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Research article

Bridging scales for landscape-level wildfire adaptation: A case study of the Kittitas Fire Adapted Communities Coalition

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ABSTRACT

Federal-level strategies or guidance for addressing wildfire risk encourage adaptation activities that span progressively larger scales, often focusing on landscape-level action that necessitates coordination between decision-makers and socially diverse communities. Collaborative organizations are increasingly explored as one approach for coordinating local efforts that address wildfire risk and adaptation, offering a platform for scaling and adjusting federal and state guidance that align with the needs of local landscapes. We conducted semi-structured interviews with members and supporters of the Kittitas Fire Adapted Communities Coalition (KFACC) and later facilitated two workshops at the behest of the organization. The goal of our interviews and workshops were to better understand how organizations such as KFACC emerge, function, and evolve in complex social and ecological landscapes, with a focus on their role in addressing landscape-level wildfire adaptation. We use an existing theoretical analogy of fire adaptation that crosses institutional and physical scales to help conceive of lessons from in-depth analysis of KFACC functioning. We found that KFACC originated from a need to establish a shared local mission for fire adaptation and a recognition that federal and state initiatives surrounding wildfire management needed further contextualization to be effective among diverse local social conditions. Later organizational foci included identifying key audiences for targeted adaptation efforts, including the identification of key messages and communities where specific mitigation actions might be needed. KFACC members were effective in strategically advocating for fire adaptation resources and policies at broader scales that might increase adaptation within Kittitas County, including caveats to local planning efforts designed for wildfire risk reduction. Likewise, the organization had begun to focus on tailoring mitigation efforts to different communities in the landscape as an effective means of catalyzing sustained, realistic fire adaptation actions. We suggest that organizations like KFACC are well-positioned to act as “board hoppers” who can integrate community-based needs into wildfire management, but caution that the functioning and ‘niche’ of such organizations may require strategic development or regular reflection on organizational goals.

1. Introduction

Addressing wildfire risk necessitates coordination between residents, organizations, and agencies within a shared landscape in order to facilitate unified and strategic adaptation efforts (Charnley et al., 2020; Huber-Stearns et al., 2022). These actions also must recognize the social diversity of communities within a landscape by tailoring adaptation to place-specific circumstances (Paveglio et al., 2015; Brenkert-Smith et al., 2017; Nielsen-Pincus et al., 2015). Wildfire adaptation is the shared implementation of context specific processes or actions that increase human capacity to live in environments where wildfire plays a

natural role. Adoption of specific actions (sometimes called mitigations) and development of strategic relationships or plans are related parts of the adaptation process and can span a broad suite of efforts ranging from behavioral change to fuels management across land ownerships (Paveglio et al., 2016, 2018; Carroll and Paveglio, 2016). Tailoring wildfire adaptation may require distinct sets of tools, techniques, and partnerships across different locations depending on the interactions among communities and agencies or histories of resource management, among other considerations (Paveglio et al., 2018). Likewise, establishing an understanding of community diversity and social cohesion or conflict within a shared landscape is essential to “scale up” adaptation efforts

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beyond the community level (Abrams et al., 2015; Tedim et al., 2016; Paveglio et al., 2019a). Yet meeting the emerging policy foci of managing wildfire at landscape levels is further complicated by a need to establish shared decision-making processes across actors in planning pathways forward, including how to prioritize which communities to work with, where to place fuels treatments, and how to navigate complex social conditions (Steelman and Nowell, 2019; Ager et al., 2019; Williams et al., 2012; Paveglio, 2021). The research presented here explores these challenges in wildfire adaptation by studying an emergent organization attempting to navigate shared adaptation spanning landscapes. We also explore how efforts to work across ownership boundaries and landscapes align with both local level and state or national level directives for fire adaptation and in ways that are applicable to audiences at different scales.

