



# U.S. FIRE LEARNING NETWORK FIELD GUIDE 2009





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# U.S. Fire Learning Network: Restoring Fire-Adapted Ecosystems Across America



**The U.S. Fire Learning Network** is a system of landscape-scale collaborative projects working to accelerate the restoration of fire-adapted ecosystems at local, regional and national scales. Eighty percent of U.S. ecosystems, major habitat types and conservation areas—America’s forests and grasslands—are significantly departed from their historical conditions.<sup>1</sup> In many cases, this departure from a healthy balance is the result of a landscape experiencing too little, too much or the wrong kind of fire. At the same time only an average of two million acres are treated each year with the fire they need.<sup>2</sup> The U.S. Fire Learning Network was formed to advance a scientifically and socially appropriate role of fire at landscape scales. Using effective collaborative processes and tools, the Network’s efforts contribute significantly to restoring and maintaining the nation’s ecologically, economically and culturally important forests and grasslands.

**Collaborative planning**, implementation, adaptive management and sharing lessons learned are at the core of the U.S. Fire Learning Network. Workshops, peer learning and training exchanges are just a few of the mechanisms the Network uses. Participants have a common desire to learn and to share their results and insights with one another; this allows landscape teams to more rapidly overcome barriers to sustainable and integrated ecological, economic and social solutions for the long-term conservation of these important lands.

<sup>1</sup> Blankenship, K. et al. 2007. An Ecological Assessment of Fire and Biodiversity Conservation Across the Lower 48 States of the U.S. Global Fire Initiative Technical Report 2007-1. Arlington, VA: The Nature Conservancy.

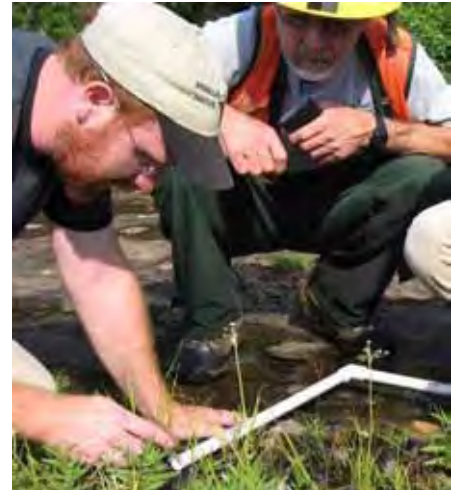
<sup>2</sup> National Interagency Fire Center 2008. Wildland Fire Statistics. [http://www.nifc.gov/fire\\_info/prescribed\\_fires.htm](http://www.nifc.gov/fire_info/prescribed_fires.htm)

*This page, from top:* The Conservancy’s Broken Kettle Grassland Preserve in the northern Loess Hills of Iowa (© Susanne Hickey / TNC); Jemez Mountains in New Mexico (© Patrick McCarthy / TNC); longleaf pine stands at Onslow Bight in North Carolina (© Mark Daniels / TNC)

*Facing page, from top:* Site tour and discussion at the Centennial Valley in Montana (© Tyler Remfield); plot monitoring at the Big Piney Ecosystem Restoration Project in Arkansas (© McRee Anderson / TNC); a Great Plains workshop included a working tour of the Nebraska sandhills (© Susanne Hickey / TNC); members of the Southern Blue Ridge network at Tallulah Gorge, Georgia (© Wendy Fulks / TNC)



## WHAT IS THE FIRE LEARNING NETWORK?



**Launched in 2002**, the U.S. Fire Learning Network (USFLN) is a joint effort of The Nature Conservancy, USDA Forest Service, Bureau of Indian Affairs, Bureau of Land Management, Fish and Wildlife Service and the National Park Service. The national network currently supports eight regional networks across the U. S. and includes several international linkages.

Networks and landscape teams work together to tackle integrated conservation challenges. For example, the Great Plains network participants focus on grazing and fire interactions; teams from Florida and five Caribbean nations work on fire and invasive plant species interactions; teams in the Appalachians work together accelerating oak-hickory and pine forest restoration while western landscape collaborations are implementing strategies to restore ponderosa pine, piñon-juniper woodlands and arid shrublands. And across the network, partners are working to incorporate adaptation to climate change in their plans.

Because of the collaborative approach taken and the variety of stakeholders involved, the treatments implemented by FLN projects often have benefits beyond restoring a prairie or improving the resiliency of a forest. Depending on local needs and opportunities, projects are also designed, for example, to create jobs, reduce hazardous fuels near communities or develop sources of biomass energy.





# THE NETWORK APPROACH



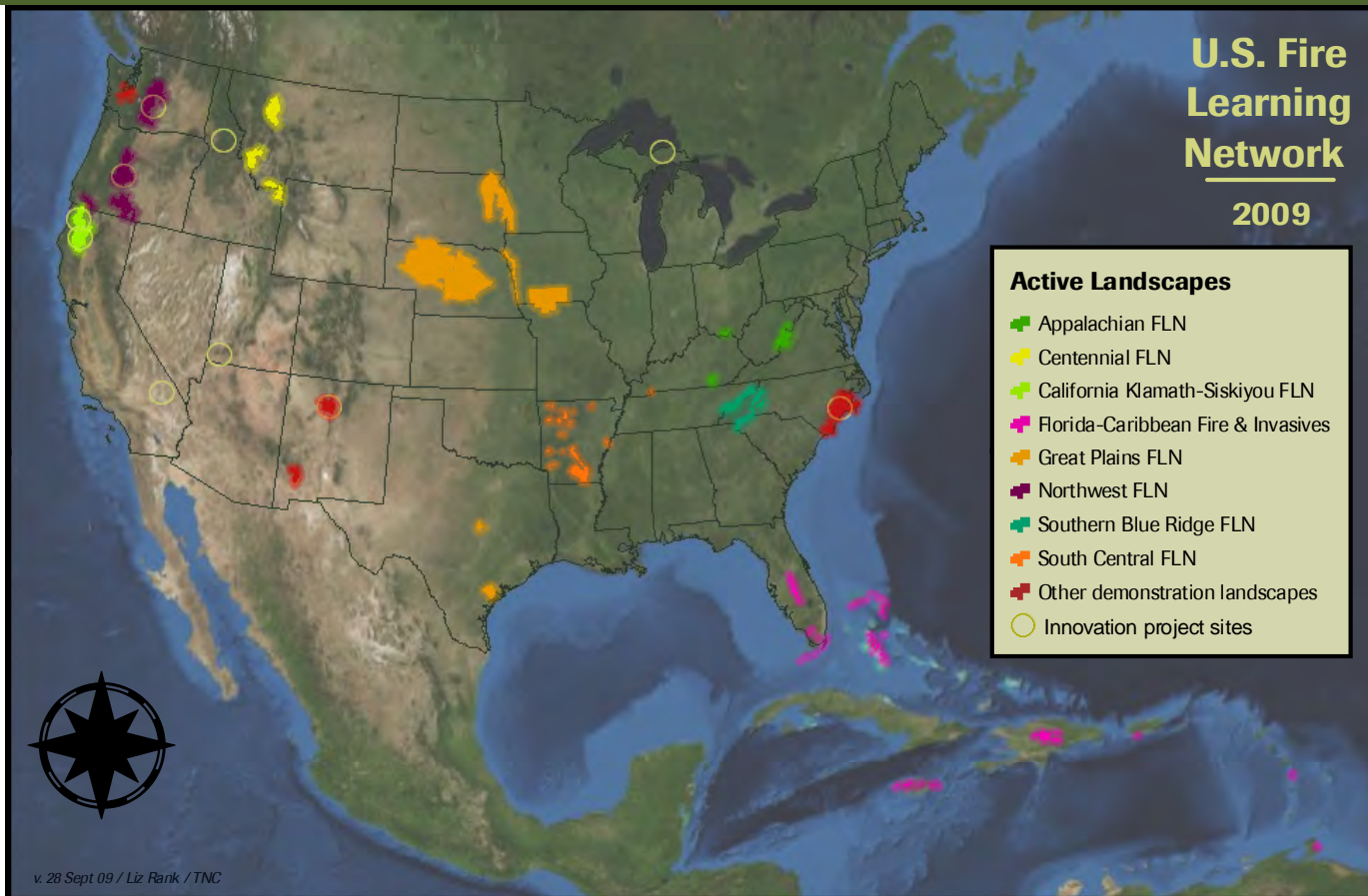
**Landscapes in the U.S. Fire Learning Network** typically are large areas—the mean landscape size is about a million acres—and all include multiple ownerships and numerous stakeholders. Landscapes coalesce around ecological challenges such as altered fire regimes or invasion by non-native species and work toward ecologically and culturally appropriate restoration. Participants form their own partnerships to become networks and define their own landscape boundaries and priorities. Network partnerships include federal, state, local and tribal governments, along with private landowners and community members. When landscape collaboratives are initiated, partners engage in a facilitated iterative four-step process. The USFLN provides modest financial support for leadership, structured facilitation and planning.

**In the Fire Learning Network process**, participants establish collaborative goals, determine actions, and direct resources to gain the greatest conservation results. It is an iterative and adaptive approach that operates at multiple scales and has been employed successfully in diverse geographic and cultural settings. This approach and the methods to implement it allow the practitioner community to share experience and learning across geographies and to improve integrated fire management practices over time. Among other things, Fire Learning Network products facilitate effective NEPA preparation and fire management plan development, contribute to forest and land management plans and inform policy. The Network’s track record of success and the credibility of its products have allowed the partnership to positively affect management on more than 80 million acres to date. The regional networks serve as a forum for landscapes to come together once or twice a year for peer review of products and learning exchange. The national Fire Learning Network convenes workshops where landscapes can share knowledge across regions and gain access to restoration tools, products and ideas.



*From top:* Workshops at the landscape, regional and national levels provide opportunities for peer review (© Jeannie Patton / TNC); site visits involving numerous stakeholders encourage discussion about landscape values, desired conditions and treatment options, while strengthening partnerships (© Tyler Remmfield); crews made up of practitioners from numerous agencies and organizations often work together to implement treatments (© Wendy Fulks / TNC); pre- and post-treatment monitoring allows plan adjustments to be made in a scientific and timely manner (© Roger Cole)

# U.S. Fire Learning Network 2009



**Active Landscapes**

- Appalachian FLN
- Centennial FLN
- California Klamath-Siskiyou FLN
- Florida-Caribbean Fire & Invasives
- Great Plains FLN
- Northwest FLN
- Southern Blue Ridge FLN
- South Central FLN
- Other demonstration landscapes
- Innovation project sites

## 2009

- 61 ACTIVE LANDSCAPE PROJECTS
- 1 INNOVATION PROJECT (INVOLVING 10 LANDSCAPES)
- 21 STATES (PLUS PUERTO RICO)
- 5 CARIBBEAN COUNTRIES
- 56 MILLION ACRES

## NETWORK NUMBERS

This guide provides a snapshot of the scope of the 2009 activities of the Fire Learning Network in states across the nation. It is by no means an exhaustive catalog of the efforts in which the Network is or has been engaged. Since the inception of the USFLN in 2002, the Network has assisted over 150 landscapes and 15 regional networks; they have engaged over 650 partners in 37 states, and their work has affected over 150 million acres of the U.S. landscape.

For more information about the Network, please contact Lynn Decker at [ldecker@tnc.org](mailto:ldecker@tnc.org) or (801) 320-0524.

*From top:* Network partners have recently used fire to restore forest health and reduce fuel loads in Oregon (© Craig Bienz / TNC), California (© Will Harling / Mid Klamath Watershed Council) and Arkansas (© McRee Anderson / TNC), to name but a few projects



# Northwest Fire Learning Network

7.2 million acres



Thinning and prescribed fire are used in the Lakeview Stewardship Unit to reduce fuel loads

© Craig Bienz / TNC

**THE NORTHWEST'S PONDEROSA PINE FORESTS** are unhealthy, suffering unnaturally severe wildfires, insect outbreaks, diminished biodiversity and wildlife habitat and lowered aesthetic and recreational values. They are stressed and vulnerable to drought, leading to higher mortality in old-growth trees than has occurred in the past.

At the root of many of these problems is a history of decades of fire exclusion, which has led to overcrowding and heavy fuel loads. The intense fires that burn as a result pose threats to communities and to the forest themselves. Millions of acres require treatment so that they can burn in a way that is safer for communities and restorative to the forests. The Conservancy has calculated that about 160,000 acres need to be treated annually in order to reach all the area that requires it over the next 25 years; to do this, the scale of annual treatments will have to triple.

Landscape-scale planning provides a framework for evaluating the problem at its full scale and for prioritizing treatments to protect values that are at greatest risk. The strategic placement of treatments can also protect untreated acres and increase the available options in the management of naturally occurring fires. Such landscape-level plans require the joint efforts of diverse stakeholders. Through the Northwest FLN, communities, scientists and agencies develop collaborative desired outcomes and management plans for ponderosa pine ecosystems across a broad swath of the northwestern United States.

## **NETWORK VISION**

The Northwest FLN consists of landscapes that share the overarching goal of accelerating forest restoration through collaborative landscape visioning and management.

### ***Demonstration Landscapes***

Applegate (OR)

Upper Deschutes Basin (OR)

Lakeview Stewardship Unit / Sprague Watershed (OR)

Tapash Sustainable Forest Collaborative (WA)





Map © 2009 Liz Rank / TNC

**The network’s recent accomplishments** include:

- Holding a facilitated workshop to assist with treatment prioritization maps for all four landscapes;
- Providing GIS analysis support to federal planners and enhancing the efficient transfer of related information among partners;
- Launching a partner-friendly Web site to increase social acceptance for forest restoration and improve the sharing of information; and
- Facilitating collaborative input into federal projects, adding monitoring capacity to projects and bringing scientific information to the planning table.

**In the next year**, the regional network plans to:

- Hold a wildlife workshop to improve FLN members’ understanding of the benefits and costs to wildlife of various restoration approaches;
- Provide GIS technical support to assist with treatment prioritization maps for four landscapes to improve treatment design; and
- Promote projects that fall within the landscape assessment priorities at each network site.

**NETWORK PARTNERS**

Partners in the Northwest regional network include the Bureau of Land Management, The Nature Conservancy, USDA Forest Service, U.S. Fish and Wildlife Service and U.S. Geological Survey, as well as Oregon state agencies, Washington state agencies, tribal organizations, county governments, watershed councils, timber companies and industry associations, schools and universities, local and regional fire agencies, private landowners and numerous NGOs.

More detailed lists are included on each landscape’s pages.

# APPLEGATE WATERSHED

## OREGON

### Northwest Fire Learning Network

493,000 acres



The Red Buttes rise behind the Upper Little Applegate watershed

© Rick McEwan

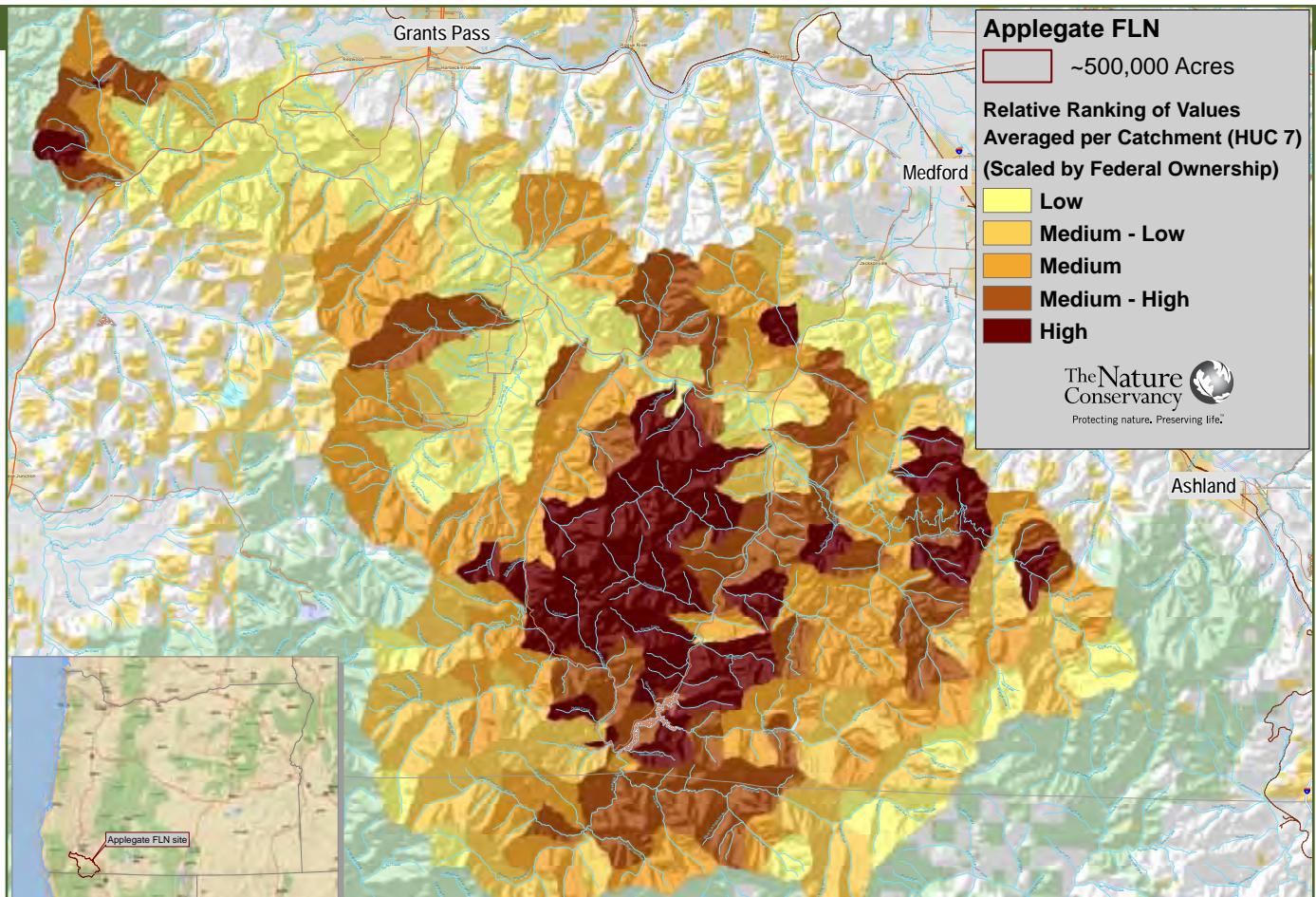
**THE APPLEGATE WATERSHED** is a site unique for its ecological diversity and range of community partnerships. It occupies a small but central position in Siskiyou Mountains in southwest Oregon. The influence of a Mediterranean climate, the rain shadow of the coast range and a diversity of soils support a complex array of dry fire-maintained forests, woodlands, chaparral and grasslands, along with rare serpentine systems and plants of the Josephine peridotite sheet. The landscape's temperate forests are home to the northern spotted owl and the Siskiyou Mountain salamander. The area also contributes cool, clear water to one of the more important Pacific coastal salmon rearing grounds. Its importance is reflected in the watershed's designation as an Adaptive Management Area under the Northwest Forest Plan.

Under the Plan, land in the watershed began to be collaboratively managed; the highly-engaged community used this foundation to form the Applegate Fire Learning Network. Landscape partners have since hosted numerous stakeholder workshops to develop objectives that optimally integrate ecological and social values. The group has met in a series of facilitated workshops to map their values, both biological and social. Maps of each value were refined, then overlaid to locate the areas of greatest overlap. These highlighted areas indicate the places in and around which active restoration is most urgently needed. Community groups and federal land management agencies alike were excited to use this "values map" to inform selection and prioritization of landscapes for federal and local projects that will help restore fire-adapted systems.

#### LANDSCAPE GOAL

Partners at the Applegate Watershed support functioning fire-adapted systems, with their abundant and diverse fish and wildlife, while respecting the social and economic goals and values of the community.

### DEMONSTRATION LANDSCAPE



Applegate Values Map: Partners in a facilitated process identified the landscape values they were most concerned about losing due to continuing ecological degradation that results in uncharacteristic wildland fire, insect outbreaks and disease. The values were mapped across the whole watershed, then summed. "Hot spots" show where many of the values intersect and where active management can simultaneously address many of the values of concern. The results were averaged and scaled by the proportion of federal ownership to help federal partners prioritize their planning efforts. *Map © Chris Zanger / TNC*

## LANDSCAPE ACCOMPLISHMENTS & OBJECTIVES

A tremendous amount of information exists for the Applegate Watershed. Values previously described in a Conservation Action Plan (CAP) process have been prioritized and mapped in the past year. Three workshops and several small group meetings helped clarify priority values and how to translate complex and varied data into "value maps." A clear consensus among participants resulted in twelve driving values. These included oak woodlands, pine-dominated systems, at-risk endangered species habitat, late successional old-growth, "next generation" old-growth, areas in fire-regime one, fire-suppressed forests, areas prone to intense fire, timber infrastructure, public land adjacent to private land, communities at risk and the wildland-urban interface.

The map is expected to help inform project selection and treatment planning over the next five years. Partners anticipate that the map will guide work to the right parts of the landscape, and that more detailed planning at the project level will integrate the values identified in this process. The active participation of staff and stakeholders from the Forest Service, Bureau of Land Management and environmental community ensures that the map has a high degree of credibility and reliability.

## LANDSCAPE PARTNERS

Applegate Fire District 9  
 Applegate Fire Plan  
 Applegate Partnership  
 Applegate River Watershed Council  
 Black Oak Restoration  
 Bureau of Land Management –  
 Medford District, Grants Pass RA  
 and Ashland RA  
 Community groups & leaders  
 Klamath Bird Observatory  
 Klamath-Siskiyou Wildlands Center  
 Out of the Woods Eco-Forestry  
 Siskiyou Regional Education  
 Project  
 Southern Oregon Timber  
 Industry Association  
 Southern Oregon University  
 The Nature Conservancy – Oregon  
 Threatened and Endangered Little  
 Applegate Valley  
 USDA Forest Service –  
 Siskiyou Mountains RD and  
 Wild Rivers RD  
 U.S. Geological Survey

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# LAKEVIEW STEWARDSHIP UNIT/SPRAGUE WATERSHED

## OREGON

### Northwest Fire Learning Network

1.7 million acres



A controlled burn reduces lodgepole encroachment into meadows at Sycan Marsh

© Craig Bienz/TNC

**THE NORTHWEST FIRE LEARNING NETWORK** expanded in 2007 to engage the Lakeview Stewardship Group, a 10-year-old collaborative that has been working to develop a biomass cogeneration plant in the Lakeview Stewardship Unit. This group found that the FLN process provides the action mapping tools as well as integrated modeling efforts that help the group test collaborative management goals through time. The Stewardship Unit is about 500,000 acres. Analysis at this scale provides a model that, when expanded to the Upper Klamath Basin watershed, will protect communities and restore forests and wildlife habitats over three million acres in 2010.

The Cascade Range boasts myriad forest systems from the upland areas of ponderosa pine, with mixes of true fir, Douglas-fir and lodgepole pine, to lower-elevation juniper and sagebrush with some juniper grasslands. Stream valleys and the broad, sediment-filled structural basins generally have extensive marshes. This vast system hosts threatened fish and newly discovered aquatic species, and is a vital nesting spot and migratory stopover for thousands of waterfowl and other bird species.

As in many other forests on the Cascades' east side, years of fire exclusion and problematic land uses have resulted in lodgepole pine becoming dominant over many acres of the forest. Such stands are more susceptible to drought stress and associated outbreaks of insects and disease, which increases the risk of large-scale wildfires. Working together, stakeholders have embarked on the first 10-year stewardship contract on Forest Service land in Oregon, and on planning that will ensure the long-term health of both the forests and the human communities in the region.

#### LANDSCAPE GOAL

The partnership envisions a sustainable forest ecosystem that, through a new understanding of the interrelationships between the people and the land, will ensure quality of life for present and future generations. Partners and local communities will work together to accelerate the restoration of fire-adapted ecosystems while protecting communities from wildfire.

#### DEMONSTRATION LANDSCAPE



Hairy woodpeckers nested in the area the first season after a controlled burn

© Craig Bienz / TNC

## LANDSCAPE PARTNERS

Collins Company  
Defenders of Wildlife  
Fremont Sawmill  
Klamath/Lake Forest Health  
Partnership  
Klamath Tribes  
Lake County High School  
Lake County Resource  
Initiative  
Oregon Department of Fish  
and Wildlife  
Oregon Department of  
Forestry  
Oregon Solutions  
Private landowners  
Sustainable Northwest  
The Larch Company  
The Nature Conservancy –  
Oregon  
The Wilderness Society  
USDA Forest Service –  
Fremont-Winema  
National Forests  
USDA Forest Service –  
Pacific Northwest  
Research Station  
Watershed Councils

## LANDSCAPE ACCOMPLISHMENTS & OBJECTIVES

The landscape team's work on a spatially explicit implementation action map for Lakeview Federal Stewardship Unit began in 2008. In the latter part of the year, the Fremont-Winema National Forest, the Pacific Northwest Research Station and the Klamath Tribes all indicated that the analysis area should be expanded to encompass the Sprague Watershed / Sycan Marsh and areas of interest to the Klamath Tribes. The project is thus evolving into one with the potential for guiding management over a significant multi-jurisdictional geographic area.

A stand layer map for the whole forest was completed in 2008. This important GIS layer was created using eCognition; it was edited and proofed by Forest Service staff, and has support from them. This stand layer will be the foundation for summarizing analysis results and values across the landscape. This approach and foundation was chosen by the Lakeview group, and the product was jointly created by the Forest Service Region remote sensing shop, local Forest Service and the Conservancy.

Analysis of threats to wildlife focal species has been initiated; the key characteristic of a focal species is that its status and trend provide insights to the integrity of the larger ecological system to which it belongs. Forested wildlife species have been classified to unique forested communities using a system that includes vegetation structure and size as well as canopy closure. Biologists from the Regional Office, Forest and District level of the Forest Service as well as from the state of Oregon have worked with the Conservancy to project the forest restoration needed to sustain wildlife populations.

Partners from this landscape also attended VDDT modeling training in Portland in early 2008 with partners from three other Northwest FLN sites; the workshop covered applications of management scenario modeling specifically tailored to FLN landscapes.

A biophysical setting map was also completed by the Forest Service in early 2009; with this, the project is ready to develop a local Fire Regime Condition Class (FRCC) map and a restoration implementation map.

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# TAPASH SUSTAINABLE FOREST COLLABORATIVE

## WASHINGTON

### Northwest Fire Learning Network

2.9 million acres



Standing on a ridge in the original 11,000 acre Tieton checkerboard acquisition project are participants in the 2009 Tapash Leadership Tour, including the Commissioner for Public Lands, Regional Forester, Forest Supervisor, Acting Director for the Washington Department of Fish and Wildlife, Conservancy State Director, Acting Director of the Yakama Nation Tribal Government and leaders from Tapash Collaborative affiliate sponsor organizations. In the background is the next 11,000 acre checkerboard project the group is buying together. © Julie Conley / TNC

**FROM THE FORESTS** of the East Cascades to the arid, sage-dotted hills of the Columbia Basin, the rugged hills and canyons of this landscape support some of the few remaining mature groves of ponderosa pine in the state and provide habitat for white-headed woodpeckers, golden eagles, Rocky Mountain elk and mountain lions. These forests, riparian areas and faunal communities have changed dramatically in ecological character over the last century.

The landscape faces threats common to many in the west: Fire regimes have been altered by decades of fire suppression. Drought, disease and insects are taking a toll. And the forests are being encroached upon—and fire management made more complicated by—an expanding wildland-urban interface.

All of these factors are exacerbated by the difficulty of land management coordination due to a checkerboard ownership pattern that developed in the 19th century. Stakeholders now agree that it is beyond the ability of any one group to ameliorate these threats and restore the forests and the communities they support.

The Tapash Sustainable Forest Collaborative, a coalition of public, non-profit and tribal land managers, was organized under a Memorandum of Understanding in 2007. Members work cooperatively to address forest threats at the landscape scale and to overcome the constraints of the checkerboard ownership patterns. The Collaborative is currently focused on restoring fire-adapted ecosystems in a core area of the Wenatchee National Forest by exploring new implementation tools and opportunities including stewardship contracting, ecosystem services markets, forest biomass energy production and new ways of efficiently allocating agency targets and resources across ownerships.

