP, rental payments only.

Figure 28: FSA - CRP and EFCRP Accomplishments

Following is a summary of forest related acres enrolled in CRP and EFCRP, which are administered by FSA:

Private Forest Acres Enrolled in CRP and EFCRP – Farm Service Agency					
		FY 2008	**FY 2009**	**FY 2010**	**FY 2011**
EFCRP Acres		258,856	288,532	291,873	292,119
CRP Acres	Tree Planting Acres (CP3, CP3A, CP11)	2,111,530	2,059,281	1,949,110	1,870,369
	Riparian Buffer Acres (CP22)	848,923	860,190	871,392	880,263
	Bottomland Harwood Acres (CP31)	41,767	46,329	58,575	74,500
	Longleaf Pine Acres (CP36)	59,450	72,856	85,544	102,836
	Other Tree Practice Acres 1/	386,524	394,822	430,369	471,553
Total Acres		**3,707,050**	**3,722,010**	**3,686,863**	**3,691,640**
1/ Includes estimated acres of trees enrolled in other CRP practices including: CP23 – Wetland Restoration (floodplain and non-floodplain), CP28 – Farmable Wetland Program (Buffers), CP30 – Wetland Buffers (Marginal Pasture), CP32 – Hardwood Trees (Previously Expired), and CP38 – State Acres for Wildlife Enhancement.					

Figure 29: Private Forest Acres Enrolled in CRP and EFCRP

The above table shows cumulative acres under CRP and EFCRP contract and earning a rental payment. FSA reports that 256,137 acres of new CRP tree plantings have occurred since 2008.

Biomass Crop Assistance Program (BCAP)

BCAP provides financial assistance to owners and operators of agricultural and non-industrial private forest land to establish, produce, and deliver biomass feedstocks under two types of assistance:

1) Establishment and annual payments to produce eligible biomass crops on contract acres within approved BCAP project areas, and

2) Matching payments for the delivery of eligible material to qualified biomass conversion facilities by eligible material owners. Qualified biomass conversion facilities produce heat, power, biobased products, or advanced biofuels from biomass feedstocks.

BCAP was authorized by the 2008 Farm Bill. On June 11, 2009, a Notice of Funds Availability (NOFA) was published to make available matching payments for the collection, harvest, storage, and transportation of eligible material for conversion to bioenergy at biomass conversion facilities. The 2008 Farm Bill provides such sums as necessary for BCAP. However, subsequent appropriation acts have capped the amount of funding available. The Department of Defense and Full-Year Continuing Appropriations Act of 2011, enacted on April 14, 2011, limits funding for BCAP to $112 million in FY 2011.

In February 2010, a proposed rule was published in the Federal Register, which also terminated the NOFA. Over 24,000 comments were received. On October 27, 2010, a final rule was published, and by January 2011, three qualified biomass conversion facilities were approved, and matching payments for herbaceous materials were authorized.

For the project area component of BCAP, proposals could be submitted beginning October 27, 2011. With the enactment of funding limitations on April 14, 2011, FSA announced on April 20, 2011 that project proposals could be submitted no later than May 27, 2011, to be considered for FY 2011 funding. Over 40 project area proposals were received by the deadline. The proposals outlined projects that would support the establishment and production of 1.5 million acres of dedicated energy crops requesting more than $1 billion over a 5 to 15 year period. The range of feedstock proposed included camelina, algae, short rotation woody crops, grasses, energy cane, and sweet sorghum.

BCAP is the only energy program that is dedicated to the expansion of the diversity of cellulosic feedstock for commercial conversion. The program has demonstrated, through project area proposal submission and designations and matching payment distribution, that the demand for such diversity and feedstock support exists. BCAP made over $250 million in matching payments to eligible material owners in FY 2009 and FY 2010 for the supply of biomass to over 400 biomass conversion facilities for the generation of heat, power, biobased products, and advanced biofuels under the NOFA. The biomass supply was predominantly woody materials.

BCAP has generated support and incentives for numerous biomass conversion facilities (BCFs) to enhance their bioenergy output, much of which has been accomplished through facility retrofits and entrepreneurial startups. Project area designations have strengthened numerous cooperatives and expanded the diversity of available long-term feedstocks. The expansion of project area designations in FY 2011 may assist many States in meeting Renewable Electricity mandates. BCAP incentives for conversion to liquid biofuels have encouraged the submission of proposals for drop-in fuel production and various advanced biofuels.

To date, three BCFs have been qualified. These three qualified BCFs convert herbaceous materials. Approximately 105 eligible material owner applications for matching payments have been approved, and more than $1.5 million in matching payments have been disbursed. FSA has allocated $2.65 million to the States where these eligible material suppliers are located.

Of the pending BCF applications to become qualified for matching payment purposes, a sample of 47 BCF applications provides evidence of an estimated quarterly supply rate of more than 1 million dry tons of woody biomass. The matching payment estimates for the approximate 1 million dry tons is over $61 million.

FSA allocated $35 million to support five project areas earlier this year. On July 26, 2011, USDA announced the creation of four additional Biomass Crop Assistance Program (BCAP) project areas in six states to expand the availability of non-food crops to be used in the manufacturing of liquid biofuels. The four project areas set aside acres in California, Kansas, Montana, Oklahoma, Oregon, and Washington for the production of renewable energy crops. According to industry estimates, these projects will create more than 3,400 jobs in the biorefinery, agriculture, and supporting sectors, and

provide the feedstocks to produce more than 2 million gallons of biofuels annually when full production levels are achieved.

Voluntary Public Access Habitat Incentive Program

The Voluntary Public Access Habitat Incentive Program (VPA-HIP) allows State or Tribal governments to create new, or expand existing, public access programs. It also helps to ensure that land enrolled in VPA-HIP has appropriate wildlife habitat, enhances wildlife habitat on land enrolled in the CREP, and publicizes the location of public access land.

The 2008 Farm Bill authorized the VPA-HIP and provided $50 million of mandatory funding for FY 2009-2012. VPA-HIP funding is made available to State and Tribal governments through a competitive grant process.

In July 2010, FSA solicited applications to participate in VPA-HIP and announced the availability of $16.667 million in FY 2010 funding. FSA announced on October 4, 2010, that 17 States were awarded a total of $11.756 million of VPA-HIP funds in FY 2010.

The second opportunity to apply for participation in VPA-HIP was held January 19 through March 7, 2011. Twelve new applications, totaling approximately $4.6 million, were approved for VPA-HIP funding on June 13, 2011. In addition to the newly approved applications, approximately $13.2 million of 2011 VPA-HIP funds are obligated to applications originally approved in 2010.

States and Tribal governments participating in VPA-HIP are Arizona, California, Colorado, Georgia, Hawaii, Idaho, Illinois, Iowa, Kansas, Kentucky, Michigan, Minnesota, Montana, Nebraska, New Hampshire, North Dakota, Oregon, Pennsylvania, South Dakota, Texas, Utah, Virginia, Washington, Wisconsin, Wyoming and the Confederated Tribes and Bands of the Yakama Nation.

VPA-HIP assists these States and Tribal governments with encouraging owners and operators of privately held farm, ranch, and forest land to voluntarily make that land available for public access for wildlife-dependent recreation, including hunting or fishing.

Rural Development Energy Programs

USDA Rural Development has several programs that assist in the development, conversion, and commercialization of wood-to-energy projects. From the Rural Energy for America Program, Community Facilities Grant Program, to the Business and Industry Program, Rural Development has loans, grants, and loan guarantees to help rural Americans support and pursue the development of woody biomass for energy. Since the 2008 Farm Bill, Rural Development has invested $35.8 million in grants, $90.1 million in loan guarantees, and $2.5 million in loans to support woody biomass. In addition, these investments have resulted in 2,944 projected jobs being created /saved and over 19 trillion BTUs of energy generated. See Appendix E for additional investment and summary data. Rural Development continues to work to ensure that America becomes more energy and economically secure through sustainable investments in renewable energy sources like woody biomass.

The Biorefinery Assistance Program provides loan guarantees of up to $250 million for the development, construction, and retrofitting of commercial scale biorefineries that produce advanced biofuels (fuels derived from renewable biomass, other than corn kernel starch). (http://www.rurdev.usda.gov/BCP_Biorefinery.html)

The Repowering Assistance Program is a payment program to eligible biorefineries to encourage the use of renewable biomass as a replacement fuel source for fossil fuels used to provide process heat or power in the operation of these eligible biorefineries. (http://www.rurdev.usda.gov/BCP_RepoweringAssistance.html)

The Bioenergy Program for Advanced Biofuels payment program supports and ensures an expanding production of advanced biofuels (fuel derived from renewable biomass, other than corn kernel starch) by providing assistance payments to eligible advanced biofuel producers. (http://www.rurdev.usda.gov/BCP_Biofuels.html)

The Rural Energy for America Program (REAP) is a grant and loan guarantee program designed to assist agriculture producers and rural small businesses. A producer or company can apply for a loan guarantee of up to $25 million or for a grant up to $500,000. The total grant cannot exceed 25 percent, and a combined loan guarantee and grant cannot exceed 75 percent of total project costs. This program funds renewable energy systems and energy-efficiency improvements. Energy audits and feasibility studies are also eligible for assistance. REAP also supports our energy-efficiency efforts; see Appendix E for details.

Energy Efficiency Improvement Grant Program:
http://www.rurdev.usda.gov/BCP_ReapResEei.html

Energy Efficiency Audit and Renewable Energy Development Audit Grants Program:
http://www.rurdev.usda.gov/BCP_ReapEaReda.html

Feasibility Grants:
http://www.rurdev.usda.gov/BCP_ReapGrants.html

Guaranteed Loan Program:
http://www.rurdev.usda.gov/BCP_ReapLoans.html)

Through the Electric Loan Programs, USDA's Rural Utilities Service (RUS) finances electric infrastructure in rural areas to ensure availability of modern, reliable, secure, and affordable electricity for rural communities and businesses, supporting the production and delivery of renewable energy and other domestic energy resources. Electric loans and loan guarantees are available to rural cooperatives, utilities, and other rural electricity providers for building and improving generation, transmission, and distribution facilities; on-grid and off-grid renewable energy systems; wind, solar, biomass, hydroelectric, and geothermal systems; and for energy efficiency and conservation programs. In FY 2009, RUS approved $6.6 billion in rural electric infrastructure loans, including $186.7 million for renewable energy projects. (http://www.rurdev.usda.gov/UEP_Apply_for_Loan.html)

High Energy Cost Grants administered through RUS provide grants for rural communities with average home energy costs exceeding 275 percent of the national average. Grants are issued to help meet generation, transmission, and distribution needs. Because renewable energy and energy-efficiency projects can be cost effective, USDA awarded $10.2 million in grants for wind, solar, and biomass energy projects in extremely high-energy cost communities during 2009. (http://www.rurdev.usda.gov/UEP_Apply_for_Grant.html)

Business and Industry Guaranteed Loan Program was established to improve, develop, or finance business, industry, and employment and improve the economic and environmental climate in rural communities. This purpose is achieved by bolstering the existing private credit structure through the guarantee of quality loans up to $25 million that will provide lasting community benefits. (http://www.rurdev.usda.gov/BCP_gar.html)

The Value-Added Producer Grant Program provides grants for planning activities and for working capital for marketing value-added agricultural products, and for farm-based renewable energy. Eligible applicants include independent producers, farmer and rancher cooperatives, ag producer groups, and majority-controlled producer-based business ventures. (http://www.rurdev.usda.gov/BCP_VAPG_Grants.html)

The Rural Business Enterprise Grant Program facilitates development of small and emerging private rural business enterprises. (http://www.rurdev.usda.gov/BCP_rbeg.html)

The Rural Business Opportunity Grant Program sustains economic development in rural communities with exceptional needs. (http://www.rurdev.usda.gov/BCP_RBOG.html)

The Rural Economic Development Loan and Grant Program provides zero-interest loans and/or grants for sustainable rural economic development and job creation projects for Rural Development electric and telephone utility loan borrowers. (http://www.rurdev.usda.gov/BCP_redlg.html)

Outcomes Achieved in Meeting the Priorities—Conserve, Protect, and Enhance

The conservation of private forests contributes significantly to economic stability and landscape restoration. We can measure increases in number of jobs, acres of forest protected, or homes saved from wildfire. These stories from across the United States tell the human side of forest benefits.

Forest Action Plans created by the state forestry agencies address the three national priorities laid out in the 2008 Farm Bill. The forest activities supported by Congress have helped forest owners strategically conserve, protect, and enhance their forest land, as well as the communities where they live.

CONSERVE WORKING FORESTS

In **Montana**, **woody biomass utilization** is helping to conserve working forest landscapes while improving watershed health. Nearly **700,000 acres** of forest within the Yellowstone, Tongue, and Rosebud watersheds provide a tremendous resource that historically supported a natural resource-based economy, benefiting family forest owners, the Northern Cheyenne and Crow Tribes, and state and Federal forests. Montana's Multi-Agency Integrated Restoration Strategy (MAIRS) identified this area as a state priority. **Forest Service** State and Private Forestry competitive funding and other leveraged funding will allow the project to maintain and re-establish working forest landscapes throughout the area, increase economic activity via forest management and urban tree planting, enhance community livability and energy conservation, attract/retain workers for jobs in emerging industry, retain existing wood products infrastructure while bringing in complementary infrastructure, and lay a foundation for implementing a biomass utilization project to support management goals on Federal, State, Tribal and private forests.[1]

For almost a decade, the **Utah** Division of Forestry, Fire and State Lands, and The Nature Conservancy have been working diligently with landowners from the Kanarra Mountain Landowners Association to protect more than **11,000 acres** of forest and grazing land from subdivision and development in southwestern Utah. The Virgin River Headwaters Project is located in the scenic high plateau above Zion National Park and adjacent to the Dixie National Forest. Conservation easements funded through the **Forest Legacy Program** and support from project partners will protect critical wildlife habitat, breathtaking scenery, and regional water supplies. To meet the diverse needs of the area, as well as sustain myriad benefits derived from the forests, the conservation easements include a mix of forest stewardship, habitat enhancement, grazing, and limited allowances for family-built structures on the properties.

