



Hand-planting sagebrush after a fire in Southwest Idaho.

AFTER FIRE: SAGEBRUSH RESTORATION EFFORTS YIELD MIXED RESULTS

By Steve Stuebner

Restoring native sagebrush-steppe plant communities after wildfires is a hot topic these days because of the focus on recovering sage grouse populations in Idaho and the West and the importance of sagebrush cover for nesting habitat and the overall health of the bird.

It's also an important topic to the science community, which hopes to restore sagebrush-steppe plant communities in Idaho and the Great Basin as a long-term goal. Roughly half of native habitat in the Great

Basin has been transformed to annual grasses such as cheatgrass and medusa-head wild rye after repeated wildfires. The much-needed shrub component has been eliminated by wildfires as well, particularly on sites where fires burned more than once.

In looking into several examples of sagebrush-restoration projects that have occurred in the aftermath of large fires in Southwest Idaho, such as the Soda wildfire in 2015, the Pony and Elk complex fires in 2014, and the restoration efforts

in the Morley Nelson Snake River Birds of Prey National Conservation Area, agency officials have had mixed results. Researchers are looking into why it's difficult to establish sagebrush in its native range, but at the same time, they recommend using best practices and to carefully monitor the results.

Local ranchers also have experience with restoring sagebrush. They believe that incorporating livestock grazing into the mix can help with restoration efforts. See more about their perspective below.

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In general, public agencies are using hand-planting treatments and aerial seeding of sagebrush following large-scale fires, and drill-seeding of perennial grasses and forbs in hopes of restoring native plant communities and giving nature a jump-start in recovering from wildfire.

Cindy Fritz, a restoration expert for the BLM, oversaw the rehabilitation efforts on the Pony complex fire zone in the fall and winter following the wildfire. The BLM aerially seeded 32,800 acres of land with native grasses, alfalfa and sagebrush. When Fritz went out to check out results the following spring for a Life on the Range story for the Idaho Rangeland Resource Commission, after a wet winter, she was pleased with what she saw.

“See this sagebrush plant coming up? This is from our aerial seeding,” she said. “That’s what we want to come back. This is for sage grouse. On a favorable year, aerial seeding is a good way to get sagebrush in the ground.”

Fritz was involved in rehab and restoration activities in the Soda Fire zone as well. “We were seeding sagebrush seed on 100 percent of the burn areas, trying to get small pockets established, so the sagebrush could spread from there,” she

- 16,200 acres of Big Basin sagebrush.

All of the seedings were done in the fall and winter after the 279,144-acre wildfire. In the last two years, the BLM hired contract workers to hand-plant 960,000 sagebrush seedlings, meaning shrub recovery is well underway on thousands of acres in the Soda burn.

Research officials with the U.S. Geological Survey are closely monitoring the results of BLM sagebrush seeding and planting efforts following the 280,000-acre Soda fire. Matt Germino, a supervisory research ecologist for USGS in Boise, shared some of the insights he has gleaned from Soda sagebrush restoration work so far. A scientific paper is in the works and will be published soon, he said.

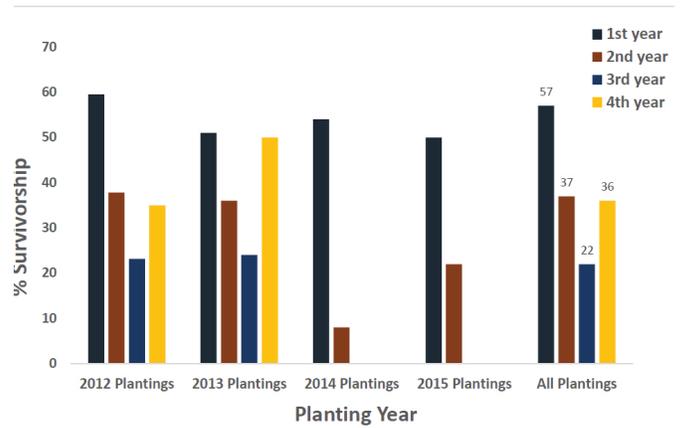
“Out of the 180,000 acres that was seeded, we have sagebrush established in about 50 percent of the plots seeded,” Germino said. “So, the seeding treatments had a tremendous enhancement to the landscape, they greatly enhanced the presence of sagebrush.”

The study will continue to track sagebrush restoration for five years after the fire, so “we still have a ways to go,” he noted.

Noting that snow-pack levels are only 39 percent of normal as of March 1 in the

Owyhee River Basin, it’s likely going to be a drought year in the spring and summer which may make it more difficult for the plants to survive. “It’s going to be really critical to monitor through the drought cycle,” he said. “No one has monitored sagebrush restoration on large landscapes like we have been doing. We are looking through the microscope for the first time.”

Germino wants to know where, when and why sagebrush plants are recovering



Relates to planting percentage of success in Morley Nelson Snake River Birds of Prey National Conservation area. Courtesy of BLM.

in the post-burn landscape. The lessons should provide wisdom for future projects, he notes.

