

Allegheny Highlands Collaborative Landscape Restoration Project

A Collaborative Forest Landscape Restoration Program Proposal

**USDA Forest Service
George Washington and Jefferson National Forests**

February 4, 2010

Promote ecosystem health and biodiversity by fostering restoration and maintenance of fire-adapted ecosystems while ensuring public safety; and improve the capacity to apply and manage fires by increasing collaboration and partnerships of interested agencies, organizations and communities.

Executive Summary

Dominant forest types(s): oak, oak/pine, mixed hardwood

Total Acreage of the landscape: 763,000

Total Acreage to receive treatment: 106,000

Total Number of NEPA ready acres: 23,000

Total Number of acres in NEPA process: 83,000

Description of the most significant restoration needs and actions on the landscape: Restore healthy ecosystem processes, and landscape heterogeneity and diversity. The targeted landscape encompasses two broad forest systems Pine Forest and Woodlands, and Oak Forests and Woodlands. The goal for this landscape is to restore forest ecosystems to be resilient to natural processes.

Description of the highest priority desired outcomes of the project at the end of the 10 year period: Continue working together as a collaborative to meet the challenges of restoring Appalachian pine and oak dominated forests across the region. Continue to monitor and document changes in the ecological systems and incorporate information into restoration design. Utilize prescribed fire on approximately 106,000 acres of FRCC 3 lands to restore and mimic natural fire regimes and move the landscape toward a FRCC of 1.

Description of the most significant utilization opportunities linked to this project: An estimated 470,000 tons of pulpwood would be removed in the treatments with a value of approximately \$3 million. Mill capacity exists within the local community to utilize the product.

Name of the National Forest, collaborative groups, and other major partner categories involved in project development: George Washington/Jefferson National Forests, The Nature Conservancy, Virginia Department of Game and Inland Fisheries, Virginia Department of Conservation and Recreation, and Virginia Department of Forestry.

Describe the community benefit including number and types of jobs created: This project is likely to employ up to 20+ people in the logging industry for 10 years. The funding from this project also supports 13+ full time equivalents over the 10 year period.

Total dollar amount requested in FY11: \$252,800

Total dollar amount requested for the life of the project: \$4,186,200

Total dollar amount provided as Forest Service match in FY11: \$252,800

Total dollar amount provided as Forest Service match for the life of project: \$4,186,200

Total dollar amount provided in Partnership Match in FY 11: \$30,000

Total dollar amount provided in Partnership Match for the life of project: CCS w/TNC to renew in 2012

Time frame for the project (from start to finish): 10 years

Table of Contents

Ecological, Social and Economic Context.....	1
Summary of Landscape Strategy.....	7
Proposed Treatment	8
Collaboration and Multi-party Monitoring.....	13
Utilization.....	17
Benefits to Local Economies.....	18
Funding Plan.....	19
Attachments	
▪ Attachment A: Planned Accomplishment Table	
▪ Attachment B: Reduction of related wildfire management costs	
○ “Results- Cost Savings” of R-CAT spreadsheet available on the CFLRP website ¹	
○ Documentation of assumptions and data sources used when populating the R-CAT spreadsheet	
▪ Attachment C: Members of the Collaborative Table	
▪ Attachment D: Letter of Commitment	
▪ Attachment E: Predicted Jobs Table from TREAT spreadsheet	
▪ Attachment F: Funding Estimates	
▪ Attachment G: Maps	

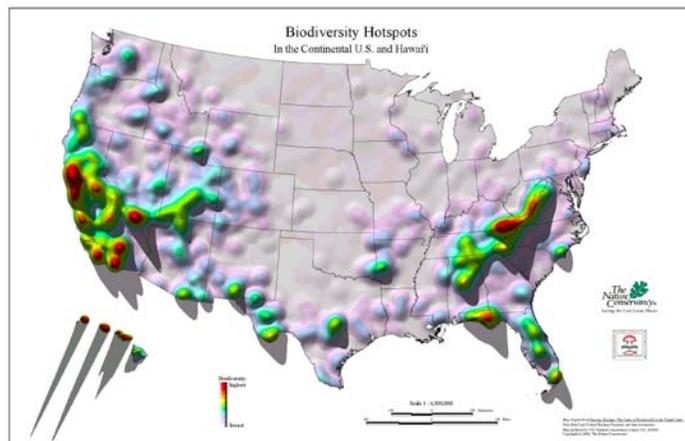
¹ R-CAT grew from the Appendix B Spreadsheet, which was originally a part of *the Suggested Economic Analysis Procedures and Templates* was developed by the Rocky Mountain Research Station and the Western Wildlands Environmental Threat Assessment Center, along with economists from the National Forest System in response to the Omnibus Public Land Management Act of 2009. Available at [HTTP://WWW.FS.FED.US/RESTORATION/CFLR/SUBMITTINGPROPOSALS.SHTML](http://www.fs.fed.us/restoration/cflr/submittingproposals.shtml)

Ecological, Social and Economic Context

The majority (83% by acreage) of the Allegheny Highlands Collaborative Landscape Restoration Project (the Project) is located within Alleghany, Bath, Rockbridge, Augusta, and Highland counties of western Virginia, in the heart of the Ridge and Valley province of the Central Appalachians and the Upper James drainage basin. Portions (17% by acreage) of the Project also extend into Pocahontas and Greenbrier counties of West Virginia and the Allegheny Front and New River drainage basin. The area totals 763,000 acres (1192 square miles) and includes the entirety of the Cowpasture River watershed, an outstanding example of a medium gradient, small Ridge and Valley river, considered by many experts to be the most pristine river in Virginia, as it is free-flowing with high water quality and healthy aquatic communities. The majority of the Project area falls between elevations of 1,700 and 3,000 feet, ranging from the lowest point 1,341 ft in the Cowpasture River valley to the highest, 4,400 ft at Reddish Knob at the northernmost edge of the boundary. Characterized by long, even, southwest-to-northeast running ridges and by narrow valleys in between, the area is covered with extensive hardwood and mixed hardwood-pine forests, a rich karst landscape interspersed with cave openings, sinkholes and intermittent streams, and the sinuous Cowpasture, Jackson, and Greenbrier rivers winding their way through rural valleys of pastureland and small farms. Mostly a product of the Weeks Law, approximately 60% of the Project area is in public ownership, primarily managed by the US Forest Service (USFS) as part of either the George Washington National Forest (GWNF) or Monongahela National Forest (MNF).