Collaborative organizations are increasingly noted as one solution to expanding capacity for implementing science and advancing sweeping policy recommendations to better “live with fire” across scales (Brummel et al., 2010; Schultz and Moseley, 2019; US Department of Interior and US Department of Agriculture, 2014). These organizations typically operate at local or regional scales and are often referred to as “boundary spanning” or “bridging” organizations in broader literatures because they include membership across jurisdictions and affiliations (Davis et al., 2021; Fischer and Jasny, 2017; Huber-Stearns et al., 2021). Collaborative organizations distinguish themselves from other entities because they are not formal agencies, but rather are comprised of an assortment of private citizens, agency representatives at federal and state scales, local governments, and non-profit organizations (among other participants) who typically share the same goals, but may operationalize them through different mechanisms (Kelly et al., 2019; Palsa et al., 2022). Existing work on collaborative organizations and natural resource management has frequently explored the roles of groups with broader goals (e.g., forest and watershed collaboratives), including fire-specific efforts to create collaborative groups at smaller scales (e.g., Community Wildfire Protection Plans or Firewise site establishment) (Cheng and Sturtevant, 2012; Diaz-Kope and Morris, 2022; Jakes et al., 2011; Williams et al., 2012). However, there has been little examination of collaborative organizations focused exclusively on wildfire at landscape scales. More specifically, less literature has explored how these organizations develop, function, or navigate the challenges of working within—and across—the variety of requirements, funding streams and priorities that characterize a complex web of external factors and local politics. Also understudied are the ways these organizations are uniquely poised to address the social complexities of the populations they are working with and how to collectively navigate these conditions as a group (Kelly et al., 2019; Hamilton et al., 2021).

The research presented here focuses on the Kittitas Fire Adapted Communities Coalition (KFACC), a county-level organization established to coordinate and advance fire adaptation in central Washington State. We explore the challenges and opportunities surrounding work on fire adaptation at the landscape level through a two-phase research approach. First, researchers conducted semi-structured interviews with KFACC members and peripheral stakeholders to characterize KFACC establishment, decision-making processes, and efforts to date. Phase two of the research included two workshops with KFACC members that were designed to help the organization navigate social complexity across communities in their landscape—specifically, prioritizing where to work and matching those communities with specific resources or opportunities. Our effort contributes to broader literatures on collaboration and co-management of wildfire risk by characterizing how fire adaptation organizations emerge, function, and evolve, including the factors that advance or restrict shared efforts to “scale up” fire adaptation. We also seek to examine the importance of incorporating adaptation efforts at multiple scales of human organization when working towards landscape level adaptation that incorporates human community diversity. Lastly, we utilize and expand an existing theoretical analogy for wildfire adaptation (Paveglio, 2021) with the intent to identify additional

insights provided by the in-depth study of a collaborative organization operating at the landscape scale.

2. Literature review

2.1. Characterizing scalar mismatches in wildfire adaptation

Federal-level strategies and guidance in the United States increasingly encourage wildfire adaptation action at progressively larger geographic scales (US Department of Interior and US Department of Agriculture, 2014; USDA Forest Service, 2022). Many of these landscape level approaches direct agency decision-makers to allocate resources to activities that elevate and address local-level needs in an effort to support coordinated adaptation across scales. Examples of multi-directional efforts for wildfire adaptation include the Collaborative Forest Landscape Restoration Program, Joint Chief’s Landscape Restoration Partnership, and the California Regional Forest and Fire Capacity program. Landscape-level efforts are often implemented top-down from the federal or state agency level, which may not always account for community diversity or create flexibility to accommodate varied contexts at smaller scales (Paveglio et al., 2019a; Kelly et al., 2019).

Existing literature indicates that incorporating local needs into landscape-level programs requires efforts to “scale down” effectively—that is, supporting local-level adaptation in order to produce aggregate outcomes at a landscape scale (Brenkert-Smith et al., 2017; Reid et al., 2018; Moritz et al., 2022). However, scaling down resources to communities and units within a landscape does not always include examination of how the availability of resources influence the variable patchwork of risk within a given landscape, including the provision of guidance on how to match local conditions with appropriate resources (Paveglio et al., 2018). Requiring localized implementation of broad-brush policies can create mismatches between the scale at which actions are required and the scale at which they are effective (Evers et al., 2019; Paveglio, 2021). Likewise, funding sources and timelines for implementation to advance cross-boundary work can sometimes overlook the time it takes to engage in the process of establishing trust and building working relationships among potentially disparate or opposing groups of landowners and managers (Cheng and Dale, 2020; Davis et al., 2021). It is not always clear how funding or resources to communities and local entities can be operationalized to catalyze meaningful progress, or the extent to which these provisions contribute to the establishment of sustainable systems for fire adaptation.

