Great Basin Fire Science Exchange - Annual Report FY2024
Part 3. Impacts of Exchange Efforts

The primary fire management challenge for the Great Basin region is the loss of native ecosystems (perennial grasslands, semi-arid shrublands) to nonnative grasses fueling large, frequent fires. Programming of the Great Basin Fire Science Exchange for the last several years has focused on resources and training related to native habitat conservation and restoration, which are topics receiving a lot of the attention of Great Basin researchers and managers. Our dedication to reducing high fire occurrence and postfire restoration information included support of the Fire and Smoke Model Evaluation Experiment, development of educational outreach products to improve conversations with our public, and adding capacity to projects designed to slow degradation and encourage recovery of Great Basin ecosystems.

Section 1. Fire Science Topics

This year the Great Basin Fire Science Exchange (GBFSE) contributed to all the key fire science topics identified by the Joint Fire Science Program (Table 1). Some of the fire topics received more focus than others, as will be partly explained in the stories presented below. Our commitment to regular delivery of newsletters, website updates, and posts through social media platforms allows us to provide information on all key fire science topics.

Table 1. Key fire science topics. Those with an X were included in Great Basin Fire Science Exchange work in FY 2024.

X	Wildlife	X	Fuels management
X	Invasive plants species	X	Prescribed fire
X	Vegetation	X	Smoke, air quality and health
X	Soil	X	Wildland urban interface and infrastructure
X	Watershed processes	X	Firefighter safety and incident management
X	Postfire recover and management	X	Social science and human dimensions
X	Fire behavior	X	Indigenous knowledge
X	Fire regimes	X	Economic impacts

Section 2. Success Stories

Increasing Agency Capacity. One of the Great Basin Fire Science Exchange's greatest strengths is the ability to meet our partners' requests for support to increase their own capacity. We were able to do this in FY 2024 for our partners at the USFS Pacific Northwest Research Station Fire and Environmental Research Applications and Fishlake National Forest to support science communication for a large, aspen-restoring, research and management prescribed burn.

Last spring a former GBFSE advisory member and retired USFS Regional Fuels Planner requested our assistance with science communications to share the research being conducted through the Fire and Smoke Model Evaluation Experiment (FASMEE) on the Monroe Mountain Aspen Ecosystems Restoration Project (https://earthobservatory.nasa.gov/images/152203/making-fire-sense-on-monroe-mountain). The FASMEE project is a joint science-management project that collects valuable data from large prescribed fires for fire modelling applications and evaluations, and was initially funded by the Joint Fire Science Program in 2015. After meeting with neighboring Fire Science Exchanges, we jointly decided on a suite of products we could produce to share information about and from the project. Along with

former Northern Rockies Fire Science Network PI and current USDA Forest Service Pacific Northwest Science Liaison Vita Wright, and with the Northwest Fire Science Consortium, we spent the next six months working with FASMEE researchers and U.S. Forest Service managers to produce two *Learning and Burning* videos (full video, 550 views and short trailer, 578 views, with additional views from the FASMEE website and NASA's FireSense News site) and a resource brief about co-production of fire and smoke science from this work. The GBFSE also worked with the Fishlake National Forest's Forest Fire Prevention Officer, the Richfield District Ranger, NASA's FireSense project scientists, and others, to host a Forest Service/NASA Fire Science Field Day for local high school and junior college students in Richfield, Utah (Fig. 1). This event was also attended by the Monroe Mountain burn boss and his family. The GBFSE and neighboring exchanges will be jointly hosting a webinar series and research briefs featuring FASMEE research after another season of data is collected in 2024.

Figure 1. Students from South Sevier High School learn about fire science. Photo by Jeff Raisor (Raisor 2023).

This success story focused on the key fire science topics of vegetation, soils, postfire recovery and management, fire behavior, fuels management, prescribed fire, and smoke, air quality and health. The impact categories of these activities addressed are as follows. We increased **Connectivity,** strengthening research and management interdisciplinary partnerships, by organizing 30 partners from 12 different agencies to help develop the Forest Service/NASA Fire Science Field Day. We supported **Conceptual** gains by bringing greater awareness and understanding to aspen ecology, fire regimes, fuels management, prescribed burning, post-fire hydrology and soil health, wildfire smoke and public health, and fire science and technology to the public through the videos and field trip. We added **Capacity** to our regional agencies by bringing our resources to the FASMEE Integrated Research Management Team (IRMT) to assist with science communication and outreach. We contributed to **Improved Social Outcomes** through the Forest Service/NASA Fire Science Field Day attended by about 50 students from four schools. One teacher remarked, "They loved it, it was a cool and great experience. Thanks for asking our school to participate," (Raisor 2023).

