



North Carolina Forest Action Plan

5-Year Review

Updated November 20, 2015



Contents

Document Overview.....	3
NCFAP Implementation Highlights (2010 – 2015)	4
A. <i>Conserve and Manage Working Forest Landscapes for Multiple Values and Uses</i>	4
Associated NCFAP Goal 1: Increase the sustainable management and conservation of forests	4
Associated NCFAP Goal 4. Maintain or increase the viability and sustainability of existing and emerging markets.....	6
Associated NCFAP Goal 5. Increase and enhance forest fish and wildlife habitat.....	7
B. <i>Protect Forests from Threats</i>	8
Associated NCFAP Goal 2. Reduce negative impacts from forest threats.....	8
Associated NCFAP Goal 3. Increase the restoration, maintenance, and management of fire-adapted species and ecosystems.....	11
C. <i>Enhance Public Benefits from Trees and Forests</i>	16
Associated NCFAP Goal 6. Manage, conserve, restore, and enhance forestlands important to current and future supplies of clean water for economic, social, and ecological uses	16
Associated NCFAP Goal 7. Enhance the benefits and sustainable management of urban forests.....	17
Summary.....	20

Document Overview

The 2008 Farm Bill amended the Cooperative Forestry Assistance Act of 1978 to include the requirement that each state develop a long-term, state-wide assessment and strategies for forest resources. North Carolina developed this Plan through the partnership of comprehensive teams of stakeholders. Cross-boundary, landscape scale actions were identified to address issues of concern as well as opportunities. This effort took into account the following three national priorities:

- *Conserve and Manage Working Forest Landscapes for Multiple Values and Uses*
- *Protect Forests from Threats*
- *Enhance Public Benefits from Trees and Forests*

There were seven Goals and 25 Objectives identified in the June, 2010 North Carolina Forest Action Plan (NCFAP). This document highlights each of these Goals and Objectives' close association with the three national priorities.

Based on direction from the Farm Bill and the U.S. Department of Agriculture, State Foresters are required to review the status of their Forest Action Plan five years following its completion. They must also update the plans at least every ten years (if not updated sooner based on state needs).

In order to meet these requirements, Forest Action Plan-related review information must be submitted to the U.S. Forest Service by November 20, 2015. This document contains the following NCFAP implementation highlights that have been identified since 2010:

1. Successes
2. Challenges
3. New issues
4. Data needs
5. Future focus (2015 – 2020)

Informal “check-ins” with North Carolina stakeholders regarding NCFAP implementation, as well as coordination with U.S. Forest Service Region 8 staff, will also be conducted to complement this review effort.

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NCFAP Implementation Highlights (2010 – 2015)

A. Conserve and Manage Working Forest Landscapes for Multiple Values and Uses

Desired Outcomes:

- reducing the rate of conversion of forested landscapes to other uses; and
- informing decisions about which landscapes should be conserved as working forests to optimize public benefits for current and future generations.

Key strategies:

- forest products, woody biomass, and environmental services market development;
- tax policies, conservation easements, and county planning tools; and
- facilitating other social and economic incentives to encourage retention of important forested landscapes.

Associated NCFAP Goal 1: Increase the sustainable management and conservation of forests

Successes:

- Sustaining Forestland acres according to FIA data with no net loss. Recent FIA data revealed that the state's forest are growing more wood volume each year than is being harvested or lost due to mortality or conversion to non-forest uses.
- Ability to maintain a strong nursery and tree improvement program within the southeast region when other states have closed nurseries or programs.
- Establishment of a second generation improved shortleaf pine seed orchard in cooperation with U.S. Forest Service (USFS) from progeny tests planted and measured on N.C. National Forests.
- Positive trend in increased Longleaf pine restoration and conservation accomplishments, particularly seed collection efforts in 2014.
- Agency participation efforts to help develop a web based decision support system for shortleaf pine in cooperation with Southern Regional Forestry Extension.
- The number and diversity of existing conservation partnerships in high conservation and priority landscapes.
- New pilot programs and partnership such as the FORCES military partnership; the NRCS-funded Farm Bill Field Coordinator position; Tar River Tobacco Trust Fund grant; and the Sustainable Forestry and African American Land Retention project.

Challenges:

- In 2014, the N.C. Legislature mandated that N.C. Forest Service (NCFS) generate revenue by charging fees for woodland plan preparation services. After one year of implementation the results indicate that FM plans have been reduced
- Availability of adequate cost-share funding for both state (ex. Forest Development Program, or FDP) and federal (ex. Environmental Quality Incentives Program, or EQIP) forestry programs. Each year the FDP cost-share program has a waiting list of 500-600 fully-qualified landowners requesting \$2-2.5 million dollars of additional funding.

- Substantial increased in NCFS staff time spent on USFS grant administration and reporting requirements.
- Elimination of the Conservation Tax Credit for donated conservation easements in North Carolina.
- Increased forest fragmentation in counties that are experiencing rapid urban development, particularly in several Piedmont and Coastal counties.

New Issues:

- Emerging rate of Threatened and Endangered species listing and potential new regulations or limitations of forest management activities on private lands.
- Emerging non-native invasive (NNI) pest threats such as emerald ash borer, laurel wilt, and thousand cankers disease. The NCFS’ “Where are They Now” online map tracks these threats: http://ncforests.service.gov/forest_health/pdf/Map_Invasives_NCTracking.pdf
- Waters of the US (WOTUS) rules and implications.
- Environmental concerns of environmental groups regarding Pellets for fuel and Bioenergy.

