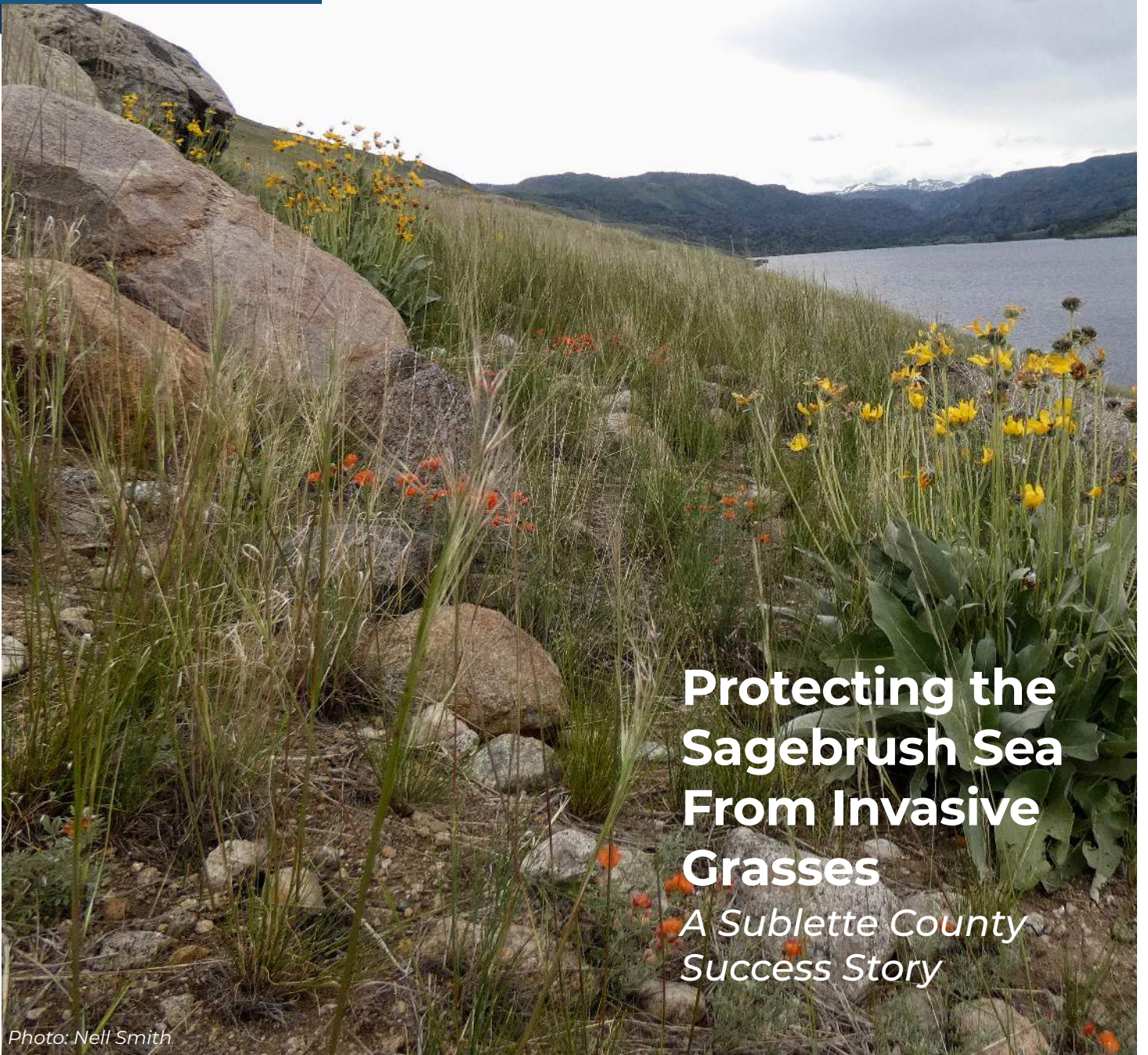


HOLDING THE LINE:

DEFENDING WYOMING'S SAGEBRUSH CORES FROM CHEATGRASS

Sublette County, Wyoming has successfully treated more than 97,000 acres of cheatgrass, protecting core sagebrush habitat.