Places where sagebrush have taken hold “are quite patchy,” he says. “We’re seeing differences between north and south slopes – areas on the ground that are hotter than others.”

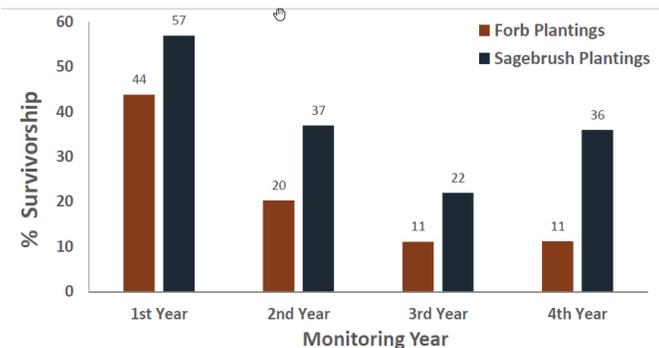
He’s also discovering some new things about how soil surface features might affect restoration success – things like soil crusts but also previous fertile islands of plant life that may affect the ability of seeded plants to survive in the same location. “These are the kinds of cool things that are being discovered,” he said. “They’re meaningful. We can predict which burn areas will respond to seeding in the future.”

For best success, it’s important to plant sagebrush immediately following a fire in the fall and winter, experts say. If you wait a year after a fire, annual grasses or other plants may have grown back on the site, and it would be difficult for the tiny sagebrush seeds to compete with existing vegetation, especially a thick carpet of cheatgrass.

“That situation makes it more challenging or darn near impossible,” Fritz said.

Sagebrush seeds need to penetrate the soil by about 1-2 millimeters to germinate successfully, Germino says. The soil surface and soil crusts may have an impact on whether the seeds can penetrate into the ground. “We haven’t really considered the skin of the soil as a factor in restoration success,” he said. “There’s a lot more going on out there than we realize.”

“If soils are hard-crusts and they have



Relates to planting percentage of success in Morley Nelson Snake River Birds of Prey National Conservation area. Courtesy of BLM.

said. “It’ll take 10-15 years for them to grow back.”

In Fritz’s view, all of the planting techniques are important. “I can’t say one thing is better than the other,” she said. “Nature is too fickle to have one answer.”

In the Soda fire zone, the BLM aerially seeded:

- 83,600 acres of Wyoming big sagebrush.
- 56,000 acres of low sagebrush

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poor inorganic content, they are going to be inhospitable sites for seeds," he said. "The texture of the soil surface could be a factor in success or failure."

While most of the literature in the scientific community and federal agency policy calls for resting the land after wildfire events for about two years to allow new plants to germinate and take root, ranchers believe that livestock grazing can be

NRCS' Sagebrush Restoration Tips

- Draw up site-specific objectives for sagebrush, forb and bunchgrass restoration.
- Seed where there's not a sagebrush population within 100 yards to serve as a seed source.
- Use seed from a local sagebrush population or from a population adapted to site conditions.
- Use seed collected recently or stored for no more than three years in cool, dry conditions. A recent germination test is required for older seed.
- Seed at a rate of five to nine PLS per square foot (0.1 to 0.2 pounds PLS per acre).
- Include only native grasses and forbs in the seed mix.
- Prepare a firm, weed- and non-native grass-free seedbed.
- Broadcast seeds in the late fall or early winter and press, drag, or roll after seeding.
- Plant containerized or bare root stock in early spring where seeding is not practical or does not meet objectives.

For more information, also see U.S. Geological Survey's 3-part handbook on Sagebrush Steppe Restoration.

beneficial in stirring up the soil to help restore sagebrush.

Sagebrush responds well to soil disturbance, says Jeff Lord, a Mayfield rancher. "In my opinion, it's pretty hard not to grow sagebrush in Idaho. I don't know how to make it quit growing on our ranch."

After the Soda and Elk complex fires burned nearly 280,000 acres of BLM and

U.S. Forest Service land, rancher Charlie Lyons didn't have many places to take his cattle. He sold off part of his cattle herd, and he grazed on his own private pastures while the Forest Service lands adjacent to his pastures were rested.

While the agencies spent funds on drill-seeding and aerial seedings to give Mother Nature a jump start on recovery, Lyons said he didn't think it was necessary to plant sagebrush on his land. Just by grazing cattle on 180 acres of land at 4,500-foot elevation, he had sagebrush shoots coming up everywhere his cows grazed.

"The seed source was already there in the soil," Lyons said. "The cattle eliminate the competition with the grass, and the sagebrush comes exploding back with a vengeance."

Following the 1992 Foothills fire, Lord said the sagebrush came back strong the following year and it continued to grow back quickly. Recently, some sage grouse experts toured the property and said the sagebrush canopy was actually too thick for sage grouse to use.

"I thought that was debatable," he said. "I took Cindy Fritz out there to see that recovery. We had tremendous stands of sagebrush in that whole country. You almost have to be careful what you wish for."