Data Needs:

- Continued and increased funding of the Forest Inventory & Analysis (FIA) Program to support timely data collection and reporting on North Carolina forests.
- Review and update North Carolina’s priority maps for forest conservation and working lands.
- Finalization of an online enterprise system for forest management accomplishment recordkeeping and spatial reporting.
- Increased funding for new technology tools for field data collection such as tablets.

Future Focus (2015 – 2020):

- Increased landowner engagement efforts with focused outreach and marketing to new and existing landowners using techniques learned from Tools for Engaging Landowners Effectively (TELE) workshop that was held in July 2015.
- Strategic leveraging of program funds to assist and support other partner programs.
- Continued focus on priority area initiatives related to longleaf, shortleaf, and military partnership (ex. FORCES).
- Promoting increased use of prescribed burning for restoration, wildlife habitat, fire dependent species, and fuel mitigation.
- Monitoring and adapting to threatened and endangered species listings and requirements.

Associated NCFAP Goal 4. Maintain or increase the viability and sustainability of existing and emerging markets

Successes:

- N.C. State University – Extension Forestry formed a “Fiber Analytics” group to conduct custom timber supply assessments for both existing and new industry. These assessments are especially useful to assist in the site selection process for new investment in North Carolina.
- Establishment of the N.C. Urban Wood Group to increase utilization of forest products sourced from urban regions across the state. Several meetings have been held over the last 5 years and involvement has included local, state, and federal stakeholders.
- In the last 5 years, two wood pellet manufacturing facilities have opened in the Northern Coastal Plain and two more facilities are expected to open in 2016 in the Southern Coastal Plain region of the state. Forest landowners have benefited from the subsequent strengthening of forest markets and increases in pulpwood stumpage prices.

Challenges:

- Sawtimber prices are heavily influenced by export markets. International markets tend to be more volatile than domestic markets, especially considering the strong U.S. dollar and current economic climate in China.
- Forestland conversion and fragmentation, as well as climate adaptation issues, will continue to make forest management and sustainability efforts more challenging for natural resource professionals.
- Increasing pressure from environmentally-centered NGOs (both domestic and European Union-based) has been a big challenge for the utility-scale wood pellet industry. Shovel logging and other bottomland hardwood timber harvesting systems will be heavily scrutinized for the foreseeable future.

New Issues:

- Competition for wood fiber will intensify between traditional and emerging industry.
- Forestland conversion, including wind and solar energy sources.
- Climate adaptation efforts and promotion of ecosystem services for forest landowners.
- Demand for certified wood will only intensify due to societal pressures and preferential treatment for “green” building initiatives.

Data Needs:

- FIA and Timber Product Output (TPO) data is frequently used by existing and emerging industry to assist in business investment and/or expansion decisions. Funding for these two programs is critical to ensure accurate and timely data is available for multi-million dollar decision making efforts.
- A stumpage price forecasting tool for forest landowners would be very useful to help drive timber harvesting decisions.
- A cost/benefit analysis for certified wood and the chain of custody process could help determine if the return-on-investment potential justifies the expense, especially in the absence of a price premium for wood supply stakeholders.

Future Focus (2015 – 2020):

- Continue to explore emerging markets and innovative forest products, such as cross laminated timber.
- Explore the possibility of forming a marketing and economic development branch or division with dedicated personnel and budget.
- Enhance content available online for forest landowners, economic development officials, industry leaders, trade associations, educators, media, etc.

Associated NCFAP Goal 5. Increase and enhance forest fish and wildlife habitat

Successes:

- North Carolina has a strong Forest Legacy Program, as shown in the past five years by the acquisition of six properties totaling an additional 3,585 acres.
- Another Forest Legacy project (Headwaters Phase 3), submitted in 2014 for the FY 2016, has been funded and will close this year. Management of this property will serve as a model for multi-use natural resource management, blending sustainable forestry, wildlife conservation, habitat management, and restoration with educational and recreational opportunities. The Forest Legacy Headwaters project will preserve more than 60 miles of streams classified as High Quality Waters.
- In 2014, the N.C. Legislature mandated that N.C. Forest Service generate revenue by charging fees for woodland plan preparation services. After one year of implementation the results indicate that Forest Stewardship plans have not been reduced and landowners may opt to have a Forest Stewardship plan rather than a Forest Management plan for their woodland.
- Multi-organizational partnerships continue to result in broader and more effective forestry outreach.

Challenges:

- Selling the Forest Stewardship Program to have more of the plans written as a higher desired plan over a Forest Management plan is a challenge to the plan writers and some landowners.
- Changing Federal requirements of the Forest Stewardship Program can be a challenge to field personnel and management plan writers who are trying to implement the program in a timely manner.
- Identifying “landscape level” objectives, as well as the associated on-the-ground efforts needed to meet them.

New Issues:

- Threatened and endangered species updates and identifying their presence on the ground is an emerging issue due to cutbacks in services from the N.C. Natural Heritage Program (NCNHP).
- Repeated federal funding cuts to the Forest Stewardship Program have resulted in real challenges to the program’s resources and viability.
- Spatial data collection and storage is constantly changing and there are training needs for field personnel to learn reporting procedures.

