Fire Science Exchange Network

Fiscal Year 2022
ANNUAL SUMMARY

Fire Science Exchange Network

Fiscal Year 2022
ANNUAL SUMMARY

The Fire Science Exchange Network (FSEN) is an organized science delivery organization made up of 15 regional fire science exchanges spread across the United States. Each exchange provides relevant and current wildland fire science information to federal, state, local, tribal, and private stakeholders within their region. The strength of the network lies in its ability to bring fire science to the field through strong partnerships between researchers and managers. Funded through interagency and cooperative agreements through the Joint Fire Science Program, the exchanges submit their annual science delivery accomplishments categorized by activities, participation by organizations, and stories of societal impacts. This report provides a snapshot of those results for fiscal year (FY) 2022.

IN FY 2022, THE EXCHANGES COLLECTIVELY:

- produced **230 newsletters**
- published **185 blog posts**
- developed **14 syntheses**
- hosted **119 webinars**
- hosted **79 conferences/ workshops**
- developed **58 short courses and continuing education units**
- created **139 video productions**

Tables A1 and A2 in the Appendix contain a complete breakdown of activities conducted in FY 2022.

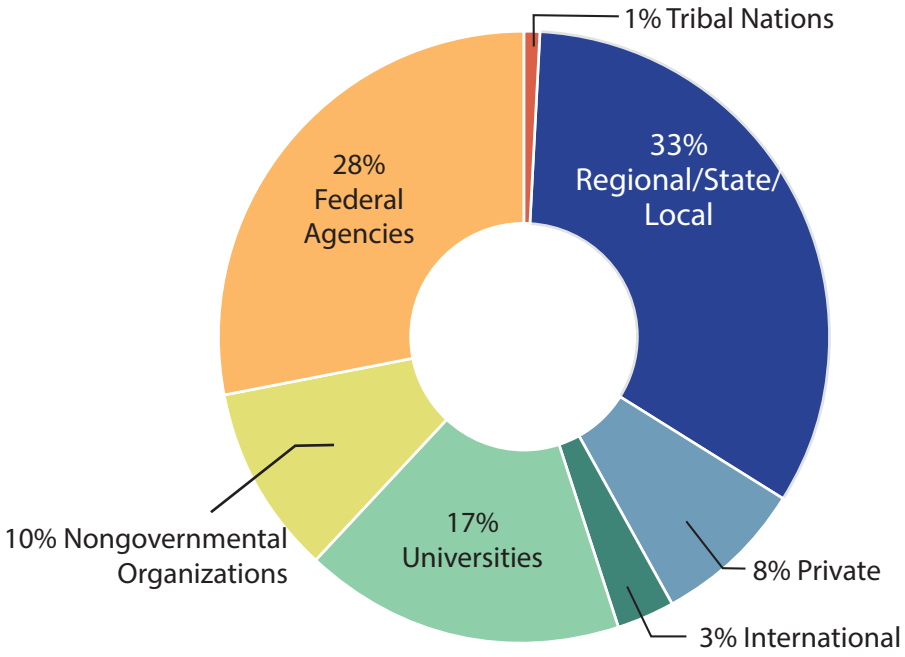


Figure 1. Approximately 21,000 individuals participated in FSEN-organized wildland fire science delivery activities in FY 2022. The pie chart highlights participation by organizational group. Participation by organization is similar to last year's numbers, with a slight increase in the Regional/State/Local category, as well as the Nongovernmental Organizations category.

FSEN Highlights

Beginning in FY 2021, the exchanges focused on capturing the impact of their activities according to categories of societal impact developed by Meadow and Owen (2021). Societal impacts are "the ways that research, and the process of conducting research, influences the world beyond the academic realm." The guidebook by Meadow and Owen is intended to offer approaches for planning projects that optimize engagement with societal partners, identifying new ways to impact the world beyond academia, and developing the skills to assess and communicate to multiple audiences. Categories of societal impact include instrumental, conceptual, capacity building, connectivity, and socioenvironmental (Table 1). The following FSEN highlights demonstrate the value and impact of FSEN investments in carrying out on-the-ground science delivery activities.