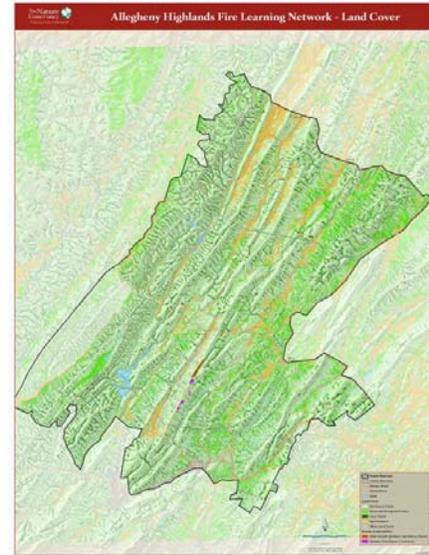
Allegheny Highlands Collaborative Landscape Restoration Project Land Ownership	
George Washington National Forest	298,000 acres
Monongahela National Forest	103,000 acres
Virginia Department of Game and Inland Fisheries	42,000 acres
Virginia Department of Conservation and Recreation	4,500 acres
The Nature Conservancy	9,000 acres
Private	306,500 acres

The contiguous forested mountains, the unaltered condition of the Cowpasture River, and the rarity and endemism of species found in local natural habitats such as shale barrens and caves make this area remarkable, and indeed it has been recognized as a biodiversity hotspot in the Central Appalachians. The Virginia Division of Natural Heritage tracks 53 extant species within the Project area, 28 of which are considered globally rare, in



addition to 22 natural community types. These species and communities include the rare roughhead shiner (*Nortropis semperasper*) which thrives in the Cowpasture River and is native only to the upper James, the James spiny mussel (*Pleurobema collina*), the small-footed myotis bat (*Myotis leibii*), the Indiana bat (*Myotis sodalis*), the Appalachian grizzled skipper (*Pyrgus wyandot*), multiple populations of the variable sedge (*Carex polymorpha*), the shale barren rock-cress (*Arabis serotina*) and the Millboro leatherflower (*Clematis viticaulis*) which are endemic to shale barren communities, and at least two obligate cave invertebrates have been identified as endemic to single caves in the conservation area.

Over 90% of the Project area is forested, and even though ownership is fragmented, The Nature Conservancy identified through its Central Appalachians Ecoregional Plan four contiguous blocks of native forest in the area that include an array of characteristic forest communities occurring across a range of geologic strata, soils, moisture regimes, topographic positions, and landforms. One of these, incorporating Warm Springs Mountain and ridges extending east to the Cowpasture River, comprises a 77,000-acre unfragmented, largely roadless area. National Land Cover Data was initially used by partners in the Allegheny Highlands Fire Learning Network (FLN) to determine existing conditions within the Project area. However, partners recognized that this dataset was developed at too coarse of a scale and cover types were not consistent with more widely-recognized systems.



Allegheny Highlands Collaborative Landscape Restoration Project Land Cover Types (NLCD 2001)		
Cover Type	Acres	Percent of Total Area
Open Water	5013	<1
Developed, Open Space	23513	3
Developed, Low Intensity	2602	<1
Developed, Medium Intensity	529	<1
Developed, High Intensity	68	<1
Barren	280	<1
Deciduous Forest	597735	78
Evergreen Forest	57991	8
Mixed Forest	27239	4
Pasture/Hay	45366	6
Cultivated Crops	2402	<1
Woody Wetlands	95	<1
Emergent Herbaceous Wetlands	167	<1
Total	763000	100

The FLN more recently mapped the Project area for ecological zones, units of land that can support a specific plant community or plant community group based upon environmental and physical factors that control vegetation distribution. Ecological zones are basically equivalent to LANDFIRE's Biophysical Settings which "represent the vegetation that may have been dominant on the landscape prior to Euro-American settlement and are based on both the current biophysical environment and an approximation of the historical disturbance regime" (LANDFIRE, 2009) and have been widely used in recent years across the Southern Appalachian region.

For this Project, ecological zones were crosswalked to NatureServe ecological systems, and then for consistency to the draft GWNF land and resources management plan (anticipated April 2011), crosswalked to broader ecological system groups developed for the GWNF ecological sustainability evaluation.

Allegheny Highlands Collaborative Landscape Restoration Project Ecological Systems	
Ecological System Groups	NatureServe Ecological System
Spruce Forest	Central and Southern Appalachian Spruce-Fir Forest
Northern Hardwood Forest	Appalachian (Hemlock)-Northern Hardwood Forest
Cove Forest	Southern and Central Appalachian Cove Forest
Oak Forests and Woodlands	Northeastern Interior Dry-Mesic Oak Forest
	Central and Southern Appalachian Montane Oak Forest
	Central Appalachian Dry Oak-Pine Forest
Pine Forests and Woodlands	Southern Appalachian Montane Pine Forest and Woodland
	Central Appalachian Pine-Oak Rocky Woodland
Mafic Glade and Barrens and Alkaline Glades and Woodlands	Southern and Central Appalachian Mafic Glade and Barrens
	Central Appalachian Alkaline Glade and Woodland
Cliff, Talus and Shale Barrens	North-Central Appalachian Circumneutral Cliff and Talus
	North-Central Appalachian Acidic Cliff and Talus
	Appalachian Shale Barrens
Floodplains, Wetlands, and Riparian Areas	Central Appalachian Floodplain
	Central Appalachian Riparian
	Central Interior Highlands and Appalachian Sinkhole and Depression Pond
	Southern and Central Appalachian Bog and Fen
	North-Central Appalachian Acidic Swamp
	North-Central Appalachian Seepage Fen