Data Needs:

- Develop standardized outreach and educational tracking so data is not pulled from different sources for federal end-of-year reports.
- Develop a standardized template of a Forest Stewardship Plan so plan writers can plug in field data and simplify the plan-writing process.

Future Focus (2015 – 2020):

- Continue to build on the success of the Forest Stewardship Program and assist landowners who are positively affected to help “tell the story” of successful Forest Stewardship.
- Recognition of landowners who implement their Forest Stewardship plan by County, District and Region.
- Recognition of agency and non-agency partners to enhance Forest Stewardship Program awareness.
- Continue to find sources of funding and assistance from non-agency partners to assist landowners to obtain a Forest Stewardship Plan.

B. *Protect Forests from Threats*

Desired Outcomes:

Actions under this theme are directed at reducing threats to and restoring forest health and productivity associated with:

- uncharacteristic wildfire;
- insects and disease; and
- invasive species.

Key strategies:

- restoration of fire adapted forests;
- monitoring, assessment, and treatment of forest insect and disease pathogens; and
- prevention, early detection, and rapid response to eradicate or control invasive species.

Associated NCFAP Goal 2. Reduce negative impacts from forest threats

Successes:

- Since 2010 approximately \$17 million in equipment has been donated to rural fire departments by the NCFS through the Department of Defense to increase capability to those departments.
- 1,670 Community Wildfire Protection Plans have been completed across the state.
- 35,277 acres of Hazard Reduction burning and 587 acres of fuel modification work have been accomplished under the Community Protection Program.
- The N.C. Division of Parks and Recreation has increased its focus on active management of fire-adapted species and ecosystems within state parks and natural areas, a shift from its former preservation-oriented management philosophy. Since 2010, the agency has established new positions focusing on prescribed burning and conservation ecology, a fire management team, and developed a Prescribed Fire Program (<http://www.ncparks.gov/sites/default/files/ncparks/37/natural-resources-prescribed-fire-program.pdf>) and Fire Management Guidelines (<http://www.ncparks.gov/sites/default/files/ncparks/37/natural-resources-fire-2014.pdf>).

The following summarizes the NC Division of Parks and Recreation prescribed burning accomplishments:

○ Year	Acres	Acres burned at Carolina Beach (with flytraps)
○ 2010	1752	53
○ 2011	487	0
○ 2012	3086	53
○ 2013	1539	143
○ 2014	3852	130
○ 2015	4341	149

- Since 2010, NCFS has trained 6,179 fire department members in wildland fire suppression tactics.
- Through partnerships with N.C. Department of Agriculture and Consumer Services Plant Industries Division, N.C. State University, NCFS has stayed on the leading edge in monitoring and early detection of non-native invasive pests threatening state forest resources. Such pests include laurel wilt (first detected 2011), thousand cankers disease (2012), emerald ash borer (2013) and cogongrass (2012).
- North Carolina has increased its nationally-recognized Firewise communities to 27, representing all geographic regions of the state. Details, including the updated location of these participating communities, can be found at: <http://www.ncfirewise.org/index.htm>
- “Forest Health Invasive Pest Maps” designed to track and monitor specific non-native invasive pests can now be found at: http://ncforestservice.gov/forest_health/fh_maps.htm

- Held seven landowner workshops focused on non-native invasive species identification and control. Each workshop was attended by over two hundred participants, and follow-up was conducted to provide them with additional NNI-related materials.
- The NCFS and the State Climate Office of North Carolina collaborated to create and roll out the Fire Weather Intelligence Portal (<http://climate.ncsu.edu/fwip/>). It is designed to be a comprehensive monitoring tool for past, current and forecast weather and fire risk conditions. This portal brings together a number of point-based and gridded data resources, including weather data from the ECONet stations operated by the State Climate Office of North Carolina and calculated National Fire Danger Rating System (NFDRS) data for stations across the state.
- Emphasis on use of local firewood by Great Smokey Mountains National Park, State Parks, NCFS, etc. Standards for certified firewood have been established.
- Gypsy Moth “Slow the Spread” efforts have continued to be successful, limiting the advance of the pest at the North Carolina – Virginia state line.
- Establishment of a program manager to lead North Carolina’s Hemlock Restoration Initiative (<http://savehemlocksnc.org/>).
- Since 2010, outreach and awareness of cogongrass has led to the detection of three small (spot) infestations in the state. All three were quickly controlled/eradicated and delimiting surveys confirmed no additional spots near infested areas.
- Numerous new publications, websites, blogs, news releases and interviews, workshops, trainings, presentations, and other outreach opportunities were conducted by NCFS and allied agencies to heighten awareness of non-native invasive pests threatening state, especially pests that are easily transported in untreated firewood.

