FireScape: A Program for Whole-Mountain Fire Management in the Sky Island Region

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Abstract—*The Coronado National Forest's (CNF) FireScape program works to remove barriers to fire playing its natural role on the landscape. A long-term goal is creating landscapes that are able to survive wildfire with biodiversity and key ecological processes intact, especially important in the face of a drier, hotter Southwest. The FireScape team is nurturing multiple efforts around the Sky Islands—no two projects are alike, but those underway share an approach that includes multiple jurisdictions, investigations by University of Arizona scientists, public engagement, assessing treatment need at the whole-mountain scale, and creatively removing implementation barriers when funding is scarce. Clearance for treatments in designated Wilderness is a need across all projects. The FireScape team has completed a fuels map and an analysis of departure from reference condition for southeastern Arizona that covers the CNF and partner lands. Partners have worked together to update Landfire data for this 14 million-acre area. These products provide inputs for fire behavior and effects analyses to support decision making and outreach. The website* www.azfirescape.org *is a work in progress that displays project information, including maps, reports, and vegetation and fuels data*

"FireScape" is a Coronado National Forest (CNF) program for expanding safe, ecologically sound, large-scale, multi-party fire management across southeastern Arizona. The leadership team consists of representatives from the Forest Service, The Nature Conservancy, the University of Arizona (UA), and other regional land managers. This paper represents a 2012 progress report for work that has been underway for more than 10 years and that needs to remain a priority for land managers in the region. The 2011 fire season in the Southwest brought a 300% increase in area burned compared with the average for the previous 10 years—2.20 million acres (vs. 0.67 million) in Arizona, New Mexico, and West Texas (NIFC 2011). High-severity effects in dry woodland and forest types have left land managers uncertain about recovery trajectories (Wallow Fire example, Wadleigh 2011).

The CNF covers a number of dispersed mountain ranges separated by non-Forest Service land. These Sky Islands present different physical and biological backgrounds and challenges as well as different sets of neighbors. Thus they require custom approaches to fire management. Commercial timber operations have limited feasibility on this landscape, which makes it difficult to compete for treatment funding that ranks "utilization" significantly. The mountains and valleys of southeastern Arizona, however, have tremendous value as watersheds, habitat, working lands, and recreation sites. The importance of the FireScape project is magnified given the 2011 fires.

The many goals of FireScape can be condensed into a creative approach to fire management at a much bigger scale than in the past. The grasslands, woodlands, and forests of southeastern Arizona evolved under regimes of frequent low- and mixed-severity fire—on the order of every 5 to 20 years (Kaib 1998, Swetnam and Baisan 1996). If 1.5 million acres of the CNF used to burn every 15 years, keeping up means treating 100,000 acres/year. In some (but not all) years the Forest might come close to half or two-thirds that acreage. Expanding treatment and getting ahead of high-severity wildfires not only reduces the loss of healthy systems but also costs less than wildfire suppression and generates less smoke.

A long-term goal is creating landscapes that are able to survive wildfire with biodiversity intact, which becomes especially important in the face of a drier, hotter Southwest. Projects include monitoring that assesses our success and guides adjustments to improve our management. This work comes at a time when the CNF is also managing more wildfires for resource benefit, a shift from reliance on prescribed fire and other planned treatments to keep landscapes healthy. FireScape also emphasizes the need to keep fire out of systems where frequent fire has not been the norm, such as upland Sonoran desert, Arizona chaparral, and mountaintop spruce-fir systems.

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The FireScape program is one facet of the CNF's work underway for more than a decade to remove barriers to fire playing its natural role on the landscape. Other efforts include the Peloncillo Programmatic Fire Plan (1999) that laid out procedures for carrying out large-scale burns in the Peloncillo Mountains while protecting the endangered New Mexico ridge-nosed rattlesnake. The Pinaleño Ecosystem Restoration Program (2011) specifies careful mountaintop treatments that will protect sensitive resources and safely allow fire to play a natural role elsewhere in the range. The CNF is also a party to the Altar Valley Fire Management Plan (2008) that proposes to restore grasslands along and adjacent to the forest's southwestern edge.

The FireScape team is currently nurturing efforts at four locations around the Coronado—no two projects are alike, but those underway share an approach that includes multiple jurisdictions, UA scientists at the table, assessing treatment need at the whole-mountain scale, and completing compliance at large scale and across programs (NEPA, Endangered Species Act section 7, and cultural resources). Getting clearance from the Regional Forester for treatments in designated Forest Service Wilderness is a need across all FireScape projects. We have completed a fuels map and "departure" analysis for southeastern Arizona that covers the CNF and partner lands. Partners worked together to correct and update Landfire data for a 14 million-acre area. These products provide inputs for fire behavior and effects models to support decision making and outreach.