Conservation easements are just one strategy for protecting and restoring the Virgin River watershed, which has national significance. It is one of only five watersheds assessed nationally as a result of the 2006 Energy and Water Development Appropriations Act. The Utah Division of

[1] Woody Biomass Utilization in Montana – p. 16 of 2009 Annual Report

Forestry, along with the forestry agencies of Arizona and Nevada, are applying a number of different management strategies to this priority landscape, including the development of multiple **Forest Stewardship plans** that promote sustainable forestry while improving water quality and the restoration of riparian areas by replanting with native cottonwoods and willows, introduction of saltcedar leaf beetle, and disposal of woody slash.[2]

Hoonah is a Tlingit native community located on the northeast shore of Chichagof Island, 40 air miles west of Juneau, **Alaska**. Fishing and the timber industry are mainstays of the local economy. The Alaska Division of Forestry is helping the Huna Totem Corporation—a for profit organization with an economic and social mission to support, encourage, and perpetuate the cultural values of the Tlingit native people—implement a **Forest Stewardship plan**. Huna Totem owns and manages approximately **22,000 acres** of temperate rainforest of the southeast Alaska coast. Timber was harvested on approximately **10,000** of these acres in the 1980s and 1990s, and the organization invested some of the timber income in developing visitor services to employ Tribal members of this island community. Today, with an **$88,894** grant and project management from the Division of Forestry, forest management activities include regeneration, pre-commercial thinning, and road repair to protect salmon habitat. Through Federal funds, the division also managed cost-share opportunities and tree plantings. Long-term expected outcomes are timber products, fish and wildlife subsistence resources and Tribal employment in timber industry and visitor services. The project has brought together Tribal members with partners from the Sealaska Corporation, Tongass National Forest, and the U.S. Fish and Wildlife Service.[3]

In 2011, the State of **Wisconsin** completed the first phase of the Chippewa Flowage Forest project, protecting over **8,000 acres** and using **$1.5 million of Forest Legacy Program** funds. The Chippewa Flowage Forest is a phased project that will permanently protect the third largest inland body of water in Wisconsin, which supports a world-class fishery. The property abuts Lac Courte Oreilles Tribal lands and provides important linkage with another one million acres of already protected lands including the Chequamegon-Nicolet National Forest. By the end of all three phases, if successfully funded through the Forest Legacy Program, Wisconsin will have protected over **18,000 acres** with approximately **$6 million** of leveraged funds from the Forest Legacy Program.

The Big Rivers Corridor project will protect one of the largest private landholdings in **Kentucky** that was professionally managed for decades as a sustainable working forest. The first phase of the project will protect **2,571 acres** at the confluence of the **Ohio** and Tradewater Rivers in Kentucky, using **$3.25 million in Forest Legacy Program** funds. This property provides connectivity between the big rivers of western Kentucky, the Shawnee National Forest, Cypress Creek National Wildlife Refuge, Land Between-the-Lakes National Recreation Area, Clark's River National Wildlife Refuge, state-owned lands in the region, and other non-governmental priority conservation areas. The forest will be managed again as a sustainable working forest by the Kentucky

[2] Strategic Conservation Easements – Utah p. 17 – 2009 Annual Report

[3] Tribal Partnerships in AK – p. 17 – 2009 Annual Report

Department of Fish &Wildlife Resources (KDFWR), to provide watershed and water quality protection; endangered, threatened, and rare species recovery and protection; significant public recreational access on nationally recognized hunting land; positive impact to state and local economies; preservation of existing cultural and geological treasures; and permanent protection from likely agricultural conversion and/or development.

Forest fragmentation is slowly degrading the overall health and utility of the **Connecticut** Highlands, but in 2004, six landowners decided to join together to create the Skiff Mountain Forest Legacy Project. The **705-acre** project received **$1.7 million in Forest Legacy Program** funds, with an additional **$6.7 million contributed by the property owners themselves**. The Highlands Region extends from eastern **Pennsylvania** through **New Jersey** and **New York** to the western hills of Connecticut. The Connecticut portion of the Highlands contains some of the most pristine streams and rivers, as well as the largest blocks of contiguous forest in the State. The initiative of these six original landowners inspired a 2012 application for Forest Legacy Program funding that would protect an additional **130 acres** of forest land in the Connecticut Highlands region.

Six properties in northwestern Connecticut will continue to remain forested and provide wildlife habitat. (Photo by Larry Rousseau)

Massachusetts is the third most densely populated State, yet it ranks eighth in the Nation in forest cover. Forested land in rural areas of Massachusetts are increasingly fragmented by residential development, but north-central Massachusetts has retained a high percentage of adjoining, public-and privately-owned forest land, thanks in large part to a Forest Legacy Program project that brought together multiple landowners.

The Quabbin Corridor Connection project was a multi-tract effort that conserved **18 parcels** with different ownerships ranging from seven to **700 acres** totaling **1,689 acres** in a single **Forest Legacy Program** project. The project received **$2.71 million** in Forest Service funding.

Landowners with parcels that might not have competed successfully for funding on their own were able to protect their family forest land and continue longstanding sustainable forestry practices.

The Quabbin project's success prompted two more multiple-landowner **Forest Legacy Program** projects in Massachusetts: the Southern Monadnock Plateau and Metacomet Monadnock Forest. To date, seven Massachusetts-based land trusts have combined **77 projects totaling 11,500 acres** into the Wildlands & Woodlands Conservation Project—Western Massachusetts Aggregation.

This forest and wetland are part of the Quabbin Corridor Connection Forest Legacy project. Photo by Nicholas Holland

In 2010, the **Forest Legacy Program** conserved **3,900 acres** of private forest land in one of Idaho's most important big game migration routes, the McArthur Lake Wildlife Corridor. The wildlife corridor provides critical habitat and connectivity for six Threatened and Endangered species in a region that supports the only remaining intact predator-prey assemblages in the continental U.S., including grizzly bears and wolves. The McArthur Lake project connects more than a million acres of critical habitat on National Forest System forests, Idaho State lands, and other private parcels. In the last 20 years, **2,400 acres** of private land has been protected in this area, and this project protects the most critical remaining parcels. The McArthur Lake project received **$3.2 million** and provided leverage support for other **Forest Legacy Program** projects in Northern Idaho, totaling **$18.2 million** in Legacy funds.

Nearly **2,800 acres** of Rocky Mountain wildlife habitat will be forever protected from development under a 2010 conservation easement. The easement on the YMCA Snow Mountain Ranch backcountry acres safeguards habitat for a variety of wildlife species, including the Federally threatened and state-endangered Canada lynx and the state-sensitive Northern goshawk. The easement also protects the foundation for a new generation of healthy forests in an area devastated by mountain pine beetle damage, and protects the water quality of Pole Creek, a source of water for Snow Mountain Ranch, the town of Granby and the entire region. The conservation easement at the ranch was purchased using **$5 million** in **Forest Legacy Program** funds, with matching funds of **$1 million** from the Great Outdoors **Colorado** Trust Fund and a donation from the YMCA of the Rockies, valued at **$3.4 million**.

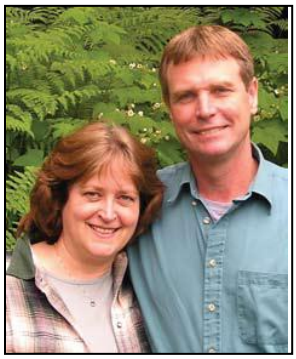
In **Hawaii, 84 acres** of degraded pastureland on the Kukaiau Ranch have been restored to native koa forest through **Conservation Reserve Enhancement Program** funding. Next year, another **160 acres** of koa forest restoration is planned. The Kukaiau Ranch project is a **Forest Legacy Program** applicant for 2012 funding, and received NRCS **Environmental Quality Incentives Program** funding in past years. The upper elevations of the ranch are already held in conservation easement by The Nature Conservancy to protect habitat for the endangered Palila, a critically endangered bird. The ranch is also part of the Mauna Kea Watershed Partnership, a collection of upper elevation landowners, both private and public, with a mission to protect the forest watershed by pooling resources and sharing good management strategies.

The **Alabama** Forestry Commission (AFC), **Florida** Division of Forestry (FDF), **Georgia** Forestry Commission (GFC), Auburn University (AU), and the Longleaf Alliance (LLA) developed and conducted 12 Longleaf Pine Academies where field foresters, NRCS personnel, consulting foresters, and landowners were presented in-depth classroom and

field instruction in "all things longleaf." The academy was designed to prepare foresters and other natural resource professionals to address management problems specific to longleaf forests and to create a uniformly well-informed network of longleaf managers. A total of **30** Society of American Foresters Continuing Forestry Education credits could be earned by each attendee. A **40-acre** longleaf orchard was rehabilitated, and **1,200 bushels** of improved longleaf cones were harvested as a result, and an additional **4,200 bushels** were harvested form longleaf stands that had been treated for this purpose; **145 acres** of silvopasture were established; the AFC, the **Mississippi** Forestry Commission, and the National Agro-Forestry Center held field demonstrations for landowners; a Longleaf Geo-Data Base was established and continues to be updated. From 2008 to 2011, funds were contributed by Forest Health **($390,000**), Cooperative Fire Assistance **($70,000),** and Forest Stewardship **($160,000).**

The Southern Pine Beetle is a destructive force in southeastern forests, and can be mitigated by thinning. However, due to high fuel prices and poor pine markets, loggers often do not find it economically feasible to work on tracts smaller than **40 acres.** The **Virginia** Department of Forestry Southern Pine Beetle Prevention Program, with funds from the **Forest Stewardship Program,** aims to mitigate the impact of the southern pine beetle in Virginia's forests. Since the average forest landowner in the Southern U.S. owns **17 acres**, prevention work in smaller tracts is essential to a landscape approach to reducing the potential impact of southern pine beetle. This program has also helped maintain the logging industry that is a vital part of many rural communities.

To date, the **Virginia** Department of Forestry has approved almost **130** applications for **2,700 acres** of southern pine beetle prevention work. The average thinning job in the program is **21 acres** in size, so the goal of working on small tracts has been met. These landowners are also more likely to continue growing trees on their land, which benefits everyone in terms of clean air and water, soil stabilization, climate mitigation, and wildlife habitat.



John and Dani Keller own **128 acres** of forest in Cowlitz County, **Washington**; the land has been in John's family for three generations. With timber markets at an all-time low, the Kellers have little income coming in to support good forest management. In this time of economic struggle, the Kellers have used Environmental Quality Incentive Program funds to control harmful invasive species, create snags as habitat for northern pygmy owls and woodpeckers, and improve roads to control soil erosion that harms water quality in the Kalama River, which is a breeding ground for several salmon species. "I couldn't have done the project without the cost-share program; it made the project financially feasible," said Keller.

PROTECT FORESTS FROM THREATS

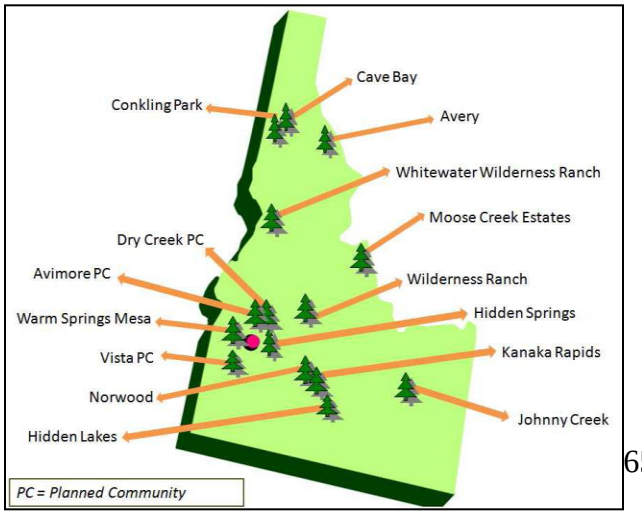
Protecting forests from insects and disease, fire, and development pressure is a priority for most, if not all States in their Forest Action Plans. They have leveraged Federal dollars and the strong interest of landowners and partners to keep forests healthy in order to reach the goal of protecting forests from harm.

During FY 2009, the **Alabama** Forestry Commission completed hazard mitigation on **244 acres** of forest land to protect property in the wildland-urban interface. From 2008 to 2011, Forest Service S&PF fire assistance funding also helped complete 22 Community Wildfire Protection Plans and established **708** Firewise Hazard Assessments and Mitigation Plans. Alabama homeowners completed **$244,000** worth of wildfire mitigation through defensible space contracts. A total of **$142,000 U.S. Forest Service grant funds** were dedicated to this cost-share effort, with homeowners contributing the difference of $102,000 through in-kind services or cash payments to service providers.

In 2009, the Georgia Forestry Commission used **$50,000** in competitive allocation dollars to detect and map over **330** new cogongrass occurrences in the state. The Commission then followed up with individual landowners to teach them about the extremely invasive and flammable grass. All the landowners who were informed of cogongrass on their property participated in the voluntary program to treat the invasive. The public continue to report occurrences of cogongrass as a result of the educational campaign.