#### LANDSCAPE GOAL

The Tapash Sustainable Forest Collaborative is united by a vision of forests, savannas and river systems that support diverse natural and human communities, produce ecologically sustainable goods and services and persist in changing conditions throughout the eastern Cascades.

#### DEMONSTRATION LANDSCAPE



## **TAPASH COLLABORATIVE**

The Nature Conservancy –  
Washington  
USDA Forest Service –  
Okanogan and Wenatchee  
National Forests  
Washington Department of Fish  
and Wildlife  
Washington Department of  
Natural Resources  
Yakama Nation

## **OTHER LANDSCAPE PARTNERS**

Conservation Northwest  
Kittitas County Commissioners  
Rocky Mountain Elk Foundation  
South Central Washington  
Resource and Development  
Council  
Yakima County Commissioners

Low-tech field research—like counting tree rings—and high-tech modeling are both part of a Tapash strategy to understand current and historic forest conditions. Understanding the past and the present is essential for managing future forests.

© Reese Lolley / TNC

## **LANDSCAPE ACCOMPLISHMENTS**

In 2008, the Tapash Collaborative launched two related analysis projects. The first was an ecological analysis designed to identify and describe current ecological conditions and model the changes that would be expected from alternative management and disturbance scenarios. The other project examined the economically feasible woody biomass supply. Taken together, these analyses will form the foundation for sustainable management.

In early 2009, the Tapash Collaborative came together to begin a Conservation Action Plan (CAP) for a 300,000 acre landscape. The plan will incorporate findings from the analyses and define the high-impact strategies that members will implement across ownership boundaries. The CAP framework for project development will serve a larger role as the basis for NEPA analyses for multiple projects in the core Ranger District within the Tapash Collaborative.

The Tapash Collaborative leadership team has also built capacity to resolve conflicts. Rather than relying on regulatory relationships, members have sought each other out to find solutions to several key conflicts. The leadership team has also worked together on external relations and all team members count the Collaborative as one of their top work priorities

## **LANDSCAPE OBJECTIVES**

The Collaborative is working to complete the CAP process, to agree on a set of objectives for forest restoration over this large landscape. The CAP will serve a pre-planning function for the next projects in agency pipelines that will require NEPA and SEPA analyses. LANDFIRE data, fire regime condition class and Vegetation Dynamics Development Tool (VDDT) modeling will be assembled within the CAP process, demonstrating the efficiency and utility of using the FLN/CAP toolset for evaluating the effects of various strategies. This process will take place over a series of workshops that will focus on goals, viability assessment, critical threats analysis and abatement strategies, respectively. The first NEPA analysis process will be initiated by the end of the year.

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# UPPER DESCHUTES BASIN

## OREGON

### Northwest Fire Learning Network

2.4 million acres



Remaining ponderosa old-growth forests have experienced decades without fire; the result is a dense understory and higher susceptibility to insects and disease, and, ironically, to fire

© Amy Waltz / TNC

**WITH ECOSYSTEMS RANGING FROM ALPINE FORESTS** and lush meadows, mixed conifer and dry ponderosa forests to dry juniper and sagebrush, and ownership by government agencies, private landowners and tribal organizations, this landscape is a true mosaic. With so many variables, land managers often face challenges when looking for data on property beyond their own boundaries, or in managing the land at effective scales. In addition, the fire-dependent ponderosa pine forests of the eastern Cascade Range have been deprived of fire for decades; as a result, fire burns less often, more uniformly and often with greater intensity than was the historic norm.

In this environment of changed ecosystems and numerous—and sometimes divergent—interests of human communities, the Upper Deschutes Basin FLN landscape formed in 2004 with the goal of bringing stakeholders together to improve the availability of tools needed to assess the landscape and set priorities for treatment. Landscape partners are collaboratively developing a common vision for the landscape, using the best available science and incorporating a wide array of values. A shared vision encourages stakeholders to manage their landscapes and find solutions that lead to restoration and fuel treatments at appropriate scales. The team is also integrating community planning efforts, like Community Wildfire Protection Plans, with agency efforts to generate a robust vision for future land management.

#### LANDSCAPE GOALS

The Upper Deschutes Basin FLN works collaboratively with diverse stakeholders on local forest and fire management issues to accelerate the restoration of fire-adapted systems. The network's goals are to:

- Develop a common vision for the landscape;
- Address technical gaps need for a scientifically defensible cross-ownership landscape assessment; and
- Develop communication tools necessary to keep both partners and external audiences informed on forest restoration activities.

#### DEMONSTRATION LANDSCAPE





Ponderosa pine stands were historically dominated by large-diameter trees; a relatively low tree density and open understory were maintained by fire © Maret Pajutee / USFS

## LANDSCAPE ACCOMPLISHMENTS & OBJECTIVES

**Principles of Restoration:** Partners have made great strides towards building and implementing a common vision for the landscape. The first steps toward building consensus and a core set of goals for the landscape were taken with the development in early 2009 of a set of principles of restoration for central Oregon. Landscape partners laid out eight basic principles to which all parties would commit (see page 28). Further partnerships with the county and federally-approved advisory committees have broadened the commitment to these principles. Using these principles as a guideline, partners began work to collaboratively prioritize landscapes for treatment.

**Prioritizing landscapes:** Using technical data spanning ownership boundaries, a restoration priorities map highlighting ponderosa and dry mixed-conifer stands in need of restoration was completed in 2007. Stakeholder values were then identified; together these were used to prioritize project areas in need of restoration and/or wildfire risk reduction. Two facilitated workshops were held in February and March 2009 to answer the question: What attributes or values in this 2.4 million-acre landscape are at greatest risk of uncharacteristic loss and/or are irreplaceable? After identifying values on the Deschutes landscape—such as old-growth forest, riparian areas, recreation areas and community safety—and identifying those at risk of loss from an uncharacteristic disturbance such as catastrophic fire or insects, a draft map of restoration areas of interest was produced.

**A test case:** The Upper Deschutes Basin team was introduced to the Deadlog Project by Pete Powers, a Forester on the Bend / Ft. Rock District of the Deschutes NF. This site contains some of the last remnants of old-growth ponderosa in this forest. These stands have been altered by fire exclusion and are at risk of being killed by the more intense fires that now occur due to high tree densities and fuel loads. When this project area was overlaid with the restoration priority stands map that the landscape team had developed, it was found to have been identified as a high need area. After collaborative work gathering data and research, the FLN team and crews from the national forest are moving forward with restoration plans.

## LANDSCAPE PARTNERS

American Forest Resource Council  
 Bureau of Land Management – Prineville District  
 Central Oregon Fire Management Service  
 Central Oregon Intergovernmental Council  
 Central Oregon Partnership for Wildfire Risk Reduction  
 Deschutes County  
 Oregon Department of Fish and Wildlife  
 Oregon Department of Forestry  
 Oregon Wild  
 Private landowners  
 Project Wildfire  
 Sierra Club  
 The Nature Conservancy – Oregon  
 Upper Deschutes River Natural Resources Council  
 USDA Forest Service – Deschutes and Ochoco National Forests  
 U.S. Fish & Wildlife Service

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# California Klamath-Siskiyou Fire Learning Network

3.3 million acres



Smoke from the October 2008 Cooper Ranch Burn rises behind Shelton Butte in the Klamath mountains

© Will Harling / MWC

**THE CALIFORNIA KLAMATH-SISKIYOU REGION** is home to diverse ecological and human communities. These communities, and their associated values, are threatened by past and present land use practices and by the impending impacts of climate change. Fire exclusion, logging, grazing and mining have significantly altered historical fire regimes and forest ecosystem structures in this biologically rich part of northwestern California. As in much of the American West, the area is seeing uncharacteristically large, stand-replacing wildfires that threaten both ecological values and human communities. Although fires burn at their historical frequencies, their impacts are increasing in severity and scale. Evacuations have become commonplace summer events due to wildfire threats, and the ecosystem impacts are equally troubling. Re-burn events, where high-intensity fires burn over the same areas at short return intervals, are causing parts of the landscape to convert from forests to shrub, brush or grassland systems.

Landscape-scale forest restoration is critical to conserving threatened ecosystem values as well as to the imperatives of human health and safety. This learning network formed so that a unified vision and effective action can be developed in this area of extremely diverse and complex ecology, numerous social pressures, and multiple-agency land ownership. Ultimately the restoration of this system depends on striking a balance that can be sustained as social values, budgets and climates continue to change.

## NETWORK VISION

This FLN is a venue for improving landscape-scale planning and implementation—scaling up strategies to protect and restore the valuable ecology and communities of the region through collaborative, region wide, ecologically and socially appropriate ecosystem restoration and sustainable stewardship of natural resources.

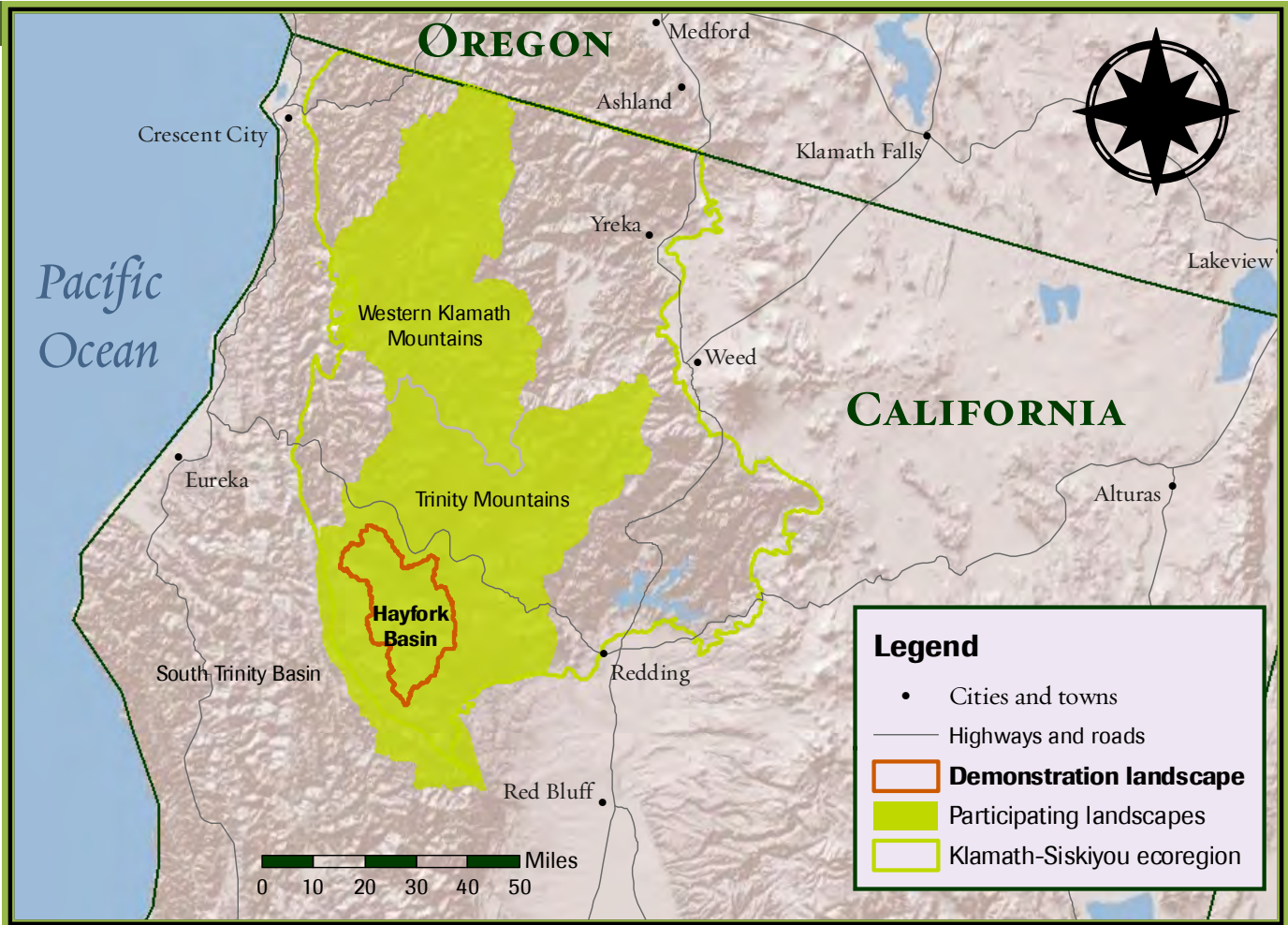
### *Demonstration Landscape*

Hayfork Basin (CA)

### *Participating Landscapes*

Trinity Mountains (CA)

Western Klamath Mountains (CA)



Map © 2009 Liz Rank / TNC

**The California Klamath-Siskiyou (CKS) Network** has grown from the Hayfork demonstration landscape, which joined the Fire Learning Network in 2006. In 2009, the network will build upon its progress by:

- Engaging local and agency leaders representing all CKS landscapes to actively participate in the network;
- Hosting workshops and symposia to establish the scientific basis for management, conducting peer reviews of existing landscape strategies in the region, seeking regional alignment of strategies and forming the Northwest California Prescribed Fire Council;
- Managing a listserv and online networking pages to facilitate consistent and ongoing communication among partners;
- Providing technical assistance and training resources such as landscape-level Conservation Action Plans and prescribed fire training to aid partners in advancing shared objectives;
- Continuing to implement and share strategies, plans and projects of the Hayfork Basin demonstration landscape; and
- Exploring the use of LANDFIRE as a tool for evaluating conditions and prioritizing actions in the CKS region.

### NETWORK PARTNERS

- Bureau of Land Management
- CAL FIRE
- Humboldt State University
- Mid-Klamath Watershed Council
- National Park Service
- Northern California Resource Center
- The Nature Conservancy
- Trinity County Resource Conservation District
- USDA Forest Service
- USDA National Resource Conservation District
- Watershed Research and Training Center

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# HAYFORK BASIN

## CALIFORNIA

### California Klamath-Siskiyou Fire Learning Network

248,000 acres



The Forest Service conducts a prescribed burn after mechanical thinning as part of the Post Mountain Stewardship Project

© Josh Smith / WRTC

**THE HAYFORK BASIN** lies in the Klamath Mountains of northern California. It has a temperate Mediterranean climate and forest types that range from pine-oak woodlands in lower elevations to mixed conifer forests to pure stands of red fir at high elevations. Interspersed is a rich mosaic of low- and high-elevation chaparral and myriad combinations of coniferous, hardwood and meadow communities. Hayfork Creek, the largest tributary to the South Fork of the Trinity River, California's longest undammed anadromous fishery, is home to some of the state's only truly wild runs of salmon and steelhead.

Many small rural communities in the area are at risk from wildfire, as is critical habitat for threatened and endangered terrestrial and aquatic species. Declines in federal budgets have left agencies unable to adequately address the ecological and social needs of the region. Partners in the Hayfork Basin are taking an integrated approach to solving the problems facing the area's forest ecosystems and communities. Landscape-scale planning for forest restoration and community wildfire protection is being integrated with strategies to use the byproducts of treatments—including sawlogs, woody biomass and non-timber forest products—to establish local industries in processing and manufacturing. The Hayfork Basin landscape joined the U.S. Fire Learning Network in 2006 as an independent demonstration landscape. Today, it is the anchor site for the regional Klamath-Siskiyou FLN, which was created in 2008. Activities are coordinated by the Watershed Research and Training Center, a community-based group founded in 1993 and based in Hayfork, California.

#### LANDSCAPE VISION

The partnership intends to restore fire-adapted ecosystems at meaningful scales, which requires an integrated fire management approach to planning and implementation that balances social, economic and ecological factors.

#### DEMONSTRATION LANDSCAPE



## LANDSCAPE PARTNERS

Bureau of Land  
Management – Redding  
Field Office  
Citizens for Better Forestry  
The Wilderness Society  
Trinity County Fire Safe  
Council  
Trinity County Resource  
Conservation District  
USDA Forest Service –  
Shasta-Trinity NF, South  
Fork Management Unit  
USDA Natural Resources  
Conservation Service  
Watershed Research and  
Training Center

A gap in the thick mixed-conifer forest canopy affords a view of the remote Hayfork Valley in the Trinity Mountains of northwest California

© Nick Goulette / WRTC

## LANDSCAPE ACCOMPLISHMENTS

In the past year, this landscape has made progress on three major fronts:

- Data have been collected for the development of a Hayfork Basin Integrated Fire Management Plan, and funding to fill the data gaps and host a database has been secured. The work will be completed during 2009, in conjunction with an update of the county-wide plan developed by the Trinity County Fire Safe Council.
- Two hundred acres were treated under the Post Mountain Stewardship Contract before burn bans and legal issues halted the work. Partners will work with the Forest Service to update the NEPA and continue this work.
- Considerable progress was made toward development of a ten-year stewardship agreement on the Shasta-Trinity NF.

## LANDSCAPE OBJECTIVES

With FLN support, partners pioneered the use of Emergent Learning (EL Map) as a tool for adaptive management and restoration on the Shasta-Trinity National Forest. Practicing adaptive management had been elusive, due to a lack of specific, efficient and effective tools and processes to accomplish it. Partners developed a number of adaptive measures that improved project outcomes in 2008.

In 2009, landscape partners plan to work on adapting and integrating the Emergent Learning method into learning exchanges aimed at capturing lessons from past demonstration projects, and applying those lessons to ongoing project design and environmental analysis for larger scale projects. Such projects include the Jones Thin, associated prescribed burning and the larger Trinity Plantation Thin project. Partners will also be working to continue populating the Hayfork Basin Integrated Fire Management Plan with information from the Big Creek Integrated Watershed Management Plan and the Miners Fire Assessment.

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# TRINITY MOUNTAINS

## CALIFORNIA

### California Klamath-Siskiyou Fire Learning Network

1.9 million acres



A lone foxtail pine stands high above the diverse Trinity Mountains landscape © Nick Goulette / WRTC

**THE TRINITY MOUNTAINS** dominate a rugged and diverse landscape facing social, economic and ecological challenges tied to the region's complicated fire ecology. Past management has left ecosystems and communities susceptible to uncharacteristic wildfire, putting at risk habitat for threatened and endangered species such as northern spotted owls and pacific salmonids as well as human life and property. Striking a balance between mechanical restoration, prescribed fire and managing wildfire will be key to enhancing landscape resilience in the face of a changing climate.

Federal agencies, which manage nearly 80 percent of the landscape, are working with state agencies, non-profit partners, conservation organizations, industry and local communities to forge broadly-supported strategies for advancing landscape scale restoration. Partners from the Trinity Mountains landscape are working together to advance restoration through strategic planning and learning exchanges. Landscape partners will be developing a Conservation Action Plan, investigating return-on-investment scenarios, helping to launch the Northwest California Prescribed Fire Council and participating in workshops focused on plantation and oak woodland restoration, ecosystem services and biomass harvest and utilization.

#### LANDSCAPE PARTNERS

Bureau of Land  
Management – Redding  
Field Office  
Citizens for Better Forestry  
The Nature Conservancy  
The Wilderness Society  
Trinity County Fire Safe  
Council  
Trinity County Resource  
Conservation District  
USDA Forest Service –  
Shasta-Trinity National  
Forest  
USDA Forest Service – Six  
Rivers National Forest  
USDA Forest Service  
– Pacific Southwest  
Research Station  
USDA Natural Resources  
Conservation Service

#### LANDSCAPE GOALS

Partners work to develop science-based, broadly supported plans and strategies that will advance landscape-scale restoration, and implement projects at meaningful scales that will enhance the resilience of the region's forests, wildlife and communities.

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# WESTERN KLAMATH MOUNTAINS

## CALIFORNIA

### California Klamath-Siskiyou Fire Learning Network

1.1 million acres



The Orleans/Somes Bar Fire Safe Council implements a controlled burn on Bull Pine Ranch in May 2009 to enhance an existing fuelbreak and improve winter habitat for Roosevelt Elk  
© Will Harling / Mid Klamath Watershed Council

**THE WESTERN KLAMATH MOUNTAINS** landscape is new to the Fire Learning Network, joining in the summer of 2009. The majority of this landscape falls within the Klamath and Six Rivers National Forests and the ancestral territory of the Karuk Tribe, with five percent privately owned. As part of the FLN, partners will work together to create a future for the landscape that meets the needs of its numerous stakeholders.

#### LANDSCAPE VISION

The partnership is working to reinstate historical fire regimes in a way that protects life and property, improves forest health and enhances resources valued by all stakeholders. The partnership will create a plan that will protect communities from severe wildfires and will guide the planning and implementation of restoration, management and research projects that will ultimately allow for the reintroduction of fire across much more of the landscape.

The landscape has one of the most complex fire environments in the U.S., with a complicated assemblage of slope, aspect, soil and vegetation types spread across elevations ranging from 500 to 9,000 feet. Characterized by warm, dry summers and cool, wet winters, lightning-caused and anthropogenic fires are important ecological processes in the Klamath Mountains. A century of fire suppression has caused much of the landscape's fire return intervals to lengthen past their normal range, leaving forests susceptible to the uncharacteristically intense fires that have been experienced annually in recent years.

The strategic reintroduction of fire at the landscape level is necessary to preserve and enhance the cultural and natural resources of the region, from forests that contain the highest diversity of conifers in the world to streams that support threatened populations of wild spring chinook and coho salmon.

#### LANDSCAPE PARTNERS

Karuk Tribe

Mid Klamath Watershed  
Council

USDA Forest Service –  
Klamath National Forest

USDA Forest Service – Six  
Rivers National Forest

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# Centennial Fire Learning Network

5 million acres



Removing conifers from an aspen stand creates defensible space in a wildland-residential interface.

© Tyler Remfield

**THE CENTENNIAL VALLEY FLN** works toward landscape-scale fire restoration in the western portion of the Greater Yellowstone Ecosystem and the High Divide region through focused multi-agency projects, sharing lessons learned, and the use of rigorous science to guide managers. The long-term viability of several ecological systems in the region depends upon ecologically appropriate fire. As in most of the West, a century of fire exclusion and altered fire regimes has substantially changed these ecosystems, threatening the viability of a number of species, as well as the systems themselves.

A central fire restoration issue across this landscape is aspen conservation. Aspen ecology is complex: herbivory by wildlife (and so, predators and hunting), hydrology, drought and disease all play a role. Previous tools for implementing aspen restoration at meaningful scales have proven difficult, and some have even been counterproductive. Effective solutions will require collaboration among wildlife managers, habitat biologists and the public—the FLN approach has thus been recognized as ideal for addressing the challenges in these landscapes.

## NETWORK VISION

The network will facilitate restoration of native habitats at ecologically meaningful scales through communication with partners and the public and clear demonstrations of restoration action at representative sites. The vision for future states focuses on restoring those habitat types and elements that have declined most significantly over the past century: aspen woodlands, old-growth Douglas-fir forests, and west-slope cutthroat trout. This vision also sees community protection zones as a prerequisite for incorporating fire as a broad-scale functioning natural process that is accepted in these landscapes.

### ***Demonstration Landscape***

Centennial Valley (MT)

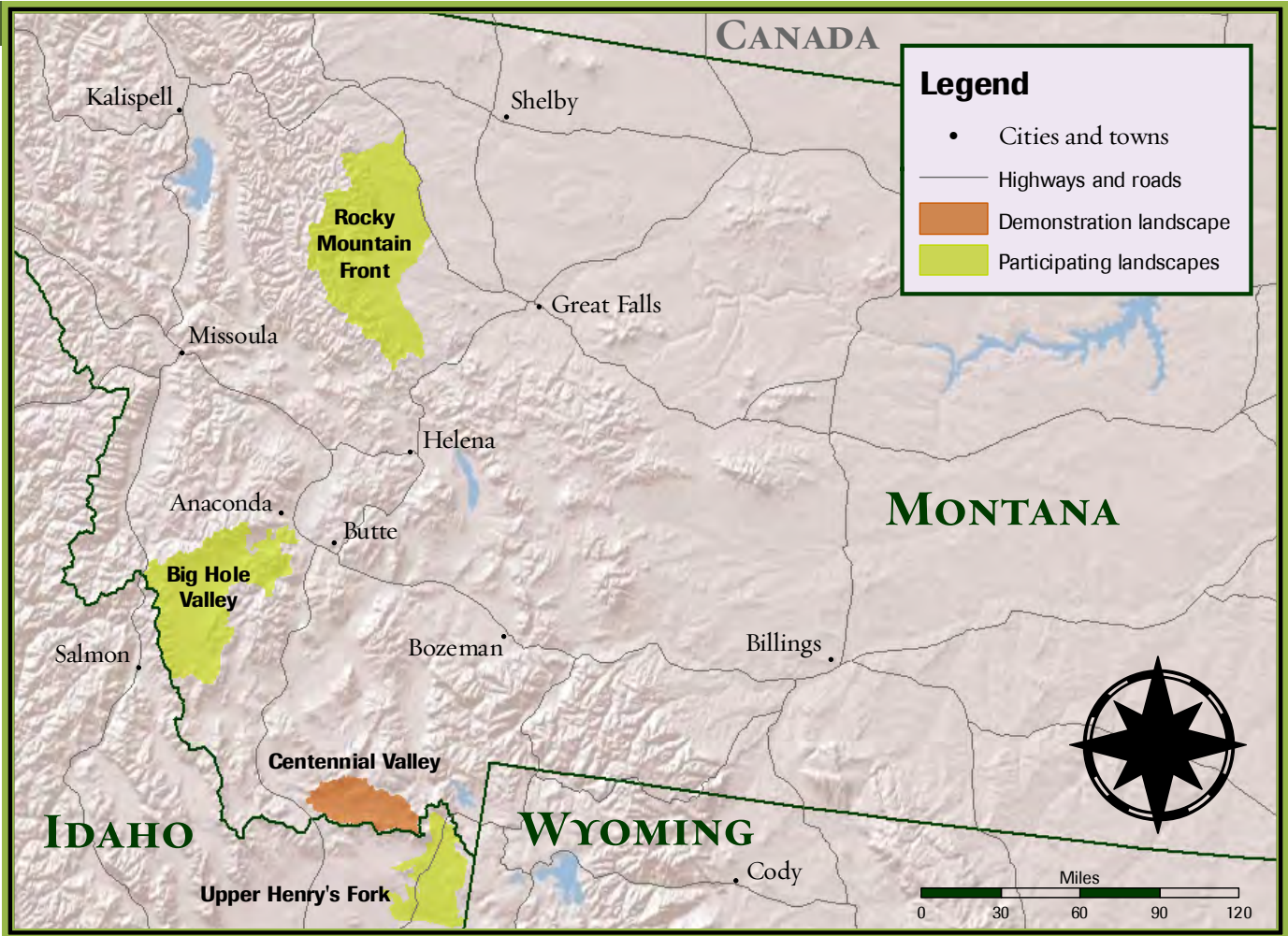
### ***Participating Landscapes***

Big Hole Valley (MT)

Rocky Mountain Front (MT)

Upper Henry's Fork Conservation Area (ID)





Map © 2009 Liz Rank / TNC

**The Centennial FLN** has been investing much of its effort in three areas: identifying common priorities for fire restoration, implementing demonstration treatments with monitoring to document the results, and sharing the lessons learned through workshops and site tours.

For example, in 2008 prescribed burns were conducted in a sandhills system (700 acres) and a post-harvest Douglas-fir forest (120 acres). In 2009 the effects of these treatments will be assessed, and partners will evaluate and refine management strategies through a series of workshops. In 2008, baseline data were collected along Bean Creek prior to a timber harvest and prescribed fire scheduled for the summers of 2009 and 2011 respectively; the sediment regime of the creek will be evaluated over the course of treatments.

In addition, in 2008 the network shared its findings by participating in the first Northern Rockies regional workshop on aspen management, conducting stakeholder site visits to Douglas-fir and sandhills sites, and making a presentation at the “The ‘88 Fires: Yellowstone and Beyond” conference in Jackson, WY. In 2009, workshops on both aspen and Douglas-fir ecosystems will advance network objectives.



© Tyler Remfield

The FLN will also construct aspen exclosures to document and monitor the effect of wildlife on post-fire aspen regeneration, and will initiate landscape prioritization along the Rocky Mountain Front.