CATEGORIES OF SOCIETAL IMPACT

Instrumental	Exchange activities or products were instrumental in changes to plans, decisions, practices, or policies related to wildland fire management
Conceptual	Exchange activities or products contributed to changes in people's knowledge about or awareness of an issue related to wildland fire management
Capacity Building	Exchange activities or products contributed to enhancing the skills, expertise, or resources of an organization or group of people related to wildland fire management
Connectivity	Exchange activities or products led to new or strengthened relationships, partnerships, or networks that endure after the project ends related to wildland fire management
Socio-environmental	Exchange activities or products led to changes to social and/or ecological systems (such as improved health and wellbeing or ecosystem structure and function) related to wildland fire management

Table 1. Definitions of categories of societal impact in relation to wildland fire management. Adapted and modified from Meadow and Owen (2021)[1].

[1] Meadow, A.M., and G. Owen. 2021. Planning and Evaluating the Societal Impacts of Climate Change Research Projects: A Guidebook for Natural and Physical Scientists Looking to Make a Difference. University of Arizona, Arizona Institutes for Resilience, Tucson, AZ. https://rie.arizona.edu/sites/default/files/Meadow-Owen_Societal-Impacts_Guidebook.pdf

ALASKA

ALASKA FIRE SCIENCE CONSORTIUM

Increasing Public and Media Awareness Related to Climate Change

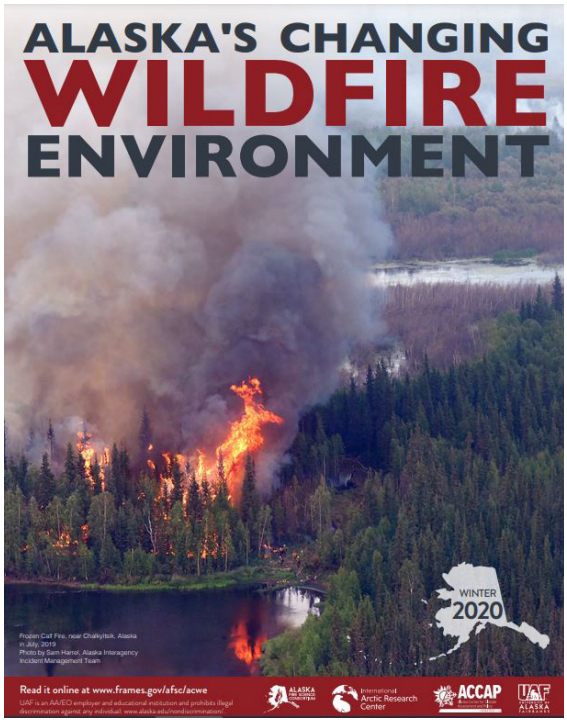
The Alaska Fire Science Consortium and agency staff, including agency administrators and public information officers, continue to refer to and draw on the consortium's recently completed report—Alaska's Changing Wildfire Environment—in their interactions with media and the public. This 16-page outreach booklet compiles information on the factors contributing to the intensifying patterns of wildland fire in Alaska. In fiscal year 2022, the consortium led several follow up activities based on this booklet.

Three top leaders of fire management in the state (Norm McDonald, Alaska Department of Natural Resources, Division of Forestry and Fire; Bobette Rowe, US Forest Service, Region 6; and Kent Slaughter, BLM Alaska Fire Service) asked the consortium to write a press release based on the booklet, titled "Alaskans Should Prepare for Wildfire Season." As part of Alaska Wildfire Prevention week, the press release was distributed through agency communications channels and published in early May 2022 as an op-ed in the *Anchorage Daily News*, the *Mat-Su Valley Frontiersman*, and the *Fairbanks Daily News-Miner*, reaching the vast majority of newspaper readers in the state. The consortium plans to assist agency staff with preparing a press release on wildfire preparedness annually.

Consortium science communication specialist Zav Grabinski was invited by three different organizations to present on the booklet material:

- presented webinar to the In a Time of Change arts and humanities group who are collaborating with Bonanza Creek Long Term Ecological Research Station on the Boreal Forest Stories project (November 2021)
- taught the "Opportunities for Lifelong Education" course at University of Alaska Anchorage, (autumn 2021)
- spoke at a Science Pub event sponsored by the National Science Foundation's Alaska Established Program to Stimulate Competitive Research (November 2021)

These outreach activities increased awareness of the interactions of climate change and wildland fire in Alaska and other northern locations with the public, the fire and resource management community, and the scientific community in Alaska and nationally.