> *The field tour and output of products provided a critical link between researchers, land managers and the public that will assist in better fire management. This science exchange and product*

development would not have been possible without the excellent work conducted by the Great Basin Fire Exchange. —Roger Ottmar, Emeritus Scientist, USDA Forest Service Pacific Northwest Research Station.

Multi-Regional, Multi-Agency Collaborations. Several recent papers (Crist 2023, Crist et al. 2023) and a GBFSE brief have highlighted the importance of, costs associated with, and lack of agency and media attention on wildfires in non-forested or rangeland ecosystems. This phenomenon is not unique to the Great Basin region. After Colorado's Marshall Fire in 2021, the Southern Rockies Fire Science network convened western Fire Science Exchanges (Southern Rockies, Great Basin, Great Plains, Southwest, California, Northwest, Northern Rockies, and Tallgrass Prairie and Oak Savanna) to brainstorm potential collaborative products to increase public, agency, and government awareness to this issue. When the group's efforts at an infographic stalled as we realized the issue was more complex than we initially envisioned due to different types of rangelands having different challenges and requiring different types of management, the GBFSE used its resources to hire a professional science illustrator and visual designer to help us with a unifying message that addressed our collective rangeland wildfire problem. The Southern Rockies shared the cost. The GBFSE designed a story map to accompany the postcard. With this assistance the group was finally able to produce a *Rangeland Wildfires* postcard and story map that was publicly distributed this fall.

By leveraging of resources and sharing costs, we developed an educational postcard (Fig. 2) and linked story map that met the overarching needs of all western Fire Science Exchanges. These products highlight that more area burns in rangeland fires than in forest fires. It defines rangelands, wildfire, and touches on the firefighting and potential ecosystem services costs of rangeland fires. These postcards provide a versatile communication tool for all audiences.

Figure 2. Wildfires burn more rangeland than forest postcard.

The GBFSE was also involved in the development and design of a Sagebrush Wildflowers poster (Fig. 3) illustrating the diversity of wildflower species important to maintaining ecosystem integrity in the Great Basin. It identifies 31 forb species as they would appear across the growing season, provides general

timing for seeding in our region, and includes close-up photos of flowers, seeds, and fruits. It includes icons that provide quick identification of each species' response to disturbance and fire, and value to sage grouse and pollinators. The species represent current and future candidates for restoration.

The backside of the poster provides brief but detailed descriptions of the Great Basin and its wildflowers including phenology, disturbance response, fire response, pollinator value, importance to sage-grouse, and resources for more information, which includes our WesternForbs.org project.

This poster was the brainchild of Agricultural Research Services' (ARS) Range and Meadow Forage Management Research and Oregon State University - Pacific Northwest Extension that pulled in forb knowledge and content contributions from the Bureau of Land management, US Forest Service Rocky Mountain Research Station, US Fish and Wildlife Service, and GBFSE. It represents a multi-agency collaboration and leveraged resources in terms of expertise, time, and production costs.

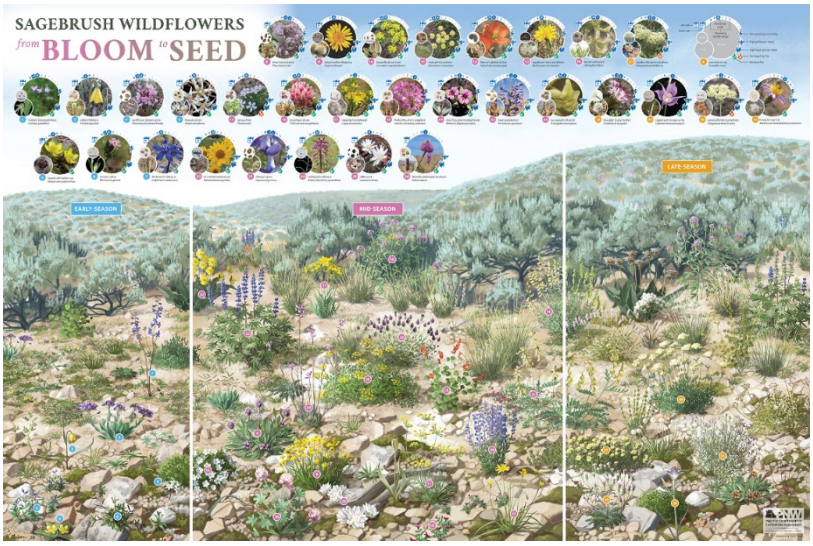

Figure 3. Front side of the Sagebrush Wildflowers: From Bloom to Seed poster.