Wilderness Ranch, a **277-home subdivision** and nationally recognized Firewise Community 26 miles northeast of Boise, was protected from wildfire thanks to Federal dollars for **State Fire Assistance**. Though a fast-moving fire burned **38 acres** and threatened homes in every direction, the flames never reached a built structure.

The evacuated homes of the subdivision were protected by the proactive efforts of homeowners who "worked long hours in the spring and summer clearing flammables away from their homes," according to Wilderness Ranch Fire Protection District Chief John McCarthy. McCarthy said, "it was this creation of defensible space that allowed us to place engines and initiate fire operations that really saved those houses. Firewise practices really do work, and I hope more folks embrace them. It's what really makes the difference between a success and a catastrophe."



The coastal area of **Massachusetts** includes over **100,000 acres** of pine barrens, heathlands, and grasslands that are prone to wildfire. The area is

also fragmented by extensive development with primary residences and vacation homes. Decades of fire suppression have resulted in mature, closed canopy forests, putting new development at risk from catastrophic wildfires.

The Massachusetts Department of Conservation and Recreation partnered with The Nature Conservancy to train municipal fire service personnel, increase fire planning in high-risk areas, and assist with developing Community Wildfire Protection Plans. Funding for the project came through a **$1.97 million ARRA grant** administered by the Forest Service.

Prescribed fire is ignited by a fire manager and allowed to burn within a predetermined set of guidelines and conditions, to eliminate flammable vegetation while protecting people and property.

Twelve training courses were held, along with educational events for youth and adults. The Department of Conservation and Recreation and The Nature Conservancy also carried out prescribed burns on **1,700 acres** of State-owned land and **65 acres** of private lands in southeastern Massachusetts, assisting **33 towns** that were at risk. The ARRA grant enabled Massachusetts and The Nature Conservancy to retain and create **43 jobs** in southeastern Massachusetts. Funds from the ARRA grant allowed these employees to assist an additional **48 communities** at risk.

Invasive plants are displacing native vegetation across **22 counties** in **Ohio**. At the same time, professional foresters recognize a shortage of trained vendors to do timber stand improvement work. There is also concern that too few qualified loggers will be available in the coming years as current loggers retire. These all add up to an occupational shortage in forestry and conservation that could adversely affect the health of Ohio's forests.

The Forest Service administered an ARRA grant totaling **$4.4 million** to address invasive plant management and workforce shortages. The grant provided short-term conservation jobs while

Crew members apply herbicide to tree-of-heaven seedlings.

training members of the Ohio Woodlands Job Corps to be potential timber stand improvement vendors. Corps participants were trained to identify invasive plants and obtain commercial pesticide licenses needed to spray herbicides for invasive plant control. The grant also provided training for all Corps members in a standard wildfire response curriculum and master logger equivalency, including chainsaw safety and operations, and logging best management practices. The Ohio Division of Forestry and Ohio State University managed the training program.

The ARRA grant provided employment to **132 people** over a 2-year period, and made Ohio's **$15 billion** wood industry more visible to the public.

The Pacific Ant Prevention Plan matches and leverages **$300,000 of integrated Forest Health Protection and Urban Forestry funding** to combat invasive ants. Invasive ants are a serious problem in **Hawaii, the Federated States of Micronesia, Palau**, and the **Commonwealth of Northern Mariana Islands**, all of whom participated in creating and implementing the Plan. The forestry, quarantine and invasive species agencies of U.S.-affiliated countries and the Hawaiian Department of Agriculture and the Pacific Cooperative Studies Units contributed in-kind support to the Ant Prevention Plan. The project addresses detection and control of invasive ants at a regional (Pacific-wide) level and aims to coordinate activities within and between Pacific Island countries and territories. The Hawaii Department of Agriculture receives Federal funding from the **U.S. Forest Service and the Cooperative Agriculture Pest Survey program of USDA-APHIS**.

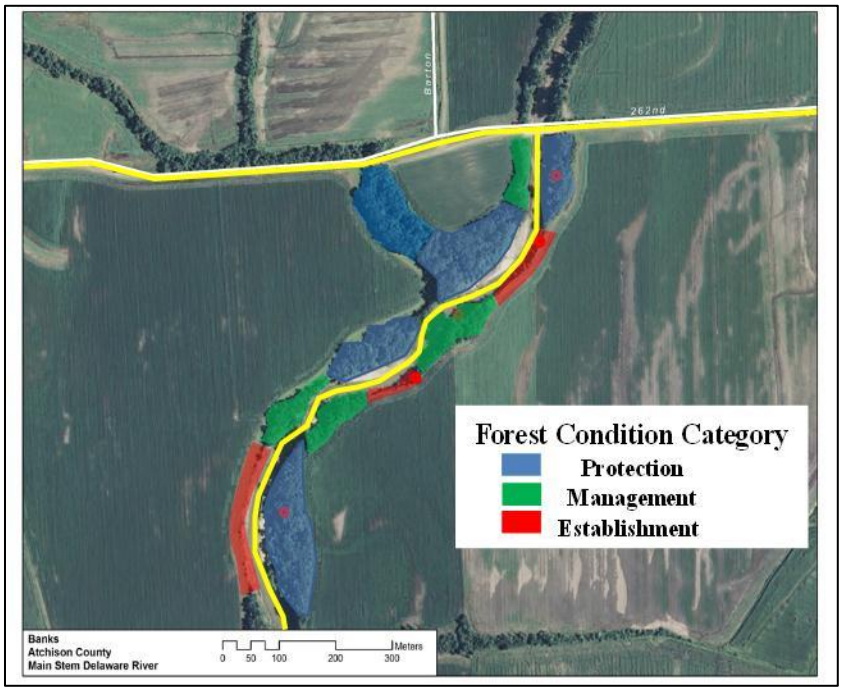
Each year, the Colorado State Forest Service (CSFS) uses **Forest Service Forest Health Monitoring** funds and matching State funds to conduct a cooperative aerial survey with the Forest Service to map insect and disease activities in forested areas of the state. The annual aerial survey, which spanned **29 million acres** of **Colorado** in 2010, provides data to help land managers identify and address forest health concerns such as bark beetle infestations and sudden aspen decline.

Survey results provide a snapshot of landscape-level conditions that may be monitored and addressed more closely by on-the-ground foresters. This information is used cooperatively to determine the scope of insect and disease activity on all landownership types, track ongoing infestations and forest conditions, help focus management actions, and assist private landowners in long-term planning. One of the most important benefits of the aerial survey is the resulting set of publications used to inform and educate lawmakers, forest landowners and other stakeholders.

The Colorado State Forest Service builds and maintains a fleet of **140 wildland fire engines** for fire departments throughout the state using Federal Excess Personal Property (FEPP) program funds provided by the **Forest Service**. Smaller fire departments play a critical role in the initial attack on wildfires in **Colorado**'s valuable private forest lands, but these mostly volunteer fire departments are notoriously underfunded. The FEPP program equips small fire houses with the tools they need to effectively respond to wildfires in the wildland-urban interface.

The CSFS fire equipment shop obtains the retired vehicles from the Department of Defense and other Federal entities, which become property of the Forest Service on loan to rural fire departments through the FEPP program. The CSFS fire equipment shop provides ongoing major vehicle maintenance on the fleet, replacing vehicles as needed, to make certain that firefighters are able to protect private forest lands and those who live within them from dangerous wildfires.

Federal reservoirs, such as Lake Perry in **Kansas,** provide two thirds of water supplies to the people of the State, but many reservoirs in Kansas are filling with sediment, which reduces the amount of water available. It can cost up to **$42 million** to dredge just one reservoir to maintain capacity, so stream-side riparian forests are an inexpensive frontline defense against soil erosion. A new project in the Delaware River watershed uses GIS to track the condition of riparian forests and their ability to keep soil out of streams and reservoirs. Combining landownership data layers with forest function and condition helps the Kansas Forest Service and other partners focus landscape restoration efforts where the greatest public benefit can be obtained.



The project has leveraged over **$2 million** through the Forest Service Forest Stewardship Program, EPA's Section 319 Clean Water Act, 2009 ARRA funds, State Revolving Loan, Kansas Water Office, State Conservation Commission, and the Delaware River Watershed Restoration and Protection Strategy stakeholder group. Funding will continue to restore and protect **33 areas** of riparian forest buffers at critical places in the watershed.

As **Texas** continues to experience unprecedented population growth, communities must consider alternatives to "business as usual" development, where urban sprawl is the norm, and focus on sustainable community planning that provides for the needs of today without jeopardizing the needs of future generations. The majority of the state's new development also encroaches on undeveloped wildland areas, where the risk of wildfire is greater.

The Texas Emerging Communities Web site (http://www.texasemergingcommunities.org) has a variety of resources to help communities make more informed decisions about planning. Funding from the **Forest Service Urban and Community Forestry -$1,000,000; Forest Health Protection - $450,000; and Community Wildfire Protection Planning - $170,000** supports the Web site, as well as **six** Regional Emerging Communities Workshops across the state. The workshops help Texas communities begin planning early and help build local capacity for resource management. Through the current network of local, state, Federal, public, and private organizations, community leaders can obtain proactive management tools and technical support.

The Texas Forest Service, Texas Parks and Wildlife Department, Texas A&M University, Ladybird Johnson Wildflower Center, Texas Department of Rural Affairs, American Planning Association, and International City/County Management Association partner with the Forest Service for this project.

ENHANCE PUBLIC BENEFITS FROM FORESTS

Enhancing public benefits from forests covers a myriad of projects from improving water quality to reducing energy costs and demonstrates how essential sustaining private forest lands are to this country.

In 2009, USDA awarded a High Energy Cost Grant of **$1,081,392 grant** to Maine School Administration District No. 58 (MSAD 58) in Franklin County. This rural area in **Maine** is heavily dependent on fuel oil for its heating needs. With funding provided by USDA, MSAD **58 partnered** with Skanden Energy LLC, from San Diego, CA, to purchase and install a wood pellet heating system to provide heat and hot water to the school buildings to replace its oil fired boilers, annually displacing 110,000 gallons of fuel oil with a local, renewable fuel supply.

Rich in natural and cultural resources, the beloved **Chesapeake Bay** is in peril. Widespread non-point source pollution such as nitrogen, phosphorus, and sediment are threatening native plants and animals in and around the Bay, and on average, the Chesapeake watershed loses about **100 acres** of forest every day. Because forests play a vital role in water quality, every acre of forest lost means a potential increase in nutrients polluting the Bay.

With **90 percent** of the Chesapeake's watershed in private ownership, strong partnerships and collaboration are essential to protection and restoration. The Chesapeake Watershed Forestry program, a **Forest Service** program, leverages partnerships to develop and implement projects focusing on trees and forests—vital tools for restoring the Chesapeake Bay's health and productivity. It also seeks to retain and enhance the economic potential of healthy forests. The Chesapeake Watershed Forestry program emphasizes the three most vital practices for improving water quality in the Chesapeake region: restoring riparian forest buffers, increasing urban tree canopy, and protecting priority forests.

An interagency multi-state Forestry Workgroup coordinated by the **Forest Service** facilitates resources and expertise from **Forest Service Research and Development**, the Southern Region, and the George Washington and Jefferson National Forests. State forestry agencies in **Maryland, Virginia, Pennsylvania,** and the **District of Columbia** are primary partners, with growing participation by **West Virginia, New York,** and **Delaware**. The collective efforts of government and concerned citizens have shown tangible results: **In 2008, cooperators restored 450 miles** of streamside forests, raising the total to more than **6,170 miles** since 1996. Cooperative Forestry programs like this one provide financial and technical support for planning, assessment,

coordination, education, and capacity building, as well as on-the-ground projects. Partnerships with state forestry agencies, non-profits, and other agencies and organizations leverage Federal funds; in 2009, just **$190,000 of Federal funding** provided the basis for another **$810,000** in grants and contracts. Of the **$1 million** project budget, **81 percent** of it was brought by partners and other organizations.

Urban forests are emerging as an important tool for combating air pollution, particularly ground-level ozone. The Environmental Protection Agency (EPA) now permits tree planting and preservation as viable measures for air quality improvement in State Air Quality Implementation Plans (SIPs) under the Clean Air Act. These changes provide an avenue to connect improvement in air quality with the presence of urban forests.

The **Virginia** Department of Forestry (VDOF) recognized the opportunity to develop a project that would serve as "proof-of-concept" that urban forests could create marketable air quality credits for urban forest landowners. In FY 2008, the **Forest Service provided $78,000** in **Urban and Community Forestry** competitive program dollars, and the VDOF **matched this grant with $84,000** in state and local funds, as well as in-kind services. Using the air quality planning area of Northern Virginia, the VDOF will determine the exact reduction in air pollution provided by an acre of forest. This scientifically defensible measure will be used as the basis for creating a marketable ecosystem service air quality credit to generate income for urban forest landowners and encourage the protection of vulnerable exurban forest lands.

In FY 2009, the VDOF Ecosystem Services Workgroup worked with the Forest Service, the Metropolitan Washington Council of Governments (MWCOG), and EPA officials to develop scientific parameters. VDOF and its partners investigated the applicability of the Urban Forestry Effects Model (UFORE) and other urban forestry models in determining air pollution reductions along the urban-rural continuum.

This project has provided the urban forestry community with a scientific tool that validates the effectiveness of urban trees in dealing with air quality attainment issues. In FY 2009, the VDOF shared that message with county governments, stakeholders, and resource professionals through presentations at regional meetings like the Mid-Atlantic Chapter of the International Society of Arboriculture (MAC-ISA) and at the Washington, D.C., Tree Summit. In the future, the VDOF will use its partnerships with groups like Northern Virginia Power and the Center for Chesapeake Communities to expand its outreach efforts to more localized groups.