The relevant societal impact categories are conceptual and capacity building (Table 1).

APPALACHIANS

Consortium of Appalachian Fire Managers & Scientists

Creation of the Southern Blue Ridge Prescribed Burn Association

This fiscal year, the Consortium of Appalachian Fire Managers and Scientists had the opportunity to partner with several new organizations in a proposal to start and new prescribed burn association (PBA) in Western North Carolina.

The newly formed Southern Blue Ridge PBA officially kicked off in January 2022 with grant funding from Coalitions and Collaboratives, Incorporated. Since receiving the grant in January, the PBA has:

- assisted with 6 burns for a total of 108 acres with 44 volunteers
- written fourteen burn plans for future prescribed burns on private lands
- hosted four events: a Flames to Forest webinar, Firescape training, and two "learn and burns" at the Southern Blue Ridge Fire Fair

The consortium helped Southern Blue Ridge PBA with the Firescape training and the learn and burns. Through the consortium's involvement, there have been meaningful interactions with landowners on the "why" of prescribed fire. Using previously developed materials, the consortium answered landowner questions and helped them identify their land management goals based on relevant fire science from the region. So far, private landowners have very defined ideas on how they want their forest lands to look and what wildlife species play an important role to them personally. Their desire to use science to reach personal land management goals is evident.

The relevant societal impact categories are conceptual, capacity building, and connectivity (Table 1).

CALIFORNIA

CALIFORNIA FIRE SCIENCE CONSORTIUM

Post-fire Conversations

With millions of acres burned across California, addressing post-fire concerns is one of the state's most pressing issues. This fiscal year, the California Fire Science Consortium worked with ecologists, managers, and others on the Eldorado National Forest and organized a post-fire restoration symposium.

Because plans to restore recently burned areas were being made, the consortium recognized this was a vital time to hold a symposium and revisit the lessons and barriers learned from past post-fire management. The area the symposium covered encompasses several fire interactions, including the impacts of a recent fire (the Caldor fire) and other fires from over a decade ago. Management actions have ranged from no action to innovative post-fire silvicultural practices that can provide a template for what forest recovery might look like for recently burned areas.

This symposium was a hybrid in-person and virtual event, made up of Zoom presentations and panel discussions followed by an onsite field day. The consortium was able to overcome the challenges event organizers typically face when COVID-19 concerns affect meeting logistics. With cohosts, the consortium skillfully navigated zoom fatigue, technical glitches, safe carpooling to field sites, and parking issues. This event was cohosted by several partners, including the US Forest Service Eldorado National Forest, Region 5 Ecology Program; Amador-Calaveras Consensus Group's Monitoring Work Group; and South Fork of the American River Cohesive Strategy Landscape Design Team; and the consortium.

The mix of presentation methods provided a balance of both accessibility and grounded understanding. There were over 50 attendees for the virtual presentations and fewer than 20 field day participants. The recorded presentations received over 150 views in just a few months and cover a broad range of postfire topics and evaluation of methods.

The relevant societal impact categories are connectivity and socio-environmental changes (Table 1).

GREAT BASIN

GREAT BASIN
FIRE SCIENCE
EXCHANGE

Pinyon-Juniper Woodlands in a Changing Climate

Since 2019, the Great Basin Fire Science Exchange has fostered an improved understanding of the ecology and management of fire prone pinyon-juniper ecosystems. The exchange has developed a synthesis, factsheets, a webinar series, supported a pinyon-juniper 101 website, and contributed to the development of a woodland encroachment science education website.

To build on this understanding, the exchange planned and hosted a webinar series this year to highlight recent research and observations of climate and drought-driven changes in pinyon-juniper woodlands that can affect fuel loads, fire behavior, and post-fire restoration. This webinar series:

- featured four researchers presenting and interacting live with attendees
- hosted 168 webinar attendees
- reached 376 additional users through viewing of recorded presentations

All webinar attendees surveyed indicated that the material presented in the series was definitely or probably applicable to their work, and 80% or more thought the series was definitely or probably applicable to their work immediately and would change or support their current approach to land management. Based on the survey responses, this conceptual knowledge exchange brought about greater understanding among partners and paved the way for improved dialogue and outcomes. While the focus for the last several years has been laying the foundation for understanding the function and management options in pinyon-juniper ecosystems, this fiscal year the exchange provided context and new options for management challenges that are paralleling shifts in increasing temperatures in the Great Basin.

