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Burning from the ground up: the structure and impact of Prescribed Burn Associations in the United States

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ABSTRACT

Background. To combat losses and threats from fire exclusion and extreme wildfire events, communities in the United States are increasingly self-organizing through locally led Prescribed Burn Associations (PBAs) to plan and implement prescribed burns on private lands. **Aim.** Our study aimed to document the expansion of PBAs and provide insight into their structure, function, and impacts. **Methods.** Leaders from 135 known PBAs across the United States were invited to participate in an online survey. **Key results.** Survey results demonstrate a widespread emergence of PBAs in the United States, successfully mobilizing thousands of volunteers to collectively burn more than 34,000 ha annually. **Conclusions.** PBAs demonstrated that they are reducing myriad barriers to prescribed burning while meeting their goals to broaden access to the use of fire using a neighbors-helping-neighbors model to provide training, pool resources, and reduce the costs of prescribed burning. By including volunteers with diverse levels of experience and backgrounds, PBAs are changing the narrative of who has access to the use of fire. **Implications.** The adaptability of the PBA model to local contexts provides an alternative model of community-led, non-agency-based fire management critical to advancing the pace and scale of restoration needed in fire-adapted ecosystems.

Keywords: beneficial burning, controlled burns, fire, organization, Prescribed Burn Association, prescribed fire, private lands, stewardship, volunteers.

Introduction

Fire has influenced the evolution of humans and landscapes across the world (Bowman *et al.* 2011; Coughlan *et al.* 2018; McLauchlan *et al.* 2020). For millennia, human populations have used fire to steward landscapes and promote valued resources (Lake *et al.* 2017; Long *et al.* 2021) while shaping the distribution, structure and function of ecosystems (Syphard *et al.* 2007; Pausas and Keeley 2009; Trauernicht *et al.* 2015). In the United States (US), broadscale fire suppression policies enacted in the early 20th century effectively excluded fire from landscapes adapted to or dependent on fire (Nowacki and Abrams 2008; Marlon *et al.* 2012; Ryan *et al.* 2013; Ratajczak *et al.* 2016). The ecological, social and cultural implications of this fire suppression era have been severe. The elitism of fire management agencies in the US has excluded numerous fire-dependent cultures and people, including Tribes, ranchers and local communities (Stephens and Ruth 2005; Vinyeta 2021). These patterns have naturally extended from wildfire management into prescribed fire, especially as demand and momentum for prescribed fire have increased in recent decades. Exclusivity is implicit in the various regulations, qualifications and policies that govern the use of prescribed fire, especially in the US federal fire system (Black *et al.* 2020). However, as losses and threats compound – both from fire exclusion and extreme wildfire events – communities are self-organizing to reclaim their right to beneficial fire. Much of this organizing is happening through local and regional Prescribed Burn Associations (PBAs): cooperative volunteer networks of landowners, community members

and others working together to plan and implement burns on their own land and in local landscapes. PBAs represent a collaborative approach to fire management on privately owned lands that promotes healthy ecosystems, safe prescribed fire practices and community connection; this approach is relevant in the US, where this research was focused, but also in many other parts of the world.

Local, community-based fire has long been inspired by Indigenous burning practices established over millennia to achieve ecological, cultural and spiritual objectives in connection to Tribal or Traditional Indigenous laws and customs (Clark *et al.* 2022). The adoption of fire exclusion as a primary policy after colonization led to the persecution and criminalization of Indigenous fire practices (Norgaard 2019; Vinyeta 2021; Colenbaugh and Hagan 2023). Settlers who promoted the intentional use of fire saw their cause derided as 'Piute forestry', a derogatory term intended to belittle Indigenous burning practices while marshaling anti-Indian sentiment to sell fire exclusion to the public, a tactic later employed by Smokey Bear ad campaigns (Greeley 1920; Vinyeta 2021; Vinyeta and Bacon 2024).

Despite mounting evidence supporting the benefits of prescribed burning (Chapman 1932; Stoddard 1935), the practice remained restricted. US Forest Service (USFS) researchers and foresters in the western US insisted that repeated light burning was wasteful and destructive to forests while burying research that showed otherwise (Pyne 1995; Smith 2017; Miller 2020). When unauthorized 'woods-burning' by ranchers and hunters nevertheless continued in the southeastern US (Pyne 1982; Johnson and Hale 2002; Coughlan 2016), psychologists were federally funded to investigate this persistence to inform fire prevention campaigns (Shea 1940; Dunkelberger and Altobellis 1975; Doolittle and Lightsey 1979).

Federal policy changed to allow prescribed burning on federal lands in 1943 (Bickford and Newcomb 1946) and in 1945, the California State legislature authorized the California Department of Forestry (CDF) to issue permits to private landowners for controlled burning (van Wagtendonk 1995). Although the USFS, CDF and timber industry continued to condemn the use of prescribed burning in timberlands (Miller 2020), ranchers began forming Range Improvement Associations (RIAs) to organize cooperative burns over large tracts of rangeland under permit. During this period, groups of ranchers in California burned approximately 40,000 ha annually under permit to control woody plant encroachment and enhance forage for livestock (Biswell 1963). The RIA movement, however, was short-lived, partially owing to warnings from CDF foresters about the risks and liability of fire escapes, and declined following a peak in 1955 (Biswell 1989, p. 98).

