

Annual Report for FY 2021

The Great Basin Fire Science Exchange (GBFSE) continued delivering fire, fuels, and restoration science information through our normal outlets that did not require gathering in person. We hosted many virtual events (symposiums, summits, webinars, meetings) and alerted our users about new research and virtual events hosted by us and others through regular newsletters, website updates, and social media posts. In FY 2021, we had our highest newsletter open rate in over 2 years. Use of the GBFSE website was up in FY 2021. Our website had almost 2,000 more pageviews, 800 more users, and 250 more return users in FY 2021 than in FY 2020. We almost doubled the number of Twitter posts and added 50 more Facebook posts in FY 2021 than in FY 2020.

We are particularly proud of the following activities, which highlight our ability to improve knowledge, strengthen networks, and enhance capacity throughout the fire, fuels, and restoration communities in the Great Basin. The impacts of these activities are described using Meadow and Owen's¹ conceptual, connectivity, and capacity building categories of societal impact.

1. Fuel Breaks Webinar Series for Mutual Understanding (Impact – Conceptual)

After announcing plans in 2019 for 11,000 miles of fuel breaks throughout the Great Basin, the Bureau of Land Management (BLM) received intense criticism, and the proposal put the fuels management and post-fire restoration communities at odds. To bridge the gaps in understanding, we and our agency and institutional partners developed a 6-part [Fuel Breaks in Sagebrush Ecosystems webinar series](#). The series included speakers with management and research expertise. It began with an introduction about what fuel breaks are, why and where they could be implemented, and the purpose they can serve. Subsequent webinars tackled the ecological implications of fuel break installation, maintenance, and connectivity. They discussed what is and is not known about the effects and utility of fuel breaks. The series concluded with a panel of research and management voices discussing the current state of fuel breaks in the Great Basin and the challenges related to their management with respect to changes in climate, nonnative species, and agency policies and regulations.

The series was well attended, and recordings were often viewed as much as or more than the live webinars (Table 1). A total of 734 people either attended live or viewed recorded Fuel Breaks webinars. Most of the live attendees surveyed indicated that the webinar series was at least probably applicable to their work ($\geq 80\%$; Fig. 1). Seventy-five percent or more of live attendees indicated that what they learned from the webinar series would at least probably change or support their approach to fire, fuels, and vegetation management situations (Fig. 1). In addition to the survey responses, we heard the following from webinar attendees:

I found this webinar topic very interesting and informative. The speakers presented the topic very well and provided great content. – Wildfire Consultant

Excellent job setting the stage for the webinar series! You [GBFSE] were the perfect messengers for this opening talk. Nice work. – Ecologist

That webinar was one we all needed to hear. – Biologist

¹ Meadow, A.M.; Owen, G. 2021. Planning and evaluating the societal impacts of climate change research project: A guidebook for natural and physical scientists looking to make a difference. Available : https://rie.arizona.edu/sites/default/files/Meadow-Owen_Societal-Impacts_Guidebook.pdf

The Fuel Breaks series was instrumental in increasing the knowledge about fuel break systems and awareness of the systems planned in the Great Basin. From comments, survey responses, and post-webinar conversations, we believe this conceptual knowledge exchange brought about greater understanding among partners and paved the way for improved dialogue and outcomes.

Table 1. Webinar topics covered and the number of live attendees and webinar recording views in the GBFSE Fuel Breaks in Sagebrush Ecosystems webinar series.

Webinar	Attendees (live)	Views (recorded)
What are fuels breaks, why are we doing them?	87	126
Ecological considerations of fuel breaks	76	60
Science gaps, modeling, and efficacy of fuel breaks	57	59
Targeted grazing for fuel breaks	53	53
Fuel breaks in practice	49	46
Bringing it all together: Panel discussion on fuel break perspectives	32	36
Total views	354	380

