

## Burned Area Learning Network

### Southwest Burned Area Field Trips: Arizona, New Mexico and Colorado

As fires have burned across the West, it's become increasingly clear that we need collaboration between scientists and land managers to better understand current barriers to reforestation in burned areas and how potential reburns in large fire landscapes have been or should be incorporated into land management

In the spring of 2019, several partners teamed up with the Burned Area Learning Network to coordinate a series of field trips to three sites across the Southwest. Scientists, researchers and land managers came together to visit burned areas in New Mexico, Arizona, and Colorado. The goal of these field trips was to provide a space for land managers and scientists to identify opportunities, challenges, and priorities surrounding the management of burned landscapes.

In Arizona, participants visited the burned area of the Boundary Fire of 2017 and the Pumpkin Fire of 2000. In New Mexico, participants visited the Las Conchas Fire of 2011 as well as a reforestation nursery in Mora. In Colorado, participants visited the Hayman Fire burned area from 2002. Each field trip focused on a unique and locally important aspect of post fire reforestation.

#### Arizona: Reburning

The Boundary Fire was caused by a lightning strike and burned for 32 days, from June 1 to July 3, 2017. It covered 17,788 acres in Coconino County, on the Kaibab and Coconino National Forests.

Participants visited sites that elicited discussion on the role of reburning in ponderosa pine ecosystems and its implications for future management. Frequent, low-severity fire is an important disturbance regime in these ponderosa pine-dominant, dry mixed-conifer forests.

The pruning back of seedlings from repeated fires protects the larger, healthier "mother trees." Problems arise when reburning happens in large patches of uncharacteristic, high-severity fire, where the regeneration of seedlings is more difficult. Shrub layers and dead and down wood that results from high-severity fire also makes conifer regeneration more difficult. Managing for fire refugia, or forested areas that remain unburned or minimally affected by wildfire, was an important management goal discussed by the group. Other management takeaways were to protect and retain refugia in the form of "tree islands." For example, applying fuels reduction treatments around the edges of tree islands to increase the likelihood that subsequent reburns will not kill the remaining mother trees in these refugia.

#### New Mexico: Replanting

The Las Conchas Fire started in Santa Fe National Forest and burned more than 150,000 acres. After five days, it had grown to be the largest wildfire in recorded New Mexico state history (although that record was eclipsed the next year). The Las Conchas reburned much of the the area of the Cerro Grande Fire, which had burned 150,000 acres in 2000.

Participants visited several sites to discuss conifer regeneration and issues about replanting. The Las Conchas Fire killed entire stands of conifers, which has severely affected the natural regeneration occurring in these stands. A key concern discussed was the lack of natural conifer regeneration in the many large burn patches far from any "mother" trees. Another important area of focus was the feasibility of replanting, including the limited capacity of nurseries to provide seedlings and their survival rates in burned areas, as well as understanding different planting strategies to increase successful regeneration.

Management takeaways from this field trip included the need to carefully consider the natural regeneration potential of a site before deciding to invest time and money into planting seedlings. These considerations also influence which types of replanting strategies may be most successful.

#### Examples of Planting Strategies

**Target plant concept:** choosing plants that have characteristics that would best allow seedlings to survive and grow after outplanting in severely-burned areas. Consider the environmental factors of the landscape like soil, climate, and competing vegetation. It's also important to consider locally adapted seed sources with adequate genetic diversity.

**Nucleation strategy:** planting clustered "tree islands" in severely-burned landscapes and allowing them to grow and eventually act as a seed source for natural regeneration across the remainder of an un-planted landscape.

**Assisted migration:** This can be a climate change adaption strategy for forested ecosystems since the climate is changing faster than some native species can migrate naturally. Scientists and land managers can work together to move seed sources within or to the edges of anticipated ranges.

From the "After the Fire" storymap:

*Left:* Refugia are important. Within areas of a burned landscape where small, isolated patches of trees survived fires, researchers are seeing more recovery in that landscape as opposed to large unburned swaths of land.

*Right:* The John T. Harrington Research Station and Nursery in Mora, New Mexico. One of the biggest challenges to accomplishing reforestation goals is the large number of viable seedlings needed to re-plant burned areas.