Although the use of intentional fire in the Great Plains continued in some areas (Hoy and Isern 1995), widespread fire exclusion resulted in increasing woody plant encroachment on rangelands across the region. The use of fire for brush management began gaining interest owing to its cost-effectiveness, but many ranchers 'needed to be educated, equipped, trained, and empowered to implement burning on their own ranches' (Taylor 2005). Inspired by the earlier RIA era in California (J. R. Weir, pers. comm.) and recognizing a need to organize communities to overcome these various barriers, the first PBA was formed in Nebraska in 1995, bringing ranchers together to receive training, pool equipment and resources, and return fire to the hands of ranchers (Diaz *et al.* 2016; Weir *et al.* 2016). The PBA model has rapidly spread across the US, with more than 140 PBAs across the country today (Great Plains Fire Science Exchange 2025). Additionally, statewide PBAs have formed to support and promote local PBAs (Weir *et al.* 2016). PBAs continue to shift attitudes and perceptions toward prescribed fire use by building mutual trust among members (Toledo *et al.* 2014) and on a larger scale, through a demonstrated safety record (Weir *et al.* 2018). However, little is known about the structure of PBAs or the scale at which they are applying fire to the landscape at a national level. This article aims to illuminate the expansion of the PBA movement and highlight the ways it is reversing the trend of fire exclusion – both ecologically and culturally.

Methods

This descriptive study used an online Qualtrics survey to explore various aspects of PBAs. This project was reviewed and approved by the Oregon State University Institutional Review Board (No. HE-2023-240). For purposes of this study, the collective term 'PBA' refers to groups that identified themselves as a PBA or other cooperative burning group (e.g. RIAs and burn cooperatives).

Author positionalities

We serve in applied research roles working directly with PBAs in our respective regions. Authors Quinn-Davidson and Stackhouse were instrumental in the formation of the first PBA in the western US while Authors Adlam, Deak, Quinn-Davidson, and Stackhouse continue to work directly with their local PBAs and statewide with PBAs across California and Oregon. Author Fawcett played a key role in forming several PBAs and works directly with them in North Carolina, while also communicating the role and importance of PBAs across the southern US. Author Weir has been instrumental in the formation and success of PBAs throughout the Great Plains and has assisted with starting over 60 PBAs in 18 states. As a result of our backgrounds and positionalities, we were able to evaluate the phenomena we have experienced and formulate questions informed by our personal experiences working with PBAs.

Recruitment and survey

An email distribution list of PBA leaders was compiled using data from a national online map of PBAs (Great Plains Fire Science Exchange 2025), which is updated through PBA

submissions, along with contacts from PBA websites, statewide PBAs and personal connections of the authors. The survey was distributed via email to PBA leaders across 135 known PBAs in the US in the fall (autumn) of 2023. The survey questions were designed to collect basic information about PBAs across the US, including coverage area, annual burn accomplishments, membership, organizational structure, funding and training (Supplementary material S1). In addition to questions that utilized multiple choice and 5-point Likert scales (Likert 1932), open-ended questions were included to collect more in-depth insights. A draft survey was sent to 29 PBA and survey experts to evaluate its clarity and organization. Feedback was received from 10 respondents, and their suggestions were incorporated into the final version of the survey.

The survey followed the basic tenets of Dillman's Tailored Design Method (Dillman *et al.* 2014). In September 2023, 184 PBA leaders were notified about the upcoming survey. Accounting for nine bounce backs, the email successfully reached 175 recipients. Because some PBAs listed multiple contacts, more individuals received the email than the number of PBAs, but only one response was requested per PBA. The survey was open for 5 weeks from October to November 2023, with two email reminders sent during that period. For PBAs that submitted more than one response, only the most thorough response was kept.

Analysis

Data processing and analyses were completed using R v4.3.1 (R Core Team 2023) in RStudio v2023.6.1.524 (Posit Team 2023) with the Tidyverse (Wickham *et al.* 2019), FSA (Ogle *et al.* 2023) and ggstatsplot (Patil 2021) packages. The number of acres burned and number of burns completed by PBAs followed a non-parametric distribution; to determine the potential relationship between these data and the PBA region, we used a Kruskal–Wallis test followed by a Dunn Test for Multiple Comparison. Given the fairly small population from which the data were derived, the relationship between categorical variables (e.g. between region and primary burn objective) was not examined. An independent *t*-test was used to compare early and late respondents for the Likert scale questions, with late respondents considered as the last 50% of respondents who took the survey (Lindner *et al.* 2001).

Results

This descriptive study presents findings from selected survey questions related to the social aspects of PBAs. Of the 135 PBAs invited to participate in the survey, responses were received from 75 PBAs for a response rate of 55.6%. Three PBAs not included in our original invitation list also participated in the survey. Analysis revealed no significant differences between early and late respondents, with test statistics and sample sizes varying by question. Because not every question was answered by every respondent, results are presented as a percentage of respondents per question below to illustrate patterns, trends and discrepancies among categories.

Emergence of PBAs

Responses were well distributed across the US, with 30 from the Great Plains, 21 from the west, 14 from the southeast and 10 from the northeast (Fig. 1*a*). This represents response rates of 42.3, 63.6, 73.7 and 83.3 %, respectively.