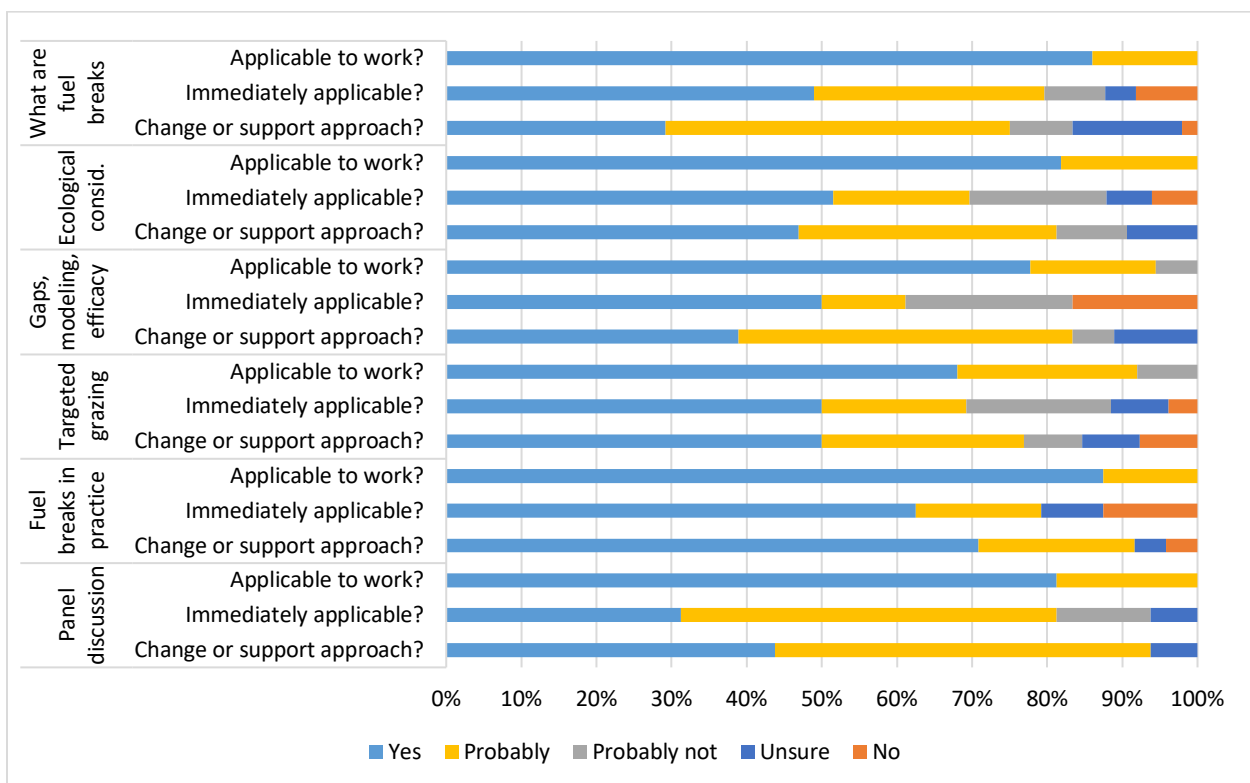


Figure 1. Survey responses to the following questions asked of live Fuel Breaks webinar series attendees: Are the concepts presented in the webinar applicable to your work? Can you apply these concepts to your work today? Will any of the information you received from this webinar change or support your approach to fire, fuels, and vegetation management situations?

2. **Helping Partners Continue Their Fire Science Missions (Impact – Connectivity)**

In 10+ years sharing fire, fuels, and restoration information in the Great Basin, we have developed strong relationships with land management, research, and outreach partners. Through these

partnerships, we leverage each other’s resources and strengths to deliver information, products, and activities better and more quickly than any of us could on our own. These partnerships also support continuity and connectivity in an ever-changing environment. This year, we provided the technology and expertise needed to host virtual symposiums at the Society for Range Management Annual Meeting for three of our partners: [Sagebrush Steppe Treatment Evaluation Project \(SageSTEP\)](#), [Restoration Technology and Equipment Council \(RTEC\)](#), and [Strategic Targeted Grazing network](#) (Table 2).

Table 2. Symposiums hosted with GBFSE technical assistance as part of the Society for Range Management’s Annual Meeting.

Symposiums	Attendees (live)	Views (recorded)
What has SageSTEP learned about sagebrush ecosystem recovery after 10+ yrs of post-treatment monitoring?	180	143
Big sagebrush restoration - Status at the start of a new decade RTEC	139	53
Strategic targeted grazing to reduce fine fuels: Updates on the ID and NV demonstration areas	195	117

There were no surveys associated with the individual symposiums, but the following comments were captured from the chat log or follow up emails.

Targeted Grazing – Outstanding session! Great session; Great Presentations; Lots of great information.

SageSTEP – Great session everyone. Really interesting research and findings; Some great wrap up points and discussion. This has been a very great seminar!

RTEC – Thank you for moderating the Big Sagebrush Restoration workshop at the SRM meeting last week. The topics presented are very applicable to the work we perform in the BLM. I would like to share the webinar recording with my coworkers who were not able to attend . . .