Challenges:

- Maintaining the level of firefighter experience across the state to meet the need in critical positions, specifically for maintaining fully-qualified Type 2 Incident Management Teams (IMTs) and aviation overhead.
- Inadequate funding for replacement of aging firefighting equipment and for ongoing maintenance of aviation assets.
- Ensuring effective fire suppression response while simultaneously complying with the intent of national firefighter safety recommendations.
- Low capacity related to private burn contractors. Impediments relating to the development of additional burn contractors include insurance limitations, liability, smoke management challenges, etc.
- Continued limits on USFS-administered forest practices (ex. thinning, harvesting, fuels mitigation) conducted on National Forests.
- Discovery of emerald ash borer in numerous North Carolina counties, which resulted in a statewide quarantine (<http://www.ncagr.gov/plantindustry/Plant/entomology/EABFAQ.htm>) by NCDA&CS Plant Industry Division.
- Detecting non-native & invasive species early, particularly given the large amount of foreign material arriving via North Carolina’s two port facilities.
- Inadequate funding to leverage new technologies related to fire detection and suppression.
- With introduction of new pests into the state, NCFS Forest Health staff have to balance traditional forest health activities and services with increasing demands of keeping up with new threats.

- Research and extension related to new threats to forest health in North Carolina is lacking.
- Control and management options for critical threats such as emerald ash borer and laurel wilt in forest stand settings are currently not available.

New Issues:

- Invasive species are more quickly changing the forest landscape. The spread of these pests can and will change the fire environment.
- Increasing use of unmanned aerial vehicles (UAVs). This relates to both the conflicts with such devices as well as the potential benefits of their use.
- Preparing for forest resiliency as it relates to evolving climate-related predictions. Examples include severity and increased length of fire seasons; increasing drought potential; rising sea levels and saltwater intrusion.

Data Needs:

- Cost of fire suppression (personnel and equipment) vs. the values saved.
- Improved understanding of climate-related impacts, as well as forest management practices that can best mitigate those effects.
- Continued evaluation of smoke modeling accuracy, and improvements to the tools available for resource managers.
- Little is known about lifecycles, habits, and specific threats/control options for emerald ash borers in North Carolina. This insect has been studied extensively in the Northeast and Midwest, but research and recommendations specific to the south are needed.
- Very little is known about lifecycles, habits, and specific threats/control options for redbay ambrosia beetles and their symbiotic fungus in North Carolina. Most of current research on this insect/disease complex has been done in Florida and Georgia, but much less is known about this threat as the insect moves north.

Future Focus (2015 – 2020):

- Increase training opportunities for NCFS firefighters to gain experience and progress through position task books.
- Increased leveraging of state and local Emergency Management assets and expertise.
- Increase the use and application of new technology (ex. UAVs, satellite imagery, infrared, GPS firespread modeling).
- Improving partnerships related to forest health and detection/control of invasive species. Increase forest community awareness related to identification, biology, and control.
- Develop management options for landowners currently or imminently impacted by non-native invasive pest threats.
- Continuing to assess and adjust N.C. Inter-Agency Annual Operating Plan in order to fully utilize all suppression resources across jurisdictional boundaries.
- Identify opportunities and conduct largescale prescribed burns cooperatively across jurisdictional boundaries.
- Continue to work with partners in order to increase prescribed burning capacity.

Associated NCFAP Goal 3. Increase the restoration, maintenance, and management of fire-adapted species and ecosystems

Successes:

- The NCFS' Bladen Lakes State Forest (BLSF), which is one of the Longleaf Restoration Initiative's "Significant Geographic Areas", has significantly increased its total longleaf habitat to 8,226 acres. This is a result of focused emphasis on longleaf planting and improvement practices. On a related note, BLSF has five known areas with more than 100 Red Cockaded Woodpecker (RCW) cavity trees.
- Inspired by the launch of the America's Longleaf Restoration Initiative and the release of the Range-Wide Conservation Plan for Longleaf Pine, the North Carolina Longleaf Coalition (<http://nclongleaf.org/>) was formed in 2010. The mission of the North Carolina Longleaf Coalition is to promote the maintenance and restoration of North Carolina's longleaf pine ecosystem, including its cultural and economic values, by forming a collaborative network of diverse stakeholders to provide strategic leadership across the historic range while also supporting local restoration activities. The Coalition serves as the State Implementation Team (<http://www.americaslongleaf.org/implementation/implementation-teams/>) for the Range-Wide plan to collaborate and coordinate longleaf activities with North Carolina's three Local Implementation Teams: the North Carolina Sandhills Conservation Partnership (<http://www.ncscp.org/>); the Onslow Bight Conservation Forum (<http://cooperativeconservation.org/viewproject.asp?pid=727>); and the Cape Fear Arch Conservation Collaboration (<http://capefeararch.org/>).
- The N.C. Forest Service was the recipient of \$1,742,000 in funding under the American Recovery and Reinvestment Act (ARRA) to implement a comprehensive Longleaf Pine Restoration Initiative that was completed in 2012. Notable accomplishments include:
 - 5,183 acres of longleaf pine either established (930 acres) or improved (4,253 acres) at Bladen Lakes State Forest. Improvements included prescribed burning, mid-story reduction and invasive species removal.
 - 5,128 pounds of longleaf seed collected and processed. One pound of longleaf seed has the potential to produce 4,000 seedlings, thus, 5,128 pounds of seed equates to 20,000,000 seedlings.
 - Construction of a new T-rail and center irrigation system allowed the NCFS's Claridge Nursery to expand its containerized longleaf seed production capacity by 4.2 million second generation seedlings annually.
 - The NCFS Claridge Nursery began a new venture with funds from the ARRA grant, growing seedlings of understory plant species associated with longleaf pine ecosystems. Nursery staff improved approximately ten acres of seed collection areas and collected 126 clean pounds and 127 unclean pounds of seed. This operation continues today at the rate of over 360,000 native grasses and understory plant seedlings produced and sold annually. Such understory grasses are critical components that complement longleaf pine habitat.
 - A robust education and outreach initiative designed to educate landowners and train natural resource professionals on the values, opportunities and methods of longleaf pine restoration reached 559 natural resource professionals and 537 private landowners through 18 workshops. Sixteen separate educational brochures were developed and 25,000 were distributed.
 - Job creation was the primary purpose of ARRA. Fourteen annual full-time position equivalents were created or retained under this initiative, including both private sector vendor and contractor jobs, as well as public sector jobs.