Renewed interest in operating at the landscape level is driven primarily by biophysical modelling of fire risk and tempered by findings within the wildfire social science literature, the latter of which indicates that the optimal entry point for fire adaptation often is the community level (Dunn et al., 2020; Wollstein et al., 2022; Paveglio et al., 2018). Numerous existing programs and practices prioritize upscaling of mitigation actions at the individual property level, including the Firewise USA program, Community Wildfire Protection Plans, and city, town, or county-level cost share agreements for property level fuels reduction (Steinberg, 2011; Jakes et al., 2011; Meldrum et al., 2014). Fostering these unifying conditions for efforts related to fire and forest management is most attainable within communities, positioning them as a good starting point to begin “scaling up” from.

Many complexities exist for operationalizing adaptation at the community scale, and thus may be important barriers in achieving targets of landscape-level wildfire management. To begin, communities vary substantially due to the presence or absence of factors influencing social contexts (Paveglio et al., 2015; Paveglio, 2023). This can include conflict or cohesion between and within communities, trust or distrust in agencies tasked with fire prevention on adjacent public lands, differing place attachments or views about resource use, resident turnover, and negative views of past wildfire management. Importantly, communities are best thought of as an emergent and evolving set of interactions among people and the landscapes they inhabit, rather than a stagnant set

of social conditions or tidy geographic boundaries (Paveglio and Edgeley, 2023; Carroll et al., 2006; Paveglio et al., 2017). Thus, the factors that create, define, or perpetuate community are changing just as the biophysical conditions that drive wildfire risk (e.g., climate change, resource practices, buildup of fuels). Different communities embedded within the same landscape may have vastly different ideas about fire adaptation, leading to social fragmentation within and between communities (Paveglio et al., 2019a).

Directives to operate at the landscape scale, while simultaneously funneling resources to local entities, represent a large scalar leap. A disconnect between scales may also exacerbate a lack of clarity about what roles exist for organizations tasked with to “scale up” successes to more adaptive management of wildfire risk (Leone et al., 2020; Charnley et al., 2020). For instance, entities at the county level typically exist at the intersection between communities and landscapes—they are often implicated as needing to meld resources from both directions (Williams et al., 2012). Existing mechanisms for fostering fire adaptation at landscape levels also tend to be unidirectional and have been criticized for limiting or carefully controlling feedback from communities as a driver of their practices, decision-making processes, or resource allocation (Edgeley et al., 2020). As a result, ongoing wildfire adaptation initiatives are centered on collaborative groups operating at local and regional scales, leveraging pre-existing shared interests to streamline progress via relatively high levels of homogeneity in opinions (Stelman and Kunkel, 2004; Butler and Goldstein, 2010; Paveglio et al., 2019a,b). Collaborative groups or organizations increasingly are pointed to as a catalyst for facilitating broader fire management, and increasingly position themselves to receive and distribute new funding sources efficiently as they become available (e.g., the Bipartisan Infrastructure Law passed in 2021) via their existing collaborative structure. However, limitations to these groups exist, including questions as to whether collaborative groups are representative of the populations that use and share the focal landscape, meaning that funding distribution and involvement in decision making may unintentionally prioritize some places or populations over others (Paveglio and Edgeley, 2023; Cheng and Dale, 2020). As a result, there is a need to develop and document more equitable processes for decision-making about allocation of support within socially and ecologically complex landscapes.

2.2. Social context and wildfire adaptation

Social context influences the form and functions of wildfire adaptations that will be effective in a given place (Meldrum et al., 2018; Paveglio, 2023). As such, managers, policy makers, and practitioners must recognize differences in social context across landscapes where fire management is taking place and support the development and implementation of adaptation strategies tailored to those existing conditions. Existing research documents how social context emerges as part of interacting factors, and which Paveglio et al. (2009, 2015, 2018; 2019b) organize into four groups: demographic/structural characteristics, place-based knowledge/experience, informal interactions/relationships among residents, and access to scientific/technical knowledge networks. Individual expressions of characteristics in each of Paveglio et al.’s groupings combine to influence the emergence of community and the associated capacities that they can mobilize in addressing wildfire adaptation. Collectively, the social context of a place both limits and elevates community members’ ability to access resources, interact with partners, and organize to address fire risk among other risk alleviating activities (Paveglio et al. 2016, 2019b, 2022). Extension of Paveglio et al.’s so called “interactional approach to adaptive capacity” documents how landscapes can often contain many communities, each with their own unique contexts and capacities for fire adaptation, necessitating approaches that speak to the conditions that have emerged over time in each place (Stasiewicz and Paveglio, 2017; Paveglio and Edgeley, 2023; Billings et al., 2023; Uyttewaal et al., 2023). These complex patchworks of social conditions are referred to in the literature as “social