The year of PBA formation illustrates the emergence and growth of PBAs through time (Fig. 1*b*). The earliest PBA in our analysis, a remnant of the RIA era in California that was revived following the advent of PBAs, reported formation in 1956. The first non-RIA PBAs formed in the Great Plains

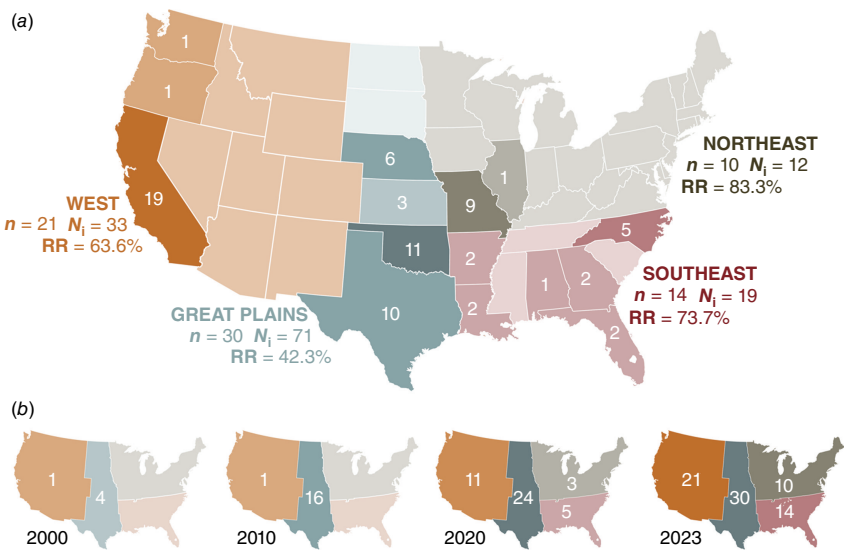

Fig. 1. (*a*) Geographic distribution of survey responses by region (N = 75) with the number of PBAs invited to participate in the survey (N_i), number of responses received (n), and response rate (RR) indicated for each region (N_i = 135). Darker shading indicates a greater number of respondents in each state. (*b*) The number of PBAs that completed the survey established within each region in years 2000, 2010, 2020 and 2023 (n = 75).

during the 1990s and by 2010, 16 PBAs had been established in that region. Over the following decade, PBAs began to spread across the nation, with 8 additional PBAs forming in the Great Plains, 11 forming in the west, 5 forming in the southeast and 3 forming in the northeast. Between 2020 and 2023, the momentum continued with an abundance of new PBAs formed across all regions.

Burn activity

PBA leaders were asked to report the average number of burns (Fig. 2*a*) and area burned in acres (Fig. 2*b*) annually by their PBA over the past 5 years or since their PBA was formed if less than 5 years old. Collectively, PBAs reported conducting a sum of 660 prescribed burns over 34,199 ha (84,508 acres) on average annually.

Excluding 8 PBAs that reported conducting zero prescribed burns over the past 5 years (i.e. they were recently established ($n = 7$) or primarily formed to provide landowner technical assistance and education about prescribed burning rather than assistance with burn implementation ($n = 1$)), PBAs conducted an average of 10, median of 7 and maximum of 50 burns annually ($n = 66$). PBAs in the southeast reported the greatest mean (19.6) and maximum (50) number of burns annually followed by PBAs in the Great Plains (mean: 8.5; maximum: 30), northeast (mean: 10.4; maximum: 25) and western regions (mean: 5.4; maximum: 18). The number of burns conducted annually was significantly different between the southeast and western regions ($P < 0.05$), with PBAs in the west, on average, conducting one-quarter the number of burns of PBAs in the southeast.

Similarly, PBAs in the southeast reported the highest mean area burned annually (868.0 ha) followed by the Great Plains (798.0 ha), northeast (92.5 ha) and west (38.3 ha). The area burned by PBAs in the west was found to be significantly different from PBAs located in the Great Plains ($P < 0.001$) and southeast ($P < 0.001$), with the average PBA in the Great Plains and southeast annually burning over 20 times the area of the average PBA in the western US.

The primary burn objectives for burns led by PBAs varied across regions (Fig. 3). In the southeast, PBAs were most likely to be burning for wildlife habitat (100%), restoration of fire-adapted ecosystems (86%) and wildfire risk reduction (64.3%) ($n = 14$). The primary objectives reported by PBAs