## NETWORK PARTNERS

- American Wildlands
- Bureau of Land Management
- Centennial Valley Association
- Greater Yellowstone Coalition
- Idaho Fish and Game
- Montana Department of Natural Resources and Conservation
- Montana Fish, Wildlife and Parks
- Montana Natural Heritage Program
- Montana State University
- Montana Wilderness Association
- The Nature Conservancy – Montana
- University of Idaho
- USDA Forest Service
- U.S. Fish & Wildlife Service
- U.S. Geological Survey

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# CENTENNIAL VALLEY

## MONTANA

### Centennial Fire Learning Network

359,000 acres



The Madison Mountains form a backdrop to the Centennial Valley

© Tyler Remfield

**THE CENTENNIAL VALLEY** is a hotspot of biological diversity and is the last large undeveloped low-elevation valley in the Greater Yellowstone ecosystem. Occupying the headwaters of the Red Rock watershed, this area supports extensive sagebrush steppe and the largest wetland complex in the Greater Yellowstone area. The Centennial Valley is also part of an important linkage area for grizzly bears and other wildlife.

Fire plays an important role in forest dynamics as well as other habitat characteristics across the valley floor, and the long-term viability of several ecological systems in the Centennial Valley depends upon fire. As in much of the western part of the country, a century of fire exclusion has substantially altered the low-elevation forests, riparian communities and deciduous habitats, and has affected the species that these habitats support.

Using the Conservancy's Conservation Action Planning (CAP) methodology, partners identified seven priority conservation targets in the Centennial Valley. Fire exclusion was a high-ranked threat for four of these targets: sandhills, aspen, mid-elevation conifer forests and west-slope cutthroat trout.

Currently, the most important factors limiting the restoration of a natural fire regime in the area are a solid ecological understanding of complex interactions, consensus among stakeholders and the capacity to plan, implement and coordinate prescribed fire. Partners in this landscape are working to address these limitations through demonstration and experimental projects, collaborative learning and adaptive management, so that these lands can flourish again.

#### **LANDSCAPE VISION**

Partners in the Centennial Valley FLN will restore the ecologically important role of fire to systems across the Centennial Valley whose structure or function has been impaired by a century of altered fire regimes.

#### **DEMONSTRATION LANDSCAPE**



Partners from federal and state agencies, conservation groups and private landowners tour areas where treatments designed to protect old-growth Douglas-fir forests, conserve aspen woodlands and restore fire at meaningful scales in the Centennial Valley have been applied. © Tyler Rennfield

## LANDSCAPE PARTNERS

Bureau of Land Management  
Local ranchers  
Montana Department of  
Natural Resources and  
Conservation  
Montana Natural Heritage  
Program  
Montana State University  
The Nature Conservancy  
U.S. Fish & Wildlife Service

## LANDSCAPE OBJECTIVES

In 2009, landscape partners will:

- continue on-the-ground work with maintenance and monitoring of the aspen exclosures;
- share the lessons learned by the Centennial Aspen Assessment Project at the Northern Rockies Aspen Conference in Missoula in March, as well as through a report and publication;
- organize and participate in the Centennial Conservation Partners workshop in July; and
- organize and participate in the Centennial Sandhills workshop in September.

In addition, partners hope to begin work on a fire atlas database for the Centennial sandhills, based on available historic maps and other records.

## LANDSCAPE ACCOMPLISHMENTS

In 2008, the Montana Natural Heritage Program completed aspen woodland mapping for both the Centennial and Big Hole watersheds. Landscape partners also repaired, maintained and monitored aspen exclosures in the Centennial landscape. These fenced areas exclude herbivores, so that the effects of fire and herbivory can be monitored to provide valuable insights into how fire can return to its natural role without negatively affecting the very targets that are to be restored.

Much of this network's work depends on building a diverse coalition of partners. To support this, partners and key stakeholders visited a variety of forest treatments designed to improve the resilience of old-growth Douglas-fir forests in light of climate change, altered fire regimes and effects of past forest management practices.

Partners also conducted three controlled burns aimed at restoring the natural dynamics to three very different habitats: Douglas-fir and aspen forests, grasslands and sandhills habitats. To support adaptive management in this ecologically complex area, monitoring projects include those for birds, rare plants, insects, vegetative structure and small mammals.

# BIG HOLE VALLEY

## MONTANA

### Centennial Fire Learning Network

1.1 million acres



Stands of lodgepole pine, broad expanses of sagebrush and wetlands characterize this broad, high-elevation valley, with the Big Hole Mountains rising in the west © Nathan Korb / TNC

**IN THE UPPER BIG HOLE VALLEY**, multi-generational ranches still prevail and provide rich habitat for wildlife. The Big Hole River, winding for 150 miles through the valley, is a world-renowned fishery and the only river in the lower 48 states that still supports the fluvial Arctic grayling.

The USDA Forest Service has a long history of using fire in the Big Hole Valley to address conifer expansion into sagebrush grasslands, aspen and riparian communities. It has also entered into an innovative agreement with the state wildlife agency, Montana Fish, Wildlife & Parks, to facilitate burning in sagebrush grasslands without harm to wildlife. The resulting projects in this landscape contribute to the regional FLN by allowing partners to examine the effectiveness of various strategies and to explore how to export successful strategies to other landscapes.

An inventory of aspen treatments in this landscape was completed in 2008, and aspen woodlands were mapped by the Montana Natural Heritage Program. The Big Hole Conservation Action Plan, evaluating threats and strategic actions needed to meet them, was completed last year as well.

#### LANDSCAPE PARTNERS

Montana Fish, Wildlife & Parks

Montana Natural Heritage Program

The Nature Conservancy – Montana

USDA Forest Service – Beaverhead-Deerlodge National Forest

U.S. Fish & Wildlife Service – Partners for Fish & Wildlife

#### LANDSCAPE GOALS

Partners in this landscape support the network's vision of improving the viability of conservation targets that have been negatively affected by altered fire regimes. They envision the process of fire being safely restored to its natural role across diverse ecological systems through prescribed fires and wildland fire use. This is only possible by restoring the resilience of the systems and addressing a variety of related problems, including impaired riparian areas, invasive species, altered hydrologic regimes, excessive wildlife browsing, impacts of roads and habitat connectivity threats. The collaborative learning process of the FLN allows partners to deal with these as well as fire and make progress at a meaningful scale.

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# ROCKY MOUNTAIN FRONT

## MONTANA

### Centennial Fire Learning Network

1.6 million acres



Limber pines (*Pinus flexilis*) dot the savanna on the Rocky Mountain Front

© Dave Hanna / TNC

**THE ROCKY MOUNTAIN FRONT**—where mountains and plains converge in a 50 mile wide swath extending from Montana through southern Alberta, Canada—has some of the greatest biological diversity on the continent. Two hundred years ago, Lewis and Clark encountered vast assemblages of mammals. While the wild buffalo is gone, virtually all other plants and animals the explorers encountered have survived here. Home to grizzly bears, black bears, wolves, cougars, lynx, wolverines, elk, deer and moose, the Front is recognized by wildlife managers as among the best wildlife habitat remaining in the nation. This region is one of the last places in the U.S. where the grizzly bear still ventures out onto the plains, and sandhill cranes, massive migrations of waterfowl, and a steady stream of raptors all rely on the area's abundant habitat.

Like other landscapes in the Centennial FLN, the Rocky Mountain Front has a complex mix of land ownership, with a high proportion of the land privately owned. Because these lands comprise core habitat used by grizzly bears and other wide-ranging carnivores, cooperative management is essential. Partnerships among agencies, conservation organizations and landowners are needed to make possible the restoration of fire to these fire-dependent systems.

#### LANDSCAPE PARTNERS

The Nature Conservancy  
– Montana

USDA Forest Service –  
Lewis & Clark National  
Forest

#### LANDSCAPE OBJECTIVES

This landscape is new to the Fire Learning Network in 2009. The landscape will build upon a cooperative agreement that was signed by The Nature Conservancy and the Lewis & Clark National Forest in 2009. The agreement enables resource sharing for fire management on both Conservancy and Forest Service lands, and will continue a tradition of cooperative fire management across boundaries.

In the coming year, partners plan to map limber pine habitat, which is an important fire-dependent conservation target on the Rocky Mountain Front. The resulting digital map of canopy classification of limber pine woodlands will advance the purposes of the agreement by supporting the ranking of restoration opportunities.

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# UPPER HENRY'S FORK CONSERVATION AREA

## IDAHO

### Centennial Fire Learning Network

468,000 acres



Henry's Lake, Idaho

© TNC

#### LANDSCAPE PARTNERS

Bureau of Land  
Management  
Idaho Fish and Game  
The Nature Conservancy –  
Idaho  
USDA Forest Service –  
Caribou-Targhee National  
Forest

#### LANDSCAPE VISION

The Henry's Fork landscape team works with partners and local communities to restore the ecologically important role of fire to systems across the western portion of the Greater Yellowstone area whose structures or functions have been impaired by a century of altered fire regimes.

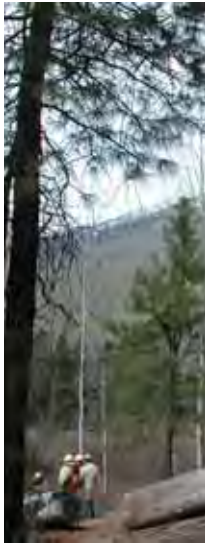
**HENRY'S LAKE AND ITS TRIBUTARIES** form the headwaters of the Henry's Fork of the Snake River. The landscape is a migratory corridor connecting Yellowstone National Park with the Saint Anthony Sand Dunes, the Upper Madison River and the Centennial Valley, making the Upper Henry's Fork a critical landscape linking the Greater Yellowstone and the Northern Continental Divide Ecosystems. The white spruce-aspen forested wetlands on the east shore of Henry's Lake are globally rare and found nowhere else in the continental U.S. Nearly the entire conservation area is within the primary recovery area for grizzly bear, and the forested slopes of the Henry's Lake and Centennial mountain ranges are widely believed to be the best dispersal conduits for large carnivores leaving the Greater Yellowstone area. The primary conservation targets identified for the Upper Henry's Fork Conservation Area include wide-ranging carnivores, Yellowstone cutthroat trout, wetlands, ungulate migration corridors and aspen communities.

One of the strategies for conserving these targets, particularly the aspen communities, is the restoration and maintenance of healthy fire return intervals. A landscape-scale approach to this requires collaboration among wildlife managers, habitat biologists and the public. The Fire Learning Network has been recognized as the most effective approach to addressing the continuing decline of aspen in the area.

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Old growth forest (*above*) and ponderosa pine (*below*) in the Three Sisters Wilderness Area, Deschutes NF

© Maret Pajutec / USFS



**RESTORATION PRINCIPLES** for central Oregon were developed by Upper Deschutes Basin partners in cooperation with other groups.

Eight shared principles guide their work:

- Collaborate with diverse stakeholders at the front end of project planning.
- Restore natural processes and function within the biophysical setting's natural range of variability.
- Plan restoration projects with landscape-scale objectives, with project treatments placed in a strategic way.
- Prioritize treatments so that placement can benefit multiple values: incorporate fire risk and threats, biodiversity, old-growth maintenance and development, and wildlife attributes.
- Incorporate lessons learned using monitoring, transparency and adaptive management.
- Integrate ecological restoration with public values and funding feasibility.
- Incorporate best science to ensure biodiversity is restored and ecosystem resilience and resistance to natural disturbances is sustainable.
- Make by-products of forest restoration treatments available for use in ways that support local businesses and workers and that build local capacity to implement further restoration work.

# Great Plains Fire Learning Network

28.5 million acres



Prairie sparsely interspersed with trees covers the Broken Kettle landscape in the Loess Hills of Iowa.

© Carl Kurtz

**THE GREAT PLAINS GRASSLANDS** enrich our world with wildlife that inspires us, food and water that nourish us and ways of life that define us. These large landscapes support charismatic plains species such as bison, antelope and prairie dogs. They provide critical habitat for grassland birds such as the Attwater's prairie chicken, greater prairie chicken and sharp-tailed grouse, and sustain the time-honored traditions of our ranching culture. They are, however, one of the least-protected, most-threatened habitats on Earth. In North America, 90 percent of our grasslands have been converted to farms and development.

Grassland conservation depends on proven land stewardship techniques—such as prescribed fire, grazing management and invasive species control—that maintain natural processes. The Great Plains Fire Learning Network provides a framework to explore and implement large-scale regional grassland conservation strategies by enacting local conservation plans that have been developed collaboratively. The combined efforts of network partners can ensure grassland conservation in the future by reintroducing and managing ecologically appropriate fire regimes in the U.S. and by employing sound science to exemplify restoration and stewardship practices useful in other countries and continents.

## NETWORK VISION

The Great Plains FLN brings together landscapes from throughout the Great Plains to develop strategies to integrate private lands into landscape-scale fire management activities that serve ecological restoration objectives.

### **Demonstration Landscapes**

Loess Hills (IA)  
Refugio-Goliad Prairie (TX)

### **Participating Landscapes**

Central Platte River (NE)  
Fort Hood (TX)  
Lower Loup Rivers (NE)  
Middle Niobrara (NE)  
Prairie Coteau Habitat Partnership (SD)  
Southern Iowa Oak Savannas (IA)

### **Other Critical Areas**

Antelope Hills (OK)  
Flint Hills (KS, OK)  
Lower Cedar River (IA)





Map © 2009 Liz Rank/TNC

## NETWORK PARTNERS

- Agren, Inc.
- National Park Service
- The Nature Conservancy
- USDA Natural Resources Conservation Service
- U.S. Fish & Wildlife Service

The over-arching goal for the network in the past year was to focus more strongly on fostering partnerships—both within the network and with others—to build capacity, allowing network sites to better implement ecological fire at scale. Network sites also capitalized on opportunities to share staff among sites via what has become a successful program of prescribed fire training and implementation exchanges. These exchanges are drawing growing interest from partners across the U.S., such as the BIA, BLM, US FWS, NPS, USDA NRCS and USDA Forest Service as well as from other NGO partners and private contractors.

Relationships among network participants have matured over the years and now more one-on-one and spontaneous informal communication occurs, resulting in efficient sharing of lessons and strategies. For example, the Loess Hills and southern Iowa sites

worked together to develop volunteer fire department collaboratives. Facing similar resource issues, partners from the Refugio-Goliad Prairie and Lower Loup Rivers sites plan to test whether a similar model will work on their landscape.

The network has also reached out to regional groups with overlapping interests, such as the Conservancy's Great Plains Initiative and the Patch Burn Working Group (PBWG). The network is holding a joint meeting with the PBWG in September 2009, hosted by the Southern Iowa site.

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# LOESS HILLS

IOWA

Great Plains Fire Learning Network

649,000 acres



Volunteer fire departments are playing an increasingly important role in the reintroduction of fire in many places across the Great Plains. Partners in this landscape are working with other landscapes in the Great Plains FLN to help VFDs gain experience in prescribed fire for ecological and management objectives.

© David Carter/ Tabor VFD

**THE LOESS HILLS**—built up of exceptionally thick deposits of windblown silt known as loess—are home to much of Iowa’s remnant prairie and extensive areas of bur oak woodland. The area provides habitat for over 49 grassland species of special concern including the regal fritillary butterfly, birds such as the bobolink and dickcissel, reptiles like the ornate box turtle and Great Plains skink, and Iowa’s only known population of prairie rattlesnakes. Historically the area was periodically swept by fires and grazed by bison and elk; together, these disturbances kept Iowa’s prairies healthy. Today, the natural role of fire has been significantly altered, resulting in accelerated woody encroachment into grasslands and a decline in the regeneration of oak woodland. This alteration, coupled with increased residential development and other incompatible land use, threatens to harm the area’s fragile natural areas.

Restoration here is as complex as it is essential. With over 95 percent of the Hills privately owned, restoration must involve numerous landowners across large areas. Acceptance of prescribed fire and grassland restoration varies across the landscape, but can be accelerated by creating jobs in rural communities. Tree shearers, fire crew professionals and native seed producers can enable compatible economic uses, such as livestock grazing and native seed production. Through collaboration, partners will find compatible activities that meet the ecological and economic needs of both natural areas and landowners.

## LANDSCAPE VISION

The partnership will restore and maintain viable ecological communities, provide protection from unwanted wildland fire and improve productivity and value of the land through implementation of a regional fire management plan.

## DEMONSTRATION LANDSCAPE



A late spring burn reduces the encroachment of rough-leaf dogwood

© Glenn Pollack / TNC



The Pottawattamie County Conservation Board burn crew is one of several partners cooperating on a prescribed burn

© Glenn Pollack / TNC

## LANDSCAPE PARTNERS

Agren Inc.  
 Golden Hills Resource  
 Conservation &  
 Development  
 Iowa Department of Natural  
 Resources  
 Iowa State University  
 Loess Hills Alliance  
 National Park Service  
 National Wild Turkey  
 Federation  
 Pheasants Forever  
 Plymouth County  
 Conservation Board  
 Pottawattamie County  
 Conservation Board  
 Soil and Water Conservation  
 Districts  
 The Nature Conservancy –  
 Iowa  
 University of Nebraska at  
 Omaha  
 USDA Natural Resources  
 Conservation Service  
 U.S. Fish & Wildlife Service

## 2009 OBJECTIVES

- Establish a fire specialist position to provide leadership and mentoring to fire practitioners in VFDs and to private lands conservationists and landowners via assistance with prescribed burn planning and implementation;
- Host landowner burn workshops and field tours of recently burned areas;
- Monitor grassland birds, butterflies and floristic quality to assess select sites in restoration programs;
- Conduct savanna restoration in the 4,289 acre Waubonsie and the 6,000 acre Bur Oak Ridge priority areas in the southern Loess Hills; and
- Complete the Loess Hills LAND-FIRE application project.

## LANDSCAPE ACCOMPLISHMENTS

The Loess Hills landscape has participated in the U.S. Fire Learning Network since 2002. The collaboration has leveraged state and federal funding sources to establish fire equipment caches throughout the landform, supported a private lands mobile fire crew and completed intensive outreach on prescribed fire to landowners, volunteer fire departments and the media. The burn crew project has relied on local on-call crew members, an approach that has built a cadre of experienced fire practitioners in the region.

Future plans include a shared fire specialist position to coordinate and encourage fire activities in the region among the conservation agencies, landowners and volunteer fire departments and revitalizing landowner workshops to capitalize on the successful spring 2009 burn season.

The acres treated on private land in the Loess Hills with equipment from established fire caches has increased from 2,600 acres in 2000 to 5,600 acres in 2008. Four volunteer fire departments are now actively offering prescribed fire as a service to landowners and others.

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# REFUGIO-GOLIAD PRAIRIE

TEXAS

Great Plains Fire Learning Network

664,000 acres



Prescribed fire implemented by a crew of Fish & Wildlife Service and Conservancy practitioners clears mesquite brush from whooping crane habitat on Matagorda Island in the Aransas Fish and Wildlife Refuge Complex

© Jason Ahern / TNC

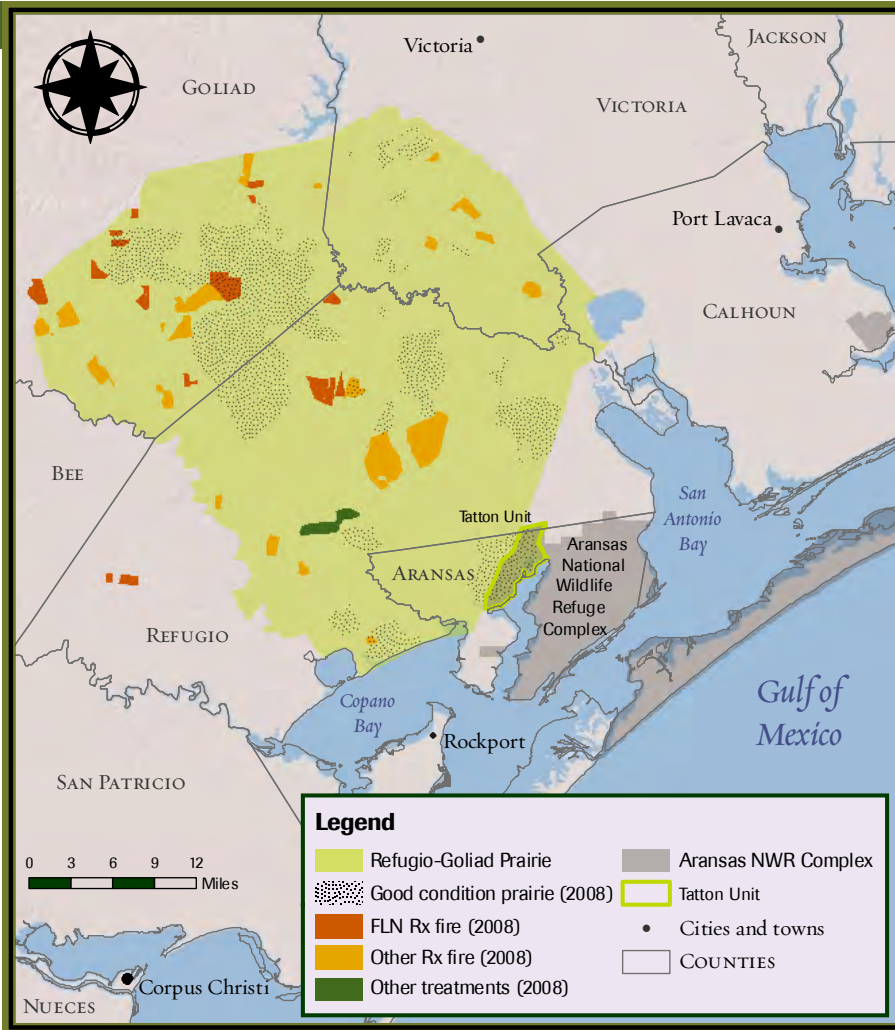
**THE REFUGIO-GOLIAD PRAIRIE (RGP)** is one of the largest and highest-quality expanses of coastal tallgrass prairie in Texas. It supports one of the last known wild populations of Attwater's prairie chicken, which was federally listed as endangered in 1967 and is now one of the rarest bird species in North America with fewer than 70 birds remaining in the wild. Because of its size and its relatively unfragmented habitat, RGP is considered the best location for prairie chicken reintroductions. In 2007 and 2008, more than 200 birds were released on a private ranch in the heart of this prairie.

The prairie is a fire-dependent ecosystem, but fire has been largely removed for over a century. This disruption of the historical fire regime has allowed the encroachment of woody plants, which has greatly reduced habitat for many grassland wildlife species such as Attwater's prairie chicken. Private landowners also incur economic losses as both livestock forage and opportunities for hunting of grassland species decrease. To reverse this trend, the Coastal Prairie Conservation Initiative (CPCI)—a partnership among private landowners, Grazing Lands Conservation Initiative, U.S. Fish and Wildlife Service, Texas Parks and Wildlife, Natural Resources Conservation Service and The Nature Conservancy—was formed to restore coastal prairie habitat. Prescribed fire, with increased geographic scope and frequency, is needed to accomplish this. Six years ago, the Conservancy formed a prescribed fire module to assist landowners; the fire module has since helped private landowners apply fire on 61,273 acres, but the landscape's need for fire is much greater than this. Consequently, innovative methods to prioritize and plan prescribed fire efforts, and strategies to further engage partners who can these efforts—such as volunteer fire departments and CPCI partners—are being pursued.

## LANDSCAPE GOAL

The Refugio-Goliad Prairie will be an ecologically functional coastal tallgrass prairie network, capable of supporting its historic richness and diversity of plants and wildlife, as well as local agricultural enterprises.

## DEMONSTRATION LANDSCAPE



Map © 2009 Liz Rank / TNC

A fixed-wing aerial survey conducted in 2004 showed about 93,000 acres of prairie in the 230,000-acre Attwater's prairie chicken core Recovery Area. In March 2008, a more extensive aerial survey mapped the entire landscape and documented 119,000 acres. (The 2008 survey showed a slight decrease in prairie acreage in the Recovery Area, but this may have been partially due to differences in methodology. The more systematic 2008 survey will serve as the baseline for future comparisons.) The 2008 survey also documented 23,000 acres of burning on private lands in the landscape, a type of burning that had not previously been amenable to tracking. This finding was encouraging, both for the significant acreage treated and the cultural importance of a return to the use of fire as a common management practice.

### LANDSCAPE ACCOMPLISHMENTS

In addition to completing the monitoring surveys of the prairie, in the past year the partners working in this landscape:

- Completed a Conservation Action Plan (CAP) for the site;
- Enlisted five new ranches, representing an additional 26,000 acres, bringing the private lands total to about 217,000 acres;
- Treated 13,500 acres, bringing in the total use of prescribed fire on the prairie to 36,500 acres;
- Hosted prescribed fire training exchanges for partners and other members of the USFLN, and attended exchanges at other FLN sites; and
- Hosted an international learning exchange about the use of fire in prairie management that was attended by practitioners and managers from many agencies from three countries.

### LANDSCAPE PARTNERS

- Coastal Bend Prescribed Burn Association
- County of Victoria – Fire Marshal's Office
- National Audubon Society – Texas Chapter
- NOAA – National Weather Service
- Private landowners
- Raisin Volunteer Fire Department
- Texas Parks and Wildlife Department
- The Nature Conservancy – Mexico, Texas
- U.S. Fish & Wildlife Service
- USDA NRCS – Grazing Lands Conservation Initiative

### LANDSCAPE OBJECTIVES

In 2009 partners plan to:

- Increase community acceptance of prescribed fire by pursuing media outreach opportunities;
- Further engage volunteer fire departments to build capacity;
- Enter into a MOU with Aransas National Wildlife Refuge Complex to enhance cooperative work;
- Reduce habitat fragmentation by identifying and pursuing potential conservation easement opportunities;
- Host a training exchange to promote the professional development of local fire personnel; and
- Survey and map private burn events to monitor progress.

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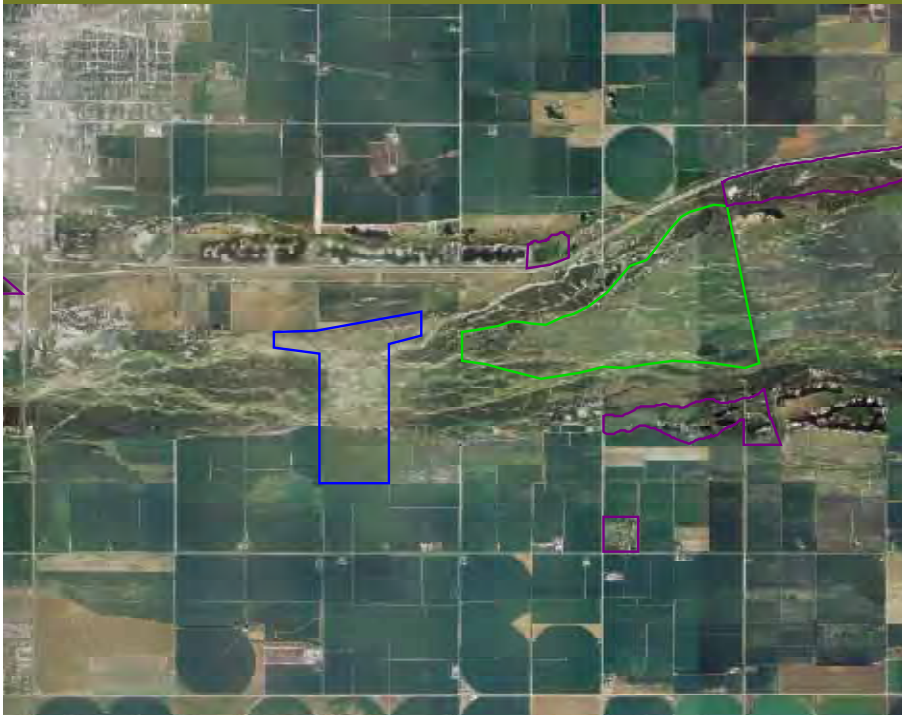
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# CENTRAL PLATTE

## NEBRASKA

### Great Plains Fire Learning Network

2.1 million acres



The Platte River runs through a highly fragmented landscape, with patches of grassland and woodlands scattered in an agricultural matrix and dissected by a major interstate highway. Conservation areas are outlined in color by ownership: U.S. Fish & Wildlife Service (blue), The Nature Conservancy (green) and Nebraska Game and Parks Commission (purple).

**THE CENTRAL PLATTE LANDSCAPE** lies within the main Platte River floodplain in the central third of Nebraska. This fragmented landscape is characterized by cropland, degraded native pasture, and woodlands that have encroached upon the grasslands since European settlement. The I-80 highway corridor parallels the river and sprawling development is occurring. Conservation targets that are under pressure in this landscape include grasslands and wetlands, which have been subjected to fragmentation and altered hydrology; migratory birds, which rely on vanishing wet meadows and well as roosting habitat; and whooping cranes, which face reduced roosting habitat and increased predation.