These ecological systems are fully described at NatureServe Explorer at www.natureserve.org/explorer/ or at the GWNF plan revision page at [http://www.fs.usda.gov/wps/portal/fsinternet/lut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gDfxMDT8MwRydLA1cj72DTUE8TAwjQL8h2VAQAMtzFUw!!/?ss=110808&navtype=BROWSEBYSUBJECT&cid=fsbdev3_000397&navid=0910000000000000&pnavid=null&position=WELCOME.HtmI&ttype=detailfull&pname=George Washington & Jefferson National Forests- Home](http://www.fs.usda.gov/wps/portal/fsinternet/lut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gDfxMDT8MwRydLA1cj72DTUE8TAwjQL8h2VAQAMtzFUw!!/?ss=110808&navtype=BROWSEBYSUBJECT&cid=fsbdev3_000397&navid=0910000000000000&pnavid=null&position=WELCOME.HtmI&ttype=detailfull&pname=George%20Washington%20&Jefferson%20National%20Forests-Home)

Oak Forests and Woodlands are the most common ecological system in the Project area and can be viewed as the matrix forest in which many other types exist. Overstories are typically dominated by red oak (*Quercus rubra*), white oak (*Quercus alba*), chestnut oak (*Quercus montana*), black oak (*Quercus velutina*) and scarlet oak (*Quercus coccinea*). Heath shrubs such as blueberry (*Vaccinium* spp.), huckleberry (*Gaylussacia* spp.) and mountain laurel (*Kalmia latifolia*) are common in the understory and often form a dense shrub layer. Regenerating forests (0-10 years old) comprise from 3 to ten percent of system acreage. Mature forest (60 years old or older) comprise approximately 60 to 70 percent of system acreage. Fire is a very important component of this system and results in open canopy structure on about 43 to 53 percent of the area. In many of the woodland areas native grasses are common.

Pine Forests and Woodlands are the next most common system in the Project area, occupying the upper slopes and south to west exposures. Overstories are typically dominated by table mountain pine (*Pinus pungens*), pitch pine (*Pinus rigida*), and some Virginia pine (*Pinus virginiana*) along with dry site oaks such as chestnut oak, scarlet oak, and bear oak (*Quercus ilicifolia*). A dense heath shrub layer is almost always present. Mountain laurel is the most typical and dominant, but species of blueberry and huckleberry along with fetterbush (*Leucothoe* spp.) may also be dominant. Native grasses and sedges are common along with dry site herbs and forbs. Their density varies depending on shrub cover. Regenerating forests (0-10 years old) comprise from ten to twenty percent of system acreage. Mature forest (60 years old or older) comprise approximately 35 to 45 percent of system acreage. Frequent fire occurring about every 3-9 years is a very important component of this system and results in open canopy structure on about 30 to 40 percent of the area.

Overall ecological integrity of the Project area is relatively good due to its rural context with large contiguous forested habitat, mostly free flowing river systems, and an undisturbed karst network. However, while compositional integrity may be optimal overall, the structural and functional conditions of the forest systems are particularly stressed. Over the past century, there has been a steady decline in forest health due to invasive plant species, forest pests and pathogens, poor air quality, fire suppression, and the intensive logging practices from the late 19th to early 20th century. The greatest stresses and threats to this system are lack of disturbance to create regeneration and open woodland structure, invasive plant and animal species including gypsy moth and the native pine bark beetle, and climate change that could reduce rainfall and make insect outbreaks more common. Data suggests that these oak- and pine-dominated systems burned at low intensities over a 3-9 year interval with stand replacing fires at >50 year intervals (ongoing University of Tennessee and Texas A&M research conducted

on GWNF lands). In the absence of fire over the 20th century, these areas have seen increases in fire intolerant hardwood species as well as the thickening and spread of heath vegetation. Absence of fire has impeded the regeneration of pitch and table mountain pine and has reduced the grassy/herbaceous component in these woodlands. Thus, absence of fire in all of these systems has led to species change (favoring fire intolerants and mesic species), and a general increase in biomass (i.e., stems per acre). This increase in biomass has led to a situation where there is a build-up of fuels and an increased potential for damaging wildfires. This is of particular concern to the human communities, including the Homestead, a luxury resort hotel built in 1766, located in the wildland-urban interface (WUI) along the western slope of Warm Springs Mountain. Approximately 82% of the project area is classified as a WUI.

Reviewing past wildfire history on the forest suggests over the past 10 years wildfires are increasing in size, severity and intensity. For example, 5 fires required the use of Type 1 or Type 2 Incident Management Teams in last 10 years. In addition, we now have years where we experience wildfire starts every month of the year, which is historically unheard of. Most of our lands are FRCC 3 as a result of successful wildfire suppression/exclusion efforts of the past. This coupled with tree mortality caused by severe gypsy moth defoliation and being in a drought cycle since 1999 with only 2 ½ years of normal precipitation has led to increased fuel loading and increased severity and intensity of wildfire.

Social and Economic Context

There are several major population concentrations within two hours drive of the George Washington National Forest including Washington, DC and its northern Virginia suburbs, as well as urban areas within the forest boundaries including Harrisonburg and Staunton, Virginia. These growing areas suggest that this national forest may provide increasing opportunities for recreation, fishing and hunting for the population in northern Virginia area. In addition, wild land and urban interface is expected to increase as the population increases and the percent of urban land increases and expands from current urban areas.

Analyzing the major sectors of an economy allows insight into how diverse and what industries may be driving its growth. Manufacturing is the most significant part of the area economy for counties within the George Washington National Forest boundary. The Manufacturing sector includes lumber and wood products, furniture, and pulp and paper products. From 1990 to 2000, the employment share from manufacturing decreased by 0.9 percent to 19.4 percent of the economy's employment.

Unemployment rates have increased in the counties within the Project area by 0.5 to 1.6 percent between November 2009 and November 2010 as identified by the US Department of Labor. Timber staff on the Warm Springs and James River Ranger have observed a decline of approximately 20% in logging operators in the area since 2000.

A principle way an economy grows is by export of goods and services. Most typically, manufacturing activity is thought of as providing most of this export related activity. However, services and retail trade can be considered "export" industries if significant visitors come in

from outside in travel related activities to bring in new dollars to an economy. A manufacturing industry can be a net importer if it imports more of a commodity or service than it exports.