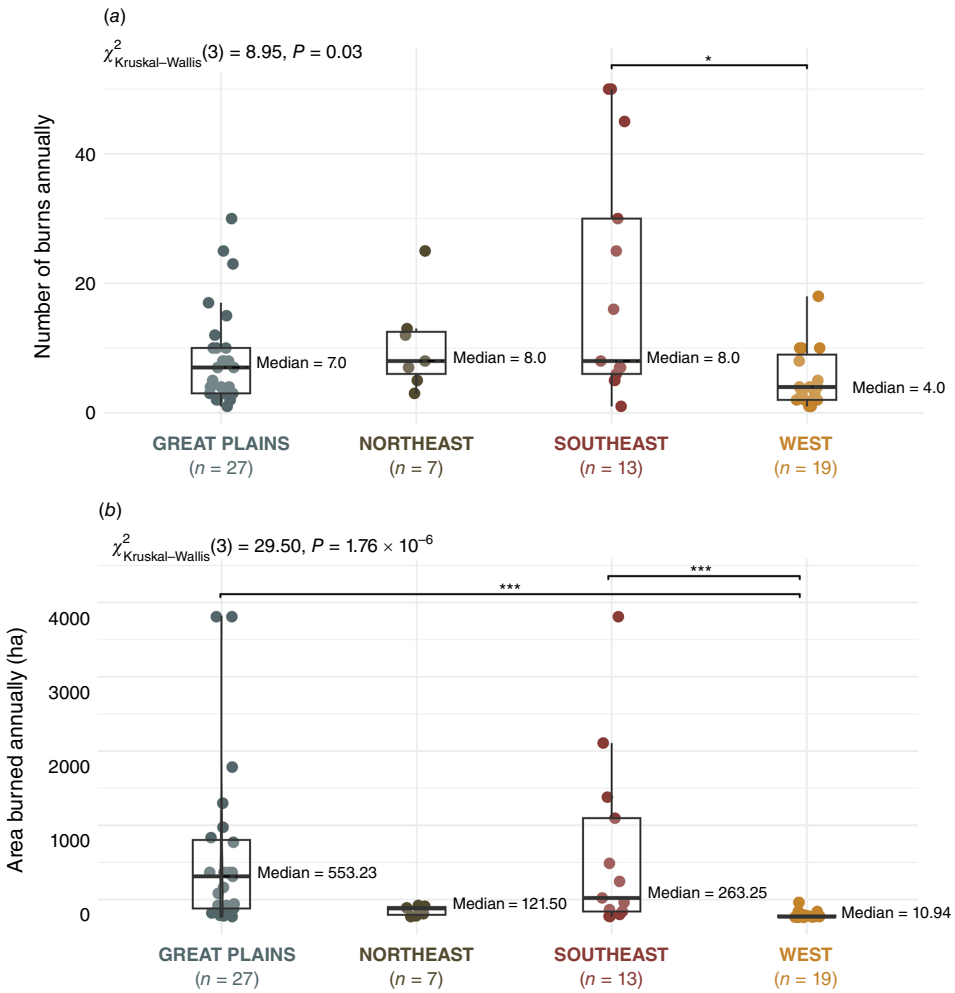

Fig. 2. Regional distributions of (*a*) average number of burns completed, and (*b*) average number of hectares burned annually reported by PBAs. Medians, indicated by thick black horizontal lines, are reported to the right of each box plot. Statistics reported at top of each panel are for the Kruskal–Wallis rank-sum test with three degrees of freedom and *P*-value. Significant pairwise differences for Dunn's test with Holm adjustment are reported above each pair using brackets (*$P \leq 0.05$, **$P \leq 0.01$, ***$P \leq 0.001$).

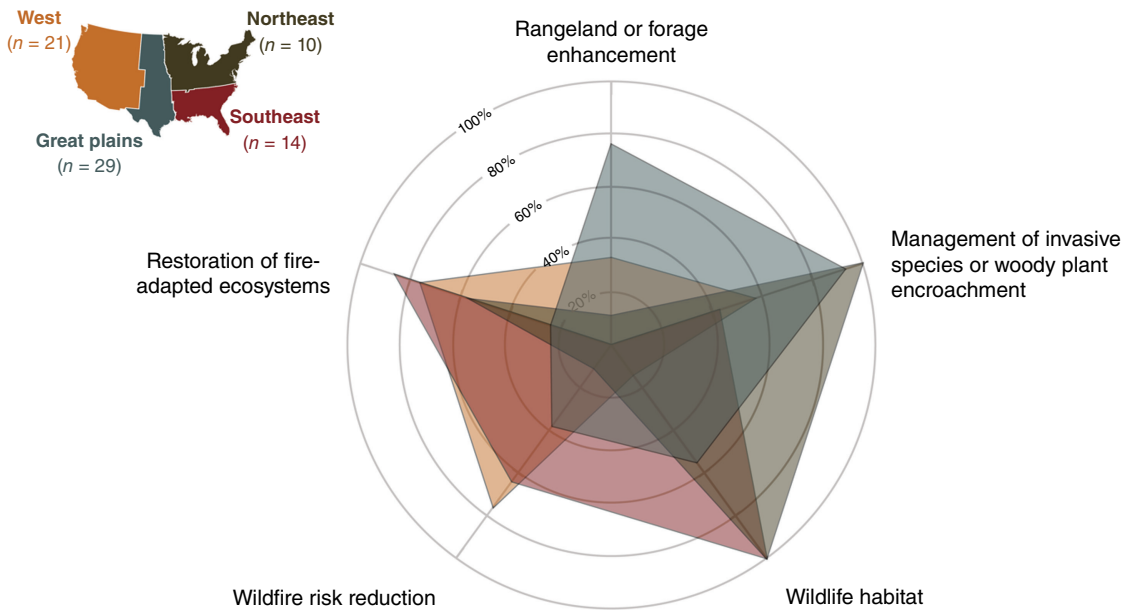

Fig. 3. The primary objectives of PBA burns by region selected by more than 15% of respondents (N = 74).

in the Great Plains were management of invasive species or woody plant encroachment (93%), rangeland or forage enhancement (76%) and wildlife habitat (55%) (n = 29). PBAs in the northeast reported wildlife habitat (100%), management of invasive species or woody plant encroachment (100%) and restoration of fire-adapted ecosystems (60%) as their primary objectives (n = 10). In the western region, the primary objectives were wildfire risk reduction (76.2%), restoration of fire-adapted ecosystems (76.2%) and management of invasive species or woody plant encroachment (57.1%) (n = 21). Notably, 14% of PBAs in the western region also selected 'Indigenous cultural revitalization or other cultural objectives' as a primary objective of their PBAs.

Broadening access to the use of fire

When asked to select what they considered to be the three most important actions of their PBA, 'Broaden[ing] access to the use of prescribed fire as a management tool' was selected as the most important action (72%). Other frequently selected options included 'Increas[ing] public acceptance and understanding of prescribed fire' (57%), 'Provid[ing] field-based training' (57%), 'Provid[ing] tools and equipment for burns' (48%) and 'Maximizing acres burned/number of burns' (21.3%) (N = 75). Options selected by less than 20% of respondents included: 'Secure funding for burn implementation, equipment, and/or staff time' (16%), 'Act as a liaison with agencies/cooperators/regulators' (11%), 'Provide social networking opportunities for members' (7%), 'Provide classroom/online education' (5%) and 'Other' (3%).