- Between 2010 and 2015, the N.C. Forest Service was awarded \$962,566 in grants and agreements from the U.S. Forest Service and the Natural Resources Conservation Service for a variety of projects focused on longleaf and shortleaf pine restoration, as well as prescribed burning.
 - Funds were used to support the implementation of the NCFS Longleaf Initiative and Action Plan. Efforts include contracting with the Forest Research Modeling Cooperative at Virginia Tech to develop a report and plan for “Enhancing Longleaf Pine Growth & Yield Information in the Atlantic Coast Region.”
 - Regional Shortleaf Restoration Initiative (joint project with the Arkansas, Oklahoma and Texas state forestry agencies). Under this project, NCFS entered into a shortleaf pine germplasm MOU, established a 2nd generation shortleaf seed orchard, and collaborated with the Southern Regional Extension Forestry to develop a web-based decision support and management tool for shortleaf pine. This site-suitability application is housed within the Shortleaf Pine Initiative website (<http://www.shortleafpine.net/>).
 - A contribution agreement with the NRCS led to the creation of two time-limited positions which focused on increasing on-the-ground implementation of costshared forestry practices (mostly associated with the Environmental Quality Incentives Program, or EQIP). Particular emphasis was placed on longleaf practices within a 15-county priority area. The positions also worked toward increasing prescribed burning capacity by private contractors, consultants, landowners, agencies and conservation organizations.
 - The Atlantic Coast Longleaf Initiative is a joint project between the North Carolina, South Carolina and Virginia state forestry agencies. This Initiative has successfully supported a NCFS Longleaf Coordinator position, professional training opportunities, outreach and education to landowners. It has also resulted in the development of a GIS and web-based decision support tool used to prioritize longleaf establishment, management, prescribed burning, and outreach.
 - The “Increasing Private Landowner Involvement in Longleaf Pine” grant effort is another joint project involving the North Carolina, South Carolina and Virginia state forestry agencies. This grant helps to support the NCFS Longleaf Coordinator position, and is providing focused landowner outreach to increase longleaf pine management and restoration within North Carolina’s three Significant Geographic Areas identified in the Range Wide Conservation Plan for Longleaf Pine. Additional activities involve resource professional training, partnership relations, a cooperative applied research and demonstration project with The Nature Conservancy on ecological pine straw management, and collection/synthesis of geospatial data to enhance the functionality of the Longleaf Interactive Decision Support Tool.
- In September, 2010, the NCFS hosted 94 participants at the first Regional Shortleaf Pine Conference in Raleigh. This spawned the formation of the Shortleaf Working Group, and eventually, a formalized Shortleaf Pine Initiative (<http://shortleafpine.net/shortleaf-pine-initiative>). In May 2015, the NCFS hosted a workshop in Troy, NC with approximately 150 attendees. In July 2015, The Consortium of Appalachian Fire Managers & Scientists and The Nature Conservancy hosted a shortleaf pine workshop in Asheville, NC.
- Prescribed fire awareness campaigns in North Carolina have successfully reached the public, resulting

in an increasingly-positive understanding of the importance of the practice. Through collaborative work by many partners, February is now “Prescribed Fire Month” in North Carolina. Media events, burning demonstrations, gubernatorial proclamations, etc. have been used to maximize positive exposure on the issue.

- U.S. Department of Defense installations such as Camp Lejeune and Fort Bragg continue to make great strides when it comes to prescribed burning and the restoration/conservation of longleaf pine habitat. North Carolina’s forestry/military partnership continues to strengthen, as indicated by the establishment of efforts such as Sentinel Landscapes and the Forest Opportunities for Resource Conservation and Environmental Security (FORCES) pilot project.
- The N.C. Prescribed Fire Council (<http://www.ncprescribedfirecouncil.org/>) brings together natural resource professionals, public and private land managers, and others who support the use of prescribed fire. The Council’s looks to actively:
 - Promote public education about the benefits of prescribed fire.
 - Advocate for the ability to use prescribed fire as a land management tool now and in the future.
 - Increase expertise in prescribed fire by sharing technical and biological information.
 - Promote safety, training, and research in the art and science of prescribed fire.
 - Review prescribed fire practices, regulations, and policies and suggest improvements.
 - Promote best management practices that minimize smoke and air quality impacts from prescribed fires.
- The N.C. Division of Parks and Recreation has increased its focus on active management of fire-adapted species and ecosystems within state parks and natural areas, a shift from its former preservation-oriented management philosophy. Since 2010, the agency has established new positions focusing on prescribed burning and conservation ecology, a fire management team, and developed a Prescribed Fire Program (<http://www.ncparks.gov/sites/default/files/ncparks/37/natural-resources-prescribed-fire-program.pdf>) and Fire Management Guidelines (<http://www.ncparks.gov/sites/default/files/ncparks/37/natural-resources-fire-2014.pdf>). The following summarizes the NC Division of Parks and Recreation prescribed burning accomplishments:

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Challenges:

- The U.S. Census Bureau projects that North Carolina will grow in population from over 9 million in 2010 to over 12 million by 2030. Given our current population and projected growth, many land management activities will become more difficult to implement. This is especially true of the ability to conduct prescribed burns due to air quality, smoke management concerns, and increased residential

development. North Carolina ranks higher than any other state in areas where wildland vegetation and homes meet. This wildland urban interface totals more than 5.5 million acres. With greater road density and traffic comes greater risks to travelers from smoke. For private contractors, obtaining insurance and overcoming liability concerns has become increasingly difficult. Many public agencies are also limited, not by insurance, but rather by time, budgets, weather, and manpower. Source: North Carolina Prescribed Fire Council 2013-2018 Strategic Plan

http://www.ncprescribedfirecouncil.org/pdfs/FINAL_NCPFC_StrategicPlan.pdf

- Financial incentives, primarily through federal and state cost-share programs, are often necessary to encourage prescribed burning and restoration of fire-adapted species and ecosystems on private forestlands. Demand for these financial incentives related to prescribed burning far exceeds available funding. Many landowners view the application process and compliance provisions of federal programs to be complicated and cumbersome.
- Low capacity of private prescribed burn contractors limits total acreage burned annually.
- Limited number of acceptable burning days, as defined by current North Carolina smoke management guidelines and weather forecasts.
- A lack of market differentiation, or price premium, for longleaf and shortleaf pine forest products and associated ecosystem services creates a disincentive for landowners wishing to manage for these species and ecosystems. Many landowners who require financial returns from their forestland turn instead to faster-growing loblolly pine as their species of choice.
- There is a lack of familiarity, experience, and knowledge among the public, landowners, and resource professionals on best management practices for some fire-adapted ecosystems.
- Public awareness of the presence of fire-reliant species, as well as acceptance of the benefits of prescribed fire, continues to be an ongoing challenge.

New Issues:

- Emerging concern with potential effects of containerized longleaf seedling root system architecture from root deformity. The issue relates to the potential for restricted root development and greater risk from wind throw.
- There are emerging concerns that intensive pine straw management may contribute to longleaf stand decline and decreases in wildlife habitat and ecosystem richness. As a result, various organizations have developed best management practices related to pine straw harvesting. The N.C. Forest Service is partnering with The Nature Conservancy to evaluate and demonstrate these practices on its pine straw operations at Bladen Lakes State Forest.

Data Needs:

- Growth and yield models relevant to longleaf and shortleaf pine plantation management in the Atlantic Coast region are non-existent and have been identified as a significant barrier to providing foresters and landowners with the information necessary to adequately evaluate costs and returns of various management prescriptions and investment alternatives.
- Research and assessment related to containerized longleaf seedling root deformity concerns.
- There is a lack of research and knowledge among practitioners on the establishment, maintenance, and restoration of fire-adapted species.
- Finer-resolution spatial data on forest cover in North Carolina is needed to more effectively prioritize restoration activities.

Future Focus (2015 – 2020):

- The NCFCS will complete the implementation of deliverables of its FY12 Atlantic Coast Longleaf Initiative grant, as well as its FY15 Increasing Private Landowner Involvement in Longleaf Pine

grant. A priority focus will continue to be placed on promoting prescribed fire and the establishment and management of longleaf and shortleaf pines, as well as other fire-adapted/dependent forest types and ecosystems.

- The N.C. Longleaf Coalition will continue to be proactive in advocating for and promoting longleaf restoration and management in the state; will continue to actively support longleaf efforts of the three local implementation teams; and will continue to support and collaborate with the Longleaf Partnership Council in implementing the Range-Wide Conservation Plan for Longleaf Pine.
- The NCFS will continue to be an active leader in promoting the management and restoration of longleaf, shortleaf, pitch and table mountain pine on sites where they are suitable and with landowners, whose management objectives align with the values and attributes of these fire-dependent forest types.
- The NCFS and other state, federal and conservation partners will work to increase the capacity to conduct prescribed burns on more acres in North Carolina. Various approaches will be used, including: increased training and greater utilization of fire behavior and smoke modeling tools to increase the number of acceptable burning days; continuing to train and develop private burning contractors; training and mentoring of landowners interested in burning their own property; continuing to support and offer certified burn training; development of prescribed burn associations or cooperatives; and greater use of dedicated prescribed burn crews.
- The North Carolina Prescribed Fire Council identified seven goals in its 2013-2018 Strategic Plan:
 - Increase training and emphasize safety to promote best management practices and maintain the credibility and professionalism of our fire practitioners.
 - Implement a targeted Communication and Education campaign that increases public support, understanding, and acceptance of prescribed fire in North Carolina.
 - Establish partnerships to promote the mission and vision of the Council.
 - Acquire resources to promote, support, and sustain the mission and goals of the Council.
 - Take a strategic and proactive role in policies that positively impact prescribed fire in North Carolina.
 - Promote prescribed fire as a high priority for public and private lands in North Carolina.
 - Increase research in the science and application of prescribed fire that will benefit land managers and landowners.