Perhaps the most discussed issue regarding replanting and regeneration is lack of capacity and number of conifer seedling nurseries. To explore this, participants traveled to the John T. Harrington Research Center in Mora to hear from the team led by Dr. Owen Burney. Nurseries struggle to keep up with demand while maintaining conditions that lead to good survival rates among the seedlings that they have. Seedlings that thrive in the nursery have had an average survival rate of 25 percent in the field.

### Colorado: Water

The Hayman Fire started on June 8, 2002, 35 miles northwest of Colorado Springs and 95 miles southwest of Denver. It is the largest wildfire in the state's recorded history at over 138,000 acres. Participants in this field trip focused on water issues such as post-fire flooding, erosion and downstream infrastructure. Burned Area Emergency Rehabilitation (BAER) team analysis after the Hayman Fire identified values at risk after the fire, including increased flood flows, water quality in the South Platte River conveyance system and the public water supply of the Denver metropolitan area, and threats to aquatic life and fisheries.

Several partnerships between forest managers and water providers began to emerge after the Hayman and Buffalo

Creek fires, including the Forests-to-Faucets partnership that began in 2010 between Denver Water and the Rocky Mountain Region of the U.S. Forest Service. After the two wildfires, Denver Water spent \$27 million on initial response efforts for water quality treatment and sediment and debris removal. Many of these partnerships have been integral in the implementation of rehabilitation recommendations from the BAER team. Some of these rehabilitation recommendations include using groundcover and seeding to reduce erosion, hydromulching, noxious weed treatments and important public outreach and education initiatives.

### Lessons Learned in the Southwest

- ▶ A major goal of this effort is to provide a roadmap for managers and the public to be prepared for many of the decisions that will have to be made in the days, months and years following a major wildfire.
- ▶ Advance planning around these issues will help managers more efficiently meet the challenges presented by limited resources to manage burned areas, and be strategic about when, where, and how to conduct restoration efforts in post-fire landscapes.

### MORE ONLINE

#### ORGANIZATIONS

Burned Area Learning Network (BALN)	<a href="http://www.conservationgateway.org/ConservationPractices/FireLandscapes/FireLearningNetwork/RegionalNetworks/Pages/BALN.aspx">http://www.conservationgateway.org/ConservationPractices/FireLandscapes/FireLearningNetwork/RegionalNetworks/Pages/BALN.aspx</a>
Forest Stewards Guild	<a href="https://foreststewardsguild.org/">https://foreststewardsguild.org/</a>
Southwest Fire Science Consortium	<a href="http://www.swfireconsortium.org/">http://www.swfireconsortium.org/</a>
Southern Rockies Fire Science Network	<a href="http://www.southernrockiesfirescience.org/">http://www.southernrockiesfirescience.org/</a>

#### INFORMATION

Story Map: After the Fire	<a href="https://arcg.is/PaqOG">https://arcg.is/PaqOG</a>
Webinar Recording: "Use of the Target Plant Concept to Promote Successful Post-Fire Forest Restoration"	<a href="http://www.swfireconsortium.org/2019/04/03/april-9-2019-use-of-the-target-plant-concept-to-promote-successful-post-fire-forest-restoration/">http://www.swfireconsortium.org/2019/04/03/april-9-2019-use-of-the-target-plant-concept-to-promote-successful-post-fire-forest-restoration/</a>
Webinar Recording: "New Reforestation Practices for Post-Wildfire Landscapes—Building Early Resilience"	<a href="http://www.swfireconsortium.org/2019/04/10/may-2-2019-new-reforestation-practices-for-post-wildfire-landscapes-building-early-resilience/">http://www.swfireconsortium.org/2019/04/10/may-2-2019-new-reforestation-practices-for-post-wildfire-landscapes-building-early-resilience/</a>

For more about the Burned Area Learning Network contact:

Anne Bradley      [abradley@tnc.org](mailto:abradley@tnc.org)  
Kendal Martel      [kendal@forestguild.org](mailto:kendal@forestguild.org)

The Burned Area Learning Network is part of Promoting Ecosystem Resilience and Fire Adapted Communities Together, a cooperative agreement between The Nature Conservancy, USDA Forest Service and agencies of the Department of the Interior. For more information about PERFACT, contact Marek Smith at [marek\\_smith@tnc.org](mailto:marek_smith@tnc.org).

*An equal opportunity provider*