Partners have engaged in a variety of activities to reintroduce fire and increase the resiliency of the landscape. The Central Platte Natural Resources District, with Conservancy support, has employed a prescribed burn crew to assist private landowners in fire management to improve the land for agriculture, wildlife and hydrologic integrity. Partners have also co-hosted a National Wildfire Coordinating Group fire training academy for the region to engage volunteer fire departments, helped in the organization of landowner fire cooperatives and developed materials for private landowner workshops and outreach.

#### LANDSCAPE PARTNERS

Central Platte Natural Resources District  
Nebraska Game and Parks Commission  
Prescribed Burn Task Force  
Private landowners  
The Nature Conservancy—Nebraska  
USDA Natural Resources Conservation Service  
U.S. Fish & Wildlife Service  
Volunteer fire departments

#### LANDSCAPE GOAL

By educating and involving private landowners and public agencies in the uses and benefits of fire, and using a variety of tools, partners will maintain a highly diverse and heterogeneous native grassland system. Partners also aim to alter the cultural perception of fire, and foster awareness of its benefits in the next generation of land managers and citizens.

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# FORT HOOD

## TEXAS

### Great Plains Fire Learning Network

219,000 acres



A January prescribed fire reduces fuel loads

© Jackelyn Ferrer-Aviles

#### LANDSCAPE PARTNERS

The Nature Conservancy – Texas

U.S. Army

U.S. Fish & Wildlife Service

#### LANDSCAPE GOAL

Together, partners work to manage fire on this landscape to promote recovery of endangered bird species, allow effective use of the land for military exercises and protect nearby developed areas from wildfire.

**THE FORT HOOD LANDSCAPE** is a mosaic of grassy valleys and wooded mesas on the northeastern edge of the central Texas Hill Country, where fire has historically been a natural occurrence. Unlike other lands in the Hill Country, the variety of military training activities that occur on the installation—tracked- and wheeled-vehicle maneuvers, live fire, dismantled exercises—make Fort Hood prone to incidental ignition, so fire has not been excluded from this part of the landscape.

Fort Hood has the largest populations of two federally endangered birds—the black-capped vireo (*Vireo atricapilla*) and golden-cheeked warbler (*Dendroica chrysoparia*)—under single management authority. Because of these birds, the Conservancy began working at Fort Hood in 1992. In 1993, the U.S. Fish and Wildlife Service issued the first of two Biological Opinions listing the measures that the Army must take to promote recovery of these birds. Provisions of this Opinion included habitat management (including prescribed burning), as well as monitoring and research. In 1997, the Conservancy assumed primary responsibility for these activities when the first Cooperative Agreement was signed.

Prescribed fire is used at Fort Hood to reduce hazardous fuel loads and is applied around areas where live ammunition is used, which helps keep ordnance-sparked fires contained and reduces shrub encroachment into training areas where clear lines of sight are necessary. Fire is also used to reduce fuel loads in the wildland-urban interface and at the installation's boundaries. Prescribed fire applied to grasslands below the Ashe juniper-oak woodlands on the mesa slopes is used to manage fuel loads and to prevent fire from escaping up-slope into this golden-cheeked warbler nesting habitat. The black-capped vireo also benefits from fire, nesting in shrublands that are maintained by occasional disturbances such as fire. Finally, prescribed fire is used to maintain or improve the health of the fire-adapted grasslands that make up such a significant part of the landscape at Fort Hood.

Numerous research projects have been conducted in this landscape. Recent projects at Fort Hood have assessed the recovery of Ashe juniper woodlands following catastrophic wildfire, fire effects on native and exotic vegetation, bird response to fire and the use of mastication in combination with prescribed fire for habitat management.

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# LOWER LOUP RIVERS

## NEBRASKA

### Great Plains Fire Learning Network

5.1 million acres



#### LANDSCAPE PARTNERS

Lower Loup Natural Resources District  
Nebraska Game and Parks Commission  
Pheasants Forever  
Prescribed burn associations  
Prescribed Burn Task Force  
Private landowners  
USDA Natural Resources Conservation Service  
Volunteer fire departments

A stretch of the North Loup River, just north of Broken Bow, shows a typical mix of irrigated farmland on the river bottoms and native prairie on the divides. © John Ortman / Lower Loup NRD

**THE LOWER LOUP NATURAL RESOURCES DISTRICT** project area comprises all or parts of 16 counties and covers 7,923 square miles in central Nebraska, including the Central Loess Hills and parts of the southern Sandhills region. Set up along hydrological boundaries, the Districts are responsible for managing a variety of natural resource challenges, protecting and maintaining natural resources in areas ranging from water quality and quantity to forestry, range management, soils and more.

About half of the district is tilled agricultural land; the remaining 2.5 million acres are native grasslands, which are severely threatened by eastern red cedar encroachment. Numerous landowner cooperatives have formed to manage this threat, and their numbers are increasing in the region. Lessons learned from their efforts will be shared with other landscapes in the Great Plains FLN that face similar issues.

Outreach to volunteer fire departments, landowner training and burn plan development are planned for the coming year to develop further capacity in the landscape. This project will also provide leadership to the regional network.

#### LANDSCAPE VISION

Partners wish to maintain the biologically unique Central Loess Hills Prairie as prairie, both by reversing brush encroachment and by improving and restoring diverse native plant communities.

To this end, the area's private landowners and managers are becoming empowered to take the control of fire into their own hands to safeguard their economic well-being and the region's ecological integrity.

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# MIDDLE NIOBRARA SANDHILLS

## NEBRASKA

### Great Plains Fire Learning Network

12 million acres



From the high point on the reserve overlooking the Niobrara River, burn bosses reconnoiter units prior to ignition during a cross-training exercise. © Mary Lata / USFS

**THE MIDDLE NIOBRARA SANDHILLS** landscape contains both forests and grasslands, systems that present radically different fire challenges. The area is a meeting ground for northern, eastern and western forests, central and northern mixed-grass prairie and tallgrass prairie. The central mixed-grass prairie here is one of the largest nearly-unbroken native prairies in the United States. The prairie is, however, being rapidly invaded by eastern red cedar, partly as a result of fire suppression. Fire is also important for the restoration of riparian grasslands, tallgrass prairie and bur oak savanna. In Nebraska, prescribed fire can prevent brush and trees from overtaking the prairie, prevent build up of dead vegetation that encourages weeds and retards new growth, and improve habitat for prairie birds, mammals and butterflies.

This landscape is largely privately owned and has been part of the FLN since 2002. Barriers to the reintroduction of fire include cultural attitudes toward fire, lack of funding for volunteer fire departments and a shortage of fire-trained staff. Landowners and managers are being empowered to conduct fire collaboratively, in either formal or informal associations. Training and other technical assistance has improved access to equipment and strategic use of cost-share programs to demonstrate positive fire effects and create an initial critical mass of fire practitioners. As a result, stakeholders are moving more quickly from the problem stage to the solution stage of a shared, feasible vision and strategies.

In the past year, federal agency and Conservancy participants from multiple states implemented prescribed fire on more than 3,000 acres of the 56,000 acre Niobrara Valley Preserve. A two-week effort both provided training opportunities and allowed larger, more complex units to be burned than local capacity permitted. The success of this pioneering effort demonstrated its usefulness for bringing fire-capacity needs and resources into balance. New techniques were also tested and refined, including the use of temporary mineral lines in unstable soils and prescriptions for more intense and effective fires. These developments can be applied elsewhere, to make fire safer and more feasible in other landscapes of this type.

#### LANDSCAPE PARTNERS

Middle Niobrara Natural Resources District  
National Park Service – Niobrara National Scenic River  
Nebraska Game and Parks Commission  
Nebraska Forest Service  
Niobrara Council  
Private landowners  
Sandhills Task Force  
The Nature Conservancy – Nebraska  
USDA Forest Service  
USDA Natural Resources Conservation Service  
U.S. Fish & Wildlife Service – Fort Niobrara National Wildlife Refuge  
Volunteer fire departments

#### LANDSCAPE VISION

Fire will be restored to the landscape, where appropriate and necessary, by empowering private land managers through training, capacity building, organization and demonstrations showing that fire can be both effective and safe.

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# PRAIRIE COTEAU HABITAT PARTNERSHIP

## SOUTH DAKOTA

### Great Plains Fire Learning Network

5.0 million acres



Prairie Coteau wetlands and grasslands

© Pete Bauman / TNC

**THE PRAIRIE COTEAU REGION** of South Dakota and Minnesota is an excellent example of the once vast northern tallgrass prairie. The area is characterized by native big and little bluestem, switchgrass, indiangrass and blue grama, with bur oak woodlands surrounding wetlands to the northeast. These grasslands are interspersed with thousands of wetland basins and small forested valleys known as coulees. As fire is gradually reintroduced, native grasses and forbs burst forth abundantly. Today, this mosaic of wetland and prairie attracts a diverse array of waterfowl and grassland birds. The landscape also provides excellent habitat for rare prairie-dependent insects, including numerous species of butterflies.

The Partnership's goals are to conserve biodiversity, including rare and endangered species; improve management practices on lands that are currently being managed to improve native species habitat; increase the number of private landowners using ecologically sound prescribed fire and grazing practices and model appropriate disturbance regimes while exploring new niche markets for participating landowners. Under the U.S. Fish and Wildlife Service Private Stewardship Grant Program, the partnership has worked with Region 6 fire personnel to ensure the fire program meets all national and regional FWS and National Wildfire Coordinating Group (NWCG) standards for fire planning and implementation.

The Partnership was formed in 2004 as part of the Great Plains FLN, and has seen an impressive increase in landowner participation and interest over the years. To date, 20 landowners across nine counties have participated, implementing 5,000 acres of fire and monitoring for ecological effects. Outreach and education—at farm and home shows, through landowner tours and SDSU Extension 'Pasture Walks' and at a 2009 landowner tour and forum—along with partnering to secure long-term funding, have set the stage for continuing growth in the effectiveness of the Partnership's activities.

#### LANDSCAPE PARTNERS

Bureau of Indian Affairs  
Day County Conservation District  
Ducks Unlimited  
Ecosun Prairie Farms  
National Fish and Wildlife Foundation  
National Park Service – Pipestone National Monument (MN)  
Northern Prairies Land Trust  
Pheasants Forever  
Private Landowners  
South Dakota Dept. of Agriculture – Wildland Fire Suppression  
South Dakota Department of Game, Fish, and Parks  
South Dakota Fire Marshall's Office  
South Dakota Grasslands Coalition  
South Dakota Natural Resources Conservation Service  
South Dakota State University – Animal and Ranch Sciences, Wildlife and Fisheries  
South Dakota State University – Extension Service  
The Nature Conservancy  
Upper Big Sioux Watershed Project  
USDA Forest Service  
U.S. FWS – Big Stone NWR (MN)  
U.S. FWS – Madison WMD  
U.S. FWS – Partners for Fish and Wildlife  
U.S. FWS – Waubay NWR

#### LANDSCAPE VISION

The Partnership will promote a greater appreciation of the value of native tallgrass prairie by working with agencies, landowners and the public to return to a more natural fire and grazing regime.

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# SOUTHERN IOWA OAK SAVANNA

## IOWA

### Great Plains Fire Learning Network 4.0 million acres



#### LANDSCAPE PARTNERS

- Decatur County Conservation Board
- Decatur County Economic Development Board
- Drake University
- Graceland University
- Iowa Department of Natural Resources
- Iowa State University
- Pheasants Forever
- Private landowners and ranchers
- Southern Iowa Oak Savanna Alliance
- The Nature Conservancy–Iowa
- USDA Natural Resources Conservation Service
- U.S. Fish & Wildlife Service
- Volunteer fire departments

**THE SOUTHERN IOWA OAK SAVANNA** conservation area lies across several counties in south central Iowa. The landscape was untouched by glaciers during the last Ice Age, which left a terrain of mostly rolling hills. Today, well over 95 percent of the landscape is privately owned, with much of it used for grazing and, on the river bottoms and less-steep hill tops, conventional row-crop agriculture. A large portion of the cropped acreage has been enrolled in the Conservation Reserve Program for 20 years, and much of this land has seen woody species encroachment. In addition, a fairly recent trend has resulted in many acres being purchased by absentee landowners for recreational use. Many of these acres are no longer grazed and are also being encroached by woody vegetation, especially eastern red cedar.

The Southern Iowa Oak Savanna Alliance, an organization of landowners and conservationists, was formed to raise the funds needed to restore oak savanna in this landscape. This group and the U.S. Fish and Wildlife Service are working to develop a burn crew for the area; such a crew would meet national firefighting training standards and be able to implement a prescribed fire program. Partners also work to provide training opportunities for volunteers and university students, and cooperate on burns to reduce woody encroachment.

#### LANDSCAPE GOAL

Partners are working toward the restoration of oak savanna by working cooperatively to address woody species encroachment, intensive grazing and fire management across this landscape.

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# South Central Fire Learning Network

1.8 million acres



Regular fire helps maintain a healthy mix of forest and prairie and a diversity of species in the blackland prairie ecosystem

© McRee Anderson / TNC

**THE SOUTH CENTRAL** Fire Learning Network encompasses 17 sites in four ecoregions—the Ozarks, Ouachita Mountains, Upper West Gulf Coastal Plain and Interior Low Plateau—that span two states—Arkansas and Kentucky. Each site has partners collaborating in ongoing fire restoration projects that are addressing the threats posed by altered fire regimes. The SC FLN looks forward to continuing the development of the current network of fire restoration projects, as well as working with partners to develop institutionalized integrated fire management programs in the region.

## NETWORK VISION

By engaging regional resource management partners and working with a core, science-based peer-learning group, the network will develop landscape-scale restoration and hazardous fuels reduction projects that return fire to its natural place in this region.

### *Demonstration Landscapes*

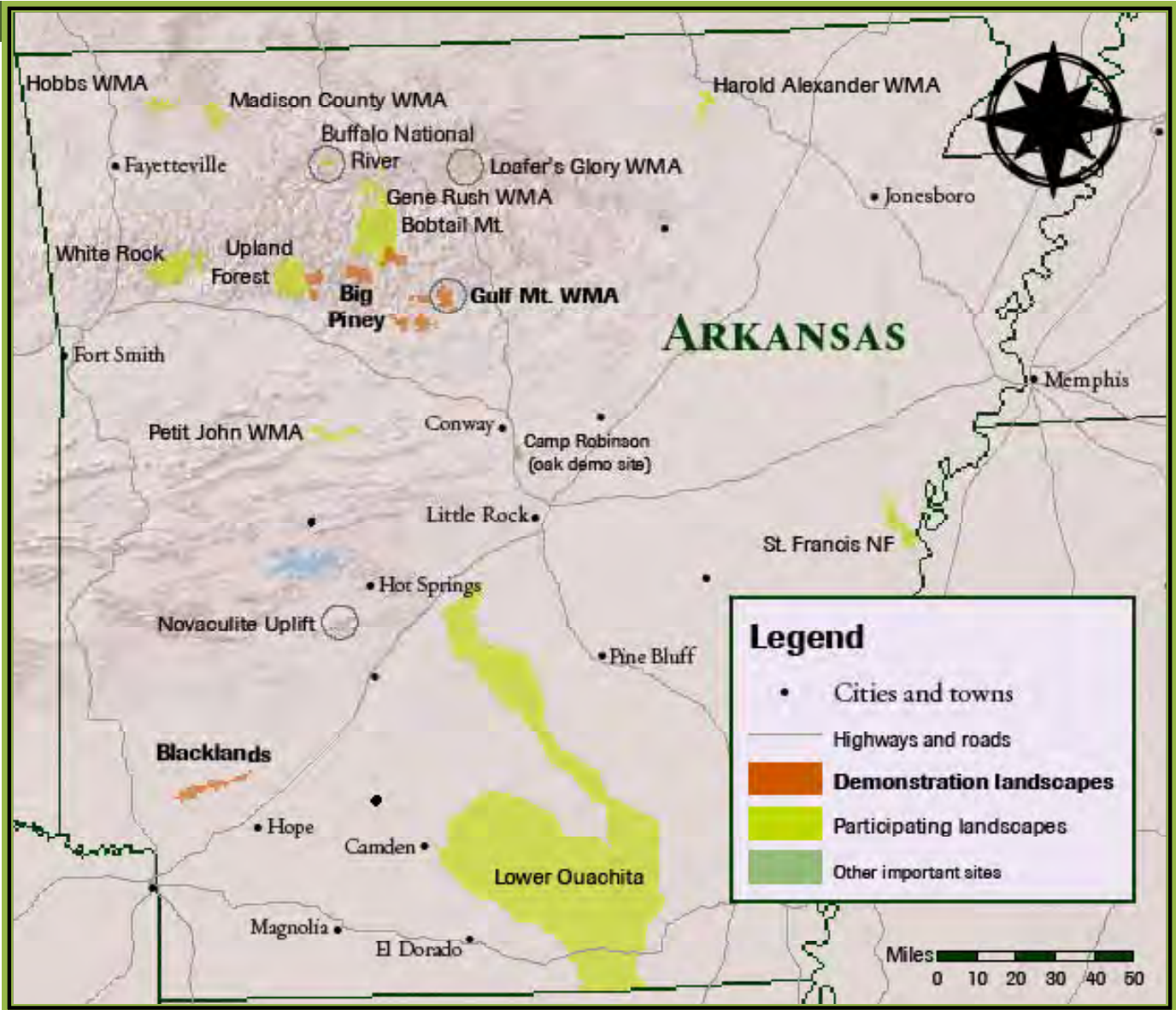
Blacklands Ecosystem Restoration Project (AR)  
Big Piney (formerly Bayou ERP) (AR)

Gulf Mountain WMA (AR)  
Land Between the Lakes (KY, TN)

### *Participating Landscapes*

Bobtail Mountain ERP (AR)  
Buffalo National River ERP (AR)  
Lower Ouachita (AR)  
Novaculite Uplift (Caddo & Trap Mt. ERP) (AR)  
St. Francis National Forest ERP (AR)  
Upland Forest Restoration Projects (AR)  
White Rock ERP (AR)

Arkansas State Waterfowl Management Areas  
Gene Rush WMA  
Harold Alexander WMA  
Hobbs WMA  
Loafer's Glory WMA  
Madison County WMA  
Petit John WMA



Arkansas landscapes in the South Central Fire Learning Network

Map © 2009 Liz Rank / TNC

**An important goal** of the South Central Fire Learning Network is to export key lessons learned and disseminate knowledge of participating projects' successes, both to other forest managers and to the general public. In the last year:

- A core partner group began work on a media strategy, giving fire restoration presentations to the editorial boards of a television outlet and five newspapers in the region; partners also hosted a media site tour.
- Two papers written by partners were accepted for publication in *Fire Management Today* and the 15<sup>th</sup> Annual Upland Oak Symposium Proceedings.
- Network representatives made presentations at the 15<sup>th</sup> Annual Upland Oak Symposium, Western Stewardship Summit, 35<sup>th</sup> Annual Natural Areas Conference, Regional Wilderness Stewardship Training Course, and USFS Region 8-9 Burn Boss Meeting.

## NETWORK PARTNERS

- Arkansas Forestry Commission
- Arkansas Game & Fish Commission
- Arkansas Natural Heritage Commission
- National Park Service
- National Wild Turkey Federation
- The Nature Conservancy
- USDA Forest Service

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# BIG PINEY ECOSYSTEM RESTORATION PROJECT

## ARKANSAS

South Central Fire Learning Network

60,000 acres



Pine-oak woodlands are becoming more common in the Interior Highlands as more controlled burns are implemented.

© 2008 McRee Anderson / TNC

**THE OZARK AND OUACHITA MOUNTAINS**—collectively known as the Interior Highlands—are cloaked in forests rich with wildlife, valuable timber, recreation opportunities and a high diversity of plants and animals. Unfortunately, the frequent, low-intensity fire regime under which the ecosystem evolved has been disrupted. About a century ago, these woodlands were heavily logged and the fire return interval was drastically reduced. This has led to a significant increase in fuel loads and tree densities, a shift in species composition and a decrease in forest health. Over 60 percent of National Forest lands in the Interior Highlands are experiencing die-offs of red oak; the composition and structure of an entire ecosystem is changing. Restoring fire to these forests is necessary to sustain the forests and the services they provide, as well as to protect people and communities.

The Big Piney Ecosystem Restoration Project (ERP)—formerly known as the Bayou ERP—has been at the forefront of this work. The project began in 2001, with the goal of restoring approximately 60,000 acres of primarily oak ecosystems in the Ozark-St. Francis National Forest's Bayou Ranger District. Since then, a diverse coalition of partners has completed forest restoration work on thousands of acres. The project is now moving toward monitoring forest health, making adjustments to the restoration work and sharing its findings to aid in the restoration of other landscapes.

### LANDSCAPE VISION

This project team will contribute knowledge and expertise to others in the regional learning network. Participation in the regional network will also help promote this project at the regional and national levels, highlighting ecosystem restoration and securing funds for other large landscape scale demonstration projects on public lands managed by the USDA Forest Service.

### DEMONSTRATION LANDSCAPE



## LANDSCAPE PARTNERS

Arkansas Forestry  
Commission  
Arkansas Natural Heritage  
Commission  
Private landowners  
The Nature Conservancy,  
Arkansas  
USDA Forest Service

Partners from Arkansas Natural Heritage Commission, USDA Forest Service and The Nature Conservancy count herbaceous plants on one of over 120 macro plots scattered throughout the demonstration site. Monitoring has taken place each summer from 2003-2008.

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## LANDSCAPE ACCOMPLISHMENTS

The Big Piney and Pleasant Hill Ranger Districts Baseline Plant Community Monitoring Report was completed and published in September 2008. Baseline plant community monitoring was conducted at seven restoration areas on the Ozark National Forest between the years 2003 and 2006. Ninety-six of the 124 sampling plots were in the Big Piney Ranger District; plots were installed in June 2003 and 2004 and 48 of the plots were monitored each year.

The baseline monitoring data showed that for most of the cover types, most parameters were outside those specified by the desired forest conditions. The data will be used to determine whether treatment activities in the area are reducing hazardous fuels within the project area, and whether the health of the Ozark forest community within the project area is being enhanced by the treatments.

## LANDSCAPE OBJECTIVES

This project continues to be a focal point in the region for demonstrating the benefits of oak and pine woodland restoration and management. Partners continue to host field visits to this demonstration area to promote the success of this collaborative project in restoring the oak-hickory and pine-oak ecosystems of the Ozark Highlands.

Partners continue to implement project activities, including thinning by commercial and non-commercial methods and the use of prescribed fire. The comprehensive monitoring program documenting ecosystem responses to these treatments continues, and the data help guide management decisions. The monitoring program currently includes tracking changes in overstory, understory and herbaceous plant species; the structure of plant communities; fuel loads; non-native invasive species and breeding and wintering bird communities.

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# BLACKLANDS ECOSYSTEM RESTORATION PROJECT

## ARKANSAS

### South Central Fire Learning Network

22,000 acres



A fireline is prepared as part of a late summer controlled burn to reduce woody encroachment onto the prairie.

© 2008 McRee Anderson / TNC

**BLACKLAND PRAIRIES AND THEIR ASSOCIATED WOODLANDS** occur primarily in northeast and east-central Texas, with smaller outcrops in southwest Arkansas, northwest Louisiana, Mississippi and Alabama. The blackland region of Arkansas occurs in the West Gulf Coastal Plain in Clark, Hempstead, Howard, Little River, Nevada and Sevier Counties. The region is characterized by gently rolling topography, with scattered blackland prairies and woodlands. These communities are found in discrete areas where blackland soils have formed from calcareous substrates. The state's blackland prairies and associated woodlands and bottomlands harbor more than 600 plant and 315 animal species, including many that are classified as rare.

All of the blackland plant communities depend on fire to maintain their species diversity and structure. As in many grasslands, fire in the blackland prairies has been suppressed in the past century. As a result, prairie openings have declined in size and quality due to encroaching woody vegetation. Restoration of fire is thus essential for maintaining these rich systems.

This project has participated in the Fire Learning Network for the past three years. Because fire is the most important ecological process maintaining the distribution, composition, and diversity of blackland prairie, woodland and forest communities, a primary goal is to restore a regular fire regime to these areas. Specific tasks needed to accomplish that are the development of a set of restoration guidelines and procedures, spatially explicit current and desired future conditions, and an ecological monitoring program to track restoration progress.

#### LANDSCAPE VISION

The Blacklands Ecosystem Restoration Project partners will restore, maintain and conserve a functional ecosystem that encompasses a diverse landscape with the full mosaic of blackland communities and ecological processes, while providing educational, recreational and economic opportunities.

#### DEMONSTRATION LANDSCAPE





Pale purple coneflower (*Echinacea pallida*) is one of over 600 plant species native to the blackland prairies of Arkansas. © 2008 McRee Anderson / TNC

## LANDSCAPE ACCOMPLISHMENTS

Partners are continuing to work to protect, preserve, and restore what remains of the state's blackland ecosystems. This involves moving additional lands into conservation ownership and actively managing conserved areas to maintain or increase native plant and animal diversity. The Conservancy owns 215 acres in two preserves and holds a conservation easement on 400 privately owned acres. The stewardship staff also works with state agency partners to manage thousands more acres of public lands. One of these sites is the Arkansas Game and Fish Commission's Rick Evans Grandview Prairie Wildlife Management Area. At 4,885 acres, Grandview is the largest known area of blackland ecosystem in conservation ownership.

The Landowner Incentive Program has been one of the key conservation strategies to accomplish fire restoration on private lands. Over the next three years, the Conservancy and other partners will continue to expand fire restoration on private lands throughout the area with over 1,500 acres per year enrolled in the program.

In the past year, partners in this landscape mechanically thinned eastern red cedar from over 150 acres of blackland prairies using chainsaws and, with assistance from a contractor with a skid-steer grinder, treated over 2,000 acres with late growing season burns; they also began implementing an invasive species monitoring and control program.

## LANDSCAPE PARTNERS

Arkansas Game and Fish Commission  
 Arkansas Forestry Commission  
 Arkansas Natural Heritage Commission  
 National Wild Turkey Federation  
 Quail Unlimited  
 The Nature Conservancy – Arkansas  
 U.S. Fish & Wildlife Service – Arkansas Field Office

## LANDSCAPE OBJECTIVES

Partners in this landscape are working to:

- Update the landscape's Conservation Action Plan;
- Secure dedicated funding for ecosystem restoration in the project area;
- Develop, maintain and publicize ecosystem restoration treatments, including a native prairie grazing demonstration area;
- Deliver a Landowner Incentive Program to support fire restoration on private land, by increasing local knowledge of prescribed fire and helping landowners develop capacity to use fire;
- Continue to protect land within the conservation area via the use of fee title acquisitions, conservation easements and management agreements; and
- Continue to improve collaborative restoration efforts with partners.

# LAND BETWEEN THE LAKES

## KENTUCKY & TENNESSEE

### South Central Fire Learning Network

9,000 acres



The Homeplace project area, pictured the spring after a moderate-intensity prescribed fire the previous spring

© 2008 Jim McCoy / USFS

**LAND BETWEEN THE LAKES NATIONAL RECREATION AREA** is managed by the USDA Forest Service for the enjoyment and safety of the American public. It is home to the largest publicly-owned bison herd east of the Mississippi River, and to 1,300 plant species, 240 bird species and 53 mammal species.

The 5,000-acre Prior Creek oak/grassland restoration project is located in the central part of this landscape. This project area was selected due to its proximity to environmental education facilities and to the South Bison Range, both of which are popular attractions. The project area is highly visible to the public, which facilitates education and interpretation: Nature uses fire to maintain forest health; humans use selective tree cutting or timber management for the same purpose. Selective thinning allows sunlight to reach the forest floor, helping seedlings become established. The flourishing young plants provide food and cover for a wide variety of wildlife. Because fire alone will not allow restoration goals to be met in an efficient time frame, forest management will include mechanical thinning—selection of single trees and small groups of trees—on up to 2,600 acres of dry and xeric forest. The result will be the restoration of oak savannas by reducing stand density from approximately 100 trees per acre to 50 trees per acre in patches on these dry and xeric sites.