The State forestry agencies in **Texas** and **Oklahoma** are designing and implementing the Trees for Energy Efficiency and Savings (TREES) project to encourage urban tree planting in high-priority regional landscapes and residential properties. This cost-effective tree planting program will reduce energy consumption and greenhouse gas emissions to mitigate climate change and conserve energy. The Texas Forest Service and the Oklahoma Department of Forestry are building coalitions that support broad implementation of the TREES program with utility and green trade associations, national conservation groups, local municipalities, the U.S. Conference of Mayors, and other interested entities.

The two state forestry agencies contributed **$205,000** in in-kind and partner contributions to match **$150,000** in competitive grant funding from the **Forest Service.** Partners in the Texas effort are completing a roadmap for tree planting in Dallas that identified **297,127** sites on private residential properties and **48,162** sites on public property that could be planted for energy conservation and efficiency. In Oklahoma, the Department of Forestry is building partnerships with utility companies, non-profits, foundations, government agencies, cities, businesses and citizens to create cost-effective, tree-based energy efficiency programs that will add to property values and reduce dependence on fossil fuels.

In 2009, the USDA National Agroforestry Center (NAC) produced a spiral-bound field guide titled Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways. The book, designed for natural resource professionals, describes ways a vegetative buffer can be applied to protect soil, improve air and water quality, enhance fish and wildlife habitat, produce economic products, provide recreation opportunities, or beautify the landscape. In the first two years of printing (2009-2010), natural resource professionals have requested about **5,000 copies** of the Conservation Buffers Guide. The Center translated and printed Spanish and Chinese versions and distributed over 1,400 Spanish copies to resource professionals in the southern U.S. The Guide was developed with **Forest Service Research and Development** funds, and translated and printed using **Forest Service Forest Stewardship Program** funds. The Spanish, Simplified Chinese, and Korean translations are available on the NAC Web site. The Canadian Agroforestry Development Center released a French translation in July 2011.
http://www.unl.edu/nac/bufferguidelines/index.html

The USDA National Agroforestry Center partnered with **North Carolina** State University and the University of **Georgia's** BUGWOOD Network to create an online silvopasture training course. The new Web site is a companion resource to the technical handbook, Silvopasture: Establishment & management principles for pine forests in the Southeastern United States. Forest Service Forest Stewardship Program funds were used to develop and maintain the Web site, and develop, print, and distribute the handbook. The Web site is a resource for natural resource professionals and landowners to understand and apply the economic and ecological principles of silvopasture.
http://www.silvopasture.org/

Through 2009 **ARRA** funds, the Los Angeles Conservation Corps **provided job skills and job placement** assistance to at-risk youth in the **Los Angeles Metro Area.** The students are **planting 1000 trees** in strategic locations around the city, while also learning needed tree maintenance skills such as pruning, staking, and proper watering.

In 2010, the **Forest Service Urban and Community Forestry Program awarded a $190,000** challenge cost-share grant to the University of **Illinois** at Urbana-Champaign to further studies into the positive impacts that urban forest, trees, and landscaping have on school children's academic performance and classroom behavior (in peer review).

Since 2008, the **Forest Service Urban and Community Forestry Program** has continued leadership and cost-share grant funding **($130,000 – $150,000 per year**) for i-Tree, a unique public-private partnership, including **Forest Service Research**, which has successfully developed and supported a public domain software suite that enables communities to improve the management

of their forest resources by assessing the structure, function, and value of their trees and forests. As of February 2011, requests for i-Tree have come from over **7,290 entities** (over **80 percent** from the U.S.) representing all **50 states**, and **89** other countries worldwide.

The emerald ash borer (EAB) and other invasive species pose a major threat to American Indian communities and their forest products industries. American Indian forest and land managers need information about EAB and other invasives that address the economic stability of their communities. Responses to these threats need to be coordinated among Tribes to reduce the impacts of invasive species on both American Indian forest product industries and the Tribal communities they support.

American Indian forest products industries face economic threats from the emerald ash borer and other invasive species.

The **Forest Service Wood Education and Resource Center** provided **$15,373** to the **College of Menominee Nation** Sustainable Development Institute and its Center for First Americans Forest lands Initiative to provide educational materials about invasive species, including EAB, and improve outreach efforts to American Indian communities. Up-to-date educational materials focus on new utilization options and stewardship opportunities that address Tribal-specific concerns. Understanding the impact of invasive species on the culture and economic viability of Tribal communities will foster cooperation and improve the coordination of Tribal responses to forest threats.

The Crawford Central School District, Crawford County Career and Technical Center, and the Meadville Recreation Complex in **Pennsylvania** together spend more than **$600,000 per year** for electricity and natural gas. With funding from the **Forest Service Wood Education and Resource Center,** the Woody Biomass Technical Assistance team proposed a central heating plant for the three facilities that can save them **$200,000** each year in energy costs.

The three facilities will install a combined heating and power biomass system fueled by renewable woody biomass that produces electricity. The system will replace **80 percent** of the natural gas costs and **15 percent** of the cost of electricity. The project will stabilize the energy costs of the three

March 2011 groundbreaking ceremony at the Crawford Central School District in Meadville, Pennsylvania. Photo taken by Wilson Engineering Services.

facilities and support the local renewable energy economy. The **$3.5 million project** utilizes funding from an ARRA Grant to the Pennsylvania Department of Environmental Protection Energy Harvest program, a **Forest Service Woody Biomass Utilization Grant**, and a Pennsylvania Department of Community and Economic Development Alternative and Clean Energy Grant.

There are 21 Federally-recognized Native American Indian Tribes in **Arizona,** with lands accounting **for 27 percent** of the state's area—more Tribal land than any other state in the Nation. However S&PF program outreach to Tribes is extremely limited. The Arizona Tribal Outreach and Collaboration Project is a 3-year partnership between the Forest Service and the Arizona State Forestry Division, in collaboration with Tribal, local, and other State and Federal cooperators. The project seeks to better inform Tribes of the opportunities available to them through USDA programs such as Forest Service Forest Health Protection, Urban and Community Forestry, Cooperative Fire Assistance, and Forest Stewardship Program; and the Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program and Wildlife Habitat Incentives Program. The project leverages **$176,000 of Forest Service, Farm Service Agency, and NRCS funding** with multiple state and Federal agencies such as Arizona Environmental Quality, Arizona Game & Fish, Arizona Water Resources, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, Inter-Tribal Council of Arizona, Intertribal Timber Council, and others.

Washington – Sanpoil/Kettle Watershed Forest Restoration Prescription Pilot Project will develop a set of "desired condition" forest restoration prescription guidelines and pilot the feasibility of a low-cost incentive payment for their implementation. This project integrates **Forest Stewardship, Forest Health and Fuels Program** objectives and resources. Broad existing collaborative work—on National Forest lands in NE Washington and in the process that produced Washington State's forest health law—will be extended to at-risk private owners, building toward "all-lands" outcomes.

The project reaches beyond S&PF to restoration objectives shared among State, Federal and Tribal land managers, as well as restoration and conservation advocates. Both the Colville Tribe and conservationists have a keen interest in promoting good restoration management on private lands, and this project would integrate those objectives as well. This project partners with the USFS PNW Research Station to develop and incorporate a better scientific understanding of landscape resiliency. The diversity of Federal, Tribal, and private partners helps ensure an outcome that achieves "all lands" results.

The **Georgia** Forestry Commission partnered with the University of Georgia (UGA) Research Foundation, UGA Department of Agricultural and Applied Economics, the Northwest Georgia Regional Commission, and forest landowners in the Etowah Watershed to assess the watershed. The project provided:

- An assessment of forest resource condition by landowner type for the Etowah Watershed;
- An assessment of land use trends in the Etowah Watershed and prioritization of forest protection for the Etowah Watershed;
- A description of the methodology based on the Etowah Watershed and how the methodology was derived;
- Visualization tools for outreach activities; and
- A documented process for conducting a localized outreach component that includes stakeholder meetings, presentations of maps, visuals, data layers and findings, discussion of

partner participation, goals and input, and the role of stakeholders in developing criteria and strategies and using visualization tools.

The project focused on important strategic issues in Georgia:

- Maximizing the benefits provided by Georgia's forests (ecological services, clean water, clean air, wildlife habitat, recreation opportunities, and carbon sequestration) and
- Ensuring Georgia's forests will meet the increasing demands of future generations (fragmentation and forest land losses).

NIFA provided funds through the Renewable Resources Extension Act Program (RREA) to Cornell University to develop and conduct a workshop on Private Woodland Management. Approximately 160 **New York** woodlot owners participated in the small woodlot management and ATV logging workshops, and an additional 200 participated in classroom or webinar presentations. As a result of these trainings, participants indicated their intention to purchase and use chainsaw personal protective equipment, an increased capacity for knowledgeable firewood tree selection, a desire to participate in a formal Game of Logging™ training, and an awareness of the need for safe practices when logging with ATVs or small farm tractors. Workshops allowed owners to develop skills with tree measurements, assessment of tree vigor and health, and observational learning of safe methods for directional felling. The educational process recognizes and accommodates the variation in owner ability and equipment. This initiative uses the full range of venues, including print material, in-person woodland workshops, seminars, Internet webinars, and YouTube video. Internet technology reaches new audiences and efficiently serves existing audiences. Webinars were attended by **840 participants** who own or manage more than **1.2 million** forested acres. Respondents to post-webinar surveys estimated saving more than **60,000 mile**-equivalents through distance learning. Respondents estimated they will earn, save, or spend more than **$62,000** as a result of the webinar presentations. More than **80 percent** of respondents reported a significant increase in awareness and knowledge. More than **70 percent** of respondents indicated they sought more information as a result of the webinar. Almost **90 percent** of respondents indicated they would apply what they learned during the webinar. Additional applications of Internet technology include an owner forum and social networking through Facebook and Twitter.

The McIntire-Stennis Research Program, managed by NIFA, provided funds to **Oregon** State University to a research project titled Identifying and Sustaining Public Benefits from Family Forest lands. Two fundamental, evolutionary shifts are occurring, affecting the sustainability of family forest lands. The first involves changes in the structure and pattern of private forest land ownership. The second involves changes in social values as the United States, and much of the developed world, has evolved from a rural, to an urban, to a suburban culture. This project assessed the role of family forest lands in providing social, ecological, and economic benefits to society by identifying existing challenges and creating strategies for sustaining these benefits.

Value of Work Accomplished on Private Forest Lands

The contributions of the programs delivered through the Forest Service and the other USDA agencies working with private forests, have been significant to attaining the national priorities for private forest lands. Since the Food, Conservation, and Energy Act of 2008 has been enacted, over $2 billion has been invested by the Forest Service, over $190 million by the National Institute of Food and Agriculture, over $160 million by the Natural Resources Conservation Service (NRCS), over $1.059 billion by the Farm Service Agency (FSA), over $125 million by Rural Development, and over $11 million by the Agricultural Research Service to address the three national priorities.

Over two million landowners received educational assistance, and almost 800,000 received technical assistance to prepare plans and management prescriptions. Millions of dollars from partners leveraged the Federal investments. The work accomplished by State Forestry Agencies in developing the Statewide Forest Resource Assessments and Strategies to identify and prioritize national, regional, and state forest management goals across all ownerships, has become the foundation for agencies and partners to work together.

The values of America's private forest lands are essential to our country. Current growth trends are showing a steady loss of forests, due to development. From 1982 to 1997, the United States lost 10 million acres with 26 million additional acres projected to be developed by 2030 (Alig and Plantinga 2004). Private Forests, Public Benefits, a USDA Forest Service publication, estimates that housing density will increase on more than 57 million acres of America's private rural forests from 2000 to 2030. In many areas, the impacts of increased housing density are likely to be exacerbated by additional threats, such as insect pests and diseases, and air pollution.

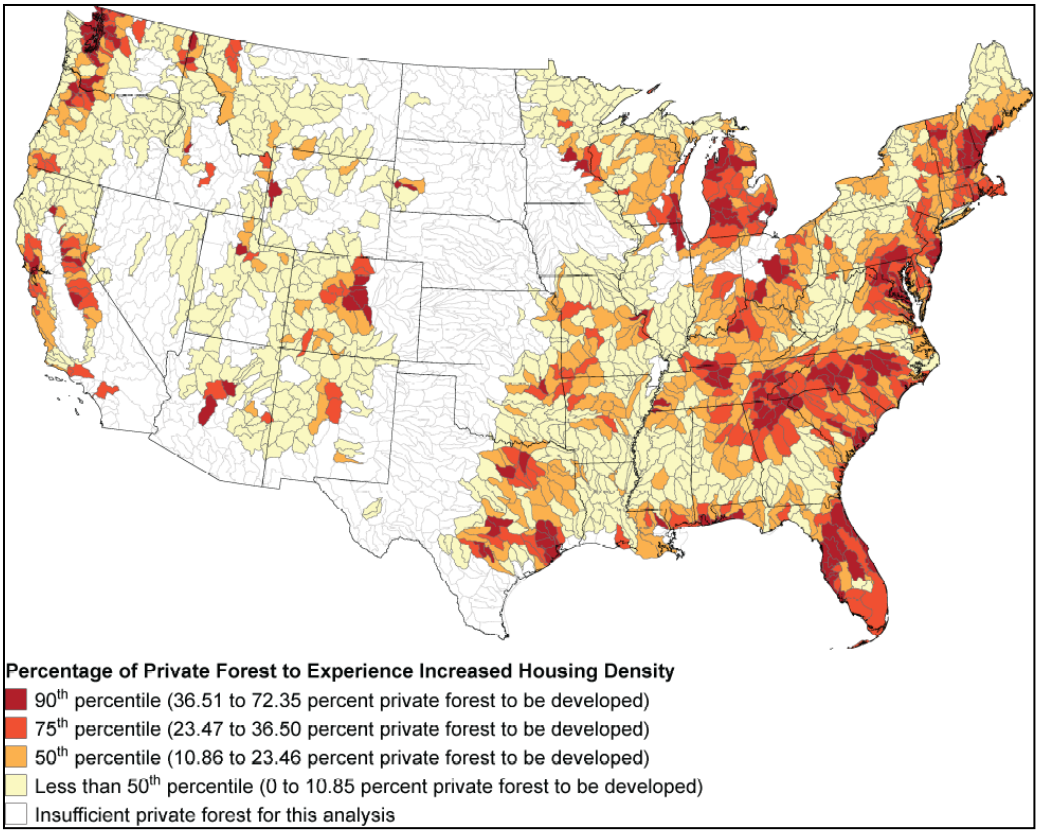


Figure 30: Watersheds by percentage of private forest projected to experience increased housing density.