The relevant societal impact category is conceptual (Table 1).

GREAT PLAINS

Assisting with the Development of a Canadian Exchange

In December of 2020, a team of local and regional agencies in the prairie provinces of Saskatchewan, Alberta, and Manitoba received funding from a conservation foundation to start a fire science program that would include training, fire science exchange, and conducting prescribed fires. A perusal of online resources led the project coordinator to the Great Plains Fire Science Exchange and to a request for assistance with founding a similar organization in Canada.

In fiscal year 2022, through emails and virtual meetings, the Great Plains Fire Science Exchange shared extensive information, resources, contacts, and key science information with the nascent organization that became the Canadian Prairies Prescribed Fire Exchange (CPFSE). The two exchanges rapidly became conduits for other fire science information, including conveying queries and identifying examples to aid in the development of Canadian grassland fire modeling efforts. It is hoped that the CPFSE will serve as a catalyst for a Canada-wide consortium of exchanges comparable to the United States' FSEN.

The relevant societal impact category is connectivity (Table 1).

LAKE STATES

Seasonality of Fire, Growing Season Burns, and Opening the Burn Window

Prescribed fire in the Lake States region typically has been limited to narrow, traditional burn windows during the dormant season (spring and fall). While fire history data—including knowledge of Indigenous use of fire—indicates that summer fires were ecologically and culturally important in this region, recent implementation of growing season burns was, and continues to be, rare. The Lake States Fire Science Consortium has worked diligently to support a paradigm shift in the fire community to "open the burn window" and expand opportunities for prescribed fires. The consortium has conducted field trips, facilitated partnerships and the exchange of information and data, and supported individuals in developing new burn prescriptions and navigating policy and rare species needs.

The consortium has been instrumental in supporting many organizations as they progress from building awareness about burn season expansion to successful implementation of growing season burns. Now, the potential and reality of growing season burns as part of a full restoration and management program is gaining significant traction in the Lake States region, as well as other regions of the northeast United States. In helping to change ideas about the region's burn season, the consortium has achieved a long-term goal.

In 2021, the consortium helped Wisconsin Department of Natural Resources (Northeast Wisconsin Region), and Metroparks Toledo (Toledo, Ohio) to conduct their first growing season burns and the groups are now deliberately incorporating growing season burns into their fire programs. This year, their ecologists presented perspectives on the opportunities and challenges of growing season burns as part of the 2022 Burning Issues Workshop, which had over 120 virtual attendees.

The relevant societal impact categories are instrumental, conceptual, capacity building, connectivity, and socio-environmental (Table 1).

NORTH ATLANTIC

Managing Pitch Pine Under the Threat of Southern Pine Beetle

In April 2022, the North Atlantic Fire Science Exchange held a three-hour virtual workshop to help participants make practical plans and get to know others interested in the science and management of southern pine beetle (SPB) in the Northeast United States. Workshop participants learned from researchers studying SPB life history, talked with managers who have applied thinning and prescribed fire to manage SPBs on public lands, and shared resources for developing management plans for at-risk pitch pine stands across the northeast. A follow-up workshop in May enabled participants to conduct a detailed review of their individual management plans. The list of people interested in SPB grew over the summer, and as more outbreaks were identified, and the exchange reconvened the network in September to update participants on the state of SPB in northeastern forests. Then in October, a key partner from the initial workshop held a follow-up meeting designed to empower land managers by providing them with southern pine beetle scientific resources and case studies.

A summary report of the April 2022 meeting has already been used for instrumental societal impact. A burn boss in Maine brought the report to conversations with a state forest regulator, and together they made different prescribed burn plans than they would have otherwise. Managing for SPB includes employing prescribed fire science to increase and maintain general forest health.

The relevant societal impact categories are instrumental, conceptual, capacity building, and connectivity (Table 1).