In a follow-up question, respondents were asked how successful they would consider their PBA in meeting the three goals they selected (Fig. 4). Over 42% of respondents believed their PBA was 'extremely' or 'very' successful in broadening access to the use of prescribed fire as a management tool (n = 54) but only 21% said they were 'extremely' or 'very' successful at increasing public acceptance and understanding of prescribed fire (n = 43). PBA leaders rated themselves as more successful at providing field-based training, with 45% selecting they were 'extremely' or 'very' successful at doing so (n = 43). Fewer respondents viewed themselves as successful in maximizing area burned and number of burns, with 47% reporting that they were 'not at all' or only 'slightly' successful at doing so (n = 16).

PBAs demonstrated how they were broadening access to the use of prescribed fire as a management tool by not having strict requirements and cost-prohibitive fees, while offering training opportunities that welcomed community participation. When asked, 'What are the requirements for people to participate in a burn on someone else's property?', the most selected option was requiring proper personal protective equipment (PPE) and/or [personal protective] clothing (45%) (Fig. 5*a*, *b*). It should be noted that based on the authors' experiences, this often refers to cotton or wool clothing, boots, eye protection and gloves, but not usually Nomex or fire shelters. Less than one-fifth of PBAs required previous training and/or qualifications, and the least selected option was 'age-based restrictions' (11%). Notably, almost one-quarter of the respondents selected 'None of the above', suggesting that their PBA did not require any of the potential requirements listed in the survey. Furthermore, 48% of PBAs reported that it was free for active members to have their land burned by the PBA.

In terms of how PBAs are broadening access to the use of prescribed fire through training opportunities, 77% provided at least one training per year and considered all of

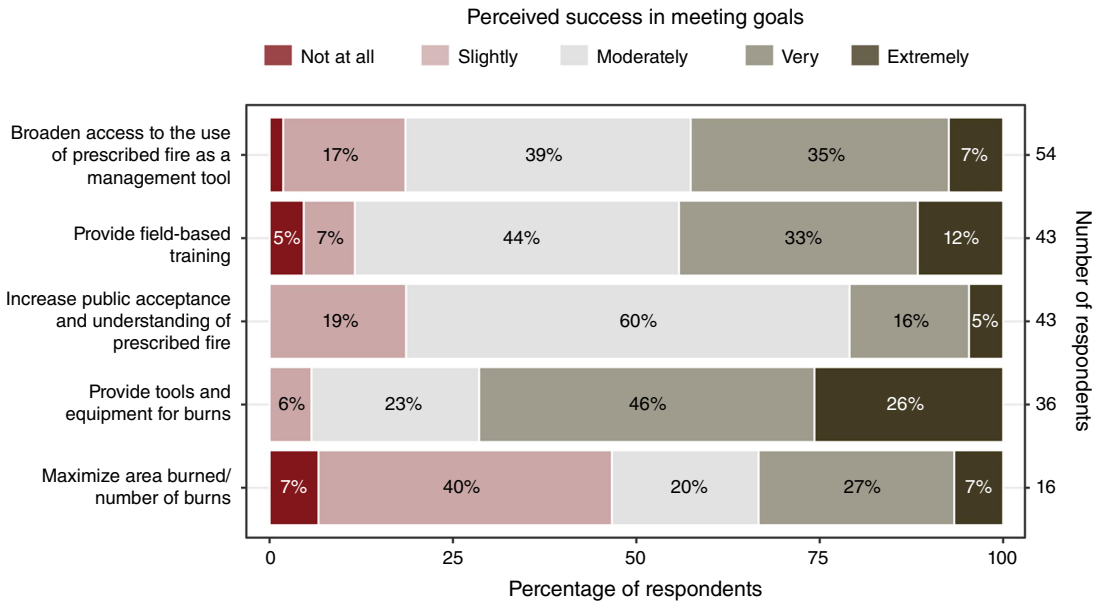

Fig. 4. Responses to the question 'How successful do you consider your PBA in meeting the three goals you selected [as one of the top three most important actions for your PBA to be doing]?' (N = 75). The number of respondents that selected the goal as one of the top three most important action(s) for their PBA is indicated on the right y-axis. Responses selected by less than 20% of respondents are not included.