Land Between the Lakes joined the South Central Fire Learning Network in 2005, and now serves as a demonstration site to share lessons learned with new site managers. Partners plan to continue building the program so that the area's oak woodlands and savannas will be restored at ecologically relevant scales.

#### LANDSCAPE VISION

Partners work to ensure landscape ecosystem components and processes are maintained within their historical ranges of variation through the use of periodic planned fire events and ecologically-based resource management.

#### DEMONSTRATION LANDSCAPE



Spring vegetation at the Franklin Creek project area, about a year after treatment with a moderate-intensity prescribed burn  
© 2008 Jim McCoy / USFS

## LANDSCAPE PARTNERS

Central Hardwoods Joint  
Venture

National Wild Turkey  
Federation – Tennessee  
State Chapter

Quail Unlimited – Jackson  
Purchase Chapter

The Nature Conservancy –  
Arkansas

USDA Forest Service

U.S. Fish & Wildlife  
Service – Frankfort Field  
Office

## LANDSCAPE ACCOMPLISHMENTS & OBJECTIVES

Partners were able to efficiently complete all required National Environmental Policy Act (NEPA) documents for the Prior Creek site; the entire project area—about 5,000 acres—has been burned under prescription. In addition, non-commercial understory thinning has been completed on about 100 acres, and a timber sale contract to accomplish the same treatments on another 370 acres has been awarded to a local contractor. The results have been dramatic: Native grasses and forbs are increasing in dominance with every growing season and animal populations are beginning to shift from typical dry forest species to a mix of grassland, shrub and forest associates.

Due in part to the success of the Prior Creek FLN site, the project area has been expanded by 3,000 acres; this new acreage is scheduled for prescribed fire and mechanical thinning in 2010.

The University of Tennessee Center for Native Grasslands Management is studying the Prior Creek site, along with similar sites on the Daniel Boone National Forest and the Tennessee Wildlife Resources Agency's Catoosa Wildlife Management Area. The goal of this study is to document avian responses to woodland restoration treatments and to develop a guide for private land managers interested in fire restoration.

Lessons learned in the Prior Creek project area have informed treatments in the Crooked Creek project area, a site in the northern part of the Land Between the Lakes NRA. This entire project area—just over 4,000 acres—has been burned under prescription, and, as with the Prior Creek site, the results have been dramatic and positive.

Partners look forward to further learning as these sites develop, and to capturing the lessons for use at other sites.

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# BOBTAIL OAK WOODLAND RESTORATION PROJECT

## ARKANSAS

South Central Fire Learning Network

86,000 acres



Partners inspect the site of a prescribed fire conducted the previous summer © McRee Anderson / TNC

**THE BOBTAIL OAK WOODLANDS** Restoration Project is located in the northeast portion of the Big Piney Ranger District of the Ozark National Forest and is a landscape typical of the Ozark Mountain region. The Fire Learning Network collaborative was formed in 2006 to develop a landscape-scale vision for the project, one that was not limited by project perimeters but that looks at how treatments today will influence the return of fire to the greater landscape. The project links restoration projects on adjacent federal and state lands to improve overall ecosystem health, and provide educational opportunities that will gain public support for restoration and improve the ability of the public to participate in project development.

The project team first focused on filling data gaps: developing the wall-to-wall vegetation and resource maps, forest condition maps and action maps prioritizing treatable areas. Information thus developed through the FLN can integrate into National Forest planning analyses, inform Community Wildfire Protection Plans and, along with agency and government efforts, help generate a collaborative vision for future land management.

Restoration is proceeding at a brisk pace. The National Wild Turkey Federation, a new partner, has recently been awarded a \$200,000 Stewardship Contract, and the project team completed 10,000 acres of prescribed fire and about 500 acres of mechanical treatments in the project area in the past year. Upcoming plans call for about 19,000 of prescribed fire, as well as 5,000 acres of mechanical treatments, 1,400 acres of high quality forage opening and 2,200 acres of invasive species treatments.

### LANDSCAPE PARTNERS

Arkansas Game and Fish Commission  
National Wild Turkey Foundation  
Rocky Mountain Elk Foundation  
The Nature Conservancy – Arkansas  
USDA Forest Service – Ozark-St. Francis National Forest

### COLLABORATIVE OBJECTIVES

- Address forest health issues;
- Control or reduce invasive species;
- Reduce hazardous fuels to prevent catastrophic fire;
- Connect restoration activities among Gene Rush WMA, Buffalo National River, Woodland Ecosystem Project and Gulf Mountain WMA;
- Improve habitat for threatened and endangered species and for other sensitive species identified by the Regional Forester;
- Improve water quality
- Increase stream integrity and habitat diversity;
- Improve dispersed recreation opportunities and management of existing dispersed recreation; and
- Retain wilderness character and values.

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# BUFFALO NATIONAL RIVER

## ARKANSAS

### South Central Fire Learning Network

4,000 acres



#### LANDSCAPE PARTNERS

Arkansas Game and Fish  
Commission

National Park Service

Rocky Mountain Elk  
Foundation

The Nature Conservancy –  
Arkansas

USDA Forest Service

#### LANDSCAPE GOALS

The goals of the Erbie-Pruitt project are to preserve native plant communities, restore species and habitat diversity and reduce the accumulation of hazardous fuel levels.

Trees cut for railroad ties were once slid into the river at Tie Slide on the Buffalo River

© Tony Collins / NPS

**THIS LANDSCAPE ENCOMPASSES** the stretch of the Buffalo River between the Erbie and Pruitt access points, and lies within the boundaries of Buffalo National River managed by the National Park Service. The terrain is varied, with ridges rising up to 500 feet above the level of the river, and vegetation consisting of an oak-hickory woodland mosaic interspersed with cedar glade, post oak savanna, short leaf pine, river riparian, open fields and historic landscape areas. About 20 percent of the landscape falls into Fire Regime Condition Class (FRCC) 3, meaning that it is highly departed from its historic condition.

Partners have invested resources to develop a project focused on ecological restoration and the maintenance of cultural landscapes. Priorities include a review of scientific research, identification and filling of data gaps, and collaboration. The team is developing vegetation maps and assessing historic data that will guide an adaptive management strategy. Participation in the Fire Learning Network has allowed the team to refine its work and build a common vision with its partners in restoration, and provides opportunities to share and synthesize data and information.

Fire has now been reintroduced to approximately 4,000 acres on a four-year return interval. In the coming year, mechanical treatments will be applied to about 140 acres, and prescribed fire to about 2,000 acres, including 1,680 acres of woodland, 80 acres of native grassland and 300 acres of open fields. As treatments return the vegetation composition to more natural conditions the fire return interval will be extended, to mimic natural processes.

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# LOWER OUACHITA

## ARKANSAS

### South Central Fire Learning Network

1.4 million acres



Saline barrens after a spring burn at Warren Prairie Conservation Area

©Mike Melnechuk/TNC

**THE LOWER OUACHITA** landscape includes big rivers—the Ouachita and Saline—bottomland hardwood forests, terrace pine-oak flatwood forests and upland matrix pine-oak woodlands, pine-grass savannas, salt slick barrens and sand prairies, and is home to a population of the endangered red-cockaded woodpecker. The land is still largely forested, with hydrologic and other ecosystem functions relatively intact. Maintaining ecologically compatible forestry practices is an essential element in achieving landscape-scale conservation results in this landscape.

The Warren Prairie site was selected by Lower Ouachita landscape partners for further study based on fire management and conservation forestry accomplishments, existing partnerships, planned red-cockaded woodpecker reintroduction and current site management planning. Participating in the South Central Fire Learning Network since 2005, partners have implemented prescribed fire, ecological thinning and monitoring to move the site toward its desired condition; one goal of this is to restore at least four breeding pairs of red-cockaded woodpeckers to the area.

Partners continue implementation of prescribed burns, timber harvesting and monitoring and stewardship of the Warren Prairie Conservation Area, and work to share the lessons learned there throughout the Lower Ouachita.

#### LANDSCAPE PARTNERS

Arkansas Forestry  
Commission  
Arkansas Game and Fish  
Commission  
Arkansas Natural Heritage  
Commission  
National Wild Turkey  
Federation  
Quail Unlimited  
Southwest Fire Use Training  
Academy  
The Nature Conservancy –  
Arkansas  
USDA Forest Service –  
Ouachita and Kisatchie  
National Forests  
U.S. Fish & Wildlife Service  
– Arkansas Field Office  
Watershed Restoration and  
Enhancement Agreements  
(Wyden Authority)

#### LANDSCAPE VISION

This project strives to use conservation forestry to enhance natural community structure and composition on public and private lands and to maintain or increase populations of rare plants and animals.

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# NOVACULITE UPLIFT

## ARKANSAS

### South Central Fire Learning Network

34,000 acres



Novaculite Ridges with shortleaf pine (*Pinus echinata*) at Trap Mountain Preserve © McRee Anderson / TNC

#### LANDSCAPE PARTNERS

Arkansas Forestry  
Commission  
National Wild Turkey  
Federation  
Oak Ecosystem Restoration  
Team  
Quail Unlimited  
The Nature Conservancy –  
Arkansas  
USDA Forest Service –  
Ouachita National Forest  
U.S. Fish & Wildlife Service  
– Arkansas Field Office

**THE NOVACULITE UPLIFT** project consists of the Caddo Ranger District's 33,000 acre restoration site, the Conservancy's Trap Mountain site and other lands managed for resource extraction and conservation. It is part of the Ouachita Mountain ecoregion of Arkansas and Oklahoma, a landscape of more than eight million acres of rugged mountain ridges, broad valleys and the headwaters of several large river systems. The complex geological formations and soils of this forested landscape have created diverse habitats for a wide variety of species including numerous birds, two dozen species of butterflies, white-tailed deer and black bear. The four major habitats types are glades, woodland slopes, riparian forests and wooded seeps. The woodlands feature shortleaf pine, oaks and hickories with shrubs, grasses and wildflower understory. Partners are using prescribed fire and other treatments to restore these woodlands to a more open structure. When selecting treatments, partners consider such factors as risks-versus-benefits to natural systems, public perceptions about fire use, economic costs, possible impact on recreational opportunities and legal and policy constraints.

The project contributes to conservation in the region by developing ecological models for the Novaculite Uplift ecosystems needed to develop a fire restoration project. Among the tasks now in progress are the development of maps of current and desired conditions and a plant community monitoring program to track the ecosystem's response to fire.

#### LANDSCAPE VISION

At the landscape scale, this partnership will design and implement management activities that ensure ecosystem components and processes are maintained within the historical range of variation through a combination of prescribed fire, mechanical, chemical and other alternative treatments.

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# ST. FRANCIS NF ECOSYSTEM RESTORATION PROJECT

## ARKANSAS

### South Central Fire Learning Network

11,000 acres



An early growing season fire is used to promote oak regeneration

© John Crockett / USFS

#### LANDSCAPE PARTNERS

Arkansas Forestry  
Commission  
Arkansas Game and Fish  
Commission  
Arkansas Natural Heritage  
Commission  
Arkansas State University  
National Wild Turkey  
Federation  
Oak Ecosystem Team  
The Nature Conservancy –  
Arkansas  
USDA Forest Service

**MUCH OF THE ST. FRANCIS ECOSYSTEM RESTORATION PROJECT** is located on Crowley's Ridge in the St. Francis National Forest and consists in large part of loess slope upland forest. Emphasis in this part of the landscape is primarily on maintaining and, where necessary, restoring the oak component within the forest community. Limiting the abundance and influence of non-native invasive species such as kudzu is also of great importance. Silvicultural practices such as prescribed fire, herbicide application, pre-commercial thinning and timber sales are used to encourage oak regeneration and maintain oak dominance. Fire is an important factor for maintaining open forest conditions and stimulating understory development within this community type.

Also of concern in this landscape is the population of Swainson's warblers (*Limnothlypis swainsonii*) that uses the giant cane (*Arundinaria gigantea*) stands scattered throughout the project area. The Fire Learning Network collaborative team was formed in 2008 to develop a vision for the landscape, and to learn and manage how fire affects this rare bird. Most Swainson's warbler nests found have been in cane, which is thought to be a fire-dependent community; it is thought, therefore, that fire should be of benefit to the warblers, but few data exist to test this. The project is working to discover how to create the best plant community response to fire, while simultaneously balancing concerns of the effects of early season burning on turkey nesting.

Teams in the landscape are currently implementing prescribed fire in a mix of seasons: 1,500 acres of growing season fire and 700 acres of dormant season were conducted in 2008, with plans for another 2,200 acres similarly distributed in 2009.

#### LANDSCAPE OBJECTIVES

In order to restore this landscape, partners are working to:

- Maintain fire in the upland forest on a 3-7 year rotation
- Encourage oak regeneration and discourage yellow poplar reproduction
- Create openings and add fire to encourage canebreak restoration in the upland and bottomland forest

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# UPLAND FOREST ECOSYSTEM RESTORATION PROJECT

## ARKANSAS

### South Central Fire Learning Network

51,000 acres



This restoration area in West Morgan has been treated with midstory removal and prescribed fire  
© Greg Taylor /USFS

**THE PLEASANT HILL RANGER DISTRICT** experienced a severe, unprecedented outbreak of the red oak borer in 2002-2003. Epidemic-scale outbreaks of this species and associated oak decline agents such as root disease fungi and canker fungi are seriously affecting oak ecosystems throughout the Ozark Highlands. Partners in the Upland Forest project are seeking to re-establish the historic fire return interval to this landscape to improve forest health, and to develop pine and oak woodlands on 24,000 acres of the project area within 10 years. Because many private lands are intermingled with lands administered by the USDA Forest Service, much of this project will also be designed to protect communities in the wildland-urban interface.

National Environmental Policy Act (NEPA) decisions are in place for periodic prescribed fire use on the entire project area and for tree thinning treatments on 29,500 acres. The thinning treatments will re-establish the historical tree density, based on 1830s Government Land Office survey records. To date, over 30,000 acres have been burned, non-commercial thinning has been done on over 2,500 acres and timber sales to thin overstocked stands have occurred on about 33,500 acres.

A comprehensive monitoring program was established at the beginning of the project to document ecosystem responses to prescribed fire and timber cutting treatments. Subject to monitoring are the overstory, understory and herbaceous plant communities; fuel loads; soils and vegetation; breeding and wintering bird communities; white-tailed deer and stream water quality. The baseline monitoring has been completed and a draft monitoring report has been published.

### LANDSCAPE PARTNERS

Arkansas Forestry  
Commission  
Arkansas Game and Fish  
Commission  
National Wild Turkey  
Federation  
Quail Unlimited  
Southwest Fire Use Academy  
The Nature Conservancy –  
Arkansas  
USDA Forest Service  
U.S. Fish & Wildlife Service –  
Arkansas Field Office

### LANDSCAPE VISION

Partners envision a landscape in which:

- Ecosystem components and processes are maintained within the historic range of variation by periodic fire use and ecologically-based resource management;
- Vegetation is in Fire Regime Condition Class 1—an indication of good condition—providing healthy watersheds and safety for communities at risk; and
- Ecosystems that are within the historic range of variation achieve biodiversity goals and provide multiple recreational opportunities.

Partners will also promote and facilitate ecosystem restoration at other sites and enhance public support of and involvement in such restoration.

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# WILDLIFE MANAGEMENT AREAS

## ARKANSAS

### South Central Fire Learning Network



GENE RUSH WMA	17,000 acres
GULF MOUNTAIN WMA	12,000 acres
HAROLD ALEXANDER WMA	14,000 acres
HOBBS WMA	12,000 acres
LOAFER'S GLORY WMA	3,000 acres
MADISON COUNTY WMA	14,000 acres
PETIT JOHN WMA	15,000 acres



Interpretive signage is an important amenity offered at Wildlife Management Areas

© 2008 McRee Anderson / TNC

**THE SEVEN WILDLIFE MANAGEMENT AREAS** participating in the Fire Learning Network are in the Interior Highlands of the Ozark Mountains, an area with extensive opportunities for successful restoration of oak and pine woodland and savannas. These areas are typical of Ozark Mountain terrain, with steep mountains, deep hollows and broad, flat mountaintops. The vegetation consists of extensive upland hardwood and shortleaf pine woodlands and savannas that fire once played a key role in maintaining.

The Arkansas Game and Fish Commission offers some of the best hunting and fishing opportunities in the state in the Wildlife Management Areas scattered around the Interior Highlands. Over the years, the agency has acquired land and constructed facilities to provide outdoor enthusiasts with places to hunt, fish and enjoy the outdoors. The projects participating in this network are using the FLN methods and planning tools; partners are developing current and desired ecological conditions maps, goal statements and specific wildlife management objectives for each site. In addition, each site has an ongoing prescribed fire program, and both commercial and non-commercial timber management objectives to reach these goals have been set.

These WMAs and their associated projects will continue to work cooperatively to expand management treatments on the ground to enhance wildlife habitat and native species diversity through the collaborative learning network process.

#### LANDSCAPE VISION

Partners work will ensure that ecosystem conditions within the historic range of variation are maintained and restored by management actions that maintain and promote natural process and native plant and animal communities, and are based on best available scientific and historical information. They will also work to increase public support, recreational uses, consumptive and non-consumptive uses and educational materials that contribute to successful wildlife habitat management.



Post oak in late summer after a single spring burn

© 2003 McRee Anderson / TNC

## LANDSCAPE OBJECTIVES

Pre-settlement tree density in the Interior Highland oak ecosystem has been estimated as about 50 trees per acre; densities in much of the region now range from 300 to 1,000 stems per acre. This high density leads to increased competition for nutrients, sunlight and moisture. During periods of drought, trees that are already stressed by competition become vulnerable to disease and insect attack. As a result, these ecosystems are declining in extent, ecological health and sustainability. In response, partners have agreed that habitat management practices in these landscapes will promote the diversity of species, while providing recreational opportunities; and that special consideration will be given to ecologically sensitive areas.

Partners are working to:

- Restore remnants of historic wildlife habitat for the range of native and migratory species;
- Enhance public recreational use, both consumptive and non-consumptive, by increasing wildlife use and carrying capacity on restored sites;
- Increase public support for the system through interpretative displays and educational programs promoting science-based restoration treatments;
- Re-establish the historic fire return interval throughout these landscapes; and
- Develop pine and oak woodlands where appropriate to promote wildlife species.

## LANDSCAPE PARTNERS

Arkansas Forestry  
Commission  
Arkansas Game and Fish  
Commission  
National Park Service –  
Buffalo National River  
National Wild Turkey  
Federation  
Quail Unlimited  
The Nature Conservancy –  
Arkansas  
USDA Forest Service –  
Ozark St. Francis NF  
U.S. Fish & Wildlife Service  
– Arkansas Field Office

## LANDSCAPE

### ACCOMPLISHMENTS

Work to restore pine-oak woodlands for improved wildlife habitat and ecosystem health has progressed steadily in these landscapes:

- Partners continue to increase their annual burning targets and both commercial and non-commercial thinning treatments. About 15,000 acres were treated in the 2008-2009 season.
- Partners were awarded a \$250,000 State Wildlife Grant for management activities.
- In addition to on-the-ground implementation, the Gulf Mountain site recently developed an “Oak Woodland and Watchable Wildlife Auto Tour” that is available to the public. This four-stop auto tour interprets different management actions occurring across all the WMAs throughout the Interior Highlands.

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# WHITE ROCK ECOSYSTEM RESTORATION PROJECT

## ARKANSAS

### South Central Fire Learning Network

41,000 acres



Partners visit a restoration site where commercial thinning has been employed © Doug Zollner / TNC

#### LANDSCAPE PARTNERS

Arkansas Forestry Commission  
Arkansas Game and Fish Commission  
Arkansas Natural Heritage Commission  
National Wild Turkey Federation  
Oak Ecosystem Team  
Quail Unlimited  
Southwest Fire Use Training Academy  
The Nature Conservancy – Arkansas  
USDA Forest Service  
U.S. Geological Survey – Arkansas Cooperative Fish & Wildlife Research Unit

**THE WHITE ROCK ECOSYSTEM RESTORATION PROJECT** area includes 16 sites on the Boston Mountain Ranger District of the Ozark-St.

#### LANDSCAPE OBJECTIVES

Partners are working to restore and maintain a healthy forest ecosystem that will provide optimal wildlife habitat for both game and non-game species and that will provide multiple-resource/use objectives, through periodic fire and mechanical treatments. To accomplish this, partners:

- Use adaptive ecosystem management to reach multiple-use and multiple-resource objectives;
- Develop public support through partnerships and education; and
- Develop partnerships to address research questions.

Francis National Forest. Restoration areas are in the oak woodland, mixed forest, old growth, riparian corridors and high quality forest products management areas. This landscape joined the Fire Learning Network in 2008 to develop a landscape-scale vision that was not limited by project perimeters, but rather looked to large-scale treatments to help return of fire to the landscape. To do this, the project links restoration projects on adjacent federal and state lands to improve overall ecosystem health. The team also provides educational opportunities for the public and a monitoring program that incorporates requirements of the Forest Plan and contributes to the District's ability to apply adaptive management methods.

Nearly the entire restoration area has received at least two prescribed fire treatments on a three-year rotation. Most of the fires have taken place in March through April; the team has found that fires taking place late in this early growing season burn period—about mid-April—are the most successful in reducing fuel loads and produce the best plant community response. This is being balanced against the increasing public and agency concern about the effects of this timing on turkey nesting. Monitoring various fire effects will help partners assess and balance these needs.

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**AT FORT HOOD**, Texas, federally endangered black-capped vireos use disturbance-dependent early successional habitat, which is often created or maintained by fire. On the Refugio-Goliad Prairie, near the Texas coast, fire is used to maintain the open grasslands to which federally endangered Attwater's prairie chickens are being reintroduced.

*Left and below left: Black-capped vireos (Vireo atricapilla) at Fort Hood © Rich Kostecke / TNC*

*Below: An Attwater's prairie chicken (Tympanuchus cupido attwateri) male displays at RGP © Ivan C. Getting*



# Appalachian Fire Learning Network

1.7 million acres



Mixed hardwood forests cloak much of the Central Appalachians

© Byron Jojorian

**THE APPALACHIANS** are characterized by rolling and mountainous terrain encompassing parts of the Central Appalachian Forest, Western Allegheny Plateau, Cumberlands and Southern Ridge and Valley ecoregions, and parts of six States—Kentucky, Maryland, Ohio, Pennsylvania, Virginia and West Virginia. Blanketed in hardwood and mixed-pine hardwood forest, pine-oak-heath shrublands and woodlands, small-patch grasslands, hillside prairies and cedar glades, they are home to numerous endemic species.

The area contains both fire-adapted and fire-dependent species, with lightning-caused fires historically playing a role in establishing and maintaining the forest communities and species. This natural need for fire strongly suggests that ecological fire management should be a primary strategy in restoration efforts. Thus, the Appalachian Fire Learning Network continues to engage multiple federal, state and private land management agencies in a collaborative effort to implement ecological fire management.

## NETWORK VISION

The Appalachians Fire Learning Network envisions project sites throughout the region having adequate technical capacity, funding and stakeholder support for increased restoration of fire-adapted ecosystems.

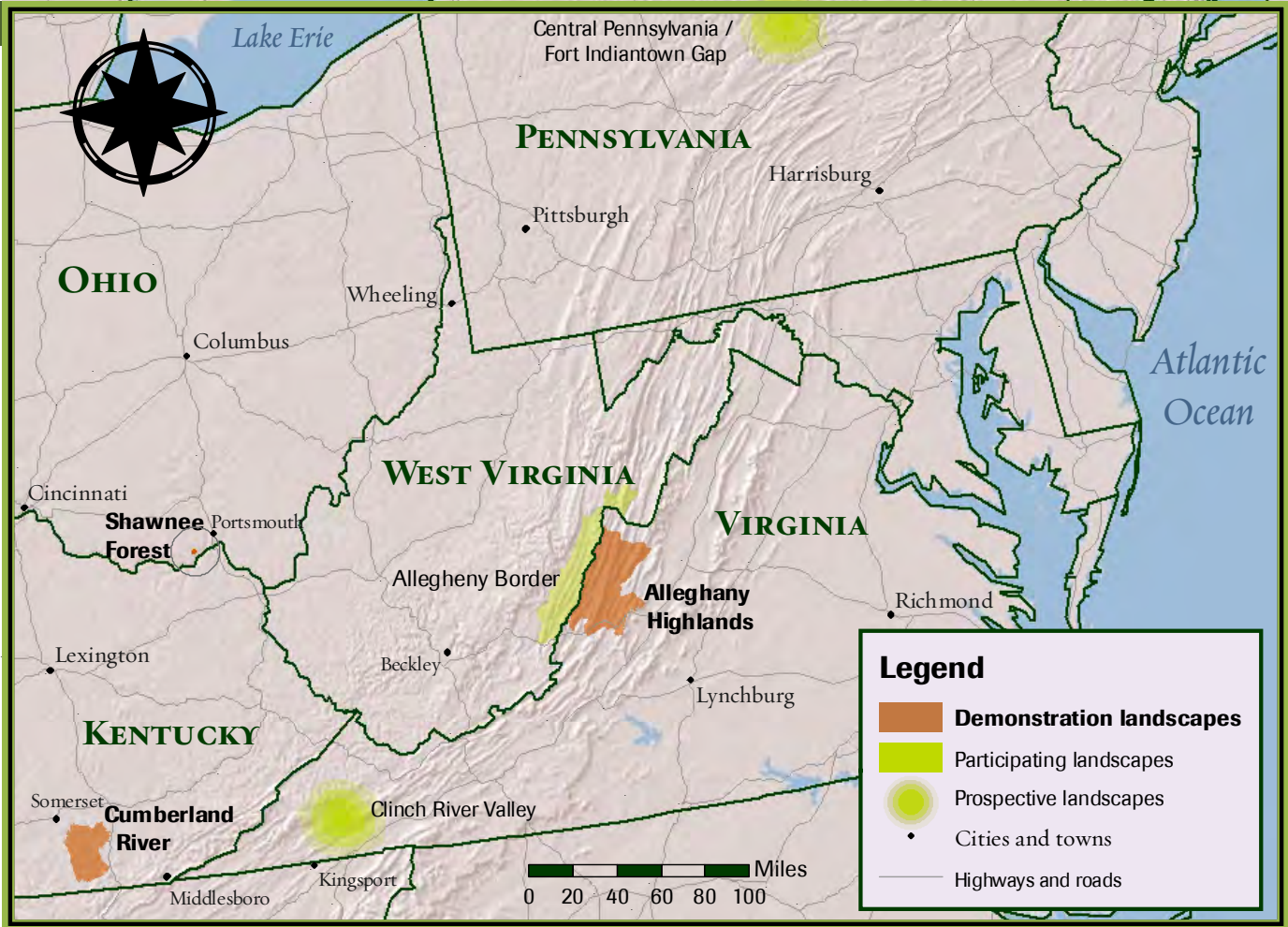
Landscapes will also demonstrate measurable progress toward achieving ecological management objectives

### ***Demonstration Landscapes***

Allegheny Highlands (VA)  
Cumberland River (KY)  
Shawnee Forest (OH)

### ***Participating Landscapes***

Allegheny Border (WV)



Map © 2009 Liz Rank / TNC

**In 2009**, the Appalachian FLN will continue to engage multiple federal, state and private land management agencies in a collaborative effort to enhance capacity to implement ecological fire management. Within this biologically diverse region, network partners seek to:

- Collaborate with stakeholders to strengthen the scientific basis for landscape-scale fire management, and develop landscape-scale desired future condition and fire management objectives for the Central, Southern and Western Appalachian regions;
- Transfer knowledge and lessons learned throughout the network to facilitate ecological objective setting, effective stakeholder engagement, efficient compliance with regulatory requirements and successful funding of ecological fire management projects;
- Identify critical barriers to implementing the restoration of fire adapted ecosystems, and develop strategies to overcome these barriers; and
- Achieve tangible and measurable progress in restoration of fire adapted ecosystems at demonstration sites throughout the network.

## NETWORK PARTNERS

Department of Defense  
 Kentucky Department of Fish and Wildlife Resources  
 Kentucky Division of Forestry  
 Ohio Division of Forestry  
 The Nature Conservancy  
 USDA Forest Service  
 Virginia Department of Conservation & Recreation  
 Virginia Department of Forestry  
 Virginia Department of Game & Inland Fisheries

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# ALLEGHENY HIGHLANDS

## VIRGINIA

### Appalachian Fire Learning Network

636,000 acres



Numerous agencies and organizations cooperated to treat over 4,000 acres of forest with fire in 2008.

