FLN

Fire Learning Network
Notes from the Field

Burned Area Learning Network:
Santa Clara Field Tour and
E. Jemez Landscape Futures Workshop

Eastern Jemez Mountains, NM
May 10-11, 2018

In areas affected by high-severity fire and post-fire flooding, restoration can take years. In the eastern Jemez Mountains of New Mexico, the Santa Clara Pueblo and Bandelier National Monument are investing for the long term.

More than 30 forest and water scientists and managers were engaged in a two-day program organized by the Burned Area Learning Network (BALN) and the East Jemez Landscape Futures (EJLF) initiative. The event combined a field tour of the Santa Clara Pueblo's Santa Clara Canyon and a workshop to share and develop new strategies aimed at restoring and improving areas of the eastern Jemez affected by drought, fire and post-fire flooding.

SANTA CLARA CANYON

Santa Clara Pueblo hosted a tour of the canyon, where participants were able to share lessons learned about ecosystem recovery and post-fire restoration after seven years of work. Santa Clara resource managers have led the way in experimenting with a range of restoration techniques to address areas severely burned by the 2001 Cerro Grande and 2011 Las Conchas fires. The severely burned landscape included the tribe's provisioning watershed as well as their ancestral lands, resulting in both significant environmental impacts and devastating cultural losses. Access to Santa Clara Canyon has been limited since the fires due to the dangers posed by flash flooding and debris flows. BALN and EJLF participants were grateful for the chance to visit the landscape.

Tour participants talk about new wetland willow plantings.   © *The Quivira Coalition (Mollie Walton)*

The 160,000-acre Las Conchas Fire affected lands managed by multiple federal, state and local agencies, tribes and private landowners. Reflecting this, and the variety of impacts from the fire, tour participants represented a range of affiliations, disciplines and experience with post-fire restoration work. The day highlighted work being done in a variety of ecological and topographical contexts, including wetland restoration, channel attenuation, reforestation and alluvial fan restoration. Throughout the day, participants considered how managers decide what actions to take and when to take them; how to set goals and objectives, including how objective-setting must be informed by the long timeframe of post-fire recovery; assessment of landscape conditions; available funding sources; and jurisdictional differences in policy and practice. A key concern noted is that—after the initial emergency stabilization following high-severity

Reflections from Santa Clara Canyon

- The work is inspiring, and challenging.
- This kind of work builds resilience.
- Policies and limited funding sources make large-scale, long-term restoration difficult.
- We need to continue to consider fire management in previously burned landscapes.
- It can be difficult to know when to intervene and when to let natural processes take their course.

fire and post-fire flooding—funding sources drop off. From the start, it is critical to think forward about how to use and develop new sources of money in the most effective way.

Wetland Restoration

Managers showcased efforts to replant vegetation to restore and expand wetland areas. The intense wildfire denuded steep slopes, sending flood flows that scoured and broadened the creek bed and dumped sediment on existing wetlands. As sediment loads decrease, work is now devoted to inducing meandering to slow and spread water flows, and planting multiple willow species to reestablish plant diversity. Because of land management issues beyond the Pueblo, in some cases restorationists

had to find sources as far away as Colorado to find healthy stands of the desired species. The tribe is currently working to build relationships with more local ranchers and federal agencies to access closer supplies.

Reforestation

Insights into improving reforestation success after fire are coming from new scientific studies and direct observation by managers. Dr. Matt Hurteau (University of New Mexico) has a project using high-resolution imagery to locate potential macro- and micro-sites for tree planting in burned areas; it is hoped that this will result in the ability to characterize reforestation sites quantitatively and lead to more consistent tree survival. Mary Stuever (district forester, New Mexico State Forestry) relayed her experience in qualitatively evaluating sites by observing plant response to the 250,000-acre Rodeo-Chedeski Fire through hours of walking the burned area.