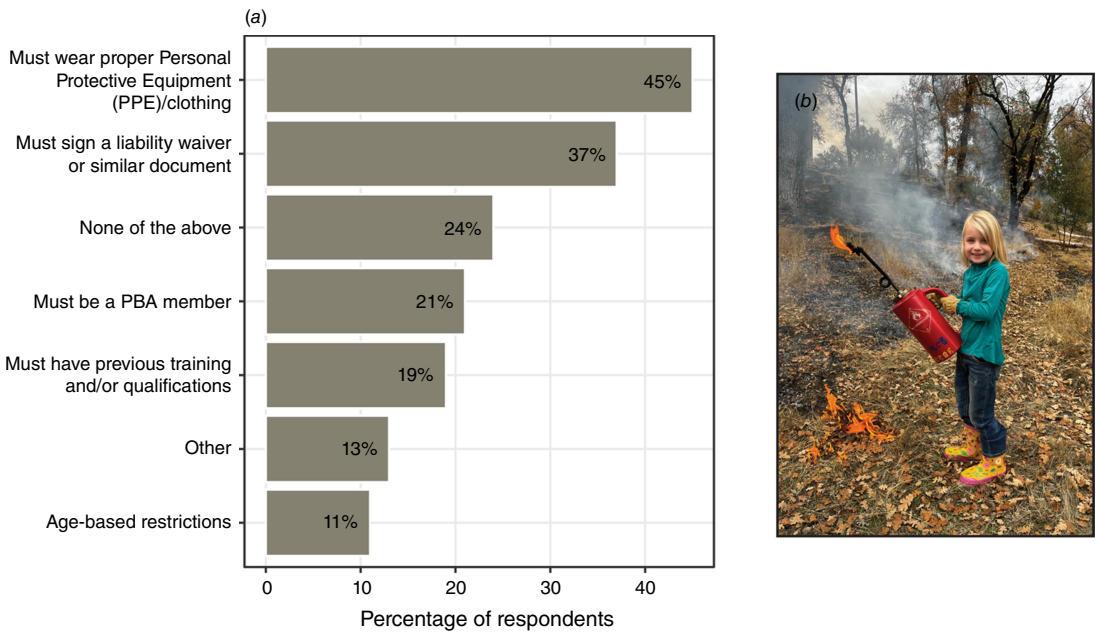

Fig. 5. (*a*) Responses to the question 'What are the requirements for people to participate in a burn on someone else's property?' (N = 75). (*b*) Only 11% of PBAs required age-based restrictions, highlighting how PBAs are transferring knowledge to the next generation of land stewards and fire practitioners (photo credit: Alison Deak).

their prescribed burns to be training burns. Over half of the PBAs surveyed (53%) reported they opened their prescribed burns to community members to participate through 'learn and burn' or other educational events.

Culture of volunteerism and complexity of funding

Our survey results showed a culture of volunteerism prevalent throughout the PBA community. Most PBAs (56%) reported having between 21 and 100 members (N = 73).

When asked how they defined PBA membership, leaders reported various membership definitions across PBAs, ranging from paying membership fees (68%) and signing memorandums of understanding (MOUs) or other membership documents (17%) to membership being informal and consisting of just an email group or contact list (28%) ($N = 75$). Of those that reported how much and how often member dues were collected, most were collected annually (86%) with rates ranging from US$10 to US$75 per year (median of US$25) ($n = 44$).

Across our dataset, 61% of PBAs reported their leadership to be entirely volunteer-based ($N = 75$); however, this varied by region. Whereas 93% of PBAs in the Great Plains ($n = 30$) and 90% in the northeast ($n = 10$) relied entirely on volunteers for leadership, only 36% in the southeast ($n = 14$) and 19% in the west ($n = 21$) reported leadership to be entirely volunteer-based ($n = 21$). In the southeast, 29% of PBAs surveyed had a full-time paid position and/or a paid staff member from a partner or umbrella organization. Similarly, 19% in the west had a full-time paid position and 52% had a paid staff member from a partner or umbrella organization that provided leadership.

When asked how they currently fund or support their PBA's work, the majority (88%) reported relying on donated time and resources from members ($N = 75$) (Fig. 6). This reliance on PBA members to support their work through donated time and resources was consistently high across regions, ranging from 100% in the northeast to 76% in the west. The Great Plains (93%) and northeast (80%) were most likely to support their work through member fees, with 45% of PBAs in the Great Plains supported by a statewide PBA. PBAs in the southeast and west were more likely to depend on grants than other regions. Specifically, 57% of PBAs in the west reported funding their PBA through state grants and 50% in the southeast received funding from federal grants.

Agency involvement

Although agencies played a role in some of the PBAs we surveyed, lack of agency support also presented a challenge for some PBAs. When asked 'How important or unimportant has support from [state fire suppression agencies] been to your PBA?', 30% of PBA leaders said it was 'critical' and 38% said it was 'important, but not critical' ($n = 66$). Support from federal agencies was viewed as less important, with only 13% reporting it as 'critical' and 53% reporting it as 'unimportant' ($n = 61$). Moreover, 36% of PBA leaders reported lack of agency cooperation as a challenge they had faced with their PBAs ($n = 66$).

The importance of support from agencies was found to wane through time. Although 43% of PBAs leaders said that support from an agency or other organization's staff was a critical element that contributed to establishing their PBA, only 30% thought this was an important element for sustaining their PBA long term ($N = 74$). Motivated landowners and strong leadership from one or more core individuals were more often reported as important for PBAs to establish and sustain themselves, with dependence on these individuals increasing with time (from 70 to 77% and 61 to 64%, respectively).

A PBA leader from the southeast explained how support from agencies has benefited their PBA, writing:

> Support from our partner agencies has been critical to our success with funding and resources, and steering the PBA during leadership transition. Educating and encouraging