© Sam Lindblom / TNC

**MIXED-HARDWOOD AND PINE FORESTS**—with large patches of older-growth oak and hickory, south-facing patches of yellow pine, stands of sugar maple, basswood, ash and poplar in coves and eastern hemlock in ravines along steep riparian zones—are hallmarks of this landscape. Drier, fire-dependent pine-oak-heath woodlands—communities of chestnut oak, pitch pine, table mountain pine and species of blueberry and mountain laurel—are found on ridge tops and exposed south- and west-facing slopes. The only Virginia occurrences of the rare montane pine barrens, which appear as dwarfed shrublands, are found on Warm Springs Mountain in the heart of the Allegheny Highlands. In addition to providing habitat for several rare natural communities and an amazing diversity of plant and animal species, this unbroken forest landscape helps safeguard the region's lands and waters.

Land managers and ecologists from several Appalachian states met in 2006 to help develop fire management approaches for Warm Springs Mountain in Virginia's Allegheny Highlands. This meeting helped launch the Appalachian Fire Learning Network, when participants at this meeting discovered a common interest in working together to meet the challenge of restoring Appalachian forests. Using the Fire Learning Network methodology, the partnership has developed strong conceptual ecological models, collaborative goal statements and maps of current and desired conditions, all of which evolve continually to help guide management decisions.

#### LANDSCAPE VISION

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

#### DEMONSTRATION LANDSCAPE





The May 2008 controlled burn treated 1,050 acres of difficult terrain © Steve Croy / USDA Forest Service

## LANDSCAPE PARTNERS

National Park Service –  
Shenandoah National Park  
The Nature Conservancy –  
Virginia, West Virginia  
USDA Forest Service –  
George Washington &  
Jefferson NF  
USDA Forest Service –  
Monongahela NF  
USDA Forest Service –  
Northern Research Station  
Virginia Department of  
Conservation & Recreation  
Virginia Department of  
Forestry  
Virginia Department of Game  
and Inland Fisheries

## LANDSCAPE ACCOMPLISHMENTS & OBJECTIVES

The Allegheny Highlands FLN site received funding in 2007 for a collaborative fire management effort between the Forest Service and the Conservancy. In May 2008, the Conservancy and Forest Service led a joint fire operation on 1,050 acres of the Warm Springs Mountain Preserve, with equipment and staff from multiple federal and state agencies as well as Conservancy staff. In total, the team conducted over 4,000 acres of prescribed burns in the landscape in 2008, and about 2,500 acres in a rainy 2009 spring season. This public-private partnership attracted interest from regional and national levels of the Forest Service, and it is hoped it can be used as a model for how fires can be conducted in sites where Forest Service ownership abuts private land at a boundary not demarcated by any physical barriers or fuel breaks.

Vegetation monitoring plots were also put in place for the Warm Springs Mountain burn; these will allow the Allegheny Highlands team to document the extent to which the prescribed fire achieved its goals, and communicate the benefits of fire to forest advocacy groups. Partners in this landscape are also collaboratively developing ecological fire management plans and conceptual ecological models to drive land management objectives.

Over the course of the last year, the Allegheny Highlands team has also:

- Completed a NEPA analysis and prescribed fire decision on about 18,000 acres within the network's boundary;
- Drafted a desired future conditions map, and used the map at the July 2008 Appalachian FLN workshop to identify high feasibility strategies to restore conservation target viability;
- Developed a map in which areas were rated by feasibility of implementation; and
- Completed a draft of an implementation plan for the landscape.

In 2009 and 2010, partners will finalize a five-year ecological fire management plan for the landscape based on current knowledge, develop strategies for addressing capacity issues, implement monitoring training for partnership staff, develop outreach materials that address common concerns about fire in the Appalachian Mountains, seek additional funding sources and continue to expand the prescribed fire and fire management programs.

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# CUMBERLAND RIVER

## KENTUCKY

### Appalachian Fire Learning Network

252,000 acres



The project area includes Daniel Boone National Forest, Cumberland Falls State Resort Park, US Army Corps of Engineers and private lands © John Omer / USFS

**THE CUMBERLAND RIVER** and its tributaries sustain an unusually large variety of fish and mollusk species, and the ravines surrounding them are among the richest wildflower areas in the country. However, what was once a remote wilderness now attracts increased recreational use and second-home development, placing new pressures on habitat and water quality—the Daniel Boone NF is now home to 23 species listed as threatened or endangered.

Ridge tops on the Cumberland Plateau are now generally dominated by oak-hickory stands, with mixed oak-pine in drier areas. Historically these ridges were mostly covered in short-leaf pine or oak-pine woodlands and savanna systems that have all but disappeared with decades of fire exclusion. Even the existing oak-hickory forest matrix needs fire to be maintained, as fire exclusion has reduced oak regeneration and allowed more mesic species to become a part of the canopy. Other signs of stress on the system are the outbreaks of southern pine beetle occurring on many ridge tops.

#### LANDSCAPE VISION

Through partnership efforts and community support, our forests and watersheds will be improved by the restoration and maintenance of fire-adapted ecosystems. Fire will be integrated into the management of our natural resources, will be evident upon the landscape and will lead to enhanced habitat diversity.

This region's forest communities and species evolved with fire. The landscape's participation in the Fire Learning Network was originally driven by the desire of Daniel Boone National Forest managers to reintroduce fire on the landscape and to provide habitats for species that rely on fire-adapted ecosystems. The FLN's collaborative process quickly brought stakeholders together and provided a roadmap to develop ecological management objectives.

### DEMONSTRATION LANDSCAPE



## LANDSCAPE PARTNERS

Kentucky Department of  
Fish and Wildlife  
Resources

Kentucky Division of  
Forestry

The Nature Conservancy –  
Kentucky

University of Kentucky –  
Forestry Department

University of Tennessee

USDA Forest Service –  
Daniel Boone National  
Forest

A surface fire burns in the Daniel Boone NF  
© John Omer / USFS

## LANDSCAPE ACCOMPLISHMENTS & OBJECTIVES

In addition to assessing current and desired future landscape conditions, partners are identifying the economic, cultural, social and recreational values that influence desired future conditions, and integrating those values into the process. The progress of these activities and the new knowledge being acquired is being shared both locally and within the larger network through education, public outreach and the involvement of multiple landowners and natural resource managers.

In 2008, partners made progress on a three-year Implementation Plan, and will complete work on it in 2009. As part of the process, areas on the desired future conditions map will be rated according to feasibility of implementation, as being feasible in the short-term, over 10-20 years, later than that, or never.

The landscape will participate in the Appalachian network's peer-review workshop to review conservation target selection, conceptual ecological modeling and mapping of desired and future conditions; it will also prepare the team to develop threat assessments and identify barriers to implementation. As part of an ongoing process of revising and updating information and plans, partners have begun to revise the maps of current landscape conditions; the revised maps will be complete in early 2011.

Kentucky Heartwood, a non-profit forest advocacy group, has been a participant in local network meetings of the Cumberland River site. This has opened a door for landscapes throughout the network to discuss how to better engage such groups in productive dialogue on fire management.

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# SHAWNEE FOREST

OHIO

Appalachian Fire Learning Network

153,000 acres



Alkaline barrens are among the numerous communities found at the Conservancy's Edge of Appalachia Preserve

© Rich McCarty/TNC

**THE FORESTED HILLS OF SHAWNEE** form part of the Appalachia Plateau known as the Western Allegheny Plateau, where the bedrock was uplifted but never buckled to form the true mountains found in the Appalachians to the south and east. Instead, streams eroded the raised plateau, resulting in the rolling hills seen today. These unglaciated hills are blanketed with a diverse hardwood forest of oak, hickory, tuliptree, sugar maple and buckeye interspersed with hemlock, pitch and shortleaf pine and oak barrens. The area is also a hotspot of songbird diversity—both for breeding and during migration—and has an abundance of wildflowers and about 100 species of state-listed plants, including globally rare species such as early stone-root, golden-star lily and small whorled pogonia.

Decades of fire suppression have resulted in the degradation of nearly all fire-adapted ecosystems in the area. Heavy litter build-up and shrubby overgrowth, particularly greenbrier, have negatively affected herbaceous species diversity and oak and pine regeneration, and has increased the potential for devastating wildfire. The threat from wildfire increased further when a severe ice storm in 2003 affected several thousand acres of forest, breaking branches and trees that added tons of fuel to the ground. Although prescribed fire has been applied in recent years, several factors—including a high-profile wildfire, heavy recreational use of the forest and the forest's proximity to areas that have air quality problems—have contributed to a small but vocal outcry against fire in the forest. Partners are therefore working with the Ohio EPA on smoke management planning and to document and deliver a clear, consistent message on the use and benefits of fire—not only to the forest but to the public as well.

## DEMONSTRATION LANDSCAPE



An ice storm in February 2003 downed trees and branches over thousands of acres, adding tons of fuel to the landscape. © Chad Sanders / Ohio Division of Forestry

## LANDSCAPE PARTNERS

Ohio Department of  
Natural Resources –  
Division of Forestry  
Ohio Department of  
Natural Resources –  
Division of Wildlife  
The Nature Conservancy –  
Ohio  
USDA Forest Service –  
Delaware Research Lab

## LANDSCAPE ACCOMPLISHMENTS & OBJECTIVES

In 2009, a 233-acre prescribed burn jumped its lines and converged with two arson fires to burn a total of 2,800 acres. In some places the fire behavior was extremely severe and canopy mortality was nearly 100 percent. The Shawnee Forests team has since been working to develop a response to calls to ban the practice of prescribed burning, noting that the extreme fire behavior in some sites was a function of high fuels build-up. This incident highlights the ongoing need for effective outreach and communication strategies at the Shawnee site.

The Shawnee FLN partnership has initiated the process of forming a statewide Fire Council in order to address the issues surrounding the use of prescribed fire, not only in the Shawnee Forest but throughout Ohio. The first meeting is slated for late winter 2010. The partnership is also working closely with Environmental Protection Agency officials in the development of the Ohio Smoke Management Plan.

## LANDSCAPE VISION

Partners seek to implement management practices that restore and naturally maintain a diverse and resilient assemblage of fire-adapted ecosystems across the Shawnee Forest landscape. Through strong partnerships, prescribed fire capacity will be increased and broad support for fire management will be fostered through public education, public safety, and by demonstrating the positive effects of fire with sound science and on-the-ground results.

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# ALLEGHENY BORDER

## WEST VIRGINIA

### Appalachian Fire Learning Network

483,000 acres



A ridge top pine/heath community at the Conservancy's Pike Knob Preserve

© Kent Mason

#### LANDSCAPE PARTNERS

The Nature Conservancy –  
West Virginia

USDA Forest Service –  
George Washington and  
Jefferson NF

USDA Forest Service –  
Monongahela NF

Virginia Department of  
Game & Inland Fisheries  
– Gathright Wildlife  
Management Area

#### LANDSCAPE VISION

Team members in this landscape will work with others in the regional network to capture the lessons learned in similar landscapes and adapt them to be applied more widely.

A **WESTWARD EXTENSION** of the Allegheny Highlands demonstration site, this landscape is new to the network in 2009. The landscape contains a diverse mix of hardwood forests and woodlands, limestone glades and barrens, cedar woodlands, high elevation pine/heath barrens, rocky summits, cliffs and balds, and subalpine coniferous forests. Over 120 rare animals, plants and natural communities have been identified in this area, making it one of the richest concentrations of biological diversity in the eastern United States. The cedar glades support a number of species restricted to this part of the Appalachians, including Smoke Hole bergamot, and the high, dry crests of North Fork Mountain support the largest pine barrens of the Central Appalachians—hundreds of acres of pines gnarled and dwarfed by the harsh conditions and by thousands of years of recurring wildfires. The summits also support virgin red pine and spruce forests, dramatic tundra-like communities of boreal plants and a wealth of rare Appalachian and boreal species.

As a new participant in the network, partners will work on collaboratively developing the foundation for the landscape, including defining and describing the project area, committing to a process of ecological management objectives and fire implementation strategies, and taking the first steps in a planning process. Team members will attend workshops held by the regional network, in order to learn from—and provide peer review to—landscapes in the area that are further along in the planning and implementation process. They will also have access to a variety of online resources and an extended network of fellow managers and practitioners.

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**IN FEBRUARY 2009,** partners from the Refugio-Goliad Prairie landscape along the south Texas coast hosted an international learning exchange. Visitors from Mexico, representing several agencies and NGOs as well as academic institutions, attended this two day workshop. The workshop included a demonstration burn conducted by a crew made up of staff from Texas Parks and Wildlife, The Nature Conservancy and U.S. Fish & Wildlife Service; two representatives from Chinese National Parks joined the group for this experience.



*Above:* Participants from the U.S. and Mexico discuss brush control techniques at a ranch near Victoria, TX. *Left and below:* On the fire line. ©Jorge Uribe / TNC



# Southern Blue Ridge Fire Learning Network

7.7 million acres



Many high-elevation red oak forests are in need of fire regime restoration

© Gary Kauffman / USFS

**THE SOUTHERN BLUE RIDGE FLN** has identified shortleaf pine-oak forest, pine-oak/heath forest, dry-mesic oak-hickory forest and high elevation red oak forest as target communities in need of fire regime restoration. These systems cover about 60 percent of the area within the network region. About 50,000 acres of this landscape burn each year, through controlled burns or wildfires; four to eight times this much area needs fire or surrogate treatments each year to maintain these forests in a resilient condition. The SBR FLN works to define a healthy, resilient landscape and to identify where, when and how to restore these ecosystems. Expertise in numerous aspects of restoration is distributed among partners and researchers involved in the collaboration. Sharing this knowledge among partners and with other networks accelerates restoration.

In 2008, partners identified landscapes in which the restoration of target plant communities could be demonstrated. Three of these landscapes have smaller focal areas within them where more intensive work and monitoring will be done; these focal areas are Bald Mountain (in the Great Smoky and Unaka Mountains), Tallulah Gorge (Southern Blue Ridge Escarpment) and locations within the South Mountains (see map). The landscapes and focal sites are distributed among the ecoregions in the area; lessons learned at each will be extended to support larger portions of the region over time.

## NETWORK VISION

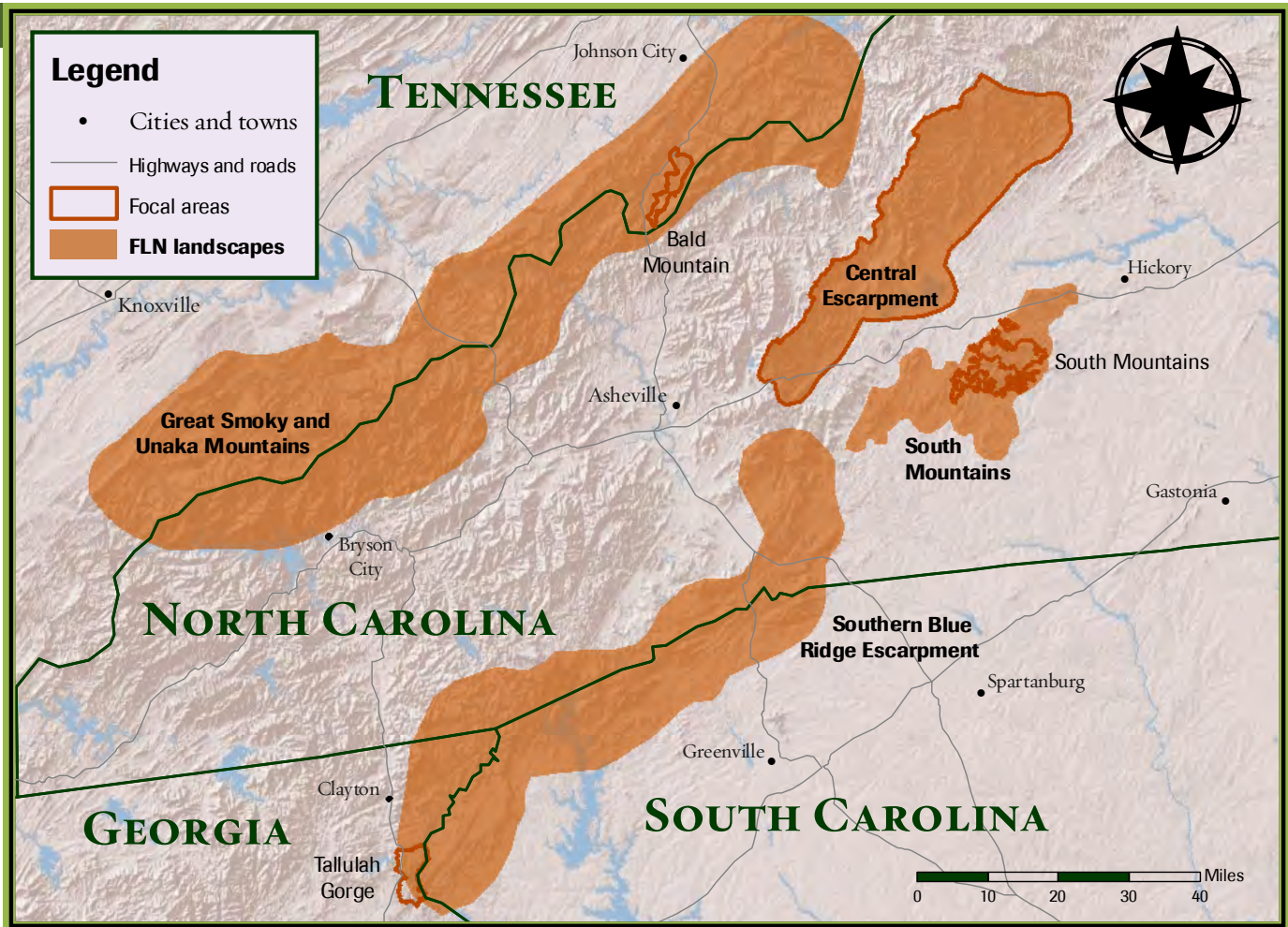
Partners in this regional network seek to restore and maintain fire adapted ecosystems on lands within the Southern Blue Ridge landscape under a model partnership of interested agencies and organizations which will work to increase the capacity for and reduce obstacles to conducting prescribed burning.

### *Demonstration Landscapes*

Central Blue Ridge Escarpment (NC)  
Great Smoky & Unaka Mountains (NC, TN)

South Mountains (NC)  
Southern Blue Ridge Escarpment (GA, NC, SC)





Map © 2009 Liz Rank / TNC

**In 2009, the partners** in the Southern Blue Ridge regional network will:

- Refine the network’s draft conceptual models of the role that fire historically played in the landscape and of the steps that can be taken to restore the structure and composition of fire-influenced forest types;
- Refine what partners plan to accomplish through restoration in the larger landscapes—Great Smoky and Unaka Mountains, Central Escarpment, South Mountains and Southern Blue Ridge Escarpment—that surround the focal areas;
- Expand the current vegetation map to encompass the entire SBR landscape, and estimate fire restoration needs;
- Share first-year monitoring results updated fire research findings from the Great Smoky Mountains with partners.
- Develop a communications plan with talking points—why and where we need fire—for internal and external communication;
- Keep citizen organizations involved as stakeholders; and
- Lay the groundwork to engage air quality regulators by 2010.

## NETWORK PARTNERS

Georgia Department of Natural Resources – State Parks and Historic Sites Division

Georgia Department of Natural Resources – Wildlife Resources Division, Nongame Conservation Section

Georgia Forestry Commission

National Park Service

North Carolina State Parks

North Carolina Wildlife Resources Commission

The Nature Conservancy – Georgia, North Carolina, South Carolina, Tennessee

University of Tennessee

USDA Forest Service

Western Carolina University

WildLaw

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# CENTRAL BLUE RIDGE ESCARPMENT

## NORTH CAROLINA

### Southern Blue Ridge Fire Learning Network

425,000 acres



View of the Grandfather Ranger District from the Blue Ridge Parkway © Bart C. Kicklighter / USFS

#### LANDSCAPE GOAL

Land managers and conservation groups work as a team to define and illustrate desired future conditions that are both ecologically acceptable and achievable. This team will strive to understand the role of fire in the mountains, disseminate the need for fire to return at a meaningful scale, and facilitate the increase of prescribed and natural fire in the Central Blue Ridge Escarpment.

**THE CENTRAL BLUE RIDGE ESCARPMENT** marks the descent from the mountains to the piedmont in western North Carolina, and is an area of steep slopes and elevations ranging from 1,000 to 6,000 feet. At the lower elevations the natural communities include chestnut-oak, pine-oak heath and acidic cove forests, and at the highest elevations northern red oak forest is more common. The northern red oak canopy overtops a thick rosebay rhododendron-mountain laurel shrub layer. The density of these two heath species is indicative of land management legacy stretching back over a century: after decades of farming and grazing, settlers sold to logging companies that removed most of the remaining large timber via railroad. Railway sparks commonly lit the left-over logging slash, and the result was often bare soil between sparse trees. The dry, infertile conditions allowed fast-growing, opportunistic shrubs to capture space once populated by oaks. In fact, the land was so damaged and in need of restoration that the first eastern-U.S. purchase for the newly-established Forest Service was made within this landscape.

While severe fire altered the structure of these forests, fire is a natural part of the landscape. It is arguably the most fire-adapted portion of the Pisgah National Forest and Blue Ridge Parkway. Lying in a rain shadow of mountains to the west, the area is subjected to dry thunderstorms, with many lightning ignitions and low rainfall. Vegetation adapted to less-intense fire is still dominant across the landscape. Oak forests benefit from fire, and embedded within them are other fire-adapted species, including turkey-beard, Carolina hemlock, and Table Mountain pine, which has serotinous cones that require fire to germinate. Golden mountain heather, a low-growing shrub, is probably the most fire-dependent species in the area, and is found nowhere in the world except in this landscape. Heller's blazing star, another federally listed plant, also benefits from fire, and is being maintained with recurrent fire in the Central Escarpment landscape.

#### DEMONSTRATION LANDSCAPE



Monitoring plots are used established to track the effects of fire and other treatments on the rosebay rhododendron (*Rhododendron maximum*) and mountain laurel (*Kalmia latifolia*) that dominate many slopes of this area to the detriment of oak and pine regeneration. © Bart C. Kicklighter / USFS

## LANDSCAPE ACCOMPLISHMENTS

Although prescribed fire has not yet been returned to much of this landscape, USFS, NPS and WildLaw are working together to understand the area's land use history as well as to prioritize burn units and to share resources. This planning will allow prescribed fires to be conducted across agency boundaries and include both USFS and NPS land. Interpretive rangers will work during burns to explain the role of fire to Blue Ridge Parkway tourists and to distribute educational materials created by the Fire Learning Network. Fire effects monitoring plots have been set up with the cooperation of NPS and USFS employees, so that the sometimes-gradual changes that occur when fire is reintroduced can be monitored and evaluated. The partners agree that each of these elements contributes to the puzzle called restoration.

## LANDSCAPE PARTNERS

National Park Service –  
Blue Ridge Parkway  
The Nature Conservancy –  
North Carolina  
USDA Forest Service –  
Pisgah National Forest  
WildLaw

## LANDSCAPE OBJECTIVES

Partners in this landscape are now taking actions that will:

- Allow lightning-ignited fires to play their natural role across the Central Escarpment, an area known for dry thunderstorms and subsequent lightning ignitions;
- Reduce the density of white pine in fire-maintained communities;
- Reduce the percent cover of evergreen heaths (rhododendrons and mountain laurel) in fire-maintained oak and pine communities;
- Monitor vegetation to better determine an ecologically-appropriate fire regime;
- Expand the extent of habitat suitable for golden mountain heather, a small shrub now confined to the edge of its former range; and
- Restore habitat for other fire-adapted plants: Heller's blazing star, ash-leaved and mountain golden banners, large witch-alder, sweet pine-sap and Gray's lily.

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# GREAT SMOKY & UNAKA MOUNTAINS

## NORTH CAROLINA & TENNESSEE

### Southern Blue Ridge Fire Learning Network

1.6 million acres



The Blackstack Cliffs rise above the trees in the Cherokee National Forest

© Rob Klein / NPS

**THE GREAT SMOKY MOUNTAINS AND UNAKA MOUNTAINS** form a typical southern Appalachians site. Running along the Tennessee/North Carolina state line with elevations of 2,000 to 4,500 feet, they are home to oak-pine heath, high elevation northern red oak, dry-mesic oak-hickory forests and other community types.

Like many landscapes, these mountains have suffered from a lack of appropriate fire. While fire has not been completely excluded from this landscape—in the Cherokee National Forest, about 20,000 acres a year are burned—partners see a need for a major reduction in hazardous fuels, as well as restoration of forest structure to ensure its long-term health and resiliency. However, getting appropriate fire into the forest meets with some public concern. More comprehensive monitoring of the effects of fire and dissemination of information about its benefits are key to alleviating these concerns. Monitoring and adaptive management programs will also improve planning, allow managers to confirm that objectives are being met and provide the feedback needed to adjust management as needed. Ultimately, the result of the monitoring and enhanced communication should speed the planning and permitting processes, allowing fire to be reintroduced over a greater range in the region.

#### LANDSCAPE GOAL

Partners are working toward a healthy and diverse ecosystem that includes appropriate proportions of structural stages/age classes for the full range of fire-adapted vegetation native to the site. This will include regeneration adequate to sustain populations of *Pinus pungens*, *P. rigida*, *Quercus montana*, *Q. rubra*, and other *Quercus* species. It is expected that such conditions will also increase the health and diversity of populations of many other biological taxa.

#### DEMONSTRATION LANDSCAPE



Map © 2009 Liz Rank / TNC

## LANDSCAPE ACCOMPLISHMENTS

According to the vegetation models developed by the Southern Blue Ridge FLN, it will require a 20-30 year commitment to bring the target forest communities to a state near the desired future conditions that have been developed for this landscape. During this restoration phase, multiple burns will be required. It is thought that three to six burns will be needed in each area, although more or less fire could be required, depending on community types and fire severity levels. Once the forests have been restored to healthy function, areas will need to be visited by fire—natural or prescribed—at least once every 25 years to maintain that health. The FLN partnership joined the work toward this goal in the spring of 2008 with the designation of a focal site at Henry Ridge / Phillips Hollow. Site assessment and pre-burn monitoring took place over the summer, with a burn plan then being developed over the winter. The team is currently seeking funding to continue the monitoring and database management. The focal area is also being enlarged in 2009 to cover a larger portion of the Bald Mountains.

## LANDSCAPE PARTNERS

- Appalachian Trail Conservancy
- National Park Service – Great Smoky Mountains National Park
- Private landowners
- The Nature Conservancy – North Carolina, Tennessee
- USDA Forest Service – Cherokee National Forest

## THREE-YEAR PLAN

Partners have developed, and begun implementing, a multi-year monitoring plan of ecological prescribed fire in the landscape.

Year 1 (2008):

- Prepare burn plan
- Critically review objectives
- Establish pre-burn monitoring

Year 2 (2009):

- Conduct first burn
- Complete post-burn monitoring of site
- Summarize and share results

Year 3 (2010):

- Revise objectives as needed
- Evaluate and plan for second burn
- Continue monitoring and adaptive management process

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# SOUTH MOUNTAINS

## NORTH CAROLINA

### Southern Blue Ridge Fire Learning Network

217,000 acres



Narrow ridges and steep slopes are typical of the South Mountains

© Ryan Jacobs

**THE SOUTH MOUNTAINS** landscape is a large area of dissected high hills rising from the rolling upper piedmont region and foothills of the Blue Ridge escarpment. Most of this landscape consists of steep slopes, narrow ridges and narrow ravines or stream gorges, with elevations ranging from 1,000 to 3,000 feet. These mountains are typical of the southern Blue Ridge in ruggedness, fire history and forest communities, which include chestnut-oak, montane oak-hickory, pine/oak-heath, rich coves and acidic coves. Scattered stands of pitch pine and Table Mountain pine are indicative remnants of historical fire influence on the landscape, but the absence of fire has resulted in encroachment by white pine, maple, mountain laurel and rhododendron on many sites. Many areas have been affected by earlier logging as well as fire exclusion. The South Mountains plant communities also include a diverse collection of rare herbaceous plant species, including a large population of white irisette, a federally-listed plant that benefits from fire.