fragmentation,” and necessitate both familiarity with diverse communities and conditions as well as skillsets and resources to tailor adaptation approaches to meet these unique conditions (Paveglio et al., 2019a; Billings et al., 2021; Paveglio, 2023).

Existing research has dedicated significant attention to investigating which approaches communities gravitate towards, support or uphold based on their local social context. For instance, Paveglio et al. (2015) examined patterns in the interacting social context characteristics described above to establish a continuum of wildland urban interface (WUI) community “archetypes.” Archetypes serve as a heuristic, allowing a starting point in the identification of interventions, framings, and motivators that are more generalizable across diverse circumstances and that can likely be operationalized in other communities with similar conditions. Additional work utilizing the interactional approach established and tested divergent “fire adaptation pathways”—combinations of messages, programs, approaches or incentives that are more effective in different archetype communities (Paveglio et al. 2018, 2023; Billings et al., 2021).

While existing research helps advance the tailoring of fire adaptation approaches to community conditions, less work explores how collaborative groups might characterize and navigate diverse social conditions together at landscape scales, or the extent to which they can leverage resources and social connections to produce more intentional adaptation (Huber-Stearns et al., 2022; Cheng and Sturtevant, 2012). Likewise, emerging and existing research both indicate that one necessity of scaling “up” or “down” fire adaptation is a need to more deeply understand how communities form to promote shared action, including examination of the ways that existing programs or fire adaptation strategies might advantage some communities and overlooked others (Fischer and Jasny, 2017; McLennan and Eburn, 2014; Ojerio et al., 2011). Exploration of more avenues for tailoring fire adaptation to various social strengths of communities might be the most productive when funding entities and organizations tasked with disbursement of funds engage in discussions about the corpus of funding opportunities available and the conditions under which they can and cannot be provided (Cheng and Dale, 2020; Colonico et al., 2022). This could then lead to identification of unmet needs and offer pathways towards more creative outreach and support as well as more equitable provision of mitigation funds and resources, supporting a more progressive trajectory for operationalizing understandings of social context within the same landscape.

2.3. Approaches for scaling up adaptation

Paveglio (2021) introduced an extended chess analogy as a framework for understanding human adaptation to wildfire across scales and shared landscapes, including as a way to understand the unique role of organizations attempting to “scale up” or “scale down” efforts to better live with fire. That approach builds from decades of iterative, longitudinal wildfire social science while also incorporating concepts often invoked in governance and collaborative literatures (Paveglio, 2023). Paveglio outlines how approaching wildfire adaptation initiatives in any given place means recognizing that the landscape (i.e., one board among many) features various groups or individuals (i.e., chess pieces) who each have specific capabilities, capacities, and restrictions (see also Stelman and McCaffrey, 2011; Gosnell et al., 2020). Each piece represents communities or their leaders, government agencies, emergency services, private landowners, non-profits, interest groups, and others whose future moves are somewhat dependent on collaborations with others in their shared landscape. In order for pieces in a shared landscape to coordinate in addressing wildfire management (i.e., the other player), they must work to understand, acknowledge and leverage the circumstances that comprise the “club rules” of that landscape (Lachapelle and McCool, 2012; Every et al., 2016; Dickinson et al., 2020).