NORTHERN ROCKIES

Firefighter Physical and Mental Health Webinar Series

In 2022, the Northern Rockies Fire Science Network partnered with the Northwest Fire Science Consortium, the Great Basin Fire Science Exchange, the Southern Rockies Fire Science Network, and the California Fire Science Consortium to host a 3-day webinar titled "Wildland Firefighter Health Series: Current Knowledge for Body, Mind, and Well-being." During this 3-day series of presentations and panel discussions, professionals and agency leaders shared some of the current science, knowledge, and tools available to support wildland firefighter physical and mental health. The series aimed to bring the latest science to those working in fire management and/or wildland firefighting. This event was likely the network's most time-consuming, but rewarding, event of the past year. Additionally, the event provides a strong foundation for the network and other fire science exchanges to help the Joint Fire Science Program's (JFSP) efforts to focus on this emerging area of interest.

The relevant societal impact categories are conceptual, capacity building, connectivity, and socio-environmental (Table 1).

NORTHWEST

Barriers to Building Resilient Forest Landscapes in the Presence of Weeds

In the spring of 2022, the Northwest Fire Science Consortium, Pacific Northwest Research Station, US Forest Service Region 6, and the Great Basin Fire Science Exchange reconvened to discuss efforts and ideas for ways to better communicate around integrating weed management into fuels management. Below is a summary of key products originating from efforts in this area over the last year:

- Website and resource hub for *Ventenata dubia* – The consortium updated an existing webpage for the JFSP-funded project "Ecosystem Change in the Blue Mountains Ecoregion: Exotic Invaders, Shifts in Fuel Structure, and Management Implications." The webpage provides an overview of the research project as well as key results, publications, news, and resources. Over the past year, there have been 404 visits to the webpage.

- Webinar – In March 2022, the consortium hosted "Invasion, Fire, and the Future of Northwest Wildlands: *Ventenata dubia* in the Blue Mountains Ecoregion," a deep-dive webinar aimed at understanding the current and future *Ventenata dubia* (ventenata) invasion. Presenters relayed findings with management implications and placed their results in the context of other plant invasion research. The webinar included 90 minutes of scientific presentations with short Q&A sessions between sessions, followed with a 30-minute wrap-up and panel discussion.
- Infographic – The consortium finalized and distributed an infographic showing how weeds can be an unintended consequence of fire and fuels management, challenging resilient forest landscapes.

The relevant societal impact categories are capacity building, connectivity, and socio-environmental (Table 1).

OAK WOODLANDS

OAK WOODLANDS & FORESTS FIRE CONSORTIUM

Special Session at 9th International Fire Ecology and Management Congress

The Oak Woodlands & Forests Fire Consortium conceived, organized, and implemented a special session at the Association for Fire Ecology's 9th International Fire Ecology and Management Congress. The session, "The role of fire across U.S. oak forest ecosystems: sharing varied ecologies to realize unifying themes," sought to identify potential unifying themes, disparities, and gaps in knowledge across Eastern and Western United States oak ecosystems. Related to the region's geography (western edge of the Eastern Deciduous Forest and the eastern edge of predominantly Western United States fire issues) and the topical expertise of staff and governing board members, team members are keenly aware that parallel research and experiential knowledge exist across Eastern and Western United States oak ecosystems, which do not typically mix. An additional goal of this session was to foster interactions and strengthened relationships, and ultimately increase collaborations, among oak-fire ecology researchers and managers from diverse geographies (California, Oregon, Central United States, Southeastern United States, and Canada). Presenters and participants in the session and its associated Fire Circle acknowledged the obvious benefits of further exploration of this topic. Panel members indicated they would be willing to work together on topic products (i.e., manuscript, future workshop, etc.) in order for the science and lessons to be shared.

The relevant societal impact category is connectivity (Table 1).

PACIFIC

Assistance to farmers

This fiscal year, the Pacific Fire Exchange continued to serve as a key hub for connecting scientists with land managers and communities, while also expanding to farmers and farming interns in the Waiʻanae area of West Oʻahu. To support West Oʻahu farmers, two in-person workshops were held. The first, "Fire and Agriculture," at Maʻo Farms for land stewardship interns introduced fourteen young, would be farmers to the basics of wildfire in the Pacific. The workshop gave them hands-on experience in pre-fire hazard identification and planning for six farm sites across Oʻahu.

The exchange also supported a two-day "Grazing and Wildfire Mitigation Best Practices Workshop" hosted by Kaʻala Farms, with University of Hawaiʻi's State Range and Livestock Extension Specialist Mark Thorne and coinvestigators Clay Trauernicht and Elizabeth Pickett. The workshop arose in response to farmer concerns following the extremely destructive West Oʻahu fires and the growing interest in grazing as a fuels management strategy. In addition to learning critical skills for animal care and husbandry, one of the major outcomes of this workshop was connecting new farmers with more experienced ranchers well versed in animal management. This resulted in increasing herd sizes and therefore more effective fuels management on the ground.