The GBFSE continues to help with outreach and product development from the RTEC, Targeted Grazing, and SageSTEP networks. For example, we created a [Targeted Grazing for Annual Grasses Resource Center](#); we are helping develop a field guide summarizing and synthesizing the 10 years of post-treatment results from all SageSTEP sites; and we have been instrumental in updating the Revegetation Equipment Catalog that was partially supported by RTEC. These networks represent a legacy of research, experimentation, and practitioner expertise. The investments of time, money, and effort have been considerable for all these networks. While these projects and communities have produced a substantial amount of fire, fuels, and restoration research and practical guidance, they also represent an opportunity to conduct long-term research and understand ecological change along longer temporal scales. However, these projects are currently experiencing reduced funding and a high rate of personnel turnover primarily through retirement of many founding researchers and practitioners. Through our collaborative efforts, each project can continue expanding its influence during their periods of transition.

3. Products that Expand Knowledge Sharing Capacity (Impact - Capacity Building)

Our dedication to rebuilding our own website in FY 2019 and 2020 has allowed us to quickly add science delivery capacity to partners within our region. Our technical knowledge and capabilities have made us the go-to resource for partners looking for dynamic methods to share their fire and fuels science

knowledge and products. With our website development expertise and infrastructure, we launched two partner websites and helped with planning of a third. The websites we launched are the [Great Basin Pinyon and Juniper Ecology, History, Restoration](#) (Fig. 2) and the [Revegetation Equipment Catalog](#) (Fig. 3). These websites were in partnership with retired Oregon State University fire and rangeland ecologist Rick Miller, and Texas A&M University, BLM, and US Forest Service Rocky Mountain Research Station (USFS RMRS), respectively. The in-process Pinyon-Juniper (PJ) Expansion Education Program website is in partnership with University of Nevada (UNR) Extension, Utah State University Extension, Intermountain West Joint Venture, and the Natural Resources Conservation Service's Sage-Grouse Initiative.

The GBFSE provided extensive support and guidance on the design and functionality of the first two sites, and acted as a go-between or translator for the web-developer and content experts. These websites function as sister websites to our GBFSE site, which means they are centrally managed, use the same website platforms, are hosted in the same location, and receive regular background maintenance updates (see [GBFSE tech-review 2020-2021](#)). For the in-process PJ Expansion Education website, the GBFSE provided content input, helped put together the team of content experts, and then largely stepped back to allow the University of Nevada Extension's Living with Fire Program to work with this team to develop the public-focused website. This site focuses on woodland expansion in sagebrush communities and the treatments (purpose and type) to limit this expansion.

The Great Basin Pinyon and Juniper Ecology, History, Restoration website includes a lot of the content featured in the [Miller et al. 2019 synthesis](#), but in a more digestible format (Fig. 2). The Pinyon-Juniper Ecology website, largely maintained by Rick Miller, includes a section where new content is continually added. This section provides summaries of newly published literature, which is discussed in terms of its agreement or departure from current science understanding. The GBFSE was involved in all aspects of designing the look, organization, and function of the Pinyon-Juniper Ecology site. We continue to review newly added content for consistency and clarity. We also help troubleshoot issues related to new content additions as needed. In FY 2021, the Pinyon-Juniper Ecology website received 1,764 pageviews, 549 users, and 62 returning users.