Lord sees that black ring that's left around the skeleton of a burned sagebrush plant to be a productive spot for new plants to take hold. Those sites contain the seeds from the burned sagebrush plants, and they're productive sites because of the shot of nitrogen from the fire. He's seen new plants grow out of those areas in a higher concentration compared to other sites.

Both Lyons and Lord would like to see the research community incorporate livestock grazing as a tool for assisting in the recovery and restoration of sagebrush. Jason Pyron, sage grouse coordinator for the U.S. Fish and Wildlife Service in Boise, said he hopes that will occur.

"Cattle can be used as a tool, either intentionally or unintentionally, to reduce competition from other herbaceous plants on a site to increase sagebrush establishment," Pyron says. "There are



Private lands where Charlie Lyons was able to restore grasslands and sagebrush following a wildfire.

many areas where we are beginning to discuss and should continue to pursue using cattle as a tool for enhancing sagebrush recruitment. This is particularly true where we have large expanses of perennial and annual grasslands that have little or no shrub component.

"Landowners and managers need to use tools that are capable of meeting the scale of the sagebrush restoration challenge they are facing. Recruiting meaningful amounts of sagebrush back onto large landscapes such as the Murphy Complex, Soda Fire, and the birds of prey area will require working with our

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partners, such as livestock producers, to implement landscape-scale projects and will be improved with good monitoring and experimental design.”

Germino says he would like to have the opportunity to incorporate livestock grazing into some of his research plots to try carefully controlled grazing techniques to see how it affects sagebrush restoration.

“If you want to raise sagebrush, put the cows out there with some hay on a piece of bare ground and you’ll have sagebrush sprouting up everywhere,” Lord says.

This is in sites where the seed source still exists, Lyons points out. In areas he’s seen where the land has burned twice or three times, the seed stock for sagebrush is gone, and the annual vegetation will come back after a fire and dominate the landscape. That’s why he advocates for grazing the annual grasses like cheatgrass so they don’t create a major fire hazard. “If you just rest it, you allow the fuels to build up and you’ll set yourself up for another big fire,” he says.

Lord adds, “I know what happens on my ranch, but I’m no expert on why it’s hard to grow sagebrush in the Birds of Prey area.”

Hand-planting sagebrush in the Snake River Birds of Prey Area

In the Morley Nelson Snake River Birds of Prey National Conservation Area, where a number of post-fire sagebrush planting efforts have not fared well over time, BLM ecologists have been transplanting and hand-planting sagebrush on sites post-burn at a smaller scale in hopes of restoring sagebrush-steppe habitat in the National Conservation Area.

From 2012-2015, the BLM projects recruited volunteers to plant a total of 12,227 Wyoming big sagebrush and 2,780 native forb seedlings across 55 acres of the NCA, according to the agency monitoring report. These restoration planting events typically occurred in areas that

had burned 1-3 years prior to the planting.

In 2017, the BLM carried out additional restoration and experimental planting events at Kuna Butte, which, when combined with previous events, brings totals to 17,431 sagebrush and 3,202 native forbs planted since 2012. Wyoming big sagebrush seedlings were produced by nursery growers using locally-collected NCA seed.

Last year, the BLM measured the success of plantings that occurred at Kuna Butte and at 11 other sites. Across all previous sagebrush plantings, the success rate ranged from 22-36 percent by the third or fourth year of monitoring, officials said.

“This can be considered successful considering the variable and often limiting weather conditions that characterize the NCA,” BLM officials said.

The planting projects occurred in late October-early November and often relied heavily on volunteer labor. Sagebrush seedlings typically received approximately 16 ounces of water at the time of planting, and some of the plantings received supplemental watering treatments the following spring/summer.

“There are various factors that influence seedling survival such as seedling size and quality, planting techniques, planting site, and particularly, weather the year of and following planting,” the BLM monitoring report said.

“Despite the inherent challenge to seedling survival in harsh and variable landscapes like the NCA, this analysis reveals that in certain years and in certain sites,



restoration plantings can be successful and at least in terms of sagebrush, align with outcomes in other regions of the sagebrush-steppe.”

When landowners consider sagebrush restoration projects, the cost of purchasing seedlings vs. using seed to be broadcast from the air would be a major factor, especially if the objective is to restore sagebrush on a large-scale. Cost-savings can occur by physically collecting seed in the late fall from live sagebrush plants, and having a local nursery raise seedlings from seed stock for out-planting.

The BLM used that method to save money, using volunteers to collect the seed, and partnering with the Lucky Peak Nursery to raise the seedlings from seed stock.

While ranchers like Lord and Lyons have experienced some success, it remains perplexing as to why sagebrush restoration has been difficult elsewhere in the sagebrush-steppe habitat, particularly in low-elevation, hot sites on the Snake River Plain. Lack of precipitation and drought following seedings on rangelands seem to be a major factor that makes it difficult for plants to survive. Continued research and monitoring are needed to provide more answers down the road, experts say. □

Steve Stuebner writes for Conservation the Idaho Way on a regular basis.

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