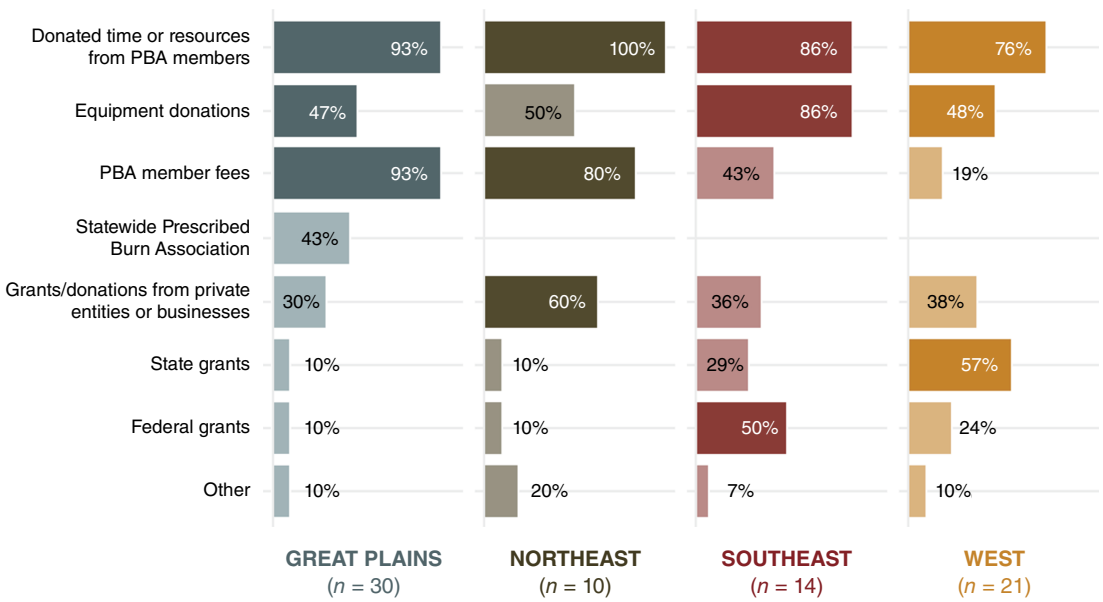

Fig. 6. Responses to the question 'How do you currently fund or support the PBA's work?', faceted by region ($N = 75$).

generational landowners in the mountains to burn their land has been challenging, and although we are projected to burn three times more acres this season, I feel like it will take multiple years to create a culture of fire where most landowners perform their own burn planning and implementation.

Discussion

Across the globe and over thousands of years, humans have used fire in targeted ways to rejuvenate, enhance and steward their landscapes. Over a century of fire exclusion has caused innumerable ecological impacts on fire-adapted ecosystems, both in the US (Nowacki and Abrams 2008; Hagmann *et al.* 2021; Knapp *et al.* 2024; Stephens *et al.* 2024) and in many other parts of the world (e.g. Australia, Sneeuwjagt *et al.* 2013; Europe, Fernandes *et al.* 2013). Fire exclusion has also had social and cultural implications, fracturing the human–fire relationship and limiting the ability of local communities to steward their lands (Eloy *et al.* 2019; Norgaard 2019; Carroll *et al.* 2021; Dickson-Hoyle *et al.* 2021; Colenbaugh and Hagan 2023; Boerigter *et al.* 2024; De Oliveira *et al.* 2025). The professionalization of fire use, where it is often conflated with wildfire suppression and subject to formalized firefighting standards, has put beneficial fire increasingly out of reach for Tribes, ranchers and multi-generational local communities – the same groups from which fire use practices originated. However, as wildfire threats and losses grow internationally, local communities are reclaiming their relationships with fire. This movement for fire is diverse, with varying approaches across geographies and cultures. The rise of PBAs in the US is one of many testaments to the appetite for a rekindled connection with fire. Over the past four decades, and especially in the last 5 years, more than 140 PBAs have emerged across the US, successfully mobilizing thousands of volunteer members and implementing prescribed fire on over 1.1 million ha (Weir *et al.* 2015; Great Plains Fire Science Exchange 2025; J. R. Weir, unpubl. data). The results from our nationwide survey of PBAs demonstrate that an alternative model of community-led, non-agency fire management is possible to restore fire-adapted ecosystems on private lands at the landowner scale.

PBAs across the US are accomplishing their goals of broadening access to and increasing public acceptance of prescribed fire in numerous ways. PBAs are offering training opportunities, lowering financial barriers to prescribed burning, welcoming community participation and pooling resources among members. Most PBAs did not require expensive personal protective equipment or training and qualifications that could present a barrier to entry for volunteers, ensuring both professionals and non-professionals can participate. A quote from a PBA leader who responded to our survey demonstrates why lowering the burden for participation is an important aspect of the PBA model: 'Keep it simple. Avoid unnecessary paperwork and MOUs… there are ample amounts of bureaucratic agencies in fire. Do not create another one with too much red tape and unnecessary requirements.' This lack of strict requirements for participation is further allowing PBAs to change the narrative of *who* has access to the use of fire. Having no age restrictions highlights PBAs' intergenerational aspect and, as noted by Twidwell *et al.* (2013), their ability to educate future land stewards about the ecological role of fire.

A culture of volunteerism was inherent throughout the PBA community that we surveyed, relying heavily on volunteer leadership and donated time and resources, especially in the Great Plains and northeast. Although our study did not aim to understand volunteers' motivations behind donating their time and resources, these results – coupled with the rapid expansion of PBAs that are able to engage large networks of members – indicate that they are filling a vital niche. PBAs are reducing many of the barriers to prescribed fire, such as liability concerns, narrow burn windows, costs and resource constraints, which have repeatedly been shown to limit use by private landowners (Haines *et al.* 2001; Yoder *et al.* 2004; Quinn-Davidson and Varner 2011; Wonkka *et al.* 2015; Clark *et al.* 2022; Watts *et al.* 2024). PBAs also complement the work of Prescribed Fire Councils – collaborative networks of land managers, policymakers and fire practitioners focusing on education, policy advocacy and resources to reduce the barriers to prescribed burning – while engaging different audiences to expand the use of prescribed fire (Coalition of Prescribed Fire Councils 2025).