Table 1 shows that the George Washington's local economy increased its net importing characteristic in 2000 by almost double from 1990. The 1990 decade saw the total economy's reliance on imports increase tremendously, thereby becoming more reliant on outside areas for its goods and services production. Such a characteristic causes dollars to leak out of the economy faster (and hence reduce having a greater multiplier capability) than if the economy was a net exporting one.

Meanwhile, all three segments of the Wood Products manufacturing showed net exporting increases. Total manufacturing also gained a significant share in net exporting, by almost doubling its amount in 1990. Other than Construction, Manufacturing, and Minerals, all other major sectors showed an increase of net imports from 1990.

Table 1: Exporting of Selected Industries in millions of 2000 dollars

	1990 Net Exports*	2000 Net Exports
Wood Furniture & Fixtures	\$2.5	\$12.5
Paper & Pulp Products	\$459.8	\$491.4
Wood Products	\$0.0	\$160.5
Total Manufacturing	\$965.4	\$1,817.1
Total of All Sectors	-\$1,463.3	-\$2,860.6

Source: IMPLAN 1990 and 2000 Data

*1990 Dollars Converted to 2000 Dollars via GDP Price Deflator; in millions of dollars

In summary, the George Washington area economy became more reliant on imports during the 1990's. More dollars, therefore, flowed out of the economy than flowed in, decreasing the ability of enhancement of further economic activity through the multiplier effect. However, manufacturing including wood based industries were a net exporter of manufacturing goods, providing "new" monies for the local economy.

Summary of Landscape Strategy

The Allegheny Highlands Landscape Restoration Project proposal is a refinement of the forest-wide landscape strategy as developed in the Draft Revised Land and Resource Management Plan (Draft Plan) for the GWNF. The Draft Plan and draft environmental impact statement are anticipated for public distribution in April 2011 and are expected to be finalized by December 2011. Restoration strategies developed within the Plan were based on Fire Learning Network products, best available science, research, lessons learned and monitoring of on the ground implementation of similar treatments, and significant public involvement. Over the course of four years (2007-2010), the Draft Plan revision has been informed by dozens of public workshops, opportunities for written comments, and collaboration with the GWNF Interdisciplinary Team. Members of the Interdisciplinary Team used an ecological sustainability framework, built around principles developed by The Nature Conservancy (TNC) in their Conservation Action Planning Workbook. Central to this framework is the recognition that by restoring and maintaining the key characteristics, conditions, and functionality of native ecological systems, the GWNF will be able to maintain and improve ecosystem diversity and provide for the needs of diverse plant and animal species.

FLN strategies were developed through a similar science-based and collaborative process, initiated when land managers and ecologists from several Appalachian states met in 2006 to develop approaches for restoring fire-adapted ecosystems on Warm Springs Mountain in Virginia's Allegheny Highlands. Through a series of meetings participants discovered a common interest in working together to meet the challenge of restoring Appalachian pine and oak dominated forests across the region. This launched the Central Appalachian and Southern Blue Ridge Fire Learning Networks, a regional collaboration of ten demonstration landscapes representing nine states. Using FLN methodology based upon The Nature Conservancy's Conservation Action Planning process, the partners (including federal, state, non-profit and university representatives) have developed strong conceptual ecological models, collaborative goal statements and maps of current and desired conditions, all of which help guide management decisions and on the ground implementation of projects. Since 2008, FLN partners have conducted controlled burns on over 10,000 acres, adopted a standardized fire effects and habitat composition monitoring protocol, and sponsored on-going fire history research. Partners are now utilizing maps of potential ecological systems and current conditions, developed from field plots and digital terrain models integrated into a geographic information system, to: 1) locate and prioritize future restoration efforts, 2) develop vegetation departure indices and refine current conditions through integration with LANDFIRE satellite imagery and local data, and 3) specifically in the Allegheny Highlands, implement a new monitoring program that will document changes in bird community response to controlled burns in different ecological systems. Additional accomplishments include completion of environmental assessments under NEPA for over 30,000 acres of prescribed fire within the FLN boundaries and expansion to include additional partners. In just a few short years, these two Fire Learning Networks have generated enormous potential for restoration, due to the collaborative nature of this effort. [Plan Revision/Strategies](#)

Proposed Treatment

The Allegheny Highlands Collaborative Landscape Restoration Project is a science-based ecological restoration strategy that covers approximately 763,000 acres in the Central Appalachians. The goal of this restoration strategy is to provide ecosystem resilience and adaptive capacity to wildfire, drought, insects, pathogens, invasive species, pollutants, and climate change. Ecosystem resiliency will be characterized by spatial heterogeneity at multiple spatial scales and sufficient natural regeneration of shade-intolerant tree species to restore and maintain the fire-adapted ecosystems of the landscape.

Recent studies on the Forest and elsewhere in the Appalachians have studied the historic role of fire in our ecosystems. By examining basal fire scars in tree trunks using dendrochronology (study of tree rings) and microscopic charcoal in bog and pond sediments it has been shown that fire was widespread and occurred frequently across our landscape. For example fire scar/tree ring studies at eight sites on or near the Forest show fires occurring at a frequency of approximately 3-9 years from the earliest chronology dates in the mid-1600s to mid-1700s and continued until the 1930s when fires ceased due to effective suppression strategies (Aldrich 2010).

Overall, absence of fire in all of these systems has led to species change (favoring fire intolerants and mesic species), and a general increase in biomass (i.e. stems per acre). This increase in biomass has led to a situation where there is a build up of fuels and an increased potential for damaging wildfires. This is of particular concern to the human communities living in the **wildland-urban interface** along the western slope of Warm Springs Mountain.

This strategy emphasizes fire resilience, public and firefighter safety, healthy ecosystem processes, and landscape heterogeneity and diversity. The targeted landscape encompasses two broad forest systems Pine Forest and Woodlands, and Oak Forests and Woodlands. The goal for this landscape is to restore forest ecosystems to be resilient to natural processes. The Appalachian Fire Learning Network collaborative was launched in 2006 and restoration efforts began shortly after.

To restore landscape-level forest resiliency a variety of restoration treatments will be used to re-establish spatial heterogeneity at the stand and landscape level.