The relevant societal impact category is connectivity (Table 1).

SOUTHERN

Developing an Online Prescribed Fire Course

During fiscal year 2022, the Southern Fire Exchange collaborated with partners from North Carolina State University, Clemson University, and the University of Florida to develop and launch an online prescribed fire training course supported by funding from the Joint Fire Science Program and a USDA Renewable Natural Resources Extension Act Capacity Grant. Development of the 4–6-hour course was guided by a southeastern regional extension agent fire science needs survey led by Hope Miller, a graduate student at the University of Florida. In early 2022, the course design team met and began assembling the self-paced, online course, which contains multimedia content on basic fire science, burn planning, safety and fire operations, ignition methods, smoke management and models, basic fire ecology, wildlife habitat, forest management, liability, and prescribed burn associations. The course is currently hosted on the University of Florida, Institute of Food and Agricultural Science's online learning management system.

Although the course was initially created to train southeastern land grant university cooperative extension agents to provide prescribed fire and fire science programming in their respective regions, the team quickly discovered that that course could address a larger need. Following requests to enroll from students, members of the public, and volunteer fire departments, the course was opened to any interested participants in early June 2022. It has been hosted since then as an entirely asynchronous online course, and prospective participants can sign up at any time and complete the course at their own pace. To date, 1,041 participants have enrolled, and 25% have completed the course, with many still in the process of completing it.

The relevant societal impact category is capacity building (Table 1).

SOUTHERN ROCKIES

Aspen Science and Management Workshop

Held in August 2022, the Southern Rockies Fire Science Network lead coordination of the Aspen Science and Management Workshop, working with the Western Aspen Alliance, The Nature Conservancy, US Forest Service, Colorado State Forest Service, American Forests, Colorado Parks and Wildlife, and others. The workshop united scientists, vegetation specialists, and wildlife managers to bridge disciplines, institutions, and political boundaries and address aspen management and fire challenges in central Colorado. Thirty-five people attended a field-based workshop to discuss process-based restoration and its applicability to aspen management, particularly impacts from the East Troublesome Fire. The group identified next steps to support aspen management and to move forward as a regional working group.

The relevant societal impact categories are conceptual, capacity building, and connectivity (Table 1).

SOUTHWEST

SOUTHWEST FIRE SCIENCE CONSORTIUM

Prescribed Fire in Shortgrass Workshop

The Southwest Fire Science Consortium partnered with the Great Plains and Southern Rockies Fire Science Exchanges to host a prescribed burn workshop focusing on shortgrass in northeastern New Mexico. The workshop, held in November 2021, was the first workshop the consortium organized that was directed specifically at ranchers, a group not engaged with significantly. In the past, the consortium produced a video about rancher collaborations and had guest presentations from ranchers during special sessions at conferences and workshops. Doug Cram (consortium board member and coninvestigator), Carol Baldwin (Great Plains principal investigator) and others provided presentations throughout the day on how and why to conduct prescribed burns in a shortgrass prairie ecosystem. Topics included why prescribed burning is useful to improve vegetation and encourage desirable wildlife, ideal prescribed

burn weather conditions, locating firebreaks, finding equipment and crew, and how to plan a burn to achieve management objectives. Participants reported that the workshop provided "on-the-ground, practical info we can apply on our ranch." Information about the impact of humidity on fire behavior, prescribed fire frequency, and the effects of prescribed burning on grama grasses were particularly noted. Additional workshops and training were proposed, and many of the participants are looking forward to a future, in-the-field training event. The ranchers who attended the workshop will be able to share the knowledge gained at the workshop with others. Attendees included ranchers, local volunteer fire department staff, as well as students and faculty from Clarendon College and New Mexico Highlands University.

The relevant societal impact categories are conceptual, capacity building, and connectivity (Table 1).