Paveglio (2021) extends the analogy to three-dimensional chess when representing hierarchical forces that influence wildfire adaptation

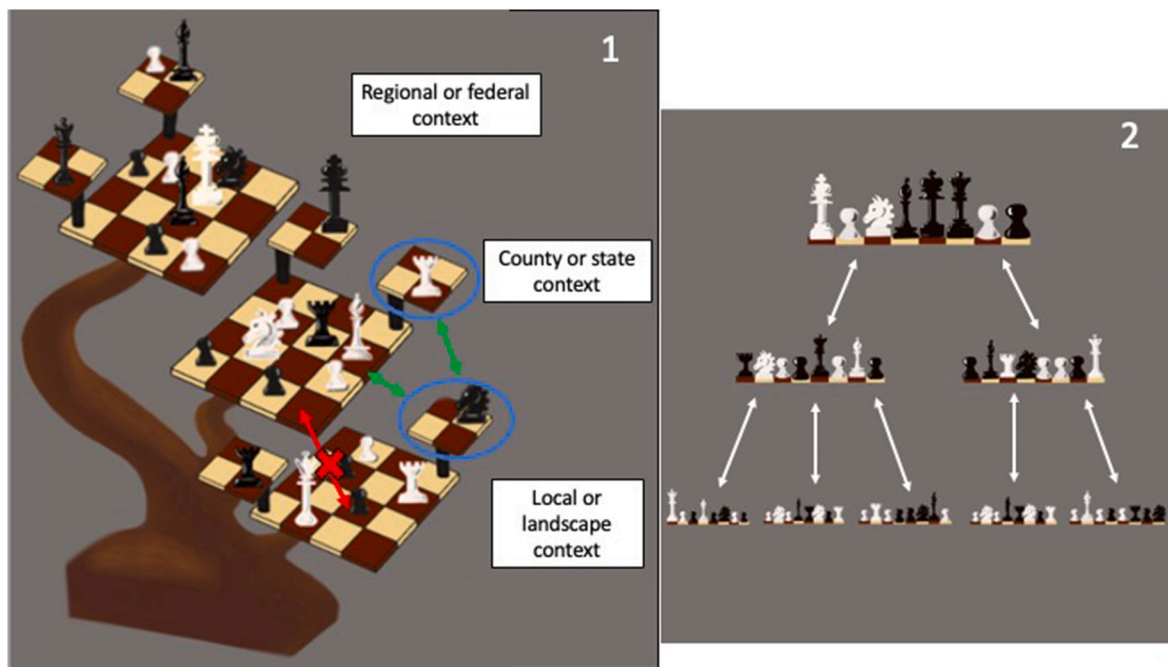


Fig. 1. Engaging in the multi-scalar nature of wildfire adaptation as three-dimensional chess. Processes influencing societal trends in wildfire adaptation occur across a variety of scales, including at local or landscape contexts, county or state contexts, and regional or federal contexts. Interactions between representatives of groups, organizations, agencies or governments at each scale (i.e. board) are all part of the same game, and thus influence the foci, programs or funding that guide ongoing approaches to improving fire management. However, key actors transmit information or ideas across scales in an effort to improve fire adaptation across the system. Translation of lessons, ideas, or efforts across scales requires strategic alignment in the values, strategies, and cultures of pieces on other boards through “attack boards” (e.g. blue circles, panel 1). Actors who strategically align themselves on attack boards can influence other pieces across scales through processes of “board hopping,” and thus can better influence fire adaptation at different scales through translation or adaptation of key ideas (green arrows, panel 1). Local cultures whose values, means of organizing, or culture do not align with those actors on higher boards are less likely to benefit from or influence wildfire policy/adaptation approaches (red arrow and “x,” panel 1). Scientific inquiry into the ways that different pieces maneuver themselves to attack boards, and how agencies or governments align with fire adaptation on the ground are one key way to better explore equity and success of initiatives across a diverse and much broader number of boards at the local or landscape level (panel 2). Figure reproduced from Paveglio (2021).

across scales (i.e., local, landscape, and federal), and that may manifest differently across diverse social conditions at landscape and community levels (Steelman, 2016; Abrams et al., 2015). That is, the fire management system in the United States also includes different “levels” of boards, each of which include a diverse collection of pieces representing hierarchical structures composing agencies, governments, organizations or scientists who interact to influence policy or funding about wildfire management (Fig. 1). Paveglio explains how broader regions are comprised of many local level chess boards of differing complexities (e.g., more or increasingly diverse groups that need to coordinate, long-term conflicts or disagreements between organizations, more or fewer neighborhoods at high fire risk) because humans inhabiting each place are an important influence when evaluating what constitutes a “landscape.” There also tends to be fewer “boards” at progressively higher levels of the three-dimensional chess game (see Panel 2 of Fig. 1). Paveglio describes how the tension between these “top down” and “grassroots” or “bottom up” influences affect fire management processes, including how alignments or misalignments between local values, landscape initiatives and state or federal policy are critical in promoting collective action at local scales (Hamilton et al., 2019; Steelman and Nowell, 2019; Paveglio et al., 2018a; Roos et al., 2016).