Increase Prescribed Fire on the Landscape

Oak Forests and Woodlands are the most common ecological system in the Project area and can be viewed as the matrix forest in which many other types exist. Overstories are typically dominated by red oak, white oak, chestnut oak, black oak and scarlet oak. Heath shrubs such as blueberry, huckleberry and mountain laurel are common in the understory and often form a dense shrub layer. Regenerating forests (0-10 years old) comprise from 3 to ten percent of system acreage. Mature forests (60 years old or older) comprise approximately 60 to 70 percent of system acreage. Fire is a very important component of this system and results in

open canopy structure on about 43 to 53 percent of the area. In many of the woodland areas native grasses are common. The current Fire Regime Condition Class (FRCC) ranges from 3 to 2.

Pine Forests and Woodlands are the next most common system in the Project area, occupying the upper slopes and south to west exposures. Overstories are typically dominated by table mountain pine, pitch pine, and some Virginia pine along with dry site oaks such as chestnut oak, scarlet oak, and bear oak. A dense heath shrub layer is almost always present. Mountain laurel is the most typical and dominant, but species of blueberry and huckleberry along with fetterbush may also be dominant. Native grasses and sedges are common along with dry site herbs and forbs. Their density varies depending on shrub cover. Regenerating forests (0-10 years old) comprise from ten to twenty percent of system acreage. Mature forest (60 years old or older) comprise approximately 35 to 45 percent of system acreage. Frequent fire occurring about every 3-9 years is a very important component of this system and results in open canopy structure on about 30 to 40 percent of the area. The current FRCC for this system within the identified landscape also ranges from 3 to 2.

Approximately 100,000 acres of NFS lands have been identified as areas to restore fire to the landscape through prescribed fire. Multiple entries will be used to restore and mimic natural fire regimes and move the landscape toward a FRCC of 1. Monitoring will be used to determine re-entry intervals and success of goals and objectives. This proposal compliments other prescribed fire areas on private and state lands identified within the landscape through the Fire Learning Network.

The first phase of restoration planning (in compliance with the National Environmental Policy Act [NEPA]) was completed in January of 2009. Implementation began in spring 2009. This encompasses approximately 23,000 acres of prescribed fire (11 units, average size approximately 2,091 acres) with multiple entries to restore fire adapted communities. Private landscape partners will be treating 9,000 acres including a rare barren.

Phase two of restoration planning will be completed in October 2011. Implementation will begin in spring 2012. This encompasses approximately 33,000 acres of prescribed fire (23 units, average size approximately 1,434 acres) with multiple entries to restore fire adapted communities. Landscape partners will be treating an additional 10,000 acres.

Phase three of restoration planning will be completed in 2013. Implementation is scheduled to begin in 2013. This will include approximately 50,000 acres of prescribed fire (approximately 29 units, average size approximately 1,762 acres) with multiple entries to restore the fire adapted communities of the area. Landscape partners are expected to treat 4,000 acres.

Areas identified for prescribed burning in the three phases are large contiguous forested areas on oriented in a north/south direction creating large 10-20 mile linear swaths across the landscape. These swaths are strategically located within the landscape to take advantage of

prevailing winds which are typically from the west. Thus, providing “breaks” in existing conditions for wildfires on the landscape (See Attachment G).

Reduce Biomass on the Landscape

Approximately 16,000 acres of young (30 – 45 year old) hardwood stands on the landscape have been identified as areas to emphasize for restoration. These areas have a large density of small trees - pulpwood size and smaller. These areas lack spatial heterogeneity and natural regeneration is dominated by shade-tolerant tree species. The goal and objective of this treatment is to promote fire adapted vegetation by reducing the composition of fire intolerant vegetation in the stand thus reducing biomass. Reducing biomass will increase tree vigor increasing the stand’s resiliency.

Controlling Non-native Invasive Plants on the Landscape -

In the United States, invasive species are reported to be the second most critical threat to conservation of biodiversity (Wilcove et al. 1998). Non-native plants are known to occur across Southern and Central Appalachian Forests, often accounting for 25% or more of the documented flora. The Chief of the U.S. Forest Service has identified non-native invasive species as one of the four critical threats to USFS ecosystems. One of the goals of the George Washington National Forest Land and Resource Management Plan is to maintain and enhance the diversity of plant and animal communities of the Southern and Central Appalachians, favoring plant and animal communities that warrant special attention (George Washington Forest Plan p2-1). The integrity of natural communities on USFS land and surrounding lands will be compromised if non-native invasive plant infestations are allowed to continue to spread and invade previously unaffected areas. Controlling non-native invasive plant infestations will minimize the degree to which National Forest System land is a source of infestations for surrounding lands, both public and private.

1,200 acres of the Project area have been identified as at risk for non-native invasive plants. While dense non-native invasive plant infestations can occur anywhere on the forest, the highest densities of infestations often occur in recently disturbed areas and travel corridors such as wildlife openings, roadsides, riparian communities and trails. The proposed treatment is to effectively control and eventually eradicate non-native plant infestations using an integrated combination of manual, mechanical, cultural, and chemical control methods. Sites to be treated for non-native invasive plants include recently disturbed stands less than 10 years old, sites to be harvested over the course of the next five years, recreation sites, trails, roads, and wildlife openings. Manual treatment methods include hand pulling or cutting and would likely be used on small spot infestations. Cultural methods include the use of fire and chemical control methods would be used when the mechanical or cultural methods would not be effective in achieving the desired level of control, would be cost prohibitive, or would result in excessive resource damage. Implementation would plan on treating 120 acres annually over a 10 year period in the following order of priority, to treat known infestations that impact threatened, endangered or sensitive species, special areas, wilderness, roadsides, trails, and wildlife openings. Although known priority sites would be treated initially, the intent of this

proposal is to incorporate an adaptive management strategy, allowing for treatment of new locations of non-native invasive plants and treatment of newly recognized non-native invasive species. A site specific implementation checklist of required reviews would be used to ensure that potential environmental impacts are within the scope of impacts disclosed in the Forest-Wide Non-Native Invasive Plant Control Environmental Assessment for the George Washington and Jefferson National Forests (December 2010).