TALLGRASS PRAIRIE AND OAK SAVANNA

Tallgrass Prairie and Oak Savanna Fire Science Consortium

Hands-on Fire Science Workshop

In March 2022, the consortium conducted a Hands-On Fire Science Workshop that gave participants introductory training in standard methods to quantify weather, fuels, fire temperature, and fire effects. The workshop also demonstrated research-management collaboration by collecting data on two typical prescribed burn operations held at The Nature Conservancy's Dunn Ranch Prairie in northern Missouri. The workshop would not have been possible without support from Ryan Gauger, the fire program manager for The Nature Conservancy's Missouri Chapter. Long-term support for the consortium helped make this workshop come together relatively quickly. Further discussion of the concepts motivating the workshop, as well as in-depth discussion of the outcomes, can be found in the open access article by McGranahan et al, 2022[2]. The article was published in the journal *Fire* in a special section on Fire Research at the Science–Policy–Practitioner Interface.

Enrollment in the inaugural workshop was split between researchers and natural resource managers. Research-focused participants included a graduate student and two post-doctoral researchers. Natural resource managers were early-career professionals representing The Nature Conservancy, other nongovernmental organizations, and two tribal authorities. As the workshop team evaluates applicants for the spring 2023 workshop, enrollment priority may favor graduate students and early-career researchers. However, increasing land manager's literacy in fire research is an important component of bridging the research-management gap. For example, one workshop participant has already worked within their program to build and deploy thermocouples to assess prescribed fire management. In addition to increasing in-house expertise, the consortium anticipates that greater literacy in research methods will have an impact as land managers negotiate research-management collaborations in the future.

The relevant societal impact categories are conceptual, connectivity, and capacity building (Table 1).

[2] McGranahan, D.A. , C.M. Maier, R. Gauger, C. Woodson, C.L. Wonkka. 2022. The Dunn Ranch Academy: Developing Wildland Fire Literacy through Hands-on Experience with Prescribed Fire Science and Management. Fire 5(4): 121.

Appendix

Table A1. Number of 2022 FSEN activities and participants by category.

ACTIVITY CATEGORY	ACTIVITIES	PARTICIPANTS
Academic Credit Courses	21	725
Bibliographies or Annotated Bibliographies	4	197
Blog Posts	185	44,503
Conference or Symposia Presentations[1]	48	34,544
Conferences/Workshops	79	9,204
Databases	11	8,019
Encyclopedias	0	0
Facebook Postings	3,286	43,310
Fact Sheets and Handouts Produced	84	14,146
Field Consultations and Expert Cadres	114	784
Field Trips, Tours, Demonstrations, or Roadshows	36	1,913
Guidelines or Guidebooks	6	1,347
Leadership Briefings	104	776
Newsletters Produced	230	158,722
Other Social Media Activities	298	1,190
Podcasts	7	484
Poster Presentations[2]	7	255
Requests for Information, Assistance, or Referrals	1,188	1,533
Short Courses and Continuing Education Units	58	2,351
Syntheses	14	12,915
Talks and Personal Briefings About The Exchange	179	5,024
Training Sessions	23	1,593
Tweets	2,469	71,523
Video/Vimeo Productions	139	18,293
Webinars	119	18,151

[1] note participants are for the talk, not the entire conference
[2] note persons engaged not the entire conference

Table A2. Number of participants by organization in 2022 FSEN activities.

ORGANIZATION CATEGORY	PARTICIPANTS
Agricultural Research Service	25
Bureau of Indian Affairs	126
Bureau of Land Management	455
Bureau of Reclamation	3
Cities and Local Communities	1,037
Companies	1,281
Consultants	514
Counties/Burroughs/Parishes	839
Department of Defense, including United States Coast Guard	235
Fire Learning Network and The Nature Conservancy	473
Foreign Organizations and Individuals	651
Geological Survey	300
National Aeronautics and Space Administration	16
National Oceanic and Atmospheric Administration, and National Weather Service	112
National Park Service	368
Natural Resources Conservation Service	326
Nongovernmental Organizations (not previously listed)	1,441
Prescribed Fire Councils	76
Private Associations	146
Private Landowners	1,323
Regional Authorities	129
States	4,244
Tribal Nations	201
U.S. Fire Administration	9
U.S. Fish and Wildlife Service	446
US Forest Service (National Forests, Grasslands, State and Private Forestry)	2,416
US Forest Service Research	566
University and College Faculty or Researchers	2,160
University and College Students	1,006


USGS
science for a changing world
INTERIOR
WILDLAND FIRE