Paveglio’s (2021) summarization of wildfire social science lessons about adaptation acknowledges that any attempt to increase or improve wildfire adaptation in a given place means joining a “game in progress.” The legacies and expressions of local context are integral to planning next moves forward. Importantly, because social context across or within landscapes differ—the strategies, initiatives and messages used to achieve collaborative action (i.e., “moves”) will be different across shared landscapes (i.e., “boards”) and thus may be differently recognized, supported, or empowered by those setting policy on other boards.

This points to a need for local knowledge across diverse communities at small scales, including diverse regional networks or expertise that ensure how social diversity scales ‘up’ or ‘down’ when planning for fire adaptation (Sword-Daniels et al., 2016; Paveglio et al., 2018; Hamilton et al., 2023). Paveglio introduces the concept of “board hopping” to describe collaborative groups, initiatives, organizations, or individuals who strategically align themselves in ways that capture top-down funding or resources, transmit “bottom up” lessons across diverse human communities or hierarchical networks, and who help translate scientific understandings into tangible actions. The notion of groups or collectives who exert influence on those above or below them in the hierarchical system of wildfire management, what Paveglio calls “board hoppers” (see also boundary spanning organizations or boundary objects; Davis et al., 2021; Fischer and Jasny, 2017; Huber-Stearns et al., 2021), underscores the importance of coordination to support wildfire adaptation within and between landscapes.

Collaborative organizations gathering momentum at the local and landscape levels are well-placed to facilitate board hopping, and thus increase the effectiveness of state and national resources aimed at wildfire adaptation by tailoring adaptation strategies in ways that build from the unique strengths of diverse local communities (Abrams et al., 2018; Stasiewicz and Paveglio, 2018; Cyphers and Schultz, 2019). Board hopping organizations can help expand area organizational capacity, improve regional ability to capture funding or utilize policy mechanisms, or increase professional development across disciplines (Paveglio, 2021). Such entities can better represent local needs for fire adaptation to higher levels, or strategically help advance initiatives that build sustainable action across conditions (Koebele et al., 2015; Davis et al., 2022). However, board hoppers can also contribute to maladaptation—their priorities, foci or efforts may lead to exclusion or

inclusion of select social networks and knowledge exchanges, a programmatic focus on uniformity in the adoption of fire adaptation efforts (e.g., one-size-fits all solutions), and path dependence through a programmatic focus on seeking funding or promoting targets that might not resonate with local people. Board hoppers, then, can advocate for the funneling of appropriate tools and resources to their landscape, but can also influence the ways in which decisions are made across scales.

One thing that distinguishes board hoppers from boundary spanners, spark plugs, and other commonly used descriptors from existing academic literature is that while the latter terms are usually used to connotate an organization or individual who always have a positive influence, board hoppers may play both positive and negative roles (Paveglio, 2021). A misguided board hopper can restrict flow of resources between boards, advocate for a resource misaligned with their board, or even board hop and then refrain from advocating at all (Paveglio and Edgeley, 2023; Meldrum et al., 2015; Ostergren et al., 2006). Understanding how to facilitate the creation of board hopping organizations that can be successful advocates for their landscapes is therefore critical to the integration and cohesion of fire adaptation across scales.

Despite interest in and the emergence of board hopping organizations, there has to date been little exploration of how such organizations develop shared understandings and convey meaning about fire adaptation, including the affect such organizations have on tangible wildfire adaptation actions. This article explores one such collaborative organization in depth to derive lessons about the way such organizations emerge and how they function in addressing the multiscale nature of contemporary wildfire adaptation efforts. We later engage Paveglio's (2021) theoretical analogy of wildfire adaptation as a chess game to extend those lessons to a fuller understanding of how collaborative organizations may function in ongoing efforts to "live with fire." As such, the following research questions guide this study:

1. How do board hopping organizations emerge to address wildfire adaptation across landscapes?
2. What opportunities and barriers do board hopping organizations face when approaching fire adaptation in varied social conditions across a shared landscape?
3. How can board hopping organizations develop or utilize planning processes that facilitate variable adaptation across landscapes?