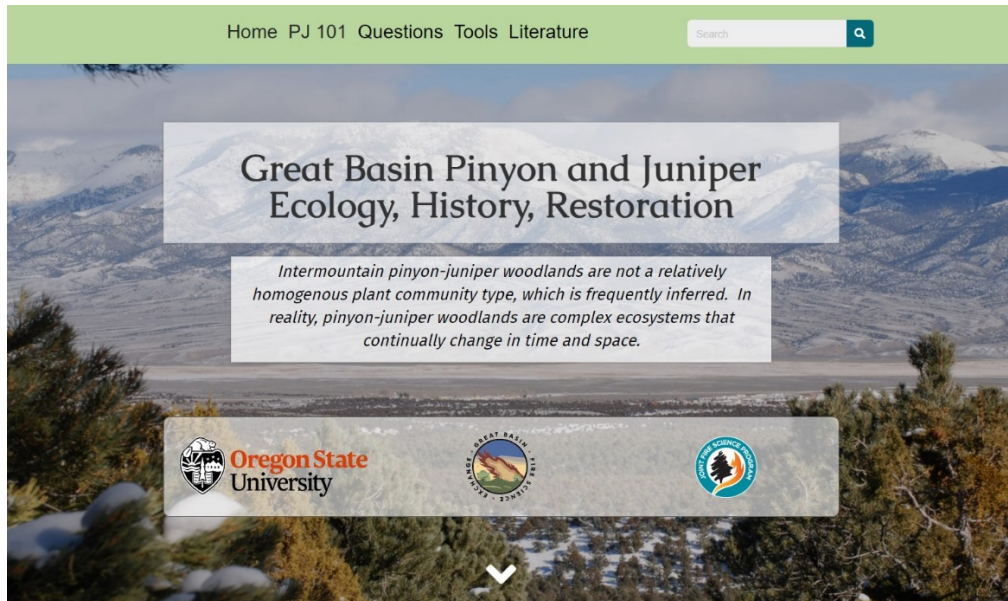


Figure 2. Homepage of the Pinyon-Juniper website, at the top is the website’s content menu.

The Revegetation Equipment Catalog website (Fig. 3) was a rebuild of an old website, which involved migrating content, adding search features, improving content updating potential, updating existing content, and building a wish list of future content additions. While the outline of the website existed, the new website improved the organization and thus the user friendliness of the original site. All photos and vendor information and links within the old website were updated. In FY 2020, our plan was to transfer the original website content to a static webpage on the GBFSE website using pdf documents, but this approach proved inadequate in terms of updating content and connecting information within the website. Construction of a new website has resulted in considerable time savings with content updates and general website maintenance. Now that the website is online, the GBFSE will work with partners (Utah Division of Wildlife Resource, BLM, USFS RMRS, Society for Ecological Restoration’s Great Basin Chapter, etc.) to solicit the writing of new equipment sections (Drones, Hydroseeding equipment, Hand planting, Seed pelleting/coating, etc.) and making of how-to videos (Seed cleaning, Drill calibration, etc.). Once the new content is produced, the GBFSE will upload it to the Revegetation Equipment Catalog website, which even in its earlier clunky PDF format was a top visited page on our website. The Revegetation Equipment Catalog website was launched in early September and first advertised to our community on 16 September 2021. Between that time and the end of the 2021 fiscal year (just 16 days), the Revegetation website already had 297 pageviews and 99 users.

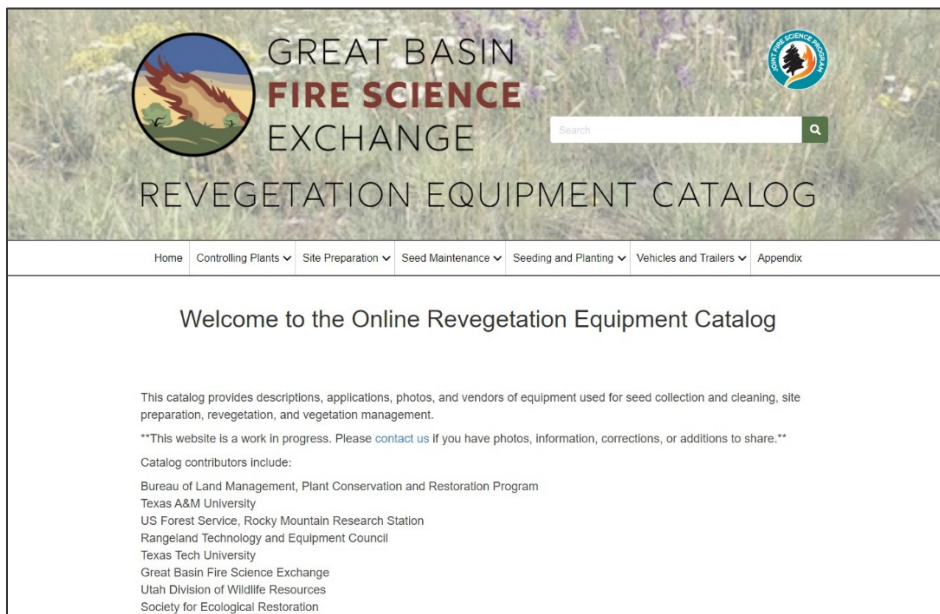


Figure 3. Revegetation Equipment Catalog website homepage, note the content available in the menu bar. The following content is available in each dropdown menu- Controlling Plants: Chemical control, Control by burning, Mechanical control; Site Preparation: Scrapers, Tillage; Seed Maintenance: Seed cleaning, Small-scale seed collecting; Large-scale seed harvesting; Seeding and Planting: Aerial seeding, Ground seeding, Site protection; Vehicles and Trailers: All-terrain vehicles, Tractors, Transport trailers.

These websites are clear examples of our commitment to capacity building. We look forward to supporting the growth of these websites to better allow our partners to share Great Basin fire, fuels, and restoration information.