Decommissioning Roads/ Hydrological Restoration

There are approximately 20 miles of unneeded Forest System Roads on the Allegheny Highlands Collaborative Landscape. Many of these routes are located near riparian areas. The primary environmental impact of these roads is interrupted sheet flow from ditching or where roads have become incised from repeated surface blading. Since implementing a review of the travel management system in 2010, the GWNF started the process for prioritizing routes to be decommissioned based on a multitude of factors including environmental consequences. This proposal will actively restore approximately 20 miles over a nine year time frame by blocking road access, planting trees and shrubs, light disking to increase ground cover and/or recontouring ditches and berms to restore normal hydrologic sheet flow.

Total restoration treatments (10 years) on NFS lands will accomplish approximately 16,000 acres of mechanical treatments, 106,000 acres of prescribed fire, 1,200 acres of non-native invasive plant control, and decommissioning 20 miles of road. Restoration treatments facilitate restoration of vegetation conditions consistent with frequent fire regimes for the Appalachians. Restoration treatments are also expected to slow the rate of spread of large damaging wildfires. Prescribe burn blocks are oriented in a north/south direction creating large 10-20 mile swaths of prescribed burn areas across the landscape (see Attachment G). With prevailing winds typically from the west, these burn areas are strategically located to help slow the rate of spread of wildfires across the landscape and in WUI areas. Once FRCC are reduced, we expect to be able to manage wildfires for resource benefit.

Monitoring of the projects implemented within Allegheny Highlands Landscape will be shared by partners. We will undertake multiple implementation and effectiveness monitoring efforts to evaluate the progress and outcomes of the proposed restoration treatments. Forest Service contract administrators and Contracting Officers Representatives will conduct standard implementation monitoring. The Nature Conservancy and Forest Service will perform qualitative, field-based, pre-implementation and post-implementation multi-party reviews of a sampling of implemented units across the landscape to assess implementation and effectiveness. We will collect quantitative data to evaluate the effectiveness of treatments in reducing fuel loads and restoring natural vegetation communities and fire regimes. The data collected before, during, and after restoration treatment of the watershed will help establish baseline conditions and evaluate the effects of the treatments on watershed function and health.

The monitoring efforts described above will help to measure both progress in implementation and effectiveness in restoring ecosystems. We will also compile summary implementation

statistics at the end of the 10 year period for acres receiving various treatments. Through intensive monitoring across the landscape we will be able to assess if restoration and fuel reduction goals are being met. The ecological departure, or Fire Regime Condition Class, will be re-assessed to compare how closely stand structure is to the historic range of variation for these forest types.

In addition to ecological monitoring, we will work with our collaborators and stakeholders to develop and implement an economic monitoring plan by 2012 for the Project.

NEPA Status

Project	Description	Status
Warm Springs Mountain Restoration	Prescribe Burn 23,000 acres	Signed December 2008
Forest-Wide Non-Native Invasive Plant Control	NNIP Control Forest-wide	Signed December 2010
Border Restoration	Prescribe Burn 33,000 acres	Expected Signature October 2011
JR/WSRD Biomass	Timber Stand Improvement 16,000 acres	Expected Signature December 2011
Phase III Restoration	Prescribe Burn 50,000 acres	Expected Signature December 2012
JR/WSRD Road Decommissioning	Decommissioning Roads 20 miles	Expected Signature February 2013

Expected Prescribed Burn Accomplishments (acres)

FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
5,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500

The prescribed fire program in the project area currently treats approximately 5,000 acres annually. Funding from this proposal will allow us to double the acres we treat.

Collaboration and Multi-party Monitoring

One historic and another emerging collaborative initiative have the opportunity to play significant roles in the Allegheny Highlands Collaborative Restoration Project: the Allegheny Highlands Fire Learning Network and the GWNF Stakeholders Group. Although most of the ecological restoration strategies were developed from the FLN, the Stakeholders Group could assist in developing the social and economic strategies needed for project implementation.

Allegheny Highlands Fire Learning Network

In March 2002, The Nature Conservancy purchased over 9,000 acres of Warm Springs Mountain from Virginia Hot Springs, Inc., creating the largest nature preserve purchased and managed by the Conservancy in Virginia. Shortly thereafter, to address conservation strategies for this landscape, The Conservancy invited members of the George Washington and Jefferson National Forests, Virginia Department of Conservation and Recreation - Division of Natural Heritage, Virginia Department of Game and Inland Fisheries, US Forest Service Southern Research Station, University of Virginia Department of Environmental Sciences, and Cowpasture River Preservation Association to

participate in the development of a conservation area plan and partner in its implementation. Working over a 6-month period, the team used the Conservancy's "5-S Framework" to develop what became the Warm Springs Mountain/Cowpasture River Conservation Action Plan. Among strategies that abate threats to key terrestrial, aquatic and karst systems, the Plan called for large-scale restoration of fire-adapted systems and control of non-native invasive species.

As a component of implementing the Plan's strategies, land managers and ecologists from several Appalachian states met in 2006 to develop approaches for restoring fire-adapted ecosystems in Virginia's Allegheny Highlands. Through a series of meetings, participants discovered a common interest in working together to meet the challenge of restoring Appalachian pine and oak dominated forests across the region. This launched the Central Appalachian and Southern Blue Ridge Fire Learning Networks (FLN), a regional collaboration of ten demonstration landscapes representing nine states. Partners in the Allegheny Highlands FLN, one of those demonstration landscapes, spent the next two years, 2007-2008, working through a four-step process designed to develop the scientific basis for landscape-scale fire restoration and management. Partners developed a collaborative goal statement that

Allegheny Highlands Fire Learning Network Partners

USDA Forest Service
The Nature Conservancy
Virginia Department of Game and
Inland Fisheries
Virginia Department of Conservation
and Recreation
Virginia Department of Forestry
National Park Service
US Fish and Wildlife Service
National Weather Service

Allegheny Highlands Fire Learning Network Collaborative Goal Statement

Promote ecosystem health and biodiversity by fostering restoration and maintenance of fire-adapted ecosystems while ensuring public safety; and improve the capacity to apply and manage fires by increasing collaboration and partnerships of interested agencies, organizations and communities.

encompassed diverse partner objectives, identified barriers to effective collaboration, and developed commitments to improve collaborative processes.