3. Methods

3.1. Selection and description of study organization

The Kittitas Fire Adapted Communities Coalition (KFACC) was selected as the focal organization for this study as part of a larger research effort that entailed inductively identifying case studies across the Wenatchee landscape in Washington State, USA. Wildfire Crisis Strategy landscapes such as the Wenatchee landscape (now referred to as the Central Washington Initiative) are a recent focus of U.S. Forest Service efforts to address wildfire risk that crosses ownership boundaries and where wildfire adaptation will require collaborative efforts (see [USDA Forest Service, 2022](#) for a description of the Wenatchee landscape). The authors initially conducted 15 semi-structured interviews with key informants engaged in diverse wildfire adaptation efforts across the Wenatchee landscape to inform case study selection (McKenna and Main, 2013). Those key informant interviews included three members of KFACC, a county-level organization engaged in risk reduction across landownerships. KFACC was selected for further study because key informants across the landscape were interested in their unique approach for organizing landscape scale adaptation efforts at the county level while balancing considerations of diverse local communities. It is important to acknowledge that KFACC members chose to focus their efforts on Kittitas County. That does not necessarily match the prescribed characterization of the Wenatchee landscape in the

Wildfire Crisis Strategy. This is a good reminder that "landscape" is not a prescriptive, one-size-fits-all scale; for example, not all collaborative organizations engaged in wildfire adaptation will consider their county or counties a shared landscape, perhaps instead indicating a watershed, a national forest, or a shared resource. Our participant-guided documentation of scale reflects consistent calls in the social science literature to enact efforts to improve wildfire adaptation at the same scale at which action already occurs (Paveglio et al., 2018).

KFACC was established after the 2012 Taylor Bridge and 2017 Jolly Mountain Fires stimulated broader discussions about establishing more strategic partnerships and coordination across jurisdictions to effectively address wildfire risk in Kittitas County (e.g., prescribed fire use, priority fuels treatments) (Kittitas County Conservation District, 2018). The organization has approximately 50 members who represent a range of local, state, and federal governments or agencies (e.g., U.S. Forest Service, Washington Department of Natural Resources, City and town planners, local fire departments, Conservation Districts), community groups (e.g., homeowners associations [HOAs], Firewise coordinators), and other groups whose missions partially or exclusively center on wildfire management (e.g., The Nature Conservancy). Monthly meetings drew a core group of approximately 20 regular attendees.

3.2. Approach

The study outlined here consisted of several iterative data collection phases. We began by gathering and reviewing key documents created by KFACC or that influence the way KFACC operates; this included the Kittitas County Community Wildfire Protection Plan and KFACC's strategic plan. Review of these documents informed development of an interview protocol that helped explore emerging opportunities or challenges for the organization while simultaneously building a foundational understanding of policy and guidelines directing KFACC's efforts (Bowen, 2009).

Semi-structured interviews comprised primary data collected during the first phase of the research. Semi-structured interviews are well suited for case study exploration as they allow researchers to follow up on new information and establish emergent themes surrounding understudied topics such as the wildfire organizations that are the focus of this work. More specifically, semi-structured interviews allow the development of a foundational understanding about the emergence of organically organized, landscape-level organizations not tied to specific funding mechanisms (Brinkmann, 2014; Glaser and Strauss, 1967).