**Protecting the
Sagebrush Sea
From Invasive
Grasses**

*A Sublette County
Success Story*

Photo: Nell Smith

A SUBLETTE COUNTY SUCCESS STORY



The slopes above Sublette County's Boulder Lake awash in native shrubs, forbs, and grasses, thanks to the county's successful cheatgrass management efforts. Photo: Nell Smith

Written By: Nell Smith, Contract Writer, WLFW and Greg M. Peters, Communications Specialist, WLFW

After a long hard winter, the south-facing slope above Boulder Lake in Sublette County, Wyoming is lush. Needle and thread grass sways thigh-high and big bunches of arrowleaf balsamroot bloom in punches of yellow. Intermixed among the many large rocks are a host of other wildflowers and grasses.

Notably absent among these native species, is cheatgrass. This lack of cheatgrass is no lucky accident. It is the result of Sublette County's proactive treatment program—one of the first success stories in treating cheatgrass at a landscape scale.

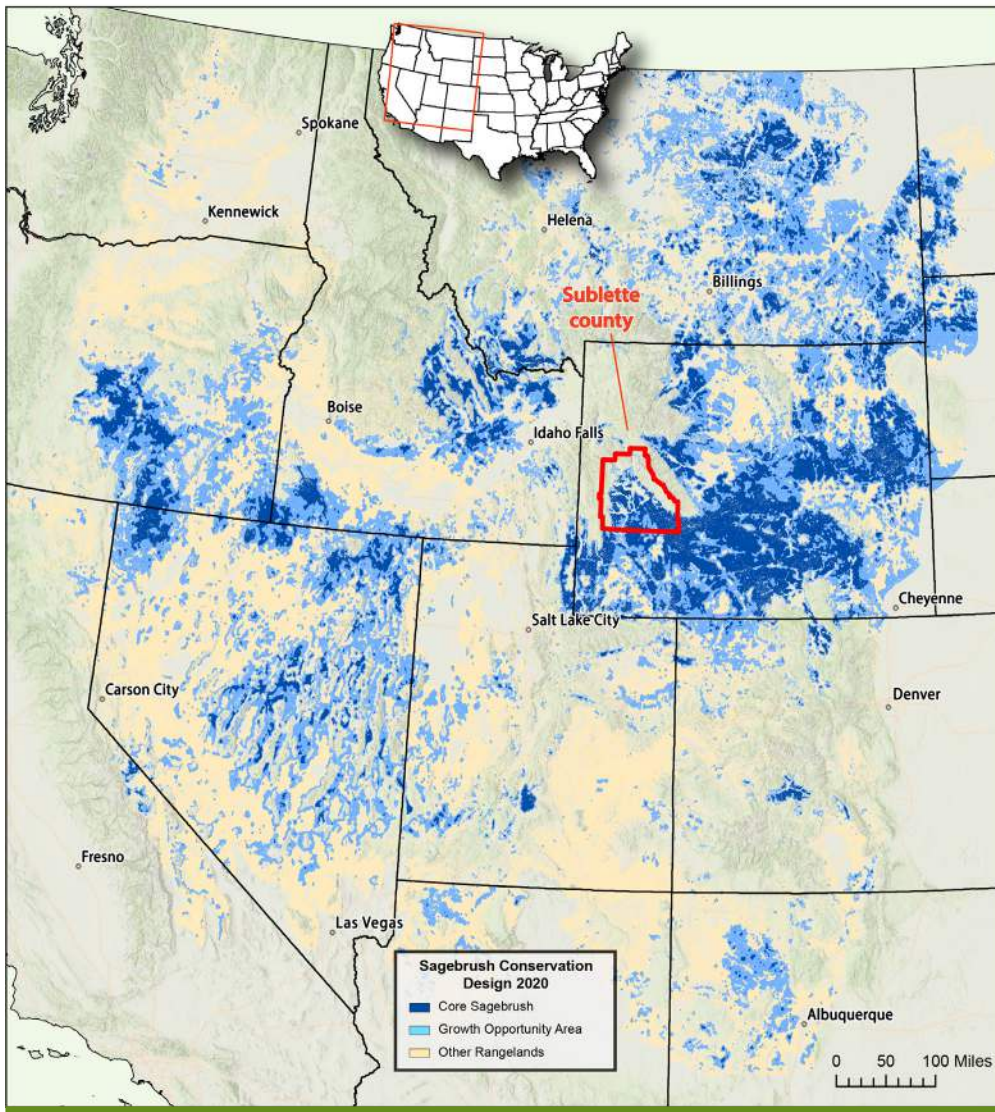
The road to this point hasn't been easy, but as Julie Kraft, Sublette County's Weed & Pest Supervisor, looks across the slopes of Boulder Lake today, her eyes brighten. "When we see results like this, along the scale of thousands of acres, it's like, man, I'm glad that we didn't give up."