In 2009, the Huachuca FireScape project completed a three-agency Environmental Assessment (National Environmental Policy Act [NEPA] compliance) and received a Biological Opinion (Endangered Species Act compliance) covering a menu of treatments for 400,000 acres in southeastern Arizona. Coronado National Memorial (National Park Service), and Fort Huachuca (U.S. Army) are the other federal partners, but adjacent Bureau of Land Management (BLM), TNC, Audubon, and private ranch lands are included in the greater planning area. These partners have worked together for over a decade to coordinate fire management in an area where wildfires burn freely across boundaries. Key treatments are large prescribed burns, but also thinning the growing wildland-urban interface (WUI). The compliance phase was completed with no appeals, and fire staff are implementing projects as funding becomes available. The 2011 Monument Fire burned 30,000 acres of the Huachuca landscape.

The 500,000-acre Catalina-Rincon FireScape includes UA research aimed at predicting fire behavior on landscapes that are topographically and ecologically complex, contain a mixture of vegetation types, and have recently experienced uncharacteristically severe wildfires. The project highlights differences in how fire has shaped the Santa Catalina versus the Rincon mountains, which share similar physical and biological conditions, but different land use histories. Ecological mapping was completed in 2009 and covers partner lands—CNF, NPS, State of Arizona, and private. Treating in designated Wilderness is a challenge for this landscape but is needed to preserve desired ecological conditions, improve wildlife management opportunities (particularly desert bighorn sheep), make prescribed fire more feasible, and reduce threats to WUI. Public engagement is a huge component, given the Tucson's-backyard location. Formal compliance (NEPA, ESA section 7, NHPA) is underway; public scoping for NEPA took place during spring 2011. Catalina-Rincon work also analyzes carbon cycle effects of fire treatments and coordinates with efforts to halt the spread of invasive buffelgrass, a species that introduces fire into non-fire-adapted upland Sonoran desert.

The Chiricahua FireScape focuses on restoring natural fire regimes in the Chiricahua, Dragoon, and Dos Cabezas mountains, plus adjacent lands. Chiricahua National Monument and Fort Bowie National Historic Site are National Park Service partners, and the BLM, USFWS Leslie Canyon National Wildlife Refuge, the State of Arizona, and Natural Resources Conservation Service have also joined the planning. A number of grazing permittees who own lands adjacent to agency holdings have elected to participate. Total acreage for this project is running at about 500,000. Ecological mapping across jurisdictions has been completed, and the new fuels layer and departure analysis allow modeling fire behavior and effects with and without treatments. The science component includes a synthesis of and addition to fire history work for these mountains. Public scoping for NEPA occurred in early 2011. The 2011 Horseshoe 2 Fire burned throughout the Chiricahua range, but its effect on the project is reassessment rather than postponement.

The 135,000-acre Galiuro FireScape covers remote country with little WUI and concentrates on very large-scale burns. We are making a case on this landscape to use helicopter ignition for prescribed burning in designated Wilderness. The CNF, BLM, TNC, UA, and grazing permittees are project parties. Additional fire history studies are incorporated into the science side of this project. Compliance is underway, and a 40,000-acre three-party (BLM. TNC, CNF) burn is in the works.

Cross-boundary, large-scale fire management comes with numerous institutional challenges. All-lands conservation is a directive to agencies that have few resources to devote to such work. Agency turnover means passion ebbs and flows—loss of key players slows the process way down. FireScape competes with other agency programs for staff attention while wildfires get bigger and display increasingly severe effects. Funding for planning and implementation is not likely to increase soon. The FireScape teams carry on, knowing that the work is needed, and that creative, broad-based efforts ultimately succeed. The website www.azfirescape.org is a work in progress that displays project information, including maps, for FireScape.

References

Kaib, J. 1998. Fire history in riparian canyon pine-oak forests and the intervening desert grasslands of the Southwest borderlands: A dendroecological, historical, and cultural inquiry. Tucson, AZ: The University of Arizona. 234 p. Thesis.

National Interagency Coordination Center (NICC) 2011. 2011 Fire Season Summary. Online: http://www.predictiveservices.nifc.gov/intelligence/2011_Mid-Season_Report_Oct.pdf.

Swetnam, T. W. and C. H. Baisan. 1996. Fire Histories of Montane Forests in the Madrean Borderlands. P. 15-36 in Ffolliott, P.F., DeBano, L. F., Baker, M.B., [and others], tech. cords. Effects of fire on Madrean Province ecosystems—a symposium proceedings; March 11-15, 1996; Tucson AZ. Gene. Tech. Rep. RM-GTR-289. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 227 p.

Wadleigh, L. 2011. Wallow Fire 2011 Large Scale Event Recovery Rapid Assessment Team Fire/Fuels Report. U.S. Department of Agriculture, Forest Service, Apache-Sitgreaves National Forests. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5333354.pdf.