The core of the South Mountains includes South Mountains State Park and South Mountains Game Land. Agency partners from these lands are working together to reestablish ecologically appropriate fire regimes and the use of fire in the South Mountains through collaborative, jointly-implemented prescribed burns across the landscape.

#### LANDSCAPE GOAL

Through cooperative partnership and collaboration, land managers will work across jurisdictional boundaries to implement prescribed burning and capitalize on other fire occurrences with a common goal of restoring and maintaining fire-adapted ecosystems. Management strategies employed will target increasing the ability to apply fire and reduce obstacles to conducting prescribed burning. A fundamental part of this effort will include monitoring of sites and assessing changing environmental conditions and forest community characteristics as fire is applied across the South Mountains landscape.

#### DEMONSTRATION LANDSCAPE



An early spring 2009 prescribed fire burns in the High Peak focal area

2009 Ryan Jacobs

## LANDSCAPE ACCOMPLISHMENTS

Discussions between land managers from North Carolina state parks system and the North Carolina Wildlife Resources Commission began in 1996 to identify areas in need of fire for ecosystem restoration and to explore the potential for conducting prescribed burning in the South Mountains. Prescribed burning conducted by these agencies on their own portions of the South Mountains landscape began in 1998, and differed somewhat between agencies in objectives and strategies.

In 2008, through the partnership formed as members of the Southern Blue Ridge Fire Learning Network, the two agencies began jointly planning a landscape-level burn across property boundaries. Protocols for pre-burn sampling developed by the partnership were used to install monitoring plots, data were collected and photo points were established. With support from the Southern Blue Ridge Fire Learning Network as a catalyst, the first large-scale collaborative prescribed burn was conducted jointly by the two agencies in early spring 2009 on a 438-acre area of the South Mountains landscape known as the High Peak focal area.

## LANDSCAPE PARTNERS

North Carolina State Parks  
 North Carolina Wildlife  
 Resources Commission  
 The Nature Conservancy –  
 North Carolina

## LANDSCAPE OBJECTIVES

Partners in this landscape will implement fire management strategies that will promote:

- Restoration of open woodland conditions in oak-hickory forests and pine-oak assemblages, as well as perpetuate Table Mountain pine and pitch pine stands;
- Increased viability of rare plant populations, including white irisette and bear oak;
- Improved wildlife habitat conditions, especially for early successional species;
- Reduction of encroachment by white pine, maple, mountain laurel and rhododendron;
- Monitoring of prescribed burning projects to evaluate ecosystem changes;
- Establishment of semi-permanent firebreaks and areas for repeated fire treatments;
- Large-scale burning blocks using existing firebreaks, both natural and man-made; and
- Regular burning (every three to five years) across the South Mountains landscape.

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# SOUTHERN BLUE RIDGE ESCARPMENT

## GEORGIA, NORTH CAROLINA & SOUTH CAROLINA

Southern Blue Ridge Fire Learning Network

868,000 acres



An open woodland structure maintained by fire supports a variety of grasses, forbs and shrubs in the understory.

© Mike Brod / USFS

**TALLULAH GORGE**, at the far southwest edge of the Southern Blue Ridge Escarpment landscape, is best described as a transitional zone between the southern Appalachian piedmont to the south and the Southern Blue Ridge Mountains to the north. Numerous upland ridges and south-facing woodland slopes are embedded in a larger mesic forest matrix. The ecological system to which these upland habitats most closely conform is the Southern Appalachian Low-Elevation Pine Forest (NatureServe). This system occurs in a variety of topographic and landscape settings and is dominated by either *Pinus echinata* (shortleaf pine) or *P. virginiana* (Virginia pine) and also contains numerous dry-site oak species, such as *Quercus falcata* (southern red oak), *Q. prinus* (chestnut oak) and *Q. coccinea* (scarlet oak). In addition, but to a lesser extent, numerous pitch pine and table mountain pine specimens can also be found scattered throughout the landscape.

Within this landscape, a diverse group of partners is working to use prescribed fire and mechanical treatments to restore the natural structure and function of the upland pine ecosystems. Historically, frequent low-intensity fires were responsible for maintaining a bi-layered forest structure, with widely spaced pines and oaks in the overstory and a rich and diverse grass, forb and shrub layer in the understory. Currently, this type of forest habitat—generally described as woodland or savanna—is declining throughout the region, primarily due to fire suppression and other incompatible land use practices. Such woodlands are ideal habitat for a variety of sun-loving plants, as well as for numerous wildlife species that depend on the bi-layered structure. Wildlife species that will benefit from treatments that restore this structure include black bear, northern bobwhite, the rare Bachman’s sparrow and the declining brown-headed nuthatch and eastern wood pewee.

### DEMONSTRATION LANDSCAPE





A spring burn was conducted in the northern part of the Tallulah Gorge site in 2009. © Mike Brod / USFS

## LANDSCAPE PARTNERS

Georgia Department of  
Natural Resources –  
State Parks and Historic  
Sites Division

Georgia Department of  
Natural Resources –  
Wildlife Resources  
Division, Nongame  
Conservation Section

Georgia Forestry  
Commission

The Nature Conservancy –  
Georgia, South Carolina,  
Tennessee

USDA Forest Service,  
Chattahoochee-Oconee  
National Forest,  
Chattooga River Ranger  
District

## LANDSCAPE ACCOMPLISHMENTS

Although this landscape partnership is fairly young, some significant progress has already been made.

- Core partners met with Tallulah Gorge State Park officials in 2008 to discuss cooperative prescribed burning opportunities within the landscape.
- Members of an expanded landscape team met again in early 2009 to identify key threats to the landscape and the barriers to ameliorating those threats.
- The first cooperative prescribed burns were conducted in early spring of 2009, treating approximately 1,800 acres of the northern part of site.

## LANDSCAPE OBJECTIVES

In 2009, work will continue in the Tallulah Gorge site. Partners will:

- Establish a Memorandum of Understanding with the state of Georgia to facilitate cooperative burning across jurisdictional boundaries;
- Assist the Georgia Department of Natural Resources in implementing the North Rim prescribed burn planned for the summer of 2009;
- Implement mechanical treatments at the Watergauge Woodland in the north part of the demonstration area; and
- Begin a process in which prescribed burn units in the landscape are maintained on a three to five year rotation.

## LANDSCAPE GOAL

A variety of partners will work together across jurisdictional boundaries to effectively and efficiently restore pine-oak woodland habitats on suitable sites in the Tallulah Gorge area, developing methods that are applicable to the larger Southern Blue Ridge Escarpment landscape.

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# Florida-Caribbean Fire and Invasives Learning Network

3.4 million acres



Participants from six counties have come together to work on shared threats, beginning with a February 2009 workshop in Miami

© Alison Higgins / TNC

**FIRE MANAGEMENT AND INVASIVE PLANT MANAGEMENT** have typically been seen as two separate land management needs. However, the increase of invasive grasses and other invaders that promote—or are promoted by—fire has forced practitioners of each type to learn the other’s tools. Too often, this happens too late to abate a threat efficiently or effectively.

Advancing both the fire and invasive species management communities requires an approach that explores the connections between fire and invasives across the greater landscape, while building the capacity of practitioners on the ground. A regional learning network addressing these dynamics is an ideal format to identify priorities, develop and disseminate information and tools, and build the overall capacity of the region to effectively mitigate the interrelated threats of invasive species and fire.

Tropical islands are host to some of the richest biodiversity in the world. They are also home to some of the most vulnerable landscapes. Increasing the capacity of land managers to foresee, prevent and control threats to their conservation lands before the habitat is compromised is the only recognized method to efficiently and successfully ensure healthy landscapes.

## NETWORK VISION

The network envisions project sites throughout the region that have adequate knowledge, technical capacity, funding, policies and stakeholder support for managing fire/invasives interfaces, and are demonstrating measurable progress towards achievement of ecological management objectives.

### ***U.S. Landscapes***

Lake Wales Ridge (FL)  
Guanica Dry Forest Reserve (PR)  
South Florida Pine Rocklands (FL)

### ***International Landscapes***

Bahamas: Pine Rocklands  
Dominican Republic: Madre de las Aguas  
Jamaica: Fire-Dependent & Fire-Sensitive Habitats  
St. Lucia: Dry Forests  
Trinidad & Tobago: Nariva Swamp



Map © 2009 Liz Rank / TNC

**The Florida-Caribbean Fire & Invasives Learning Network** was formed in late 2008 with the aim of engaging stakeholders across six countries to share knowledge, actions, abilities and concerns regarding the interrelated land management fields of fire and invasive plants. By year's end, 50 partners had committed to coming together to explore shared goals and objectives, and to set future action steps and duties. In February 2009 participants in the network met for the first time at a workshop in Miami, FL, at which goals for the upcoming year were set. Accordingly, each landscape will:

- Hold a workshop to build stakeholder groups, set and prioritize goals for itself and develop timetables for short-, medium- and long-term goals;
- Develop ecological models and results chains for those goals; and
- Share information about progress and obstacles met with the rest of the network.

Each landscape will complete at least one of its goals, and a second workshop will be held late in the year to share outcomes and set goals for the next year. In addition to the work of individual landscapes, the network as a whole will determine a plan for documenting and archiving both research findings and anecdotal evidence using the Fire Effects Information System.

## NETWORK PARTNERS

CABI  
 Caribbean Agricultural Research and Development Institute (CARDI)  
 Caribbean Invasive Species Working Group (CISWG)  
 Institute for Regional Conservation  
 National Park Service  
 The Nature Conservancy  
 U.S. Fish & Wildlife Service  
 U.S. State Department  
 USDA APHIS  
 USDA Forest Service  
 USDA International Services  
 USDA Missoula Fire Lab  
 USDA NRCS

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# PINE ROCKLANDS

## BAHAMAS

Florida-Caribbean Fire & Invasives Learning Network

432,000 acres



Immediate actions for this network include steps to control melaleuca (*Melaleuca quinquenervia*). This includes establishing a task force to finalize the existing draft National Melaleuca Control Plan, increasing public awareness and beginning a program of monitoring, mapping and treatments. Climbing fern (*Lygodium spp.*) prevention and bracken fern (*Pteridium spp.*) control are also high priorities.

© Chris Bergh / TNC

**FIRE-DEPENDENT BAHAMIAN PINE FORESTS** comprise 23 percent of the terrestrial ecosystems in this archipelago. These forests of Bahamian pine (*Pinus caribaea var. bahamensis*) are the largest and most intact forests of their kind; the only other pine rocklands are found in southeast Florida, the Florida Keys and the Turks & Caicos Islands. Although these forests are in good condition, the long-term health of the forests—and the numerous globally imperiled and endemic species they support—is threatened by fire that has become too frequent and by the presence of invasive tree species such as Australian pine (*Casuarina glauca*) and monkey tamarind (*Mucuna pruriens*).

In the Bahamas, fire and invasive species threats have not been considered together. However, it is recognized that invasive species threaten the integrity of pinelands and that more research on the connection between fire and invasive species is needed. There are also questions about the impact of climate change on fire-dependent and fire-sensitive ecosystems. Such information is recognized as integral in making informed management decisions. The Bahamas seeks to participate in exchange and mentorship opportunities with the network. Over the next year, national partners will continue to encourage the government to pass the Forestry Act, develop fire management plans for national parks and conduct research related to fire and invasive species management.

### LANDSCAPE PARTNERS

Abaco Friends of the Environment

Andros Conservancy and Trust

Bahamas Department of Lands and Surveys

Bahamas Environment, Science and Technology Commission

Bahamas Ministry of Agriculture

Bahamas Ministry of the Environment

Bahamas National Trust

The Nature Conservancy

U.S. National Park Service

Volunteer firefighters

### LANDSCAPE GOAL

The overall goal in the Bahamas, as described in the National Biodiversity Strategy and Action Plan, is to control invasive alien species as a threat to biodiversity. In terms of fire management, it is envisioned that efforts will lead to a sustainably managed healthy pine forest, maintaining the uniqueness of the Bahamian pineland and the conservation priorities which exist within the ecosystem.

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# GUANICA DRY FOREST RESERVE

## PUERTO RICO

Florida-Caribbean Fire & Invasives Learning Network

10,000 acres



Invasive grasses fuel inappropriate fires in this fire-sensitive habitat

© USFWS

A **UNITED NATIONS BIOSPHERE RESERVE**, the Guanica Dry Forest Reserve consists of 10,000 acres of dry land inhabited by over 600 species of plants and animals, including 48 endangered species and 16 species endemic to Puerto Rico. This fire sensitive habitat is considered one of the best examples of Caribbean dry forest.

### LANDSCAPE OBJECTIVES

Team members are working to:

- Improve awareness about fire, invasive species and their interactions at the local government level and in agencies with jurisdiction over tasks related to them;
- Increase the level of priority for these issues;
- Enhance technology transfer and training; and
- Coordinate all planning and implementation tasks.

The forest has an altered fire regime due to invasion by non-native grasses that support seasonal fires. Partners have identified the elimination of the invading grasslands as a desired future condition, which will allow the current cycle of annual dry season fires to be broken.

To accomplish this, fire planning and implementation of restoration

actions have been identified as the primary needs, followed by increased funding and improved coordination among local and federal agencies.

### LANDSCAPE PARTNERS

National Park Service

Puerto Rico Department of Natural & Environmental Resources

South Florida Water Management District

University of Puerto Rico

USDA Forest Service

USDA NRCS – Caribbean Headquarters

U.S. Fish & Wildlife Service – Caribbean Islands

National Wildlife Refuges

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# FIRE-DEPENDENT & FIRE-SENSITIVE HABITATS

## JAMAICA

Florida-Caribbean Fire & Invasives Learning Network

224,000 acres



The Mason River Reserve, managed by the Natural History Museum of the Institute of Jamaica, is one of the first sites in which fire and invasive species are being considered together for management. The Reserve, which is home to several endemic bird and insect species, is currently affected by the spread of the invasive vampire fern (*Dicranopteris pectinata*). Fires that spread from adjacent sugar plantations contribute to the spread of the vampire fern by removing native plant species. A fire line has been created at the Reserve's perimeter, and ferns are being manually removed from the area. © Institute of Jamaica

**THE ISLAND OF JAMAICA** consists of a highland interior with a backbone of peaks, hills and plateaus running the length of the island, surrounded by flat coastal plains. Forests, which account for about 30 percent of the landcover, are the main repositories of biodiversity; as with many islands, there is a high level of endemism. Although about a third of the island's forests are in designated protected areas, they remain threatened by both non-native invasive species and changes in the frequency and type of fires now experienced.

Although both fire and invasive species have long been managed, there has been little integration of the two, and protected area plans do not always address these issues. As part of the Learning Network, partners are working to increase the available knowledge and focus attention on fire, invasive species and the interactions between them in both fire-dependent and fire-sensitive landscapes across the island, and throughout the Caribbean.

### LANDSCAPE PARTNERS

Caribbean Agricultural  
Research and  
Development Institute  
CITES Scientific Authority  
Hope Zoo  
Institute of Jamaica  
Jamaica Conservation and  
Development Trust  
Jamaica Ministry of  
Agriculture and Lands –  
Forestry Department  
Jamaica National  
Environmental Planning  
Agency  
Jamaica Rural Agriculture  
Development Authority  
Rural Agricultural  
Development Authority  
The Nature Conservancy  
University of the West  
Indies – Department of  
Life Science  
Urban Development  
Corporation

### LANDSCAPE OBJECTIVES

Partners wish to integrate the management of invasive plant species and fire so that forests can be restored to their natural fire regimes and native species can flourish.

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# LAKE WALES RIDGE

## FLORIDA

Florida-Caribbean Fire & Invasives Learning Network

552,000 acres



Treating invasive *Lygodium* (climbing fern) helps keep fire from spreading to tree crowns

© Steve Morrison / TNC

**LAKE WALES RIDGE** was once—650,000 years ago, when sea levels were higher—part of a small chain of islands. As is often the case with islands, species diverged from those on the mainland. The island heritage remains today, in the high concentration of rare species found in the area. This rich scrub landscape is subject to numerous pressures, including development, changes in fire regime and invasion by non-native plants.

Partners in the Lake Wales Ridge Ecosystem Working Group are addressing the latter two threats together, because fire and invasive species are intimately bound together here: The three plant species of most concern are *Lygodium*, cogon grass and natal grass. The first two of these cause fires to burn hotter, and natal grass then thrives in the openings left by fire.

In the coming year, the group plans to pursue the formation of a Cooperative Invasive Species Management Area (CISMA) on the Ridge, disseminate information about management actions that may promote invasive species and secure funding to support their work into the future.

### LANDSCAPE PARTNERS

Florida Division of Forestry  
Florida Division of Parks and Recreation  
Florida Fish and Wildlife Conservation Commission  
Institute for Regional Conservation  
Miami-Dade County  
National Park Service  
South Florida Water Management District  
The Nature Conservancy  
U.S. Fish & Wildlife Service

### LANDSCAPE OBJECTIVES

Partners plan to:

- Identify how fire and invasives interests overlap, identify what is known, fill gaps in this knowledge and adopt guidelines to reduce the spread of invasives during burning;
- Seek funding for an invasives “mop-up” crew to follow strike team burns and wildfires;
- Train the fire team to identify the Top 10 invasive plants on the Ridge and report them; and
- Incorporate the integration of fire and invasives into the new Cooperative Invasive Species Management Area on the Ridge.

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# MADRE DE LAS AGUAS

## DOMINICAN REPUBLIC

Florida-Caribbean Fire & Invasives Learning Network

720,000 acres



Native grasses are important for carrying appropriate fire through the pine savannas © Ron Myers/TNC

**THE MADRE DE LAS AGUAS** region in the central mountain range of Hispaniola Island is the source of water for hydroelectric power, domestic water supplies and irrigation systems that together benefit more than

### LANDSCAPE OBJECTIVES

Partners in the Dominican Republic are working to:

- Improve habitat quality and restore natural conditions in protected areas to sustain the healthy biodiversity of Hispaniola Island;
- Promote a participatory process to prevent, control and eradicate invasive alien species in the country; and
- Facilitate management tools, training and regulatory mechanisms to implement strategies that will reduce fire and invasive species threats.

70 percent of the country's population. The area also has high levels of biodiversity and endemism:

about 90 percent of the amphibians and reptiles, half the butterflies, 35 percent of the birds and 40 percent of the plants in the area are unique to the area.

Both fire and invasive species have been recognized as threats to this landscape, and both have been addressed individually; however, strategies to date have not focused on both simultaneously, or on their interactions. Partners are now working to remedy this. By 2010 they plan to establish pilot projects for restoration of invasive alien species impacts on pine and broadleaf forests in protected areas and introduce changes in fire management and invasive alien species policies and regulations, with a goal of reducing wildfires and introduction of invasive alien species in selected protected areas to less than half the current rate by 2012.

Work in this landscape will be applied to other protected areas such as Los Haitises and Bahoruco National Parks and Beata, Alto Velo, Cabrito and Catalina islands. Participation in the network will also facilitate the sharing of knowledge and Spanish-language tools throughout the region.

### LANDSCAPE PARTNERS

Dominican Environmental Consortium  
Dominican Republic Ministry of Agriculture  
Dominican Republic Vice-Ministry of Forest Resources  
Dominican Republic Vice-Ministry of Protected Areas & Biodiversity  
Hispaniola Ornithological Society  
National Botanic Garden  
The Nature Conservancy  
Universidad Autónoma de Santo Domingo – Department of Biology  
USDA APHIS – International Services  
USDA Caribbean Plant Protection & Quarantine Safeguarding Initiative

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# NARIVA SWAMP

## TRINIDAD & TOBAGO

Florida-Caribbean Fire & Invasives Learning Network

28,000 acres



Growing tall and thick, as it does here along a stream in the Asa Wright Preserve, invasive bamboo can intensify inappropriate fire

© Alison Higgins / TNC

**THE NARIVA SWAMP** is a mosaic of tropical forest, swamp forest, palm forest, mangroves, marsh and open water on the east coast of Trinidad. In 1992 it was declared a Wetland of International Importance under the Ramsar Convention. Illegal rice farming has led to altered hydrology, which has made the area more susceptible to wildfire, and many acres have burned in recent years; an active fire suppression program is now in place, but increased monitoring and education are needed to make the program successful.

Other parts of the country face similar threats from fire and from the invasive species that promote or take advantage of fire. Of particular concern are *Leucaena leucocephala* (a prolific seed bearer), *Acacia mangium* (which colonizes after fire), fire-hardy vines and bamboo. Until the current effort, the management of fire and invasives have not been considered together. Partners in Trinidad and Tobago are now working to strengthen the collaborative efforts that will continue existing management efforts that include an active fire prevention and education program during the fire season, fire patrols, monitoring fire behavior, controlled burning in teak plantations, removal of fire hazards along roads in plantations and clearing trees infested with invasive vines. In addition, they are working to gain recognition for the importance of invasive species, add an invasives management component to an existing fire protection unit, increase staffing in the unit that looks after invasives and promote the use of fire in the management of ecosystems for community benefit.

### LANDSCAPE PARTNERS

Anse Fromager Community  
Based Organization

Buccoo Reef Trust

Caribbean Agricultural  
Research and Develop-  
ment Institute (CARDI)

Private estate owners

Trinidad & Tobago

Environmental

Management Authority

Trinidad & Tobago Fire

Services

UN FAO

University of Trinidad &  
Tobago

University of West Indies

USDA APHIS

### LANDSCAPE OBJECTIVES

Partners are working to minimize the risk of invasive species and to reduce the frequency and intensity of fire in fire-sensitive habitats.

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# DRY FORESTS

## ST. LUCIA

Florida-Caribbean Fire & Invasives Learning Network

12,000 acres



Numerous endemic species in St. Lucia rely on the absence of fire

© St. Lucia Forestry Department

**DRY FORESTS** are found in small pockets on several of the Caribbean's Windward Islands—Curacao, Grenada, Martinique, St. Lucia and St. Vincent. Characterized by steep topography and found between the rugged interior mountains and flatter, xeric coastal areas, these fire-sensitive areas are under increasing pressure from agriculture and other development. More frequent fires and invasion by non-native species are two of the threats associated with this development. In 2006, the government of St. Lucia began work on a Wildfire Management Plan, but little work has yet been done in the management of invasive species.

Partners are now working to win endorsement of the Wildfire Management plan by cabinet ministers, and to review and revise a Systems Plan for Protected Areas that considers both fire and invasive species threats. Other necessary tasks include developing a database of invasive species for the island, drafting a Memorandum of Understanding between the Forestry Department and Fire Service, increasing local awareness of fire and invasive species risks, training landowners in prescribed fire techniques and increasing coordination among institutions. Participation in the network will support many of these tasks, through the sharing of information, tools and expertise.

### LANDSCAPE PARTNERS

Crown Lands Department  
Fire departments  
National Emergency  
Management Organisation  
Police departments  
St. Lucia Meteorological  
Services  
St. Lucia Ministry of Agriculture, Forestry & Fisheries  
St. Lucia Ministry of Education  
St. Lucia Ministry of Finance  
St. Lucia Ministry of Health  
St. Lucia Ministry of Planning, Development, Environment and Housing  
St. Lucia Ministry of Social Transformation  
St. Lucia National Biodiversity Programme  
St. Lucia National Trust  
Town councils

### LANDSCAPE GOALS

Partners wish to reduce the negative effects of wildfires on natural ecosystems and socioeconomic development, particularly in the most vulnerable dry scrub woodlands and savanna and grazing lands of the coastal zone.

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# SOUTH FLORIDA PINE ROCKLANDS

## FLORIDA

Florida-Caribbean Fire & Invasives Learning Network

26,000 acres



### LANDSCAPE PARTNERS

Florida Division of Forestry  
Florida Division of Parks and Recreation  
Florida Fish and Wildlife Conservation Commission  
Institute for Regional Conservation  
Miami-Dade County – Parks and Recreation  
Miami-Dade County – Department of Environmental Resources Management  
National Park Service – Everglades National Park  
South Florida Water Management District  
The Nature Conservancy – Florida  
U.S. Fish & Wildlife Service

Fire exclusion has contributed to the invasion by non-native species that alter the fire regime in various ways from its historic pattern of frequent, low-intensity surface fires. For example, Brazilian pepper trees can shade out native grasses and herbaceous plants, reducing flammability; on the other hand, Burma reed increases the fuel load and raises the fuel height, which can lead to excessive pine mortality.

© Amy Ferriter / South Florida Water Management District

### LANDSCAPE MISSION

The Pine Rockland Working Group seeks to maintain and restore the pine rockland natural community, its associated species, and the natural processes, most notably fire, upon which they all depend.

**FLORIDA'S PINE ROCKLAND FORESTS** are dominated by a single canopy tree, slash pine (*Pinus elliottii*), with a diverse hardwood and palm understory and a rich herbaceous layer. The assemblage of plants is a unique combination of tropical and temperate taxa, including many endemic species; these support a wide array of wildlife, including five federally-listed animals. There are about 20,000 acres of pine rockland in Everglades National Park, 2,000 in the Florida Keys and another highly-fragmented 4,000 acres scattered across Miami-Dade County.

Periodic fire is required to eliminate invading hardwoods, aid nutrient cycling and reduce litter. Fire exclusion and invasion by non-native species—and the interactions between the two—are altering the very character of this system. The Pine Rockland Working Group formed in response to these threats, and has held biannual conferences since 2004; the Working Group joined the newly-formed regional Fire Learning Network in 2008. Participation in the FLN will allow the group to address several of the challenges it has identified, including research questions, public communication, integrating planning for fire and invasive species, and capacity constraints.

Goals for this landscape include returning it to a more natural fire regime of frequent (3-15 year interval) surface fires, managing existing invasions by non-native species and preventing new invasive species from becoming established. Consideration of climate change will also be necessary in this low-lying area. In the coming year, partners will develop equipment and personnel hygiene protocols to minimize the introduction and spread of invasive plants in the Keys, establish an e-mail invasives alert system, incorporate invasive species management language into burn plans and refine and apply monitoring plans in the Everglades.

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# JEMEZ MOUNTAINS CLIMATE CHANGE ADAPTATION PROJECT

NEW MEXICO

990,000 acres



## PROJECT GOAL

Workshop participants and others will work through 2009 to identify science products, management practices and policies needed to facilitate cross-jurisdictional planning, implementation and monitoring of management actions that reduce the impacts of climate change on natural processes, ecosystems and species in the Jemez Mountains landscape.

The Jemez Mountains, a volcanic range at the southernmost edge of the Southern Rocky Mountain ecoregion, play an ecological role as a sky island in an arid environment. The landscape is an important center of biological diversity, and a source of water for urban areas below it.

© 1991 Space shuttle Columbia astronauts / NASA

**THE JEMEZ MOUNTAINS** climate change adaptation pilot project is located in the Jemez Mountains of northern New Mexico. This landscape—nearly a million acres of forests and woodlands, mostly under federal management—was identified as a key conservation area by both the Conservancy’s Southern Rockies ecoregional assessment and the New Mexico Department of Game and Fish’s Comprehensive Wildlife Conservation Strategy. They contain a large number of rare and endemic species, but even common species of the Rockies, such as the snowshoe hare, are of ecoregional significance because of their geographic isolation from other populations.

The New Mexico chapter of the Conservancy recently completed a statewide climate change impacts and vulnerability assessment, which identified the Jemez as an area that has both a high climate change exposure (e.g., significant drying over the last 37 years, due to temperature increases and precipitation decreases) and a high density of species vulnerable to climate change, when compared to other regions in the state. Effects of climate change are already evident in the Jemez landscape: there have been a number of large wildfires, bark beetle outbreaks and forest dieback, population declines of sensitive high-elevation species and invasion by cheatgrass.

Many partners in this project participated in the first Fire Learning Network; more recently, two of the federal agencies—Santa Fe National Forest and Valles Caldera Preserve—have begun developing a large landscape restoration project in the southwest part of the Jemez Mountains. Working collaboratively on projects is comfortable and desired by many managers in the Jemez. Because of spirit of collaboration and the magnitude of climate change experienced here, the landscape was selected by the Conservancy for a pilot climate change adaptation workshop held April 21-22, 2009. It was the first of four that will be part of the Southwest Climate Change Initiative, a joint project of the Conservancy in New Mexico, Arizona, Colorado and Utah.