Conceptual ecological models for two, broad fire-adapted ecological systems and one fire intolerant system were developed and used as the basis to assess current and desired future landscape-scale conditions using LANDFIRE biophysical settings, US Geological Survey ecological land unit models, and Forest Inventory and Analysis data, the most readily available datasets at the time. Partners also identified community values—economic, cultural, social, and recreational—that would influence desired future conditions, and worked to identify and address primary barriers to successful implementation of restoration efforts.

After determining opportunities for short-term fire restoration, FLN partners agreed to launch their first demonstration project along the eastern slope of Warm Springs Mountain. The 13-mile shared boundary between the Conservancy's Warm Springs Mountain Preserve (WSMP) and the GWNF provided the opportunity for an 18,000-acre project area. In the meantime, the Conservancy signed a challenge cost share agreement with the USFS in August 2007, which included completion of the FLN workshops and development of a habitat composition and fire effects monitoring protocol to be utilized as a template for future controlled burns in the project area. In May 2008, the Conservancy, GWNF, and other FLN partners conducted the first controlled burns on over 1,000 acres of the WSMP in the Mare Run and Bear Loop burn units.

In the meantime, the GWNF conducted an environmental assessment of its portion of the project area. FLN partners led a number of field trips for interested stakeholders, environmental organizations, and other agencies to the project site, some tours including the recently burned units on the Conservancy's WSMP. In part due to this proactive outreach, the GWNF completed their environmental assessment in 18 months, with only one comment, no appeals, and no litigation.

Results from the habitat composition and fire effects monitoring pilot on the Mare Run and Bear Loop burn units confirmed previous coarse-scale analyses and partner suspicions that vegetation composition and structure was indeed departed from the range of historical variation. FLN partners revised the protocol based on lessons learned from the pilot program and the GWNF adopted it for all future controlled burns across the Forest. Currently, the Nature Conservancy is collaborating with staff from Shenandoah National Park to develop a user interface that will allow all FLN partners to store monitoring data in FEAT/FIREMON Integrated (FFI), a database developed by the US Forest Service and the National Park Service.

In 2010, The Nature Conservancy partnered with the Appalachian Mountain Joint Venture (AMJV) to develop an avian community monitoring protocol for the Warm Springs Mountain Restoration Project. Funds were provided by the Conservancy's David A. Tice Internship program to hire a seasonal avian technician to establish and monitor a system of point count routes during the late spring and summer breeding season. These points were co-located with

the existing habitat composition monitoring plots and will utilize existing and future vegetation data for correlation to management-driven habitat changes. This pilot season of a limited number of routes helped refine the protocol, based on relatively new time-removal and mark-recapture methodologies, and will be expanded to include the entire 18,000-acre project area in 2011.

FLN partners are now utilizing maps of potential ecological systems and current conditions, developed from field plots and digital terrain models integrated into a geographic information system, to locate and prioritize future restoration efforts and develop vegetation departure indices and refine current conditions through integration with LANDFIRE satellite imagery and local data. Partners continue to meet at least annually as part of the regional Appalachian FLN and as needed for landscape-specific projects.

GWNF Stakeholders Group

The GWNF begin revising its 1993 land and resource management plan in February 2007. Comments were solicited on the draft Comprehensive Evaluation Report. Public workshops were subsequently held in March 2007 where participants were asked to describe what they thought was working well on the Forest and what needed to be changed. In July 2008 another round of public workshops was held where participants were asked to work on District maps and identify areas of the Forest they would like to see managed in a different way. A series of public workshops were held on various topics (vegetation management, access, roadless areas and wilderness) between September 2008 and February 2009, including additional workshops where preliminary opinions were presented on how the Forest could respond to the information that had been received up to that point.

In March 2010, after reinitiating plan revision under its third set of NFMA planning regulations in as many years, the GWNF solicited additional comments and held public meetings through April to discuss the need for change, issues for analysis, a range of alternatives and further plan development. Later in July 2010, the GWNF held public workshops to discuss a range of alternatives that were developed.