Steve Sandoval and Daniel Denipah shared Santa Clara's approach to reforestation, which takes into account ecological and traditional cultural values. For example, one of the goals is to assure that in the future, tribal members will have adequate Douglas fir, grown in the right places, for ceremonial purposes. The reforestation process they described takes care, and multiple steps. Seed collection and grow-out of seedlings are being done in-house by the Pueblo. A crew geolocates seed collection points, tree climbers collect cones, and then seed is carefully bagged and labeled; this information ensures that seedlings can

Seedlings are protected with shade cones. © The Quivira Coalition (Mollie Walton)

A sediment capture structure is constructed of burned trees. © The Quivira Coalition (Mollie Walton)

be planted at optimal sites. Drought stress has been causing trees to produce large seed crops almost every year and that energy is not being wasted. (Crews get some additional help when they discover an occasional squirrel cache!) Germination rates have been good, and the tribe is partnering with Dr. Owen Burney (New Mexico State University) on a planting strategy. They are using nucleation plantings—small, dense groupings of seedlings distributed across the burned area—to create islands of future seed trees. Other strategies being used to increase survival include shade structures and contour felling to create sediment catches and suitable microsites for the trees.

Channel Aggradation and Alluvial Fan Restoration

Participants hiked up the severely incised Switchback Canyon to see in-channel structures built from the available burned trees and native rock. Log mattresses and a series of small check dams slow and direct water and sediment. The strategy is to work along smaller tributaries, as high in the drainages as possible. The work is intensive—since 2011, more than

Participants review a burn map at the East Jemez Landscape Futures Workshop. © *Marie Rodriguez*

1,000 structures have been built in 26 tributary drainages, and there are many more to go. Bruce Bauer, the lead for the watershed restoration program, noted that earlier entry into the burned area would have required exponentially less time and energy to mitigate erosion, but that heavy flooding prevented safe entry. Restorationists noted that the rockier drainages in the canyon appear to be better at healing themselves. Given that resources are extremely limited relative to the scope of needed restoration, conducting soil analyses could help with prioritizing sites for work going forward.

A restoration practice new to many on the field trip was described by Bill Zeedyk, a riparian restoration specialist. He pointed out the importance of alluvial fans as pathways for water to travel below the soil surface. Their restoration also provides more opportunities for tree and other plant growth. Interruptions in flow through the fans, including roads and other tracks, concentrate flow in a smaller area. Log installations are being used to split flows and spread the water, reducing erosion and recharging the fans.

Social and Cultural Integration

Throughout the day our hosts emphasized the role that healing the land played in the healing of the community. Due to the effects of multiple fires there is now a generation that, along with future generations, will never experience their ancestral lands as described in their history, prayers, songs and culture. Engaging the community and youth in restoration can create a bridge between what was and what will be.

EAST JEMEZ LANDSCAPE FUTURES PROJECT

After the day in Santa Clara Canyon, some of the participants were hosted by Bandelier National Monument and the Landscape Conservation Initiative at Northern Arizona University, as part of the East Jemez Landscape Futures project (EJLF). The initiative seeks to collaborate across the jurisdictions affected by the Las Conchas Fire to guide research, planning and restoration actions. The workshop was a chance to share information on existing projects and develop priority actions.

Participants discussed current research and restoration activities—and future opportunities—which were organized geographically and administratively:

- Canyon bottoms and riparian areas;
- Uplands including type-converted areas, remaining tree refugia, and potential tree-replanting areas; and
- Policy, funding and network-building.

From the beginning, EJLF partners have focused their attention on both ecological and social needs. As they move forward they will try to engage the community to understand the desires of the many people affected by

the fire, and help people understand why the landscape looks the way it does, and what its possible trajectories are. They plan to incorporate traditional cultural values, including attention to native plant species, youth engagement, and exploring how restoration work can be an opportunity for Native language learning by youth. Climate change will be incorporated into project development. This could include assisted dispersal of native species into new environments that will be appropriate for them in the future.

LEARN MORE

Santa Clara Pueblo—Fire Recovery
https://arcg.is/0HGPHf

East Jemez Landscape Futures Project
https://www.eastjemez.org/

Workshop handout—Structure Design & Descriptions
http://www.conservationgate-way.org/ConservationPractices/FireLandscapes/FireLearning-Network/RegionalNetworks/Documents/BALN-Bauer-2018-StructureDesignDescription.pdf

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