Located at the head of the Upper Green River Basin, 3.2-million-acre Sublette County is comprised of vast sagebrush rangelands interspersed with verdant valley bottoms and

flanked on three sides by large mountain ranges. Such diverse and intact habitats, stretched across over a mile of elevation change, create a wildlife mecca.

Migratory big game like pronghorn and mule deer take centuries-old paths between their ancestral seasonal ranges in what are some of the longest documented ungulate migration corridors in North America. It is also home to some of the most productive core habitat for species that rely on intact sagebrush rangelands. In fact, some might call it the 'core of the core' since more than 40% of all the sage grouse on earth live in Wyoming, and 40% of those birds reside in Sublette County.

Sublette County's lower elevation sage-steppe is part of the Wyoming Basin, the largest intact sagebrush ecoregion in North America. Keeping these rangelands healthy, resilient, and functioning is critical to wildlife and people. While Sublette County, and the broader Wyoming Basin, house some of the last remaining intact sagebrush grasslands and shrublands, invasive annual grasses, including cheatgrass, are threatening the region's ecological integrity.



Sublette County, located in southwest Wyoming, supports some of the most intact rangelands remaining in the vast sagebrush biome of the western U.S. Core Sagebrush Areas (dark blue) represent relatively intact, native sagebrush rangelands, Growth Opportunity Areas (light blue) represent sagebrush impacted by one or more threats, and Other Rangeland Areas (tan) represent the most heavily impacted lands. Source: Sagebrush Conservation Design; Figure created by Kristopher Mueller.

According to the Sagebrush Conservation Design, a multi-agency report and conservation framework, 1.3 million acres per year of intact sagebrush rangelands are being degraded by large-scale threats like invasive annual grasses, conifer encroachment, wildfire, and development across the West's sagebrush biome – a 175-million-acre area that stretches from New Mexico to southern Canada. Furthermore, invasive annual grasses are responsible for nearly 69% of the degradation.



Invasive annual grass conversion

Degraded state

Transition zone

Intact core

EMERGENCY CARE
Reactive
Expensive
Low success



PREVENTATIVE CARE
Proactive
Inexpensive
High success

Prioritizing preventative management within intact rangeland cores where native plant communities still dominate is preferred over restoration of highly invaded areas which is more difficult and costly. Credit: Working Lands for Wildlife

NOT ON MY WATCH

When Kraft first moved to Sublette County in 2010 to join the County's Weed & Pest team, she wasn't thinking about cheatgrass. But in one of her first meetings with the local sage grouse working group, the question was raised—did Sublette County have cheatgrass? And, if it did, what was Weed & Pest going to do about it?

At that point, Kraft had been living in the county for a matter of weeks. She didn't know the names of all the places people were referencing, let alone whether they had cheatgrass. But she knew about the problems it was wreaking in the Great Basin. She had seen it spread to high elevations, despite the assumption at the time that it wouldn't. Mostly she knew she needed to find out more and she needed partners.

In short order, Kraft teamed up with folks from the Wyoming Game and Fish Department, USDA-NRCS, and others, and they got to work.