> *Congratulations on a superb poster! I was given one at the SageCon meeting here in Oregon. I would like several more to place around the central Oregon area.* —Stu Garrett, Native Plant Society of OR, East Cascades Bird Alliance.

These products addressed the key topics of invasive plant species, vegetation, fire regimes, fuels management, and wildland urban interface and infrastructure in the Rangelands Postcard and Story Map, and wildlife, invasive species, vegetation, and postfire recovery and management in the Wildflower Poster. They supported the societal impacts of **Connectivity** by expanding the number and quality of relationships working on collective products, **Conceptual** by increasing knowledge and awareness about important fire science issues, **Capacity-Building** by leveraging resources to create products that we would have been unable to do alone, and **Instrumental** by addressing the relatively new concepts of rangeland fires being as important as forest fires, and by furthering the goals of the National Native Seed Strategy.

Responding to Partner Requests. An important role of the GBFSE is maintaining the ability to respond to requests from our science, management, and policy partners when these needs fall within our mission.

Here we highlight two such requests. In June 2024, Department of Interior Post-Wildfire Coordinators asked the exchange network for assistance in highlighting success stories related to the utilization of funds from the Bipartisan Infrastructure Law (BIL) and Burned Area Response (BAR) funds for post-wildfire activities. We were later contacted by Jennifer Gibson, National Park Service Post-Wildfire Coordinator, to highlight the "Increasing native plant material collection, production, and use in restoration: Building on a legacy of collaboration to meet the unique challenges of post wildfire rehabilitation in the Great Basin" project funded by BIL BAR. We quickly created a brief from the funded project's progress report to feature the partnerships working to advance the National Native Seed Strategy. We worked with the project team and the Post-Wildfire Coordinators to finalize the brief to their specifications and the product was ready to share with partners and legislators.

> *[Success Story brief] looks fabulous. Thank you for doing this!* —Jennifer Gibson, National Park Service Post Wildfire Coordinator, National Interagency Fire Center.

The GBFSE was also asked by Nevada Shared Stewardship to serve as the science liaison for their Technical Action Committee. Nevada Shared Stewardship organizes state and federal partners to share in setting priorities and co-management of wildland fires, landscape restoration, and wildland urban interface. GBFSE program manager, Génie MontBlanc, serves as the fire science liaison to organize, plan, and deliver fire and fuels speakers and resources to this group. Through learning sessions, the GBFSE will work to support the implementation of shared stewardship projects by highlighting the best available science related to treatment effectiveness. The GBFSE organized one science-management brown bag discussion in FY 2023 for the NV Shared Stewardship landscape planners on the topic of *Science for Landscape Planning* and is in the process of planning the next discussion on invasive grass management this fall.

These activities addressed the key topics of postfire recovery and management for the BIL BAR success story, and invasive species, vegetation, postfire recovery and management, and fuels management for the Nevada Shared Stewardship science-management discussion. They supported the societal impacts of **Connectivity** by increasing the number and quality of relationships, **Conceptual** by increasing knowledge and awareness of fire science and management solutions, and **Capacity-Building** by adding our skills and resources to help our partners be successful in their fire management projects.

Section 3. Connecting Short-Term and Long-Term Objectives

The impacts described above contribute to our longer-term objectives of *normalizing collaboratively identified treatments* (Conceptual), *application of fire where needed* (Connectivity and Capacity-Building), and *long-term support for co-produced science activities* (Socio-Environmental). By working collaboratively with our regional entities and disciplines, communication becomes second nature, fire and fuels knowledge is broadly shared and understood, and we come closer to *consensus on treatment identification*. This supports better *application of fire where it is needed* (although still limited by agency capacity and funding) and *long-term support for co-produced science activities,* which is now a part of many agency planning efforts. Our development of more public-friendly products (videos, field day, postcard, and poster) is helping to increase understanding to help push our region toward a workable consensus around fire and fuels management.

While we do not see a need to adjust our long-term objectives, we continue to improve the planning or find ways to adjust our activities designed to realize these objectives. For example, we would like to

increase our capacity for relationship building by meeting people in their field offices, on their reservations, in their communities, but find this difficult at our current planned capacity and activities schedule. Leveraging our collaborative and cross-organization relationships may offer a way to increase this capacity need.

The long-term outcomes identified in our logic model remain valid for the often-overwhelming fuels, fire, and postfire restoration issues facing our region. The research and management challenges facing our region will not be overcome without cooperation, collaboration, and co-produced science. For this reason, GBFSE will continue to prioritize supporting, connecting, and adding capacity to those studying and managing Great Basin ecosystems. This role provides the best chance for identifying land treatments and tools for decision making that improve overall landscape resilience to disturbance and resistance to nonnative species and limit the extent and severity of future fires.

Citations

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