It’s getting hot in here: post-fire restoration in Eastern NV

To solve a hot problem, you need diverse approaches to come to a solution.

By Lauren Svejcar

The problem

Wildfires pose a major challenge across the rangelands of the Great Basin. They spread fast and furious because of fine, continuous fuel loads created by invasive annual grasses. Livestock and wildlife are put at risk because of the flames themselves but also by the lack of food after fire. That’s why taking measures to restore these lands post-fire is so critical.

However, restoring Great Basin ecosystems following wildfire can be a major challenge. Historically, these systems could have popped back on their own, but the invasive species that helped create these fires also benefit from the fires. Many invasive species in the Great Basin are driven by fire, meaning they are very quick to reestablish after a fire. So, the challenge becomes restoring desired plants with heightened levels of competition from invasive species and making sure that soils are protected and kept healthy.

This is a complex challenge, and solving the problem requires well thought out, diverse approaches and techniques. A key person tackling these complex challenges with varied approaches is ENLC Natural Resource Specialist Lara Derasary. Lara and a team of collaborators across departments and agencies, including Moira Kolada with the Nevada Department of Wildlife, Lauren Svejcar (formerly with ARS), Sasha Reed with the US Geological Survey, and Tye Petersen and Sheryl Post from the Bureau of Land Management, use a landscape scale approach to determining what treatments should be used where and when they should be applied.

Restoration starts with soils

Soils are a critically important component of restoration. Not all soils have the same ability to grow all the same species. That means if you only make one mix of seeds to put out on the landscape, those seeds may or may not establish and if you’re investing large amounts of time and money into seeding, you want to make sure at least some species establish. You wouldn’t invest in just one stock, so why would you invest in just one approach or only a few species to seed?

To address this challenge, Lara uses GIS layers and online tools to determine what the different types of soils are in a particular post-fire area. She researches the different soils and plant communities in those areas and makes calculations to ensure both diversity and

efficiency in seeding efforts are achieved. She also uses these layers to help make decisions on planting methods. Restoration success is highly variable and dependent on a myriad of factors, and it is preferable and often necessary to utilize multiple planting methods to increase the chances of a return of desirable forage for both wildlife and livestock. Aerial seeding is the most logistically feasible approach for areas with steep topography but doesn't allow for seed cover. Drill seeding and planting seedlings can be more costly and are not possible in all areas due to steep or rocky terrain and cost but provide better seed/plant material to soil contact. Keeping the balance between money spent, time put in, and likelihood of return on investment is something Lara always has on her mind.

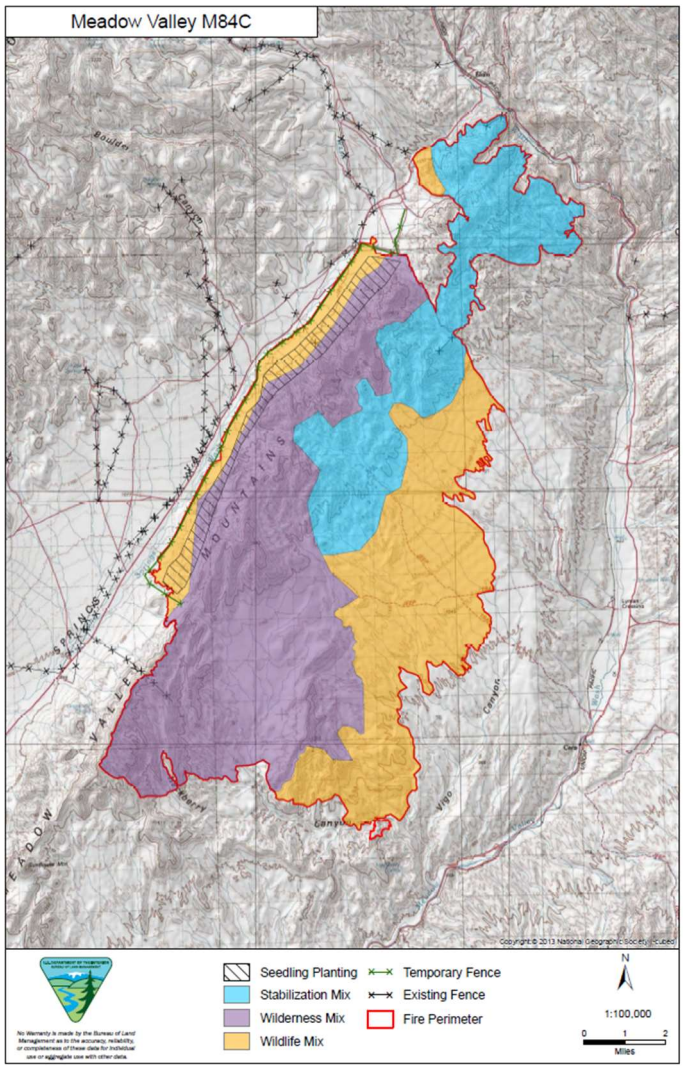


Figure 1. Seeding and treatment plan for the 2020 Meadow Valley fire.

Getting the right seed in the right place

Lara is at the forefront of thinkers in restoration ecology. Her years of observation on seeding efforts led her to question, “Is the lack of establishment of the species we’re seeding due to the fact that we get our seed from places that are cooler and receive more precipitation?”. Seed for restoration is not cheap, and using seed materials that stand very low chances of survival is not a good use of time or money. Lara spends months coming up with seeding plans that have the greatest likelihood of survival. She utilizes her research from the soils and plant community mapping efforts and a keen knowledge of the native seed market and plant breeding programs to select species, cultivars and provenances (where it comes from) of seed to ensure that the seed they put out in restoration efforts has the greatest likelihood of survival that is possible.



Figure 2. Seed mixes with 10 to 20 species are used to ensure the greatest likelihood of establishing desired species while controlling invasive species.

Combining land management with research

While Lara and her teammates utilize a wide diversity of on-the-ground knowledge and research, more questions exist. For example, are there ways we could make aerial seeding efforts more effective, while not increasing the cost exponentially? Could we add soil ameliorations to increase the likelihood of survival for both seed and tube-stock plantings? Lara has paired with researchers to both share her knowledge and work hand-in-hand on the answering of these questions to ensure all land managers have the best chance of restoring healthy rangelands for everyone.



Figure 3. Different seed treatments being tested to determine if they can provide a cost-efficient way of improving aerial seeding efforts.