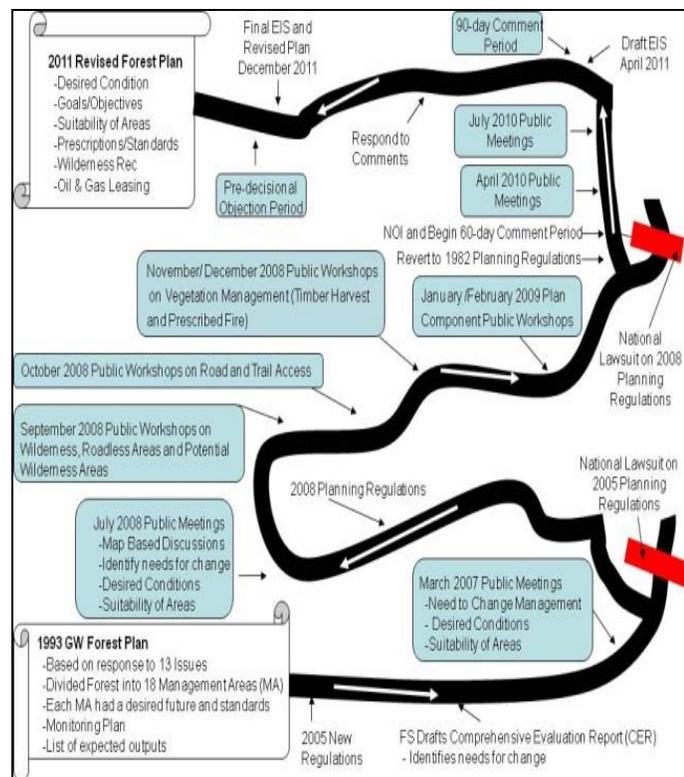


Figure 1. Forest Plan Revision - Public Involvement

This extensive public process enabled individual members of the public, organizations, user groups, industry representatives, local and state government representatives, state agency partners and GWNF staff to address a diversity of ecological, social, and economical issues relevant to the Forest. Many of these stakeholders were involved throughout the entire four years, and recognizing that despite their interactions at these public workshops, there remained a number of barriers for reaching consensus on the forest plan's direction. In September 2010, a 42-member stakeholder group formed to initially develop another alternative for the Forest to consider. Facilitated by staff from The University of Virginia's Institute of Environmental Negotiation, members of this group have met on seven occasions, either as a large audience or smaller sub-committee. Discussions have primarily focused on ecologically-based management areas and designations, but the group has begun examination of opportunities for restoration and management, and how those activities relate to the social and economic needs of the area's rural communities. Although the future of this group is uncertain, members have expressed an interest to work together on project implementation, even after the plan revision is complete. Opportunities for stewardship projects, multi-party monitoring, and pre-scoping NEPA engagement have been discussed and several members are specifically interested in developing a pilot project that incorporates remote area protection, prescribed fire, silvicultural treatments, and trail development/maintenance.

Utilization

The landscape restoration area has access to substantial industrial infrastructure to process the small diameter and biomass by-products of forest restoration. MeadeWestvaco operates a pulp plant in Covington, VA. The company is supportive of small wood utilization and is a partner on a small wood stewardship project on the James River Ranger District. The company has expressed a desire to have more product available from the George Washington National Forest. Small wood utilization helps to reduce the costs of restoration treatments and can contribute additional dollars to treatment through credits from stewardship contracts and KV funds from timber sales. It has the added benefit of providing local loggers a source of work close to home. Over the last 10 years, the number of logging operators have decreased by approximately 20% (personal observation by Timber Staff on James River and Warm Springs Ranger Districts).

Restoration has the benefit of providing local work to operators. An estimated 750,000 tons of pulpwood would be removed in the treatments with a value of approximately \$3 million. Biomass removal on these 16,000 acres is estimated to cost \$2 million, which may be paid for through stewardship credits. Project implementation is estimated to cost \$700,000 for sale preparation and sale administration. Product removal will be hardwoods less than 9" DBH and will be sold in the form of pulpwood. Grouping of treatment areas into packages of stands totaling 500 acres on average, would equate to a total sale value of approximately \$110,000 for each of the 27 sales, which would be affordable for most of the local logging contractors in the area. Larger offerings could potentially exclude some operators from being able to afford to bid on the contracts. There is definite mill capacity in the area. USFS land comprises 40% of the surrounding land base around the MeadWestvaco mill but currently supplies less than 5% of the products going to the mill.

Benefits to Local Economies

Manufacturing is the most significant part of the area economy for counties within the George Washington National Forest boundary. The Manufacturing sector includes lumber and wood products, furniture, and pulp and paper products. From 1990 to 2000, the employment share from manufacturing decreased by 0.9 percent to 19.4 percent of the economy's employment.

Increasing contracting and logging opportunities with the GWNF will have very positive economic impacts to the local communities. This will allow more dollars to flow into the local economy. Increasing further enhanced economic activity through the multiplier effect.

Implementation of the timber sales will employ up to 20 people in the logging industry for 10 years. The biomass removal would employ another 10 people for 10 years. Sale prep would create or retain positions for 5 people for 5 years. An additional 3 positions in sale administration and stewardship contract inspection would also be created over the 10 year period. These would be full time year round positions. There are numerous logging contractors in the area that are in need of timber sales to harvest. Non-native invasive plant treatments would result in contracts estimated to be worth \$360,000 to be awarded to contractors. Seasonally this project would create 5 jobs for 10 years. Road decommissioning would result in contracts estimated to be worth \$90,000 to be awarded to contractors.

Implementing the prescribed burn and monitoring programs would create or retain positions for 10 seasonal people for the duration of the project.

	Employment (# Part and Full-time Jobs)	Labor Inc (2010 \$)
Commercial Forest Products	163.8	\$7,873,990
Other Project Activities	0.5	\$18,370
FS Implementation and Monitoring	13.7	\$395,185
Total Project Impacts	178.0	\$8,287,545

Funding Plan

The National Forest System (NFS) lands in the southeastern United States offer unique opportunities for restoring the native forests and ecological systems that were once commonly found throughout the region. In many developed areas, the NFS lands are some of the few remaining large, forested landscapes in the South. Restoring and sustaining these lands and doing so in close coordination with our partners and neighboring landowners were a key part in the establishment of the Southern Region national forests and continue to be an emphasis in our management goals for today.

The Collaborative Forest Landscape Restoration Program (CFLRP) will supplement the Southern Region's work priorities very well. The Southern Region has developed a Strategic Framework to guide the important work we do. This Strategic Framework has identified restoration as one of the main areas of emphasis for developing programs of work. The goal for this region-wide focus is "ecological systems are returned to their natural resilience and sustained," which also supports intent of the CFLRP.

The Southern Region's program of restoration work includes a broad set of management practices designed to control the establishment, growth, composition, health, and quality of forests to meet the diverse needs and values of society on a sustainable basis. In developing our regional funding plans, the integration of multiple programs is the primary driver for budget development. Annual funding requests are made by each national forest based on their integrated capacity to accomplish needed work to support land management goals and objectives. The forest will actively seek out stewardship opportunities with our local partners to leverage funds in fulfilling project goals.

The goals and objectives are guided by Land Management Plans, the Region's Strategic Framework, and other restoration strategies. Our regional program managers (fire, fuels, wildlife, forest health protection, vegetation, and watershed management) work together to develop a seamless regional budget package that takes full advantage of the strengths of each individual program.

Vegetation treatment activities for restoration are designed to protect and restore ecosystems, address energy and other social needs, and protect human communities. The funding identified through the process above is used to plan, implement, and monitor the work activities to be accomplished in each fiscal year. The Southern Region will continue to utilize this process to inform allocation decisions in support of CFLRP requirements and to assure that CFLRP funding allocated in FY2011 and FY2012 will be used on this proposal in the year transferred. The Region has also committed to assuring that funding will be available to support the long-term multiparty monitoring requirement for this proposal. The Southern Region has a proven track record for delivering a very efficient program of work with high integrity for producing results.