Interviewees were recruited in two ways: (1) a combination of purposive and theoretical sampling, and (2) snowball sampling. Purposive sampling entails the identification of individuals with specific knowledge that is relevant to the study at hand, in our case members of KFACC or those they interact with at state and local levels in their facilitation of adaptation across scales (Lindlof and Taylor, 2002). Simultaneously, theoretical sampling is often described as the complementary selection of representative and diverse respondents who have the specific knowledge implicated in purposeful sampling (Charmaz, 2000; Creswell and Plano Clark, 2018; Paveglio et al., 2019a). Purposive and theoretical sampling were accomplished using both the KFACC mailing list and internet searches for specific individuals whose professional or volunteer work implicated a diverse set of influences on other individuals or groups (e.g., agencies, neighborhoods or communities, politicians) engaged in wildfire management. Snowball sampling entails asking interviewees to suggest other potential participants with similar or differing experiences and knowledge (Breckenridge and Jones, 2009). The resulting study participants included both frequent and infrequent KFACC meeting attendees ranging from federal and state agencies and local government to private landowners and community leaders engaged in HOAs and Firewise certification efforts.

Our semi-structured interview protocol had five key foci: (1) experience with wildfire in Kittitas County; (2) involvement in KFACC, including how interviewees engaged with or understood organization

operation; (3) the purpose and intended audience for KFACC work; (4) current successes and challenges facing KFACC; and (5) future directions and priorities for KFACC. Probing questions were used to explore emergent themes and elicit additional detail or clarity about KFACC's ability to work as a board hopping organization.

We conducted 22 semi-structured interviews with 27 individuals who had varying levels of involvement with KFACC, both as members and external to the Coalition. Interview length ranged from 42 minutes to 1 hour and 52 minutes, with an average length of 1 hour and 10 minutes. Interviews were recorded and transcribed with participants' permission. We were able to conduct most interviews together in person during August 2019. Following each interview, we discussed new and emergent information, allowing for potential revision or expansion of the interview protocol to ensure that new findings could be explored in greater depth with subsequent participants (Suter, 2012). Interviews concluded once both authors agreed that questioning no longer uncovered new emergent themes and information, a process known as theoretical saturation (Guest et al., 2006). Both authors also attended several meetings that KFACC led or were engaged in (Lofland, 1984); this included monthly KFACC meetings and a meeting organized by the county fire marshal to discuss county wildfire risk mapping relative to the wildland urban interface.

The authors discussed emergent findings with KFACC key informants following completion of interviews (Glaser and Strauss, 1967). This review initiated a dialog about establishing a clearer articulation of KFACC goals, a collectively agreed upon process for prioritizing communities to engage in KFACC adaptation efforts, and discussion about how to tailor efforts across socially diverse communities across Kittitas County. KFACC key informants asked whether the authors would help guide the advancement of KFACC efforts given the knowledge they had acquired during interviews as third-party facilitators – an approach that is increasingly mentioned by researchers exploring collaboration (Hamilton et al., 2021). The authors agreed to design and facilitate a series of workshops for KFACC members as a second phase of the research. That second phase engaged participatory action approaches through the objective facilitation of shared sensemaking and deliberation about next steps forward for KFACC, including those that emerged from initial interviews (Vaughn and Jacquez, 2020). Importantly, researchers did not advocate for any particular action, and instead used the facilitation opportunity to derive lessons about KFACC functioning, including their needs and strengths. All KFACC members received an invitation to attend workshops via the Coalition mailing list, resulting in a high level of continuity between interview participants and workshop participants.

Each workshop lasted approximately four hours and featured a structured agenda to facilitate idea generation and expansion in a timely manner (Brooks-Harris and Stock-Ward, 1999). The first workshop was convened in a community center in October 2019 and attended by 18 KFACC members. The second author served as the primary workshop facilitator for both workshops, with the first author supporting in facilitation duties. The first workshop entailed reflections on KFACC accomplishments to date gathered through breakout groups with report outs, consensus-building activities designed to identify organizational priority areas, structured brainstorming to develop action items for each priority, group inventory of skills and resource available to achieve those priorities, and the generation of a draft agreement to work on actionable next steps (Susskind et al., 1999). Our analysis here focuses on the lessons that process illuminates for board hopping organizations such as KFACC. For specific findings about priorities related to KFACC, please see Paveglio and Edgeley (2020).

The authors reflected on discussions and outcomes from the first workshop with select members of KFACC to propose more specific goals for a second workshop convened one month later (Srivastava and Hopwood, 2009). The second workshop took place at a conference room at a state resource management office and included 16 attendees, all but one of whom were present at the prior workshop. The second workshop

operationalized lessons from the interactional approach to adaptive capacity in response to emergency needs identified by participants during the first workshop