Although few PBAs surveyed considered maximizing area burned and number of burns as a goal, they nonetheless showed they were accomplishing substantial amounts of work, collectively burning an average of over 34,000 ha annually utilizing a largely volunteer-based labor force. As agency workforces contract (Westphal *et al.* 2022), it is increasingly important for agencies to work collaboratively to expand restoration and wildfire mitigation treatments (Schultz and Moseley 2019). In their recent report to Congress, the Wildland Fire Mitigation and Management Commission states, 'it is critical to dramatically increase both the frequency and scope of beneficial fire to mitigate wildfire impacts to both landscapes and communities', and the private sector is needed to meet this challenge (Wildland Fire Mitigation and Management Commission (WFMMC) 2024). In the current bill form of the *National Prescribed Fire Act* of 2024, PBAs are specifically identified to receive technical and financial assistance for establishment and operation by the US Departments of Agriculture and Interior (US Congress 2024). These two examples show how PBAs have established their role at a national level in the application of prescribed fire.

Although both agencies and PBAs may mutually benefit from supporting one another to accomplish training and burning objectives, agency collaboration presented a challenge for one-third of PBAs in our survey. Although nearly one-third of PBAs found support from state fire management agencies as critical, support from federal agencies tended to be viewed as less important. Given the large dependence of

PBAs on donated time and resources, agency partners – especially state agency partners – have an opportunity to play a key role in advocating for PBAs and expanding the capacity of PBAs through equipment donations, funding and provision of resources and personnel (such as engine support) during burns. However, PBAs can benefit agency partners by supporting mutual land management goals, providing live-fire training opportunities, facilitating community engagement and growing capacity for cross-boundary burning. However, it is important to note that agency engagement can also pose unintended barriers for PBAs – triggering qualifications and environmental compliance requirements, for example – so PBA–agency partnerships should be approached with intention and care.

Funding for PBAs is complex, and sources vary widely by region. PBAs in the Great Plains and northeast demonstrate that state and federal grants are not necessary for PBAs to be successful, with most requiring member fees. PBAs in the Great Plains received support from statewide PBAs, and northeastern PBAs were most successful at securing grants and donations from private entities or businesses. Alternatively, PBAs in the west and southeast were heavily reliant on state and federal grants, often covering salaries for part-time or full-time coordinators. As strong leadership is crucial to the survival of PBAs, stable funding streams may be necessary to ensure their long-term sustainability. Statewide PBAs have been organized in the Great Plains to support local PBAs with additional resources, act as umbrella organizations to secure and distribute funding, develop training and outreach materials to reach a wider audience, and advocate for prescribed burning legislative reform (Weir *et al.* 2016). These statewide PBAs could be a model for PBAs in other regions, and they could generate interest in developing a larger national PBA network that could further support the expansion of the PBA movement at a larger scale.

Although we recognize that PBAs may not be appropriate in all landscapes and cultures, the flexibility of the PBA model may be adaptable to other places to alleviate the barriers to beneficial burning and expand the pace and scale of restoration in fire-adapted ecosystems on private lands within the US and globally. In the US, our survey highlighted large gaps in PBA coverage throughout the Intermountain West, northern Great Plains and northeast regions (Fig. 1). The mid-Atlantic region of the US, for example, has a long history of fire use (Tulowiecki 2024), yet many barriers remain despite supportive statewide policies for private landowners interested in using fire to manage their land (Regmi *et al.* 2024; Smithwick *et al.* 2024). Internationally, there is a recognized role for prescribed burning in landscape management; pastoral burning and traditional fire have long been used by communities to manage shrublands and support livestock production, especially in European countries, such as France and Portugal (Fernandes *et al.* 2013; Coughlan 2014; De Oliveira *et al.* 2025) though they may be met with resistance from policy makers and local communities. Cooperative forest owner associations exist in at least 19 countries, facilitating the sharing of information and equipment for collaborative forestry activities (Kittredge 2005). Similarly, the formation of a civic group composed of farmers to revive burning in the Coastal Norwegian heathlands after a 60–70 year hiatus (Metallinou 2020) highlights the potential for PBAs or similar groups to emerge in other parts of the world. The focus on intercultural fire management in some South American countries is leading to cooperative solutions to the use of fire that bring together Indigenous communities, protected area managers and agencies (Mistry *et al.* 2016).

Additional research is needed to understand the motivations for volunteers engaging with PBAs, the demographics of PBA members, and how and to what extent PBAs are partnering with agencies, Tribes and others to accomplish cross-boundary landscape-scale projects.

Conclusion

Although laws and policies of the 20th century limited who had access to the use of fire, our study showed that PBAs are reclaiming the use of fire. PBAs are fulfilling their goals to broaden access to the use of fire by providing training opportunities, pooling resources and removing barriers while training the next generation of land stewards. Through a largely volunteer-based workforce, the PBA movement in the US is continuing to grow and expand at a remarkable rate while opening pathways to different models of fire management and land stewardship.

PBAs represent a modern 'barn raising', fostering a neighbor-helping-neighbor approach and sharing of resources. Although many organizations utilize volunteer labor to achieve environmental objectives, PBAs are unique in that they are empowering communities to reclaim fire stewardship on their local landscapes, pushing back on the decades-old notion that fire suppression professionals are the only ones qualified to use prescribed fire. PBAs are demonstrating what thousands of years of human history across the world have already shown: that local people of all ages and perspectives can *and should* play a central role in the management and restoration of fire and that fire use does not have to be overly expensive, bureaucratic, or out of reach.

Supplementary material

Supplementary material is available online.

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Data availability. The anonymized data supporting this study and R scripts used for analysis are available in the Dryad Data Repository at https://doi.org/10.5061/dryad.hdr7sqvsr.

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