NOTE – this Goal also closely associated with the National Theme “*Conserve and Manage Working Forest Landscapes for Multiple Values and Uses*”

C. **Enhance Public Benefits from Trees and Forests**

Desired Outcomes:

- enhancing the suite of public benefits associated with trees and forests such as: clean air and water, fish and wildlife habitat, open space, outdoor recreation opportunities, renewable materials, economic attributes, and climate change buffering; and
- reducing the risk to communities from uncharacteristic wildfire.

Key strategies:

- strategic use of trees and forests in urban environments;
- watershed planning;
- enhancing community fire protection capabilities; and
- linking environmental health with community well-being.

Associated NCFAP Goal 6. Manage, conserve, restore, and enhance forestlands important to current and future supplies of clean water for economic, social, and ecological uses

Successes:

- Introduced the theme of ‘Healthy Forests for Clean Water’ across North Carolina to a diversity of audiences. Developed outreach and educational materials to highlight this goal, and shared products with other states in the South, to provide a unified message.
- Completed a USDA-FS funded study that identified a positive relationship between forests, water quality, and reduced costs to treat water.
- Acquired 3,900 acres of forestland.
- Continued providing portable bridgemats for protecting water resources at stream crossings on logging jobs.
- Restored a degraded trout stream, and verified the return of trout afterwards.
- Conducted more than 15,000 water quality site evaluations and observed a continued high rate of compliance.

Challenges:

- Continued need for water resource restoration and improvement on agency-owned lands, due to lack of funding.
- Absence of a dedicated USFS funding allocation to the states to support water quality or Best Management Practices (BMP) program implementation.
- Continued reduction and challenges to the Nonpoint Source/USEPA-319 Grant program, regarding the justification for providing funds to state forestry programs.
- Reorganization of multiple state environmental cooperator agencies, requiring repeated attempts to re-establish communication and operational inter-agency relationships.

New Issues:

- Reduction in the number of agency personnel assigned to fulltime water quality duties.
- Recent increase of proposed or actual water quality regulations, mainly at the federal level. This results in uncertainty, mis-information, confusion, and lack of clarity for our customers on what will be expected of them.

- Renewed challenges from federal agencies and NGOs questioning the impact of silviculture on the status, condition, and extent of forested wetlands.

Data Needs:

- Near-real time satellite imagery capable of identifying potential timber harvest operations, so timelier site evaluations can occur.
- A cohesive web-based data management system accessible by field staff, that is easier to maintain and develop reports from.
- An accurate and thorough assessment of the status and extent of forested wetlands, especially those comprised of cypress or other bottomland species.
- Management implications of potentially rising sea levels/land subsidence, and what long term forest management prescriptions may be appropriate to account for it.
- Understanding if woody biomass harvesting has a detrimental effect on water quality or site quality, as compared with traditional harvesting practices.

Future Focus (2015 – 2020):

- Forests for Watersheds / Healthy Forests for Clean Water.
- Streamlining or re-thinking water quality regulatory governance of forestry.
- Fund and provide BMP cost-share assistance for loggers and landowners.

Associated NCFAP Goal 7. Enhance the benefits and sustainable management of urban forests

Successes:

- Twenty one NCFS foresters and rangers are International Society of Arboriculture (ISA)-certified as arborists. Despite significant reductions in federal Urban and Community Forestry (U&CF) allocations, this increase in arborist-certified staff across the state has helped to bolster the NCFS's ability to service related requests.
- The NCFS U&CF staff delivered the following urban forestry-related workshops:
 - urban forest management (4)
 - writing urban forestry plans (4)
 - planning for change (5 webinars)
 - technical foundations of urban forestry (8)
 - emergency planning for communities (2)
 - grant writing for U&CF sub-grants (20)
- Competitive grant to educate and assist communities on the benefits of managing publicly-owned wooded areas: nine workshops through The Nature Conservancy, NCSU and the American Indian Center, 11 plans written and eight plans initiated, updated existing Woodland Stewards webpage (<https://research.cnr.ncsu.edu/sites/woodlandstewardseries/>) to include community forest management.
- Tree City USA participants increased from 74 (in 2010) to 80 (in 2014).
- Tree Campus USA participants increased from 5 (in 2014) to 8 (in 2014).
- Tree Line USA participants increased from 2 (in 2010) to 3 (in 2014).
- Competitive grant to assist communities with planning to incorporate more green space into existing hardscape. To date, the following communities have been assisted:
 - Morganton (<http://www.cdac.arch.vt.edu/Morganton.html>)
 - Robbinston (<http://www.cdac.arch.vt.edu/Stecoah.html>)
 - West Jefferson (<http://www.cdac.arch.vt.edu/WestJefferson.html>), and

- Burnsville (<http://www.cdac.arch.vt.edu/BurnsvilleNC.html>)
- Two competitive grants included eight tree canopy analyses (<http://ncforestservice.gov/Urban/pdf/EcosystemAnalysisbrochure.pdf>) provided to communities.
- Promotion of tree inventories in NCFS U&CF sub-grant program; helped to develop, promote and provided training on low-cost “Talking2Trees” tree inventory software; provided workshops and presentations on tree inventories; and completion of four tree inventories and reports.
- Delivered five-part webinar series through NCSU entitled “Planning in the Face of Change” (<http://www.ncsu-feop.org/UFW/>):
 - Urban Wood Resource
 - Green Infrastructure
 - Urban Interface
 - Emergency Planning
 - Tree Management
- Developed “Tree Care Before and After the Storm” bulletin (<http://ncforestservice.gov/Urban/pdf/stormTreeCare.pdf>), and utilized during two workshops on Emergency Planning.
- Competitive grants focused on urban wood utilization (http://ncforestservice.gov/Urban/urban_wood.htm), including initiating an Urban Wood Group.
- Southern Region Urban Forest Strike Team training held in N.C. in 2013; mock exercise being planned for May 2016.