## DEMONSTRATION LANDSCAPE



Map © 2009 Liz Rank/TNC

## PROJECT OUTLINE & OBJECTIVES

An April 2009 workshop engaged 50 participants in two days of work on a Climate Change Adaptation Planning Framework developed by scientists from the Conservancy, Wildlife Conservation Society, National Center for Ecological Analysis and Synthesis and University of Arizona. Outcomes of the workshop included development of conceptual models for key ecosystem processes, identification of management intervention points within the context of these ecological models and recommended strategies or actions to reduce climate impacts under two different climate change scenarios.

Participants identified collaboration as critical to addressing climate change impacts and, at the end of the workshop, expressed a strong desire to continue working together. Objectives for the remainder of the year include developing broad partner and stakeholder engagement to generate science-based assessment information and recommended actions and policies; reviewing and refining the Adaptation Planning Framework; using lessons from this effort to inform further workshops scheduled for Arizona, Colorado, and Utah between fall 2009 and winter 2010; and using the 2009 products to develop a proposal for a climate change learning network for the Jemez Mountains, with funding to be sought in 2010.

## LANDSCAPE PARTNERS

- Bureau of Indian Affairs
- Forest Guild
- Four Corners Institute
- Jemez Pueblo
- Los Alamos National Lab
- National Park Service –  
Bandelier National Monument
- New Mexico Department of  
Game & Fish
- New Mexico Energy, Minerals  
and Natural Resources  
Department
- New Mexico Highlands  
University – Forest & Water-  
shed Restoration Institute
- New Mexico State Forestry  
Division
- Santa Ana Pueblo
- Santa Clara Pueblo
- The Nature Conservancy –  
Colorado, New Mexico
- University of Arizona
- University of California, Santa  
Barbara – National Center for  
Ecological Analysis & Synthesis
- USDA Forest Service – Santa Fe  
National Forest
- USDA Forest Service – Jemez  
Ranger District
- USDA Forest Service – Region 3
- USDA Forest Service – Rocky  
Mountain Research Station
- U.S. Fish & Wildlife Service
- U.S. Geological Survey
- Valles Caldera National Preserve
- Wildlife Conservation Society

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# MIMBRES WATERSHED

## NEW MEXICO

532,000 acres



Pre-burn monitoring of tree density by size class and canopy cover at a site on the North Star Mesa on the Gila NF Wilderness District.

© Roger Cole

**THE MIMBRES WATERSHED DEMONSTRATION LANDSCAPE** is located in southwest New Mexico, on and adjacent to the Wilderness District of the Gila National Forest. The area includes a mix of upland forest, woodland, grassland and riparian vegetation along the upper reaches of the Mimbres River. Fire suppression, invasive and alien species, incompatible operation of drainage or diversion systems, incompatible grazing practices, channelization of rivers or streams, and groundwater pumping for residential development have been identified as major threats to this ecosystem. A suite of strategies to abate these threats and to conserve and restore the identified aquatic and riparian targets have been identified by a conservation planning process conducted by the Conservancy's New Mexico chapter. The USDA Forest Service, one of the largest land managers in the region, has also identified the area as a high priority in its planning.

The Fire Learning Network focuses on two key threats—fire suppression and incompatible grazing practices. By restoring altered fire regimes and forest health, the species and the systems that rely on them can better be sustained.

### LANDSCAPE VISION

Partners aim to conserve and restore functional aquatic and riparian systems and the upland watersheds that sustain them. The upland watersheds should support grassland and forest ecosystems with an intact fire regime and distribution of successional classes that reflect the historic range of variability for these ecosystems, thereby increasing their resilience to ongoing climate change. Working in partnership with local communities and public entities, we will incorporate compatible economic and cultural interests within these watersheds into the long-term conservation of their biodiversity.

## DEMONSTRATION LANDSCAPE



Map © 2009 Liz Rank/TNC

## PROJECT OUTLINE

FLN partners in this new demonstration project will build on the recently completed Conservation Action Plan for the landscape and work with numerous stakeholders to conduct a rapid landscape-scale resource assessment. Developing an assessment that takes into account both upland fire management and riparian and aquatic system health will meet the conservation objectives of this area, and will also provide a useful example to other regional networks. The project will provide an initial analysis of the landscape and initiate a stakeholder process. This will identify partners and landscape objectives that will be used to prepare a grant proposal, which will itself provide a thorough landscape analysis, leading to a programmatic NEPA document for the Gila National Forest. Further, this landscape-scale analysis will help project partners develop additional competitive grant proposals for supplemental funds that will be used to implement priority treatments on public and private lands.

## LANDSCAPE PARTNERS

Bureau of Land Management  
 Center for Biological Diversity  
 Four Corners Institute  
 Gila WoodNet  
 Headwaters Ranch  
 New Mexico Environment Department  
 New Mexico Game and Fish Department  
 New Mexico State Forestry Division  
 New Mexico State Land Office  
 Private Contractors  
 Private Landowners  
 The Nature Conservancy  
 USDA Forest Service – Gila National Forest  
 USDA Natural Resources Conservation Service  
 U.S. Fish & Wildlife Service  
 Western New Mexico University

## LANDSCAPE OBJECTIVES

In the coming year, FLN partners working on this landscape will:

- Plan collaboratively with partners and complete fuels-fire risk assessments;
- Perform a strategic evaluation of treatment options and NEPA planning to support a Programmatic Fire Plan, and develop a monitoring plan;
- Implement the fire plan, including fuel treatments and monitoring, with the Forest Service and other partners;
- Work with ranchers on Conservancy allotments on the Gila NF to integrate fire and grazing management informed by monitoring data; and
- Share lessons learned with FLN partners.

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# ONSHOW BIGHT STEWARDSHIP ALLIANCE

## NORTH CAROLINA

3.0 million acres



Longleaf pine with an understory of native wiregrass (*Aristida stricta*) that requires growing season fire to set seed

© Mark Daniels/TNC

**THE ONSLOW BIGHT FIRE PARTNERSHIP** was formed in 2005 to address the lack of appropriate fire in this Coastal Plain landscape. In 2004, a group of 13 parties with an interest in enhancing cooperation and communication about regional conservation issues—the North Carolina Onslow Bight Conservation Forum—developed the Onslow Bight Conservation Design Plan. The Plan identified the lack of fire as a major threat to targets in the landscape.

Each year, land-managing agencies and owners burn approximately 75,000 acres across the landscape. But more fire is required: many of the area's threatened and endangered species, pyrogenic plants, transitional areas between plant communities and unique natural areas depend upon it, as does longleaf pine regeneration. Forest and timber management, fuel reduction and significant wildland-urban interface objectives also need to be addressed. The partners have mapped vegetation, wild-

land-urban interface areas and species guild richness change for both pre-settlement and present-day landscapes; this information is useful in setting priorities and will serve as a baseline for future monitoring efforts. In addition, a communications outreach plan has been developed and is being implemented to enable informed and objective media coverage of controlled burns.

In early 2009, seven of the partners signed a Memorandum of Understanding that facilitates cross-boundary cooperation and implementation of prescribed burning. By doing so, these partners—Croatan National Forest, Marine Corps Base Camp Lejeune, Marine Corps Air Station Cherry Point, NC Wildlife Resources Commission, NC Division of Forest Resources, NC Division of Parks and Recreation and The Nature Conservancy—founded the Onslow Bight Stewardship Alliance. They will plan cooperative burns with the goal of bringing fire to scale in this landscape and together will seek additional funding to support the work.

### LANDSCAPE VISION

The Alliance will restore and maintain fire-adapted ecosystems and processes within the Onslow Bight landscape under a model partnership of interested agencies and organizations which will work to increase the capacity for and reduce obstacles to conducting prescribed burning.



© Hervey McIver/TNC

### DEMONSTRATION LANDSCAPE





Map © 2009 Liz Rank / TNC

## LANDSCAPE PARTNERS

Department of Defense –  
Camp Lejeune Marine  
Corps Base\*

Department of Defense  
– Cherry Point Marine  
Corps Air Station\*

## LANDFIRE

North Carolina Division of  
Forest Resources\*

North Carolina Division of  
Parks and Recreation\*

North Carolina State Parks

North Carolina Wildlife  
Resources Commission\*

Southeast GAP Program

The Nature Conservancy –  
North Carolina\*

USDA Forest Service –  
Croatan National Forest\*

\*Signed the 2009 Memorandum of Understanding forming the Onslow Bight Stewardship Alliance. The other partners support the project, but are not formal members of the Alliance.

## LANDSCAPE

### ACCOMPLISHMENTS

Progress to date includes:

- Creation of the Onslow Bight Stewardship Alliance through a Memorandum of Understanding to improve collaborative prescribed burning across the Onslow Bight landscape;
- Identification and mapping of current and desired future vegetation conditions, and appropriate fire regimes that can be used to set burn priorities; and
- Identification of additional land conservation and protection needs that complement landscape burn goals.

## LANDSCAPE

### PLANS & OBJECTIVES

Moving forward, the Alliance plans to identify the obstacles to implementing fire goals, and develop strategies to overcome them. It will also seek additional funding to support prescribed burning within the landscape. Among other things, this will allow the Alliance to:

- Train fire practitioners in VSmoke modeling in order to enlarge windows for large-scale burning, especially in the wildland-urban interface;
- Implement the controlled burn communications outreach plan to improve the understanding of fire in this ecosystem among community leaders and the general public;
- Develop a private landowner outreach program, in conjunction with existing public initiatives, that encourages the use of prescribed fire on private lands by reducing hurdles and creating incentives;
- Hire a prescribed fire coordinator; and
- Develop cooperative relationships with local governments to build support for the partnership's goals.

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# SOUTH PUGET SOUND

## WASHINGTON

427,000 acres



Partners conduct a September 2008 prescribed burn at Mina Mound Natural Area Preserve, near Little Rock, Washington

© Mason McKinley/TNC

**LOWLAND PRAIRIES AND OAK WOODLANDS** once mixed extensively with coniferous forest and wetlands to form a biologically diverse network of habitats that ranged throughout the Puget Trough. Until about 150 years ago, these habitats were maintained through regular burning by indigenous people. As European settlement occurred, burning was halted, resulting in encroachment by coniferous forests. Much of the landscape was also converted to agriculture, housing and industrial development. Today, residual native grasslands are thought to cover only about three percent of their former extent. These prairies are home to the globally imperiled Roemer's fescue/white-topped aster community, part of a family of grasslands that extends from northern California into southern British Columbia. The residual prairie and oak sites provide habitat for several rare plants and animals, including the Mazama pocket gopher, western gray squirrel, streaked horned lark and Taylor's checkerspot butterfly.

Over the past 15 years, an active collaborative program has evolved to protect and restore the remaining prairie and oak mosaic habitat. There is a growing consensus among stakeholders that prescribed ecological fire is a critical conservation tool in these systems; the partnerships that have already developed will greatly facilitate efforts to conserve habitats at the landscape scale. The South Sound Fire Working Group was formed in 2007 to address constraints to building the fire capacity needed to effectively conserve these landscapes; this led to the founding of a Fire Learning Network in early 2008.

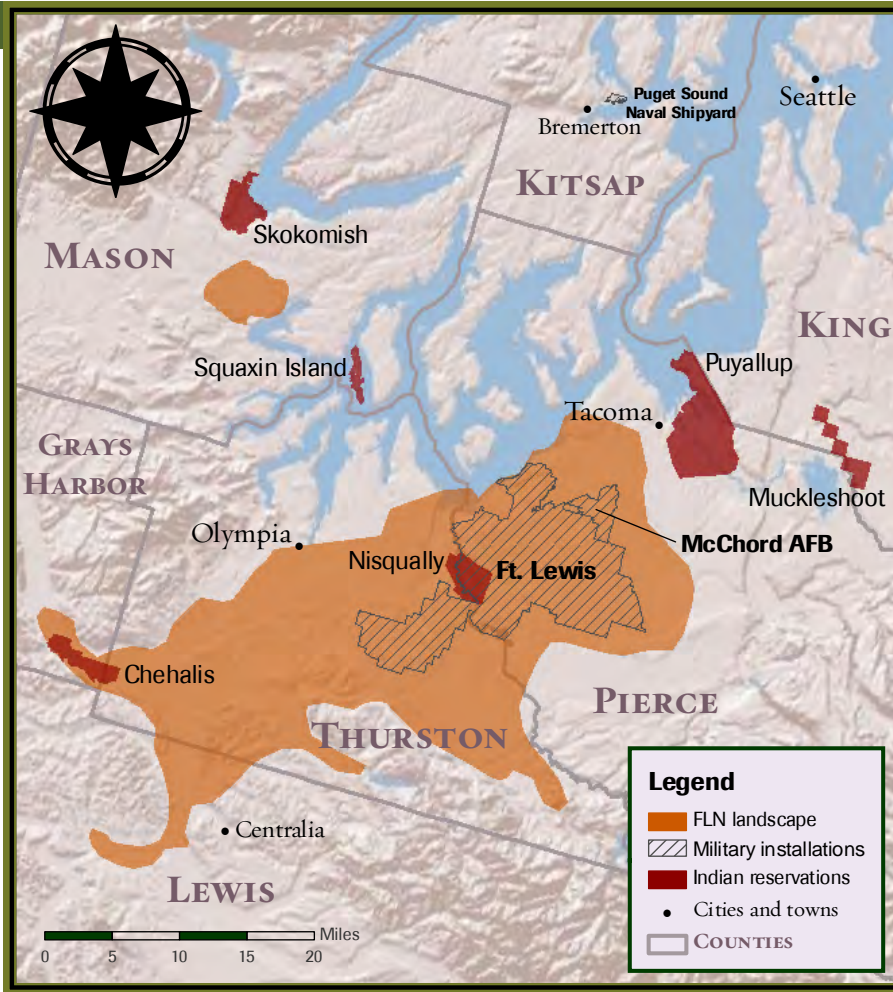


© Mason McKinley/TNC

### LANDSCAPE VISION

Partners envision a future with sufficient infrastructure, political support, funding and other resources to establish and maintain appropriate fire return intervals on priority habitat sites so that the landscape will be functionally restored and resilient.

### DEMONSTRATION LANDSCAPE



Map © 2009 Liz Rank / TNC

## LANDSCAPE ACCOMPLISHMENTS

The FLN has proven to be an invaluable resource, providing access to critically important information and numerous other fire projects across the country. Assisted by lessons and resources from the USFLN, in 2008 the South Sound program:

- Conducted 22 prescribed burns led by the Conservancy and assisted by many from the wider fire community. Participants included East Olympia Fire District 6, Fort Lewis (Forestry Fire Program and Fish and Wildlife), University of Washington, U.S. Fish and Wildlife Service, Washington Conservation Corps, Washington Department of Fish and Wildlife, Washington Department of Natural Resources (Natural Areas Program and Resource Protection) and individual firefighters who participated as volunteers.
- Trained and tested 11 new firefighters, including six from the Conservancy, four from Fort Lewis Fish and Wildlife and one from the state Fish and Wildlife department. In addition, 13 previously-trained firefighters from those agencies, plus the University of Washington and the U.S. Fish and Wildlife Service, received training and testing required for recertification.
- Invested \$23,000 (ACUB and Fort Lewis funds) on fire supplies to augment the existing inventory. Information acquired through the FLN allowed some equipment to be built and other to be purchased used, resulting in savings of about \$16,000.
- Worked with site managers and the DNR fire marshal to complete burn plans that allowed units to be burned during the county burn ban. This proved to be a valuable partnership-building process with the DNR.

## LANDSCAPE PARTNERS

- Department of Defense, Fort Lewis
- The Nature Conservancy – Washington
- Thurston County Parks Department
- Washington Department of Fish and Wildlife
- Washington Department of Natural Resources, Natural Areas Program
- Washington Department of Natural Resources, Resource Protection
- Wolf Haven International

## LANDSCAPE OBJECTIVES

In 2009, partners in this landscape plan to:

- Improve implementation capacity by having at least three firefighters participate in off-site training experiences, and by co-hosting, with local, state and federal partners, an RX-310 course in Olympia, WA;
- Improve fire program resiliency by collaborating with the Washington Department of Natural Resources (DNR) to develop a new burn plan template that achieves both Conservancy and DNR goals;
- Develop a media response plan for managing communication in case of prescribed fire escapes and other public relations needs;
- Develop and implement a program of postcard mailings to neighbors, and develop a day-before-burn call list;
- Conduct a fire planning workshop to assist with the development of fire management plans at sites in the area (this will require the completion of site Conservation Action Plans, now in progress); and
- Complete at least three burn projects on Fort Lewis under the leadership of a Conservancy burn boss.

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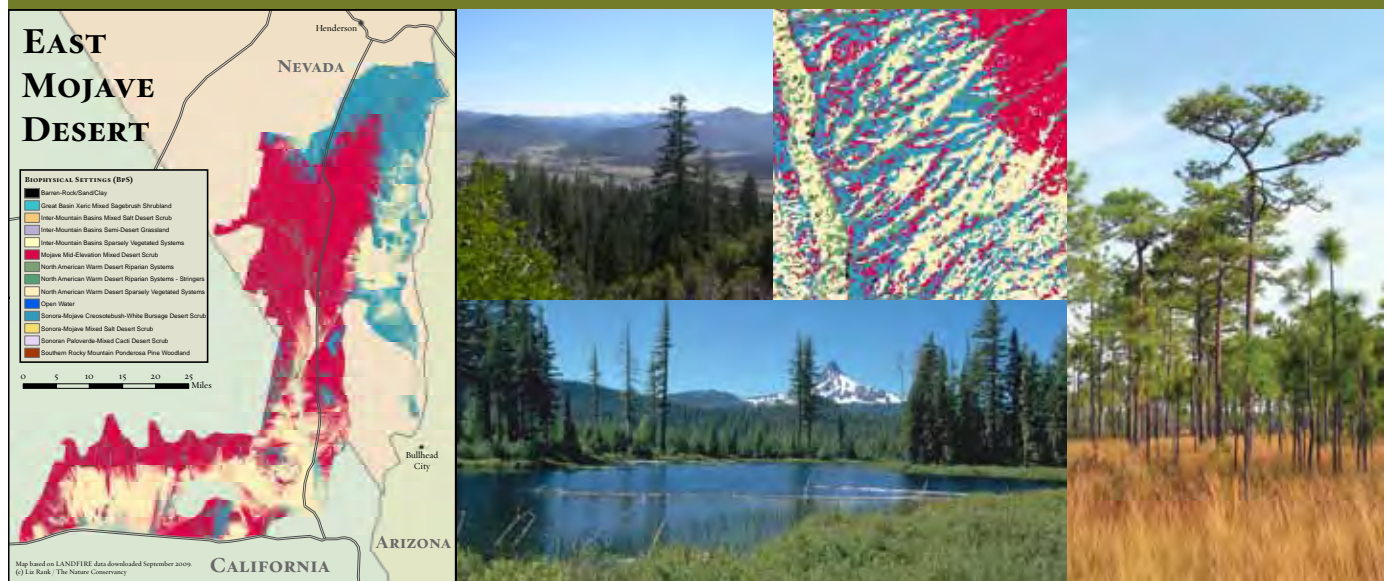
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# GENIES IN THE BOTTLE

## A LANDFIRE-EFROYMSON CAP COACHES NETWORK INNOVATION PROJECT

427,000 acres



Clockwise from left: Map of biophysical settings, East Mojave desert site (© Liz Rank / TNC); Klamath Mountains, California (© Nick Goulette); detail of biophysical setting data for the Red Cliffs, Utah site (© LANDFIRE); longleaf pine at Onslow Bight (© Milo Pyne); Deschutes National Forest, Oregon (© Charles Ort)

**THE MULTI-PROJECT EFROYMSON WORKSHOPS** will deploy LANDFIRE satellite imagery and computer-based predictive ecological models to assess the viability of focal ecosystem targets, quantitatively assess future threats, test the effectiveness of alternative strategies and develop a set of cost-effective strategies to enhance viability and abate threats. Projects containing landscapes with ecosystems that are potentially lacking their natural disturbance regime—such as fire—were solicited for participation, and the methods that are being deployed for assessing ecological departure have emerged from The Nature Conservancy’s federal LANDFIRE and Fire Learning Network partnerships. This Innovation Project proposes to leverage the innovative methods and tools that have been developed for application at other multi-ownership landscapes.

Through an Efroymsen peer learning series of four workshops, 10 landscapes will be coached to complete an enhanced Conservation Action Planning (CAP) process that includes integration of LANDFIRE tools, predictive ecological models and strategy cost-benefit analysis. This series will consist of two in-person workshops and two web-based workshops, and will be complete by the fall of 2010.

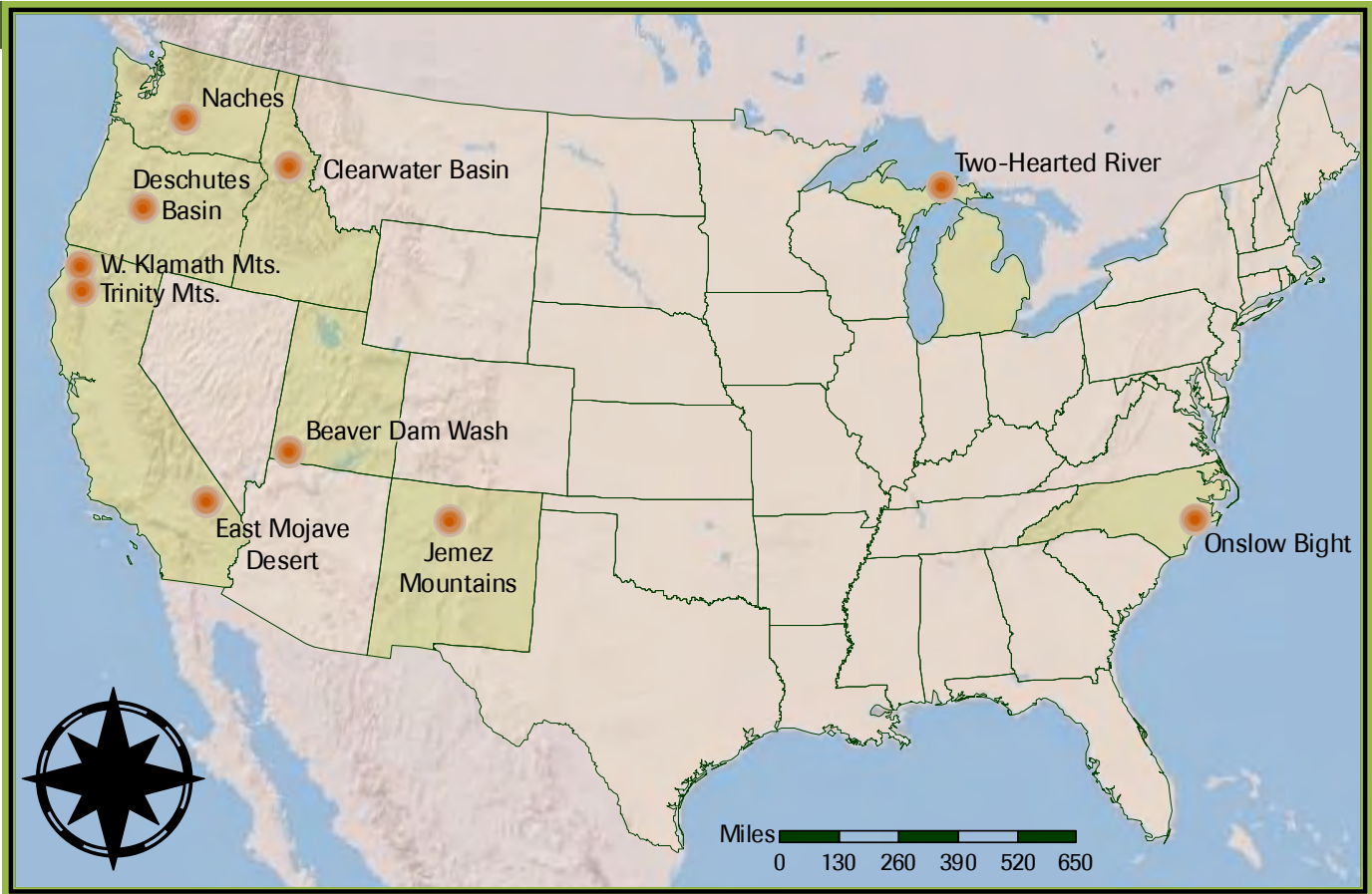
### VISION

This project will accelerate the conservation of priority landscapes by incorporating the use of LANDFIRE tools into the development of conservation action plans.

### Participating Landscape Projects

Beaver Dam Mountains / Red Cliffs, UT  
 Clearwater Basin, ID  
 Deschutes Basin, OR  
 East Mojave Desert, CA  
 Jemez Mountains, NM

Naches, WA  
 Onslow Bight, NC  
 Trinity Mountains, CA  
 Two-Hearted River, MI  
 Western Klamath Mountains, CA



Map © 2009 Liz Rank / TNC

**The enhanced Conservation Action Planning** process that each of the ten landscape projects will engage in includes the following steps:

- **Identify Conservation Targets:** Projects will map ecological systems using LANDFIRE data layers derived from satellite imagery or from similar local data sets. Each project team will identify up to eight focal conservation targets; teams will then adjust reference ecological models from LANDFIRE to reflect local conditions of the focal targets based upon their best available information and hypotheses.
- **Assess Viability:** A landscape-level measure—fire regime condition class (FRCC)—will be used to evaluate the departure of each target ecosystem from its natural range of variability. Although called fire regime condition class, FRCC is actually an integrated measure of ecological condition that incorporates species composition, vegetation structure and all significant disturbances for terrestrial, riparian and wetland ecological systems. It is, in effect, a powerful, unified key environmental indicator.
- **Assess Future Threats:** Predictive ecological models will be used to assess changes in existing conditions for focal targets, assuming minimum management of the ecosystems.
- **Develop Conservation Strategies:** Teams will develop alternative management strategies to improve viability and abate future threats. The strategies will be incorporated into the models, and computer simulations will be run to test whether strategies achieve desired results. Teams will then optimize strategies to achieve the highest ecological return on dollar investment.

### PROJECT PARTNERS

#### LANDFIRE

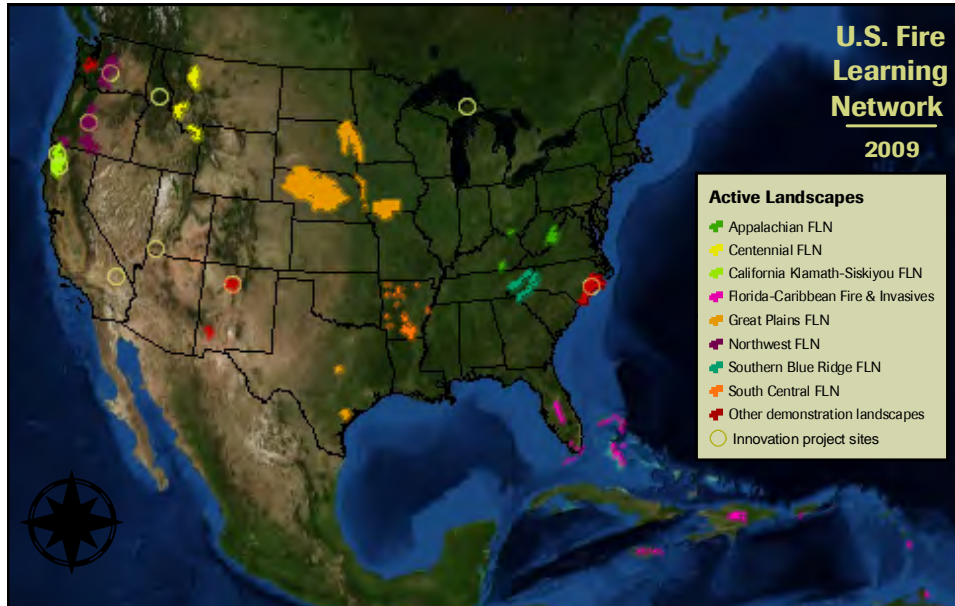
The Nature Conservancy –  
Efoymson Coaches  
Network

The Nature Conservancy –  
Nevada

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**THE U.S. FIRE LEARNING NETWORK** is a project of the cooperative agreement “Fire, Landscapes and People: A Conservation Partnership” among the USDA Forest Service, Bureau of Indian Affairs, Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service and The Nature Conservancy.



For more information, visit [www.tncfire.org/training\\_usfn.htm](http://www.tncfire.org/training_usfn.htm) or contact Lynn Decker ([ldecker@tnc.org](mailto:ldecker@tnc.org))