First, the group of resource managers invited anyone from the community who had information on cheatgrass, or who were simply interested in learning more, to an open house. Folks from the energy companies brought in location data. Private landowners pointed to where they'd seen it growing on their land. Other members of the community shared memories of where they'd seen it. In time, the team was able to compile these disparate bits of data into a map that provided a starting point.



Julie Kraft, Sublette County Weed & Pest District, is the driving force behind the county's successful cheatgrass program. Photo: Nell Smith.

Sublette County, like many western counties, includes a mix of public and private lands, and Kraft knew the team needed to work across these boundaries if they stood a chance of success. She also knew they would need to learn how to treat infestations most effectively. So, the team expanded to include individuals from state and federal agencies, the county conservation district, universities, energy companies, and private landowners.

Engaging with the community through open houses and establishing a task force with the right partners were crucial first steps, and the team soon shifted to on-the-ground action. Their early efforts focused on ground-truthing the community-sourced data and on fundraising.

Remote-sensing products that can detect grasses from space weren't yet available, so the team spent time, and money, driving, walking and flying all over the county, refining the community's input and finding as-yet-undetected infestations. They started on roads because they were easy to navigate and were known by the community to harbor cheatgrass. They also focused their surveys on warmer, south-facing slopes where the harsh conditions on these sites were more conducive to the annual grass.

Parallel to their surveying efforts, they teamed up with herbicide industry experts and research partners at the University of Wyoming to establish small study plots, so they could test different herbicide treatments and learn what worked best for the specific soils and climate of Sublette County.



Strategic use of skills and expertise allowed the still small team to move quickly and deftly while reinforcing the power of strong partnerships. Egos and baggage “were checked at the door,” says Kraft.

With grant money for implementation starting to come in, an initial understanding of where cheatgrass existed on the landscape, and study plots and research partners in place, it was time to



Photo: Tanner Wardner, Wyoming Migration Initiative

start fighting back. Navigating the complexities of management requirements on public lands proved an early challenge, but the team found an ally in DeWitt Morris, an active and influential local rancher with a penchant for sage grouse. Morris offered the group an opportunity to treat his acreage with herbicide that targeted the invading grass.

Morris' early buy-in proved pivotal, not only in starting treatment on the ground but in creating more awareness and interest from other landowners. Kraft says Morris helped the team garner trust and credibility with neighboring landowners. "Hey, it worked on my side and can work on your side." And because they had included treatments on all the different land ownerships into their grant applications, they were able to build in the flexibility to take advantage of opportunities to collaborate like this across private and public lands.

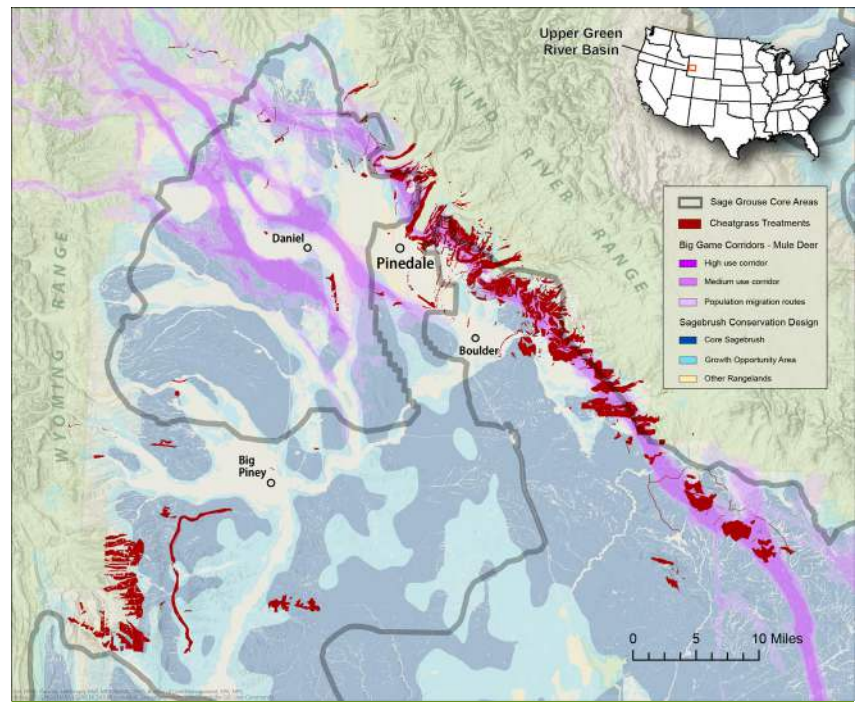
Kraft also got cheatgrass listed on Sublette County's noxious weeds list in 2015. This seemingly small move proved a strategic masterstroke for garnering additional grant monies and streamlining treatment tactics on non-federal lands. Their survey work showed that most of the infestations ran along the south- and west-facing foothills of the Wind River Range and, to a lesser degree, along the foothills of the Wyoming Range.

Infestations were also clustered around roads – known conduits for all kinds of invading species – and so the team started treating cheatgrass along roadsides. Critically, the survey effort also revealed where cheatgrass wasn't. To the west of this line, much of the county's high-value core areas remained intact and relatively cheatgrass-free.



Photo: Jeremy Roberts, Conservation Media

Kraft and the team recognized that preventing these intact cores from becoming invaded represented the best chance for maintaining their ecological integrity. To do that, the team deployed a "Hold the Line" strategy to try to keep cheatgrass from marching out of the foothills and into the valley's intact cores. This watershed-scale, proactive approach to managing cheatgrass preceded, and foreshadowed, the current "Defend the Core, Grow the Core" approach that has emerged as the battle cry throughout the West.



Sublette County, Wyoming, is home to world-class wildlife and working lands supporting important sage grouse and sagebrush core areas, as well as critical corridors for migratory big game like mule deer. Large-scale cheatgrass treatments mostly along the foothills of Wind River and Wyoming Ranges have prevented spread into the largely intact and uninvaded sagebrush rangelands. Courtesy of Sublette County Weed and Pest; Figure created by Kristopher Mueller.

A NEW TOOL EMERGES

As Kraft and the team evaluated treatment prescriptions, implemented public education efforts about cheatgrass and other invasive weeds, and treated roadways and other hotspots, a new herbicide emerged in the battle against invasive annual grasses: indaziflam.

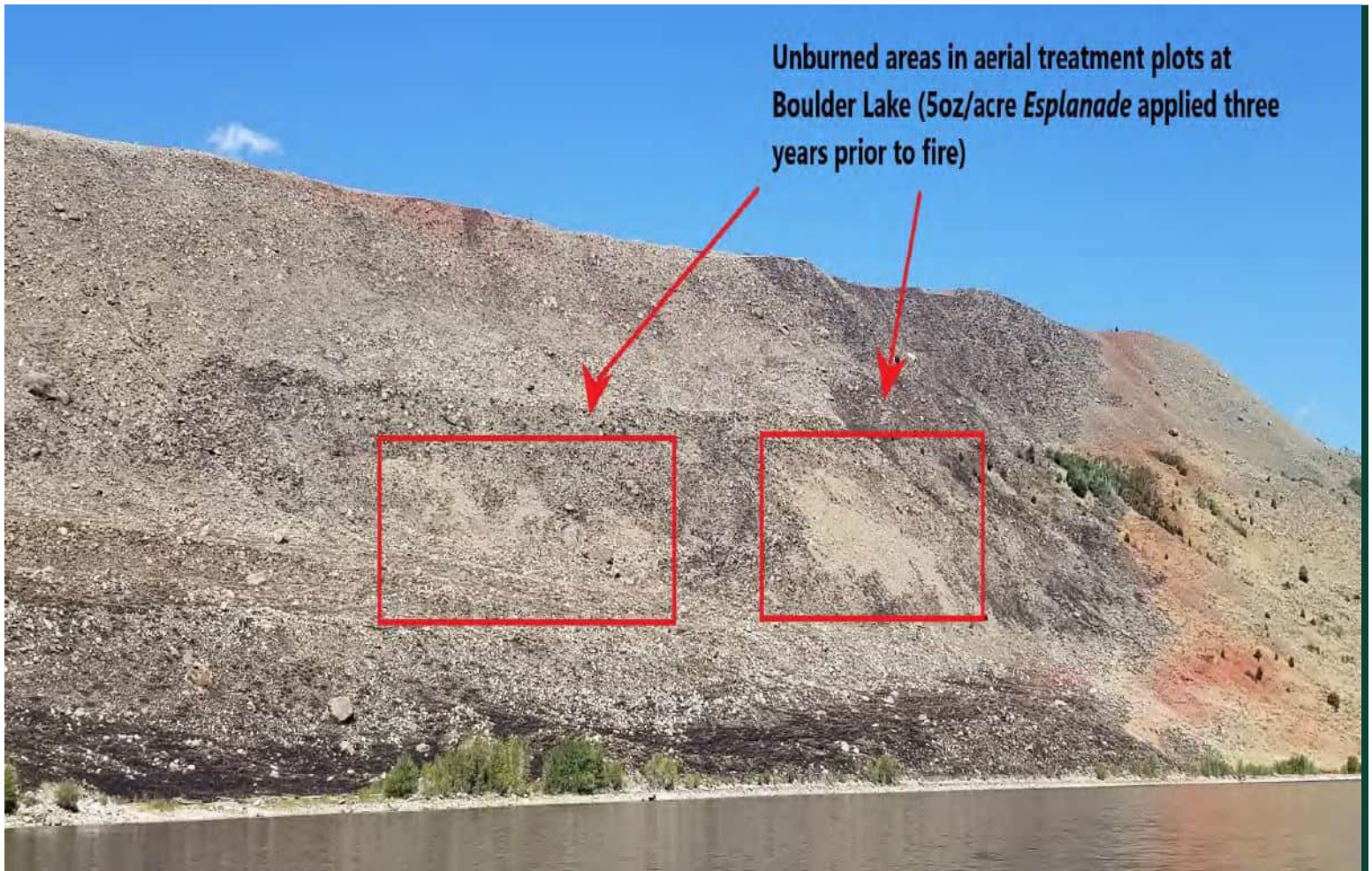
When first released for annual grass control, indaziflam (trade name, Rejuvra) wasn't approved for application on lands actively grazed by livestock. However, in 2016, the team began testing it on ungrazed lands along the flanks of Boulder Lake, which lies on the Bridger-Teton National Forest. To really understand its potential, they collaborated with Colorado State University scientists to conduct a five-year experiment evaluating treatment efficacy.

Then, on August 17, 2019, a wildfire broke out on the slopes above Boulder Lake. It was a windy day during a dry year. Once the fire hit the ridge,

it blew across the whole mountain. "I remember the day and exactly what I felt. I was in tears," recalls Kraft. Unbeknownst to Kraft and her team, the wildfire would provide a natural and much needed experiment testing the efficacy of this new treatment option.

The Boulder Lake Fire burned nearly all the slopes where the team had treatment plots. "At first glance, everything was just ash and black and gone," Kraft remembers. But as partners set out to assess the damage, they noticed that the fire had burned unevenly across the slope. The fire, they realized, provided an unexpected chance to observe how fire behavior responded to treatment areas. And what they were seeing on the ground were patches of sagebrush that the fire hadn't burned through, right where they had treated.

Julie remembers it as a roller coaster of emotions. While it wasn't great and wasn't planned, she



The Boulder Lake Fire burned around plots treated with indaziflam, providing insights into how cheatgrass treatments reduce wildfire. Photo: Jacob Courkamp



Monitoring is a key component of Sublette's success.



Field Tours share lessons learned and increase partnerships.



Arrowweed balsamroot blooms in a treated plot.

Photos: Julie Kraft

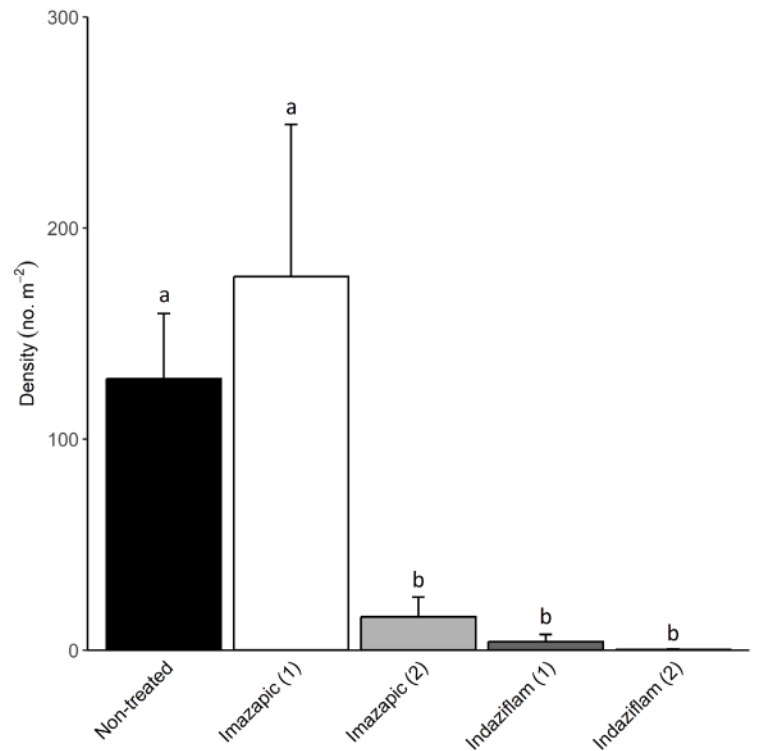
realized that where indaziflam had cleared cheatgrass, the fire didn't have fuel to burn, and it simply moved past and around their treatment plots. What they were setting out to do, in other words, was working. "It was," she says, "very exciting."

The team's treatments killed the cheatgrass, which eliminated the fine fuels that help fire spread between native bunchgrasses and shrubs. Now, nearly four years later, native species are prolific along the slope and are interspersed with the bare patches of glacial till that naturally occur when cheatgrass doesn't choke it out. Snowberry and sprouting bitterbrush dot the hillsides, and a peppering of pink bitterroot flowers and a scattering of fringed sage adorn the ridge tops.

"The key according to Kraft? Treat cheatgrass early and proactively, while there are still sufficient native species on the landscape."

And the team now has the science to back up their field observations. Published findings out of Colorado State University show that indaziflam provided cheatgrass control for five years following treatment with no impact on perennial grasses. In some instances, cheatgrass appeared to be eliminated from the plots entirely.

In 2020, indaziflam gained approval for application on grazed lands under the trade name Rejuvra, opening the door to more widespread use for treating invasive annual grasses across the western U.S. The Sublette team quickly adopted this new technology, incorporating it into their treatment



Sublette County's rigorous experimentation and co-produced science illustrates the efficacy of indaziflam. This graph shows cheatgrass density at the Boulder Lake site following single (1) and double (2) treatments with two herbicides – imazapic and indaziflam. Letters above bars indicate significant differences. Modified from Courkamp et al. 2022, courtesy of Jacob Courkamp.

prescriptions. In some areas, like Bureau of Land Management (BLM) lands, the team continues to use imazapic while land management agencies work through approval processes to add indaziflam to their toolbox.

HOPE ON THE SLOPE

Today, nearly a decade after that first open house and years after they started treating cheatgrass along roadsides and south-facing slopes, the team has treated nearly every known area of cheatgrass in Sublette County – over 97,000 acres. Despite numerous challenges and setbacks, Kraft and her team of partners have worked across private and public land boundaries to successfully defend their valuable, intact sagebrush rangelands from further cheatgrass invasion.

Out on the range, native plant species are thriving and, so far, the cheatgrass isn't coming back. "Year after year after year, there's still no cheatgrass in those sites. Those sites are still clean." Kraft is careful to acknowledge the unknowns—how long exactly will the control persist? How often will they need to re-treat? But she is cautiously optimistic.

Their experimentation with different herbicide applications, methodical tracking of results, commitment to treating areas multiple times, and their "Hold the Line" approach is producing positive long-term outcomes. Yes, treated areas are largely cheatgrass free, but perhaps

Treatment Applications & Cost

	Helicopter (per acre)	Rejuvra (5 oz/acre)	Imazapic (5 oz/acre)	Total
Standard (Rejuvra + Imazapic)	\$11.75	\$41.60	\$4.40	\$57.75
Rejuvra Only	\$11.75	\$41.60	x	\$53.35
Imazapic Only	\$11.75	x	\$7.04 (8 oz/acre)	\$18.79 (every other year)

Sublette County's typical treatment costs.

more importantly, the core areas where cheatgrass never existed also remain cheatgrass free. Even still, the team is vigilant, conducting extensive annual monitoring to evaluate past treatments, locate new infestations, and devise plans for treatments as needed.

Land managers across the West are better equipped to strategically tackle invasive grasses today than when the Sublette team got started with the availability new tools like improved herbicides and remotely sensed vegetation maps, as well as technical resources and support. The University of Wyoming's Institute for Managing Annual Grasses Invading Natural Ecosystems (IMAGINE) is leveraging the hard-won lessons learned by the Sublette team and sharing

technical know-how, strategies, and resources to empower land managers to defend and grow their sagebrush cores through an interagency technical transfer partnership.

Proactively protecting remaining core sagebrush areas, like that found in Sublette County, from becoming invaded is a key tenant of conservation strategies embodied in the Sagebrush Conservation Design and NRCS Working Lands for Wildlife's Framework for Conservation Action in the Sagebrush Biome. Alignment of these strategies with new funding from the Inflation Reduction Act, through the Farm Bill, Bipartisan Infrastructure Law, and state-based funding enable land managers to implement cheatgrass management at meaningful scales.



Monitoring is an important part of the Sublette team's learning process and success. These repeat photos taken at the same location showing extensive cheatgrass invasion before treatments were applied (2014) and the native grasses and forbs that flourished after treatment (2023). Photos courtesy of Julie Kraft.

“What Kraft wants to stress now, is that if “you’re asking the question—should I be doing cheatgrass work or invasive annual grass work? Then it probably is important enough and you should get started. And you need to hurry.” Make a plan. Start the process. “It actually can come together a lot quicker than you think.”

LESSONS LEARNED

From the Sublette Team



Leave egos at the door. For partnerships to work, everyone needs to prioritize the goals of the project over personal gains or recognition. Share leadership roles and leverage each team member’s skillsets and expertise.



Involve all local partners early in the process. Consider utilizing multiple working groups and task forces to bring in more people while maintaining efficiency within the core team.



Develop a shared vision with local partners about outcomes, priorities, roles and responsibilities, and communication and engagement with local community members’ interests or requests.



Start little, but think big. Start out with projects and teams that have a strong likelihood of success and scale up from there.



Be patient and consistent. Listen to the needs of local partners and community members and find ways to address those things. Allow for trust and credibility to build over time.



Monitor and document efforts and outcomes whenever possible. Remember that true success is not determined by acres treated, funding acquired, or contracts written, but in seeing beneficial results on the ground and building enduring collaborative relationships.



Be flexible, open, and proactive to the team and its processes and priorities evolving over time. Keep an open and creative mind towards emerging solutions.

PARTNER ACKNOWLEDGMENTS



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LEARN MORE ABOUT DEFEND YOUR CORE

Led by the University of Wyoming's Institute for Managing Annual Grasses Invading Natural Ecosystems (IMAGINE), an interagency Tech Transfer Partnership is helping empower land managers across the West with the technical training, tools, and information they need to implement proactive and strategic invasive annual grass management.

For more information, visit: invasivegrasses.com



LEARN MORE ABOUT WORKING LANDS FOR WILDLIFE

Working Lands for Wildlife is USDA-NRCS' premier approach for conserving working lands for wildlife, people, and rural communities. Through its Framework for Conservation Action, NRCS is providing technical and financial assistance to private landowners to help defend and grow their sagebrush cores.

For more information, visit: wlfw.org/landscapes/sagebrush