Challenges:

- Population growth and the resulting increases related U&CF requests/needs.
- Significant federal funding cuts and the lack of state appropriations for urban and community forestry staff and outreach. NCFS’ U&CF staff were reduced to 2.75 employees in state FY13-14 due to successive years of budget reductions. North Carolina’s population growth, combined with the lack of funding related to the U&CF Program, is increasingly unable to respond individually or strategically due to increasing demand and diminishing staff numbers.
- Effective collaboration between the North Carolina Urban Forestry Council and the ISA Southern Chapter (based in North Carolina) is not currently occurring.
- Identifying champions to commit to building the N.C. Urban Wood Group effort.
- Effectively expanding partnerships with other organizations takes time. Efforts such as this can be challenging, particularly given NCFS U&CF staff reductions.
- The Urban Forest Council’s part-time staffing and reliance on volunteers limits program expansion and further partnership development.
- Lack of ISA-certified arborists in certain parts of North Carolina.

New Issues:

- Rapid spread of emerald ash borer and the expected mortality to communities’ ash trees.
- Increasing emphasis on effective urban wood utilization.
- Stormwater management in increasingly urbanized areas.

Data Needs:

- Timely and accurate data related to municipal urban forestry staffing and program details is needed.
- There is a need for improved economic analyses regarding the economic benefits of green infrastructure and conservation planning. This would likely include comparisons of management and land use approaches (ex. hardscape percentages and densities).

Future Focus (2015 – 2020):

- Reductions in NCFS U&CF budgets and staffing will continue to require a shift in program delivery. Some program services will need to be eliminated, while “core elements” such as Tree City USA program delivery will be emphasized.
- Partnerships will need to be expanded. Reduction of staffing will require a reduction in outreach unless more collaboration can be achieved.
- Urban wood use & stormwater management
- Emphasis to be placed on effectively communicating the need for and value of urban and community forestry services. A subsequent goal would be to increase U&CF budgets and staffing levels to necessary levels.

Summary

Despite challenging economic times, North Carolina's forestry community can be proud of the many successes it has accomplished over the last five years. Many of the opportunities and challenges identified in the 2010 North Carolina Forest Action Plan have been actively addressed through multi-organizational efforts and pilot projects. Emphasis has been placed on completing on-the-ground accomplishments such as reforestation projects, prescribed burns and fuels mitigation. Significant gains have been made with longleaf restoration, as well as the identification and conservation of priority species and habitats. One of the most significant trends has been the collaboration of new partners, often resulting in opportunities for forest landowners and land conservation that would have otherwise been unavailable.

Challenges have come in various forms during this period. This includes reductions in budgets and staffing levels, which have resulted in the narrowing of some programs and services. This would necessitate the closer evaluation of the cost/benefit value of any given program. Other notable challenges relate to the increasing number of non-native invasive species aggressively taking hold in North Carolina. The emerald ash borer is an example of one such pest that is not only threatening municipal canopies, but also disrupting forest markets via mandated quarantines. Organizations are also struggling to fund both traditional program infrastructure (ex. firefighting equipment) as well as the need for emerging technologies.

Many forestry stakeholders have identified the need for improved and timely data, such as aerial imagery and landowner demographics. Other examples include regional research on emerging non-native invasive species, as well as growth and yield details on restoration species such as longleaf pine. These types of information directly relate to their ability to improve the programs and services they offer. Satisfying these data needs would likely equate to better outreach and more active forest management.

A notable emerging issue includes the rapid pace of globalization. The impact on forestry has been both positive (ex. siting of new forest industry facilities; increased exporting of forest products) and negative (ex. increased NNI introduction; debate involving wood pellet production and bottomland forests). Another issue that has quickly developed within the last five years is the use of unmanned aerial vehicles (UAVs or "drones"). Again, there are both positives (ex. more efficient monitoring of sites and wildfires) and negatives (ex. interference with aerial firefighting operations) associated with this topic that forestry stakeholders will need to face. As these emerging issues reveal themselves, forestry organizations that have seen reductions in budgets and staffing levels will need to determine where best to spend their efforts.

The next five years will likely see an increasing reliance on collaboration and mutual support between partners. There are a number of pilot projects (ex. FORCES; African-American Land Retention Program; Tar River Forest Stewardship Project) that are anticipated to succeed and positively influence forestry outreach and conservation in other areas of the state. Forestry partners will continue to recognize they must evolve and utilize new platforms to effectively reach a diverse audience, including decision-makers. Demand for real-time data presented in an easily-understood format will only continue to increase. Additional focus will be placed on obtaining improved data, and working with diverse partners who specialize in marketing and communications. Another trend may involve the shift toward "fees for services" by government forestry organizations. Tighter budgets and the resulting creation of fee services may impact landowner decisions. This in turn would necessitate the need for improved communication of those services' benefits to potential customers.