Private land changes affect public lands. Increasingly, national forests and other public lands are becoming islands of wild and semi-wild lands embedded in a matrix of developed lands. 21.7 million acres of rural private lands, about 8 percent of all the private lands within 10 miles of National Forest System boundaries, are projected to experience increased housing density between 2000 and 2030. In addition, nine national forests are projected to experience increased housing density on at least 25 percent of the adjacent private land (within 10 miles) (Stein et. al. 2007).

Importance of Private Forest lands

Fifty-six percent of the 751 million acres of forest land in the United States is privately owned. Of this private forest land, 62 percent is owned by families and individuals—"family forests." The remaining private forest land is owned by corporations, conservation organizations, clubs, Native American Tribes, and others (USDA-FS, May 2008).

Private land owners are pivotal for the protection and sustainable management of our forests across the landscape, yet they face ever-increasing pressures and challenges. Changes in land ownership and management are likely to occur as land is passed from one generation to the next (USDA-FS, May 2008). Twenty-three percent of the family forest land is owned by people who intend to sell or transfer their land soon. This is related to the fact that 20 percent of the family forest land is owned by people who are 75 years or older (Butler, 2009). If the size of the forest holdings continues to decrease in the future, as current trends suggest, there will be changes in how the land is viewed and how it is managed. Smaller forests may offer fewer opportunities for certain activities such as traditional forestry, collection of nontimber forest products, and recreation.

Smaller forests may also become more vulnerable to weeds, wildfires, development, isolation, and other challenges (USDA-FS, May 2008).

Many public land amenities are connected to private lands. Water flows across borders. Wildlife migrates. Fires that maintain healthy forests need room to burn without endangering people and their homes. Conserving forests is not a private land or public land issue, but a common challenge to be addressed at local, regional, and national levels (USDA-FS, August 2006).

Clean Water

Forests provide and protect much of the Nation's fresh water. Over half (53 percent) of America's water supply in the conterminous United States originates on forests (Brown et a. 2005), with about half of that amount coming from private forests—especially in the Northeast, Lake States, and South. Forests filter and remove pollutants, and lower the risk of sediment entering streams and rivers from landslides and erosion. This natural filter can help reduce the cost of purifying water to drinkable standards (USDA-FS, Aug 2006).

Natural Flood Control

Rain falling in forests is slowed by leaves and plants and soaks into the soil, but rain pouring on bare soil or pavement runs off the surface, causing erosion and flash flooding. Nature's stormwater management systems are intact forests (USDA-FS, Aug 2006).

Reliable Water Supply

Forests often capture and store water that fills our aquifers and reservoirs—important for irrigation and for drinking water. In many parts of the western United States, late summer water flows come from gradually melting snowpack in the forested watersheds of high mountains. Trees also work like a giant pump, returning water from the ground to the atmosphere (USDA-FS, Aug 2006).

Wildlife Habitat

In addition to fresh water delivery and flood control, forests supply habitats for wildlife and fish. In fact, private forests provide critical habitat for many wildlife species, including 4,613 at-risk plant and animal species (Stein et al. 2010).

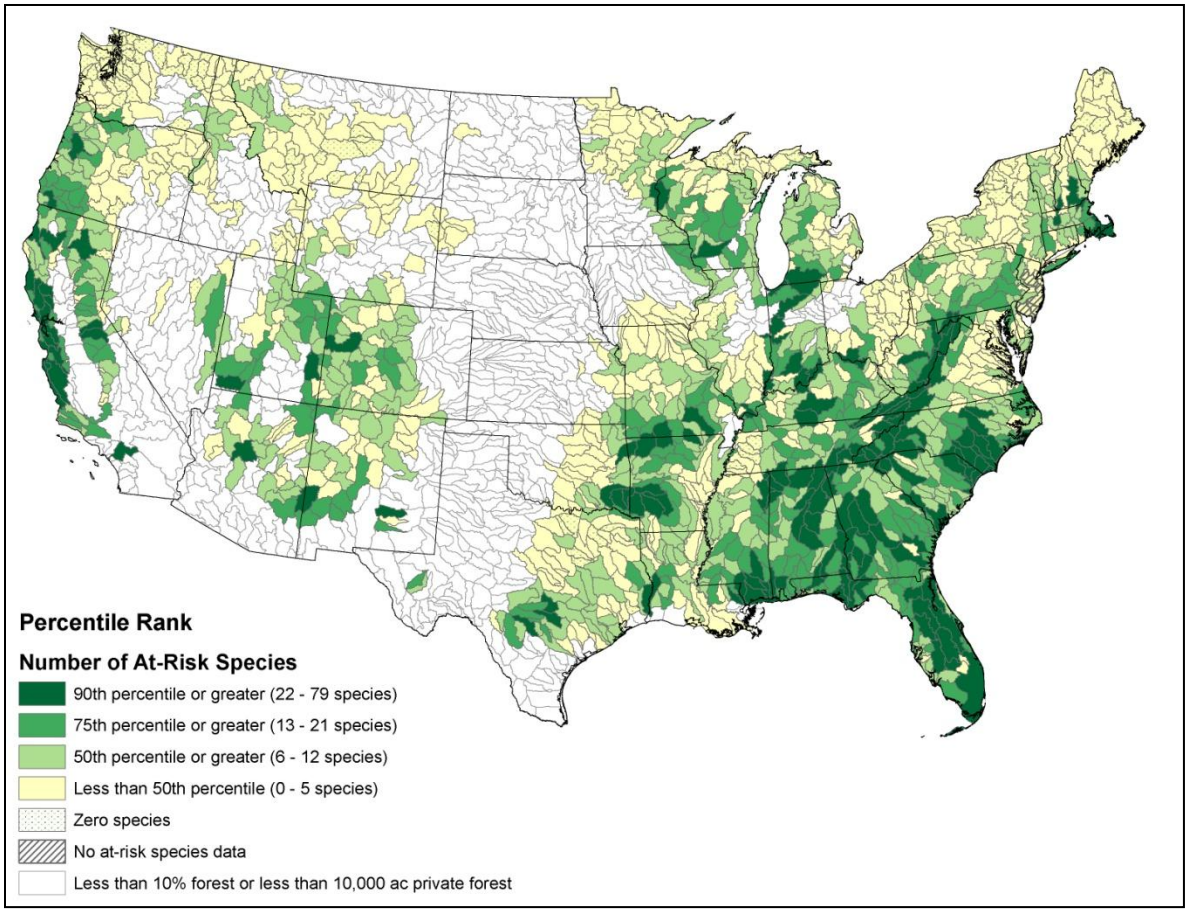


Figure 31: Number of at-risk species associated with private forest, by watershed. Most watersheds with the greatest total number of forest associated at-risk species are found in the East and in Coastal California, but some are also located in the Southwest.

Recreation and Forest Products

Forests give this generation and the next a place to get in touch with nature, and help address the challenges of climate change. Private forests offer vital economic products and accounted for 92 percent of all U.S. timber harvested in 2001 (Smith et al. 2004).

Statewide Assessments

All State forestry agencies have completed Forest Action Plans consisting of statewide forest resource assessments and strategies. These plans are guiding their work and are being used by the Forest Service and other Federal partners in setting priorities for programs. The approach used by the States is landscape-level planning and looks at all the forests, regardless of ownership. Coordinated management and attaining priority outcomes are resulting from these Forest Action Plans.

Summary

In summary, forest owners are benefiting from the programs and resources detailed in this report to help ensure forests and their benefits can be sustained for future generations. The unique power of

the Federal programs highlighted in this document is their ability to leverage funds and expertise from State agencies, forest landowners, local governments, and both the private for-profit and not-for-profit sectors. As a result, the Federal investment in private forestry provides value to the American people far in excess of its cost.

Appendices

Appendix A

Forest Inventory and Analysis Data, Services, and Reports That Support the 2008 Farm Bill

Given the overarching nature of data and information on forests provided by the Forest Inventory and Analysis (FIA) program and pervasive references to various aspects in the literature, it would be difficult to assign a priority impact to any given facet, whether it be conserving working forest landscapes, protecting forests from threats, or enhancing public benefits from trees and forests. The following sources of information and descriptions provide examples of how FIA data serve all of the Food, Conservation, and Energy Act of 2008 (2008 Farm Bill) priorities and assure that resource strategies and policies are based on the best scientific data and information available.

Online FIA Databases and Tools (http://www.fia.fs.fed.us/tools-data/default.asp)

FIA online data tools provide public access to the national forest inventory, timber products output, and forest health and forest ownership data for all forest ownerships. Users can generate tables and maps of forest statistics through a Web browser without having to understand the underlying data structures. Users may run standard reports for a specific area of interest and survey year or create completely customized reports based on criteria of choice. Also, the FIA Data Mart tool allows users to download FIA data for analysis on their own computers.

State Reports (http://treesearch.fs.fed.us/)

The primary objective in conducting State inventories is to gather the resource information needed to formulate sound forest policies and programs. FIA State inventory data are analyzed in reports that provide a view of forest resources including, but not limited to, forest area, forest ownership, forest type, stand structure, timber volume, growth, removals, and management activity. In addition, analysis is provided to help address issues of ecosystem health, including information about ozone-induced injury, down woody material, soils, lichens, and tree crown condition. The information presented furnishes the background for possible intensive studies of critical situations. Current reports also include maps and spatial analysis of critical resource issues. The FIA program has published more than 260 State reports since 1928.

National Reports (http://www.fia.fs.fed.us/program-features/rpa)

FIA has provided assessments of the Nation's forests in nine national assessments since 1953 (USDA 1958, 1963, 1973, 1982; Waddell et al. 1989; Powell et al. 1993; Smith et al. 2001, 2004, 2009). These reports provide current information on the Nation's forests and present estimates of forest area, volume, mortality, growth, removals, and timber products output in various ways, such as by ownership, region, and State. Current resource data and trends are analyzed and placed within the context of changes since 1953. Additional analyses look at the resource from an ecological, health, and productivity perspective. Recent reports include maps of forest cover, ownership, biomass, fragmentation, and other key spatial elements of the Nation's forests.

National Woodland Owner Survey (http://www.fia.fs.fed.us/nwos/results/)

The National Woodland Owner Survey (NWOS) is the official survey of the private forest owners of the United States. Its aim is to increase researchers' understanding of woodland owners who are the critical link between forests and society. The first national woodland owner survey was conducted by the Forest Service, an agency of the USDA, in 1978 (Birch et al. 1982). This survey was followed by another survey in 1994 (Birch 1996) and a third survey in 2006 (Butler 2008). The fourth survey is being conducted in 2011. Each of the surveys was conducted in collaboration with the NRCS and the National Association of State Foresters (NASF). The NWOS contacts forest landowners from across the county to ask them questions about the forest land they own, their reasons for owning it, how they use it, if and how they manage it, sources of information about their forests, their concerns and issues related to their forests, their intentions for the future of their forests, and their demographics. Results of the survey are used to provide, design, and implement services and policies that affect forest owners that include government agencies, nongovernmental organizations, landowner organizations, private-service providers, forest industry companies, and academic researchers.

Timber Products Output (http://www.fia.fs.fed.us/program-features/tpo/)

Private forest landowners provide 92 percent of the Nation's annual commercial wood supply (Smith et al. 2009). FIA monitors the flow of this wood through field inventory and primary mill surveys. FIA conducts Timber Products Output (TPO) or mill surveys to estimate industrial and nonindustrial uses of roundwood in a State by canvassing all primary wood-using mills. Questionnaires are designed to determine location, size, and types of mills and the volume of roundwood received by product species and geographic origin. Surveys also determine the volume, type, and disposition of wood residues generated during primary processing. Linkages with FIA field data provide ownership distribution information. Reports for these surveys provide invaluable information on the vitality of the wood processing capacity and industry stability in the United States (Johnson 2001). FIA conducts logging utilization studies (Blyth and Smith 1989, Morgan et al. 2005) to relate TPO to inventory volume and determine the amount of residual material left in the woods as a result of logging. Logging and mill residue information are critical inputs to potential wood-energy opportunities.

Forest Carbon (http://www.fia.fs.fed.us)

FIA is the authority for estimates of forest carbon stocks in the United States. Annual estimates of forest carbon stocks at the national level have been prepared by FIA scientists each year since 1993. FIA scientists provide these estimates to the U.S. Environmental Protection Agency as the official forest carbon numbers for international reporting (EPA 2010). Recently, FIA scientists have developed new methods for breaking these national estimates down into regional, State, and sub-State estimates. These data are publicly available on the FIA Web site.

Nontimber Issues (http://www.treesearch.fs.fed.us/pubs/6446)

More than 1,400 citations of publications were compiled from an integrated knowledge base of nontimber forest resource issues using FIA data. The focus of the compendium is on nontraditional and novel technical uses tied to FIA field surveys (Rudis 2001). Briefly noted are pioneering studies that link FIA data with air pollution, biomass, dead wood, esthetics, geographic context (geographic information systems and satellite remote sensing), nearby nonforest influences (operability, roads), owner attitudes, range (agroforestry and livestock use), recreation, tropical inventories, water quality (soils and hydrology), vegetative habitat typing, and wildlife.

Appendix B

National Institute of Food and Agriculture

Compiled RREA Indicators Data, FY 2008-2010

Forest Stewardship and Health

Number of Educational Events	6,451
Number of Landowners and Managers Trained to Develop Stewardship Plans	18,229
Number of Direct Contacts Who Increased Awareness of Benefits and Opportunities	593,255
Number of Indirect Contacts Who Increased Awareness of Benefits and Opportunities	17,899,263
Number of Direct Contacts Who Increased Knowledge of Benefits and Opportunities	260,122
Number of Stewardship Plans Developed	8,031
Number of Landowners Who Implemented at Least One New Practice	505,083
Number of Acres Impacted	270,184,941
Estimated Number of Dollars Earned or Saved	$335,302,695

Rangeland Stewardship and Health

Number of Educational Events	1,925
Number of Direct Contacts Who Increased Awareness of Benefits and Opportunities	98,405
Number of Indirect Contacts Who Increased Awareness of Benefits and Opportunities	1,066,615
Number of Direct Contacts Who Increased Knowledge of Benefits and Opportunities	63,878
Number of Stewardship Plans Developed	1,262
Number of Landowners Who Implemented at Least One New Practice	6,444
Number of Acres Impacted	206,049,260
Estimated Number of Dollars Earned of Saved	$12,905,148

Wildlife and Fisheries Resources

Number of Educational Events	2,031
Number of Direct Contacts Who Increased Awareness of Benefits and Opportunities	111,038
Number of Indirect Contacts Who Increased Awareness of Benefits and Opportunities	760,362
Number of Direct Contacts Who Increased Knowledge of Benefits and Opportunities	76,121
Number of Management Plans Developed	4,155
Number of Landowners Who Implemented at Least One New Practice	12,949
Number of Acres Impacted	5,534,906
Estimated Number of Dollars Earned or Saved	$29,531,900

Invasive Species

Number of Educational Events	648
Number of Direct Contacts Who Increased Awareness of Exotic Invasives	37,292
Number of Indirect Contacts Who Increased Awareness of Exotic Invasives	8,599,098
Number of Direct Contacts Who Increased Knowledge of Exotic Invasives	32,387
Number of Landowners Who Implemented at Least One New Practice	7,957
Number of Acres Impacted on Private Lands	893,463
Number of Acres Impacted on Public Lands	1,159,052
Estimated Number of Dollars Earned or Saved	$6,633,926

Economic Opportunities for Individuals and Communities

Number of Educational Events	1,282
Number of Direct Contacts who Increased Awareness of Opportunities	108,033
Number of Indirect Contacts who Increased Awareness of Opportunities	979,464
Number of Direct Contacts with Citizens and Landowners who Increased Awareness of Opportunities	77,321
Number of Indirect Contacts with Citizens and Landowners who Increased Awareness of Opportunities	1,025,171
Number of Direct Contacts with Community Leaders who Increased Awareness of Opportunities	18,844
Number of Indirect Contacts with Community Leaders who Increased Awareness of Opportunities	3,826
Number of Income-Generating Businesses Created or Expanded	3,639
Number of New Jobs Created	5,325
Estimated Number of Dollars Earned of Saved	$931,854,368

Public Policy

Number of Educational Events	22,704
Number of Citizens and Community Leaders Trained in Decision-Making	21,711
Number of Direct Contacts who Increased Awareness of Issues and Outcomes	28,764
Number of Indirect Contacts who Increased Awareness of Issues and Outcomes	64,598
Number of Direct Contacts who Increased Awareness of Community-Based Decision-Making	26,000
Number of Indirect Contacts who Increased Awareness of Community-Based Decision-Making	18,387
Number of Direct Contacts who Increased Knowledge of Issues and Outcomes	2,005,433
Number of Direct Contacts who Engaged in Decision-Making Process	1,819
Number of Acres Impacted	2,573,026

Land Conversion, Parcelization and Fragmentation

Number of Educational Events	818,422
Number of Direct Contacts Who Increased Awareness of Options	20,949
Number of Indirect Contacts Who Increased Awareness of Options	53,664
Number of Direct Contacts Who Increased Knowledge of Options	168,061
Number of Landowners who Implemented at least One New Practice to Ensure Retention	17,822
Number of Acres Protected	49,891

Diverse Audiences

Number of Educational Events	428
Number of Direct Contacts with Minority Landowners and Managers	2,938
Number of Minority Members of Extension Advisory Committees	429,315
Number of Minority Landowners who Implemented at least One New Practice	104
Number of Acres Impacted	17,822

Appendix C

Forest Research and Development – Forest Service Patents Relative to Private Forests

Improved Reforestation Using a Single Tool
U.S. Patents 7,059,072 and 7,086,184
Compacted soil can be a reforestation deterrent, either reducing seedling growth or killing seedlings. Forest Service inventors developed a subsoiling apparatus that consists of shanks that are attached to a grapple rake or an excavator bucket. The grapple rake allows for two separate reforestation activities, piling of harvest residues for burning and a way to reduce compaction. The excavator bucket allows for watershed restoration activities, such as recycling gravel, removing culverts, or obliterating roads. All work is performed by an excavator simultaneously, in many cases eliminating the need for other heavy equipment and reducing project duration, cost, and site entries.

Environmentally Friendly and Cost-Effective Weed Control
U.S. Patent 7,121,040
This combination foliage compaction and treatment method for applying fluids such as herbicides to plants uses a large heavy roller that is pulled across a field of plants compacting the targeted weed species to the ground. A height adjustable applicator nozzle following the roller allows fluid to be released very near the plants, which increases the amount of fluid transferred to the plants' surface and lowers the amount of fluid sprayed into the atmosphere. This reduces the amount of fluid required to treat a given area. The "crush and spray" invention results in reduced fluid costs and waste, improved environmental impact, and increased treatment effectiveness.

Technology for Measuring Duff Moisture Content Improves Safety of Forest Fires
U.S. Patents 5,920,195 and 6,078,181
Forest Service inventors developed a machine to quickly assess moisture content in the duff, or the surface of the forest floor. Their invention is a portable unit that can be carried to the forest and used for testing the moisture of forest duff using electrical calculations and surface probes. This way, people in charge of containing a fire can determine in a few minutes, rather than days, the moisture levels in the duff and, thereby, provide better control of fires. This technology has been licensed to Campbell Scientific, Inc., and is available for sale on their Web site: http://www.campbellsci.com/duff-moisture.

Nondestructive Evaluation of Trees
U.S. Patent 7,418,866
Forest Products Laboratory researchers developed a tool that uses acoustic, laser, ultrasound, and wireless technologies to evaluate the strength and soundness of the wood in standing trees. This technology allows forest managers to determine the quality of wood without cutting down the tree, which results in more efficient timber harvesting and better monitoring of forest health. This patent has been licensed by fibre-gen and is available for sale on their Web site: http://www.fibre-gen.com/st300.html.

Soy Adhesives Offer a Green Alternative for Wood Products

U.S. Patent No. 7,345,136

Soy flour has been investigated as a low-level adhesive extender in wood products for house construction, but this patented technology incorporates soy as a main component in the adhesive formulation. The use of soy reduces the cost of the adhesive and improves the appearance of the final product. The technology has demonstrated viability in making commercial-scale products, and this patent has been licensed. With the price of petroleum products increasing, the use of soy flour to replace phenol becomes even more economically attractive for making oriented strandboard and other wood products used in building construction.

Improved Biofuel Production from Woody Biomass

U.S. Pub. No. US 2009/0298149

A major barrier to the commercial development of biobased fuels and products from woody biomass has been addressed with the development of a novel process by Forest Service and University of Wisconsin-Madison scientists. The process, a sulfite pretreatment to overcome recalcitrance of lignocellulose, or SPORL, helps overcome the natural resistance of biomass to enzymatic deconstruction, a necessary step in biofuels production. SPORL can efficiently convert softwoods, which are most recalcitrant but can be sustainably produced in several parts of the world. Additional benefits of the process include significant reduction in the energy needed to reduce the size of woody biomass, which is critical to bioenergy production; excellent commercial scalability, as it makes use of existing equipment, processes, and knowledge of the pulp and paper industry; fewer technical barriers to building new plants or to retrofitting existing pulp mills to production of biofuels; and excellent potential for co-production of value-added lignin products.

Biofuels Production Using Flash Pyrolysis and Gasification

U.S. Patent No. 7,875,090

A Forest Service patent was issued on January 25, 2011, entitled, "Method and Apparatus to Produce Synthesis Gas via Flash Pyrolysis and Gasification in a Molten Liquid." Developed by FPL researcher Mark Dietenberger and University of Wisconsin-Madison researcher Mark Anderson, the invention converts solid biomass into synthesis gas, or "syngas," for the production of energy. Syngas is a feedstock comprised of hydrogen, carbon dioxide, and carbon monoxide that can be converted into liquid hydrocarbon fuels. This process is advantageous as it provides increased output of synfuel from woody biomass, allows for ready removal of contaminates, and does not require any external water sources. Additionally, the device can be built small enough to be integrated into a self-powered mobile unit. This invention is jointly owned with the University of Wisconsin-Madison. The Wisconsin Alumni Research Foundation, the university's patent and licensing arm, is currently looking for licensees for this technology.

Appendix D

NRCS

Cooperative Conservation Partnership Initiative's (CCPI) currently funded

State	Name of Organization/Partner	Project Title	FY 2010 Project Description	Programs Supported	FY 2010 FA Fund Allocation
CA	Sierra Coordinated Resource Management Council	Central Sierra CCPI Proposal	Address water quality and quantity concerns and implement forest-related practices based upon State approved plans	EQIP*	$1,000,000
CA	Yurok Tribe	Yurok Indian Reservation Road Improvement and Fuel Reduction Treatments	Address road rehabilitation, erosion, and sediment control and fuels management in forested areas	EQIP	$246,571
CA	Northwest CA Resource Conservation & Development Council	The Klamath-North Coast Forest land Conservation Project	Assist producers in implementing forest land improvement practices outlined in the Klamath-Land Conservation Project	EQIP	$855,617
SD	South Dakota Department of Agriculture, Division of Resource Conservation and Forestry	Central Great Plains Shelterbelt Renovation for Water Quality Reduced Soil Erosion and Wildlife Habitat	Renovate shelterbelts to reduce soil erosion, protect livestock and property from wind-related damage, improve energy conservation, manage snow deposition, improve air quality, increase carbon storage, provide wildlife habitat	EQIP	$400,005
SD	South Dakota Department of	Central Great Plains Forested	Establish riparian forest buffers by	EQIP	$417,135

	Agriculture, Division of Resource Conservation and Forestry	Riparian Buffers for Water Quality Reduced Soil Erosion and Wildlife Habitat	planting trees and installing fence for use exclusion		
WA	Washington State Department of Natural Resources	Family Forrest Fish Passage Barrier Correction	Accelerate the rate and number of fish (salmon) barriers to be corrected within the defined geographic location	EQIP	$10,000
Chesapeake Bay Watershed Initiative CCPI Projects Approved for Fiscal Year 2010					
VA	Trout Unlimited	Shenandoah Headwaters Home Rivers Initiative: Spring Creek Restoration	Restore brook trout habitat in priority spring creeks of the Shenandoah Valley by applying conservation practices. Brook trout, which serve as an indicator of a healthy watershed, are losing habitat due to sedimentation, lack of riparian vegetation, and livestock stream access		$32,000
Examples of State Level CCPI Projects					
AL	The Alabama Treasure Forest Association (ATFA), Alabama A&M University (AAMU), Tuskegee University (TU), National Wildlife Federation (NWF), Federation of Southern Cooperatives (FSC), and the Community-Based Land Development Consortium (CBLD)	Limited Resource Landowner Education and Assistance Network	Assist private underserved landowners in applying needed forestry conservation practices that benefit soil, water, and wildlife resources.	EQIP	

*Environmental Quality Incentives Program (EQIP)

Listed below are the forestry-related CIG awards in the past 3 years.

Forestry Related Conservation Innovation Grants—2008-2010[1/]

Entity	Title of Proposal	Federal Funds Requested	Project Location
National Wild Turkey Federation	Natives of the Longleaf Pine Ecosystem	$99,300	AL, FL, GA, MS, NC, SC
The Forest Guild	Promoting Adoption of Innovative Conservation Practices for Sustainable Forest Biomass Harvesting	$147,057	CT, ME, MA, MD, NH, NY, PA, RI, VT
The Longleaf Alliance, Inc.	Native understory restoration in longleaf pine ecosystems	$189,000	LA, FL, GA, LA, MS, NC, SC, TX, VA,
Meridian Institute	Council on Sustainable Biomass Production: A comprehensive standard and national certification program for sustainable production of cellulosic biomass and bioenergy.	$750,000	CO
Mountain Association for Community Economic Development, Inc.	Increasing Certified Forest Management in Central Appalachia through Carbon Credit Offset Markets	$500,000	KY
American Forest Foundation	Northern Forest Watershed Services: Parallel Pilot Initiatives Providing Incentives for Forest Management and Conservation	$500,000	ME, NH, VT
National Network of Forest Practitioners	Expanding Conservation Opportunities with Sustainable Forestry in Rural Communities	$260,000	MS
The Blackfoot Challenge, Inc.	Community-based Fire Management Innovative for Private Lands	$106,108	MT
New River-Highlands RC&D* Council	Extreme Forest Makeover: Expanding the Local Knowledge of Sustainable Forest Management in Appalachian Hardwood Region of Virginia	$111,000	VA
Washington State University	Absentee Forest landowner Education Project	$165,712	WA
Missouri Department of Conservation	Best Management Practices for Water Quality on Private Timber Sales	$192,700	MO
United States Endowment for	Advancing Healthy Watersheds through Healthy Forests: A Conservation Innovation	$2,000,000	

Forestry and Communities, Inc	program to Effect Improved Watershed Function through Improved Management and Retention of Non-Industrial Privately Owned		
American Forest Foundation	Developing and Implementing a Market-Based Habitat Credit Bank for the Gopher Tortoise on Family Forest lands in Portions of Georgia and Alabama	$194,350	AL, GA
George McKinley	Creating a Conservation Mechanism to Facilitate Non-Industrial Private Forest Owner Access to Carbon Offset Markets: Pilot Project	$24,800	OR
Coeur d'Alene Tribe	Using Carbon Credits to Offset the Costs of Implementing Carbon Conservation Practices: Landowner Education and Development of a Carbon Credit Market Infrastructure for Coeur d'Alene Tribe	$77,575	ID

[1/]The above list of CIG awards may not be totally inclusive of all grants awards related to agroforestry and forestry.
*Rural Community and Development

Appendix E - Rural Development – Wood to Energy Projects

State	Project Name	Fiscal Year	Type of Funding	Grant Amount	Loan Guarantee Amount	Loan	Other USDA or Federal Funding (USFS)	Total Project Cost
ID	Alpine Cedar, Inc.	2010	REAP	$ 8,436				$ 33,749
OH	American Wood Fibers	2010	REAP	$ 500,000	$ 500,000			$ 2,241,800
TN	Carlisle, Mark D.	2010	REAP	$ 137,750	$ 252,250			$ 570,000
SC	Champion Wood Pellets, LLC	2010	REAP	$ 399,260	$ 798,521			$ 1,597,042
MN	Cherry Greenhouse	2010	REAP	$ 11,543				$ 46,173
GA	Energy Chips Inc	2010	REAP	$ 86,950				$ 347,800
AL	H. E. Browder Veneer Company, Inc.	2010	REAP	$ 115,309				$ 461,239
OR	Heesacker, Steven	2010	REAP	$ 20,000				$ 98,790
MI	Kirtland Products, LLC	2010	B&I		$ 3,800,000			$ 4,546,185
AR	Leavell, Brent	2010	REAP	$ 10,385				$ 41,948
MI	Mid-Michigan Logging Co.	2010	REAP	$ 108,862				$ 435,450
AR	Nichols, Harold L	2010	REAP	$ 9,152				$ 36,609
MI	P.W.G.G., LLC	2010	B&I		$ 1,200,000			$ 1,610,000
GA	Payne Brothers Logging	2010	REAP	$ 58,750				$ 235,000
GA	Plantation Creation	2010	REAP	$ 82,160				$ 328,640
TN	Quint C Pallet	2010	REAP	$ 49,215				$ 196,859
FL	Register's Enterprises of Bay County	2010	REAP	$ 98,693				$ 400,000
AL	Rocky Creek Lumber Company	2010	REAP	$ 349,629				$ 1,400,014
GA	Scofield Timber Company, Inc.	2010	REAP	$ 41,250				$ 165,300
GA	Shepherd Brothers Timber Company, LLC	2010	REAP	$ 82,135				$ 328,540
TN	Shoun Lumber, LLC	2010	REAP	$ 19,649				$ 78,599
VT	VT Wood Pellet	2010	REAP	$ 50,000	$ 100,000			$ 200,000
OH	Webb Perennials LLC	2010	REAP	$ 9,127				$ 36,506
MO	White River Valley Electric Coop (U.R.: Gainesvil	2010	REDLG	$ 300,000		$ 740,000	$ 970,000	$ 2,144,000
VA	Wood Fuels of Virginia, LLC	2010	REAP	$ 500,000				$ 7,313,727
	Subtotal			$ 3,048,255	$ 6,650,771	$ 740,000	$ 970,000	$ 24,893,970

State	Project Name	Fiscal Year	Type of Funding	Grant Amount	Loan Guarantee Amount	Loan	Other USDA or Federal Funding (USFS)	Total Project Cost
SC	American Capital Resources Company	2009	REAP	$ 50,000				$ 200,000
MN	Bergren Farms	2009	REAP	$ 16,674				$ 66,694
IA	B & D MEYER INC	2009	REAP	$ 19,915	$ -	$ -		$ 79,660
OH	CORAM FLORA COMPANY	2009	B&I	$ -	$ 5,500,000	$ -		$ 18,211,000
OH	CORAM FLORA COMPANY	2009	REAP	$ -	$ 7,500,000	$ -		$ -
WV	Caperton FurnitureWorks, LLC	2009	REAP	$ 130,592	$ 469,408			$ 600,000
ID	Coeur d'Alene Fiber Fuels	2009	ABPP	$ 347,484				
PA	Davin, John K. [Forever Greene House]	2009	REAP	$ 7,268				$ 29,072
PA	Energex American, Inc.	2009	REAP	$ 476,685				$ 2,975,834
MN	JES Wood Products	2009	REAP	$ 20,000				$ 85,100
ME	Maine Woods Pellet Company, LLC	2009	REAP	$ 400,000				$ 6,976,200
NC	Metrolina Greenhouses, Inc	2009	REAP	$ 367,518	$ 367,000			$ 2,175,000
IL	Mid American Growers, Inc.	2009	REAP	$ 375,000	$ 750,000			$ 1,500,000
VT	Morse Farm & Sugarhouse	2009	REAP	$ 9,589				$ 38,355
ID	QB Corporation, dba Lemhi Valley Pellet	2009	REAP	$ 31,885				$ 177,045
GA	Range Fuels	2009	9003		$ 80,000,000			$ 500,000,000
MN	Root River Hardwoods	2009	REAP	$ 6,700				$ 24,830
VA	Unaka Forest Products, LLC	2009	REAP	$ 434,661	$ 435,271			$ 2,581,881
WI	Utility Buildings Corp.	2009	REAP	$ 5,246				$ 20,987
OH	Webb Perennials LLC	2009	REAP	$ 7,865				$ 31,459
MI	Wood Pecker Pellets, Inc.	2009	REAP	$ 226,438				$ 905,752
	Subtotal			$ 2,933,520	$ 95,021,679	$ -	$ -	$ 536,678,869

State	Project Name	Fiscal Year	Type of Funding	Grant Amount	Loan Guarantee Amount	Loan	Other USDA or Federal Funding (USFS)	Total Project Cost
ID	Boise County	2008	REAP	$ 36,300				$ 40,100
MI	COUNTRY MILL FARMS, LLC	2008	REAP	$ 15,310	$ -	$ -		$ 61,239
PA	Elk Regional Health System-Biomass Boiler	2008	CF			$ 1,775,000	$ 250,000	$ 2,306,304
CT	Grower Direct Farms	2008	REAP	$ 500,000	$ 850,000			$ 3,500,000
ID	Lemhi County Economic Dev.	2008	RBOG	$ 57,000				$ 292,253
VT	Limlaw Pulpwood, Inc.	2008	REAP	$ 49,830	$ 49,830			$ 199,321
MN	Oak Creek Pellets	2008	REAP	$ 50,000				$ 200,000
GA	Plant Carl	2008	RUS	$ 28,000,000				$ 28,000,000
NH	Pleasant View Gardens	2008	REAP	$ 499,662	$ 499,663			$ 1,998,650
GA	Rampey, Wallace Brandon	2008	REAP	$ 115,000				$ 460,000
WI	ST Paper, LLC	2008	REAP	$ 500,000				$ 3,950,000
VT	Steen, Burton	2008	REAP	$ 40,268	$ 40,268			$ 161,073
	Subtotal			$ 29,863,370	$ 1,439,761	$ 1,775,000	$ 250,000	$ 41,168,940
	Total			**$ 35,845,145**	**$ 103,112,211**	**$ 2,515,000**	**$ 1,220,000**	**$ 602,741,779**

Appendix E - Rural Development – Wood to Energy Projects (cont'd)

State	Project Name	Projected Jobs Created/Saved	Actual Jobs Created/Saved	Projected Energy Produced (Mbtu)	Actual Energy Saved or Generated (Mbtu)	Description (type of feedstock)
ID	Alpine Cedar, Inc.	13	14	274.7		Woody Biomass Boiler
OH	American Wood Fibers	32		884,000.0		Pelletizer Using Wood Residue
TN	Carlisle, Mark D.	25		700,000.0		Wood Residue (shavings)
SC	Champion Wood Pellets, LLC	7		19,200.0		Saw mill waste & mill residue
MN	Cherry Greenhouse	0		1.0		Wood Waste (Forest Trimmings)
GA	Energy Chips Inc	2		292.4		Forest Thinnings and Cuttings
AL	H. E. Browder Veneer Company, Inc.	81		55,214.0		Wood Barks and Chips
OR	Heesacker, Steven	2		0.9		Hazel Nut Shells & tree thinnings/slash
MI	Kirtland Products, LLC	25		820,000.0		Wood Waste to Wood Pellets
AR	Leavell, Brent	2		776.0		Wood Pellets
MI	Mid-Michigan Logging Co.	10	8	561,660.0		Hardwood to Wood Chips
AR	Nichols, Harold L	2		871.0		Pecan Shells
MI	P.W.G.G., LLC	10		350,000.0		Wood Waste to Wood Pellets
GA	Payne Brothers Logging	2		526,500.0		Forest Thinnings and Cuttings
GA	Plantation Creation	1		0.0		Forest Thinnings and Cuttings
TN	Quint C Pallet	5	2	4.1		Wood Residue (shavings)
FL	Register's Enterprises of Bay County	16		29.8		Non-marketable, diseased, fire-damaged trees
AL	Rocky Creek Lumber Company	115		335,537.36		Wood Barks
GA	Scofield Timber Company, Inc.	2		224.9		Forest Thinnings and Cuttings
GA	Shepherd Brothers Timber Company, LLC	1		290.0		Forest Thinnings and Cuttings
TN	Shoun Lumber, LLC	5		6.5		Wood Residue (shavings)
VT	VT Wood Pellet	14	28	164,000.0		Wood Pellets
OH	Webb Perennials LLC	1		573.0		Boiler Using Cordwood
MO	White River Valley Electric Coop (U.R.: Gainesvil	104		8,760.0		Wood
VA	Wood Fuels of Virginia, LLC	19	72	853,200.0		Wood Residue from Sawmill Operations
	Subtotal	496	124	5,281,416	$ -	

State	Project Name	Projected Jobs Created/Saved	Actual Jobs Created/Saved	Projected Energy Produced (Mbtu)	Actual Energy Saved or Generated (Mbtu)	Description (type of feedstock)
SC	American Capital Resources Company			1,433.0		Logging, timber, & tree trimmings
MN	Bergren Farms	1		3,743.8		Wood Waste (Forest Trimmings)
IA	B & D MEYER INC	0	1	604	604	THERMAL CONVERSION
OH	CORAM FLORA COMPANY	650	1,814	620	671,670	THERMAL CONVERSION: wood chips
OH	CORAM FLORA COMPANY	0	0			THERMAL CONVERSION: wood chips
WV	Caperton FurnitureWorks, LLC	100		20.0		Wood Waste
ID	Coeur d'Alene Fiber Fuels	0		1,162.7		Biofuel Payment
PA	Davin, John K. [Forever Greene House]	2		4.1		Green Wood
PA	Energex American, Inc.	51	48	175,218.0	24,035.0	Green Wood
MN	JES Wood Products	1	2	128,060.7	1,410.0	Wood Waste-forest trimmings/saw mill waste
ME	Maine Woods Pellet Company, LLC	17	17	1,797.0		Wood Chips
NC	Metrolina Greenhouses, Inc	780		319,302.0		Wood Chips
IL	Mid American Growers, Inc.	0	50	64.1	137.0	Wood Chips for Biomass Boiler
VT	Morse Farm & Sugarhouse	6	6	426.6	495.3	Wood Chips
ID	QB Corporation, dba Lemhi Valley Pellet	45	2	37,958.2		Wood Shavings (using a wood pellet mill)
GA	Range Fuels	20		13,000,000.0		Wood Waste
MN	Root River Hardwoods	0	1	792.8	782.6	Sawmill waste
VA	Unaka Forest Products, LLC	45	43	5,702.3	168,706.3	Wood Waste
WI	Utility Buildings Corp.	0	1	246.9	246.0	Wood Waste
OH	Webb Perennials LLC	1	1	382.0	600.0	Boiler; Cordwood
MI	Wood Pecker Pellets, Inc.	4	4	48,600.0		Wood Waste to Wood Pellets
	Subtotal	1,723	1,990	$ 13,726,139	$ 868,686	

State	Project Name	Projected Jobs Created/Saved	Actual Jobs Created/Saved	Projected Energy Produced (Mbtu)	Actual Energy Saved or Generated (Mbtu)	Description (type of feedstock)
ID	Boise County	3				R&D forest feedtocks feasibility study - CoGen
MI	COUNTRY MILL FARMS, LLC	15	0	470	356	THERMAL CONVERSION
PA	Elk Regional Health System-Biomass Boiler	450				Wood Residue
CT	Grower Direct Farms	42		81,830.0	138,574.0	Wood Chips
ID	Lemhi County Economic Dev.	25				Biomass Utilization Study
VT	Limlaw Pulpwood, Inc.	20	20	1.0	4.0	Wood Waste
MN	Oak Creek Pellets	2		65.6		Sawdust
GA	Plant Carl	15		68,240.0		Forest Thinnings, poultry litter, C&D debris
NH	Pleasant View Gardens	150	2	8.7	2.9	Wood Barks and Chips
GA	Rampey, Wallace Brandon	1		0.1		Forest Trimmings, Waste Wood
WI	ST Paper, LLC	0	1		245.1	Wood Bioler
VT	Steen, Burton	2		41.5	664.3	Wood Chips
	Subtotal	725	23	$ 150,657	$ 139,847	
	Total	**2,944**	**2,137**	**19,158,211.5**	**1,008,533.0**	

Appendix E - Rural Development – Wood to Energy Projects (cont'd)

State	Project Name	Rural Develop. Local Contact	Forest Service Local Contact	Current Project Status	TOA	NAICS Code	Type of Funding
ID	Alpine Cedar, Inc.	Brian Buch	N/A	Active	613	321999	REAP grant
OH	American Wood Fibers	Randel Monhemius		Active	510	321999	REAP Combo Ln Gt/Grant
TN	Carlisle, Mark D.	Jimmy Allen	Unknown	Active	510	321999	REAP Combo Ln Gt/Grant
SC	Champion Wood Pellets, LLC	Shannon R. Legree		Active	360/510	321999	REAP Combo Ln Gt/Grant
MN	Cherry Greenhouse	Lisa Noty	NA	Active	614	111422	REAP Grant
GA	Energy Chips Inc	Craig Scroggs	Nathan McClure	Active	508	321999	REAP Grant
AL	H. E. Browder Veneer Company, Inc.	Quinton Harris		In Construction	508	321211	REAP Grant
OR	Heesacker, Steven	Don Hollis 541-278-8049, x129		Active	614	112111	REAP Grant
MI	Kirtland Products, LLC	Alan Anderson		In Construction	076	321999	B&I Guaranteed Loan
AR	Leavell, Brent	Laura Tucker	N/A	Active	614	112320	REAP Grant
MI	Mid-Michigan Logging Co.	Alan Anderson		Active	358	113310	REAP Grant
AR	Nichols, Harold L	Laura Tucker	N/A	Active	614	112320	REAP Grant
MI	P.W.G.G., LLC	Jackie Morgan		In Construction	076	321999	B&I Guaranteed Loan
GA	Payne Brothers Logging	Craig Scroggs	Nathan McClure	Active	508	113310	REAP Grant
GA	Plantation Creation	Craig Scroggs	Nathan McClure	Active	358	321999	REAP Grant
TN	Quint C Pallet	Bob Small	Unknown	Active	508	321113	REAP Grant
FL	Register's Enterprises of Bay County	Joe Fritz, Area Director		Active	358	113310	REAP Grant
AL	Rocky Creek Lumber Company	Quinton Harris		In Construction	358	321211	REAP Grant
GA	Scofield Timber Company, Inc.	Craig Scroggs	Nathan McClure	Active	508	113110	REAP Grant
GA	Shepherd Brothers Timber Company, LLC	Craig Scroggs	Nathan McClure	Active	508	321999	REAP Grant
TN	Shoun Lumber, LLC	Bob Small	Unknown	Active	612	321113	REAP Grant
VT	VT Wood Pellet	Cheryl Ducharme	N/A	Active	360	321999	REAP Combo Ln Gt/Grant
OH	Webb Perennials LLC	Randel Monhemius		In Construction	614	111422	REAP Grant
MO	White River Valley Electric Coop (U.R.: Gainesvil	Matt Moore		In Construction	227/229	611110	REDLG loan $740,000 grant $300,000
VA	Wood Fuels of Virginia, LLC	Laurette Tucker		Active	358/508	321113	REAP Grant

State	Project Name	Rural Develop. Local Contact	Forest Service Local Contact	Current Project Status	TOA	NAICS Code	Type of Funding
SC	American Capital Resources Company	Shannon R. Legree		In Construction	508	111421	REAP Grant
MN	Bergren Farms	Lisa Noty	NA	Active	508	111140	REAP Grant
IA	B & D MEYER INC			Active	508	111150	REAP grant
OH	CORAM FLORA COMPANY			Active	76	111420	B&I Guarantee
OH	CORAM FLORA COMPANY			Active	509	111420	REAP Guarantee
WV	Caperton FurnitureWorks, LLC	Richard Satterfield		Active	510/141	337122	REAP Combo Ln Gt/Grant / B&I Gt Loan
ID	Coeur d'Alene Fiber Fuels	Brian Buch	N/A	Active	N/A	321999	Advanced Biofuel Payment Program
PA	Davin, John K. [Forever Greene House]	Todd Colley	Lew McCreery	Active	511	111419	REAP Grant
PA	Energex American, Inc.	Bernard Linn	Lew McCreery	Active	508	321999	REAP Grant
MN	JES Wood Products	Lisa Noty	NA	Active	508	321130	REAP Grant
ME	Maine Woods Pellet Company, LLC			Active	358	321999	REAP Grant
NC	Metrolina Greenhouses, Inc	David Thigpen, NC S/O 919-873-2065	??	Active	510	114210	REAP Combo Ln Gt/Grant
IL	Mid American Growers, Inc.	Molly Hammond		Active	510	111422	REAP Combo Ln Gt/Grant
VT	Morse Farm & Sugarhouse	Cheryl Ducharme	N/A	Active	511	452990	REAP Grant
ID	QB Corporation, dba Lemhi Valley Pellet	Brian Buch	N/A	Active	508	321219	REAP RES Grant
GA	Range Fuels	Craig Scroggs	Nathan McClure	Shutdown; seeking more $	496	325193	9003 Guaranteed Loan
MN	Root River Hardwoods	Lisa Noty	NA	Active	358	113310	REAP Grant
VA	Unaka Forest Products, LLC	Laurette Tucker		Active	510	321920	REAP Combo Ln Gt/Grant
WI	Utility Buildings Corp.	Brenda Heinen		Active	508	236200	REAP Grant
OH	Webb Perennials LLC	Randel Monhemius		Active	508	111422	REAP Grant
MI	Wood Pecker Pellets, Inc.	Rick Vanderbeek		Not built; may withdraw	508	321999	REAP Grant

State	Project Name	Rural Develop. Local Contact	Forest Service Local Contact	Current Project Status	TOA	NAICS Code	Type of Funding
ID	Boise County	Brian Buch	N/A	Active	081	926110	RBEG
MI	COUNTRY MILL FARMS, LLC			Active	358	111331	REAP grant
PA	Elk Regional Health System-Biomass Boiler	Robert Schoenfeldt	Lew McCreery	Active	075	321999	CF Direct Loan
CT	Grower Direct Farms	Chuck Dubuc		Active	360	11142	REAP Combo
ID	Lemhi County Economic Dev.	Brian Buch	N/A	Active	159	926110	RBOG
VT	Limlaw Pulpwood, Inc.	Cheryl Ducharme	N/A	Active	360	113310	REAP Combo Gt Ln/Grant
MN	Oak Creek Pellets	Lisa Noty	NA	Unsure	358	321999	REAP Grant
GA	Plant Carl	Craig Scroggs	Nathan McClure	In Construction		221119	RUS
NH	Pleasant View Gardens	Steven Epstein	N/A	Active	360	111421	REAP Combo Gt Ln/Grant
GA	Rampey, Wallace Brandon	Craig Scroggs	Nathan McClure	Active	358	321999	REAP Grant
WI	ST Paper, LLC	Brenda Heinen		Active	358	322110	REAP Grant
VT	Steen, Burton	Cheryl Ducharme	N/A	Active	360	531120	REAP Combo Gt Ln/Grant

References

Birch, T.W. 1996a. Private forest-land owners of the United States, 1994. Resource Bulletin NE-134. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 183 p.

Birch, T.W.; Lewis, D.G.; Kaiser, H.F. 1982. The private forest-land owners of the United States. Resource Bulletin WO-1. Washington, DC: U.S. Department of Agriculture, Forest Service. 64 p.

Brown, T.C.; Hobbins, M.T.; Ramirez, J.A. 2005. The source of water supply in the United States. RMRS-RWU-4851 Discussion Paper. 57 p. Unpublished report. On file with: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO 80526.

Butler, B.J. 2008. Family forest owners of the United States, 2006. Gen. Tech. Rep. NRS-27. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 72 p.

Blyth, James E.; Smith, W. Brad. 1980. Minnesota logging utilization factors, 1975-1976 development, use, implications. Res. Bul. NC-48. St. Paul, MN: U.S. Department of Agriculture Forest Service, North Central Forest Experiment Station; 1980. 8 p.

Johnson, T.G., ed. 2001. United States timber industry—an assessment of timber product output and use, 1996. Gen. Tech. Rep. SRS–45. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 145 p.

Morgan, T.A.; Spoelma, T.P.; Keegan, C.E. et al. 2005. Montana logging utilization, 2002. Res. Pap. RMRS-52. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 12 p.

O'Neill, K.P.; Amacher, M.C.; Perry, C.H. 2005. Soils as an indicator of forest health: a guide to the collection, analysis, and interpretation of soil indicator data in the forest inventory and analysis program. Gen. Tech. Rep. NC-258. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 53 p.

Powell, Douglas S.; Faulkner, Joanne L.; Darr, David R.; Zhu, Zhilang; MacCleery, Douglas W. 1994. Forest Resources of the United States, 1992. Gen. Tech. Rep. RM-234. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 132 p.

Rudis, V.A. 2003. Comprehensive regional resource assessments and multipurpose uses of forest inventory and analysis data, 1976 to 2001: a review. Gen. Tech. Rep. SRS-70. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 129 p.

Schomaker, M.E.; Zarnoch, S.J.; Bechtold, W.A.; et al. 2007. Crown condition classification: a guide to data collection and analysis. Gen. Tech. Rep. SRS-102. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 78 p.

Schulz, B.K.; Bechtold, W.A.; Zarnoch, S.J. 2009. Sampling and estimation procedures for the vegetation diversity and structure indicator. Gen. Tech. Rep. PNW-GTR-781. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 53 p.

Smith, W. Brad; Vissage, John L.; Sheffield, Raymond S.; Darr, David R.. 2001. Forest Resources of the United States, 1997. Gen. Tech. Rep. GTR-NC-234. St. Paul, MN: USDA Forest Service North Central Research Station. 191p.

Smith, W. Brad; Vissage, Miles, Patrick L.; Vissage John S.; Pugh, Scott A.. 2004. Forest Resources of the United States, 2002. Gen. Tech. Rep GTR-NC-241. St. Paul, MN: USDA Forest Service North Central Research Station. 140p.

Smith, W.B.; Miles, P.D.; Vissage, J.S.; Pugh, S.A. 2004. Forest resources of the United States, 2002. Gen. Tech. Rep. NC-241. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 137 p. http://www.ncrs.fs.fed.us/pubs/gtr/gtr_nc241.pdf. (17 February 2009).

Smith, W.B.; Miles, P.D.; Perry, C.H.; Pugh, S.A. 2009. Forest Resources of the United States, 2007. Gen. Tech. Rep. WO-GTR-78. Washington, DC: U.S. Department of Agriculture, Forest Service. 336 p.

Stein, S.M., Carr, M.A., McRoberts, R.E., Mahal, L.G., Comas, S.J. 2010. Threats to at-risk species in America's private forests. U.S. Department of Agriculture, Forest Service, Northern Research Station, Gen. Tech. Rpt NRS-73. 20p.

Stolte, K; Conkling, B.; Campbell, S.; Gillespie, A. 2002. Forest Health Indicators. FS-746. Washington, DC: USDA Forest Service. 24 p.

U.S. Environmental Protection Agency (EPA). 2010. 2010 U.S. greenhouse gas inventory report: landuse, land-use change, and forestry. (http://www.grida.no/publications/other/ipcc_sr/?src=/climate/ipcc/land_use/index.htm). [accessed May 2011]

U.S. Department of Agriculture, Forest Service. 1958. Timber resource for America's future. For. Resour. Rep. 14. Washington, DC: U.S. Department of Agriculture, Forest Service. 713 p.

U.S. Department of Agriculture, Forest Service. 1965. Timber trends in the United States. For. Resour. Rep. 17. Washington, DC: U.S. Department of Agriculture, Forest Service. 235 p.

U.S. Department of Agriculture, Forest Service. 1982. Analysis of the timber situation in the United States, 1952-2030. For. Resour. Rep. 23. Washington, DC: U.S. Department of Agriculture, Forest Service. 499 p.

USDA Forest Service. 1973. The outlook for timber in the United States. Res. Rep. No. 20. Washington, DC: U.S. Department of Agriculture, Forest Service. 367 p.

Will-Wolf, S. 2010. Analyzing lichen indicator data in the forest inventory and analysis program. Gen. Tech. Rep. PNW-GTR-818. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 62 p.

Will-Wolf, S.; Jovan, S. 2008. Lichens, ozone, and forest health—exploring cross-indicator analyses with FIA data. In: McWilliams, W.; Moisen, G.; Czaplewski, R. 2008 Forest Inventory and Analysis (FIA) symposium. October 21–23, 2008. Park City, UT. Proc. RMRS-P-56CD. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Woodall, C.W.; Monleon, V.J. 2008. Sampling protocols, estimation procedures, and analytical guidelines for down woody materials indicator of the Forest Inventory and Analysis program. Gen. Tech. Rep. 22. U.S. Department of Agriculture, Forest Service, Northern Research Station. 68 p.

Waddell, Karen L.; Oswald, Daniel D.; Powell, Douglas S. 1989. Forest statistics of the United States, 1987. Resour. Bull. PNW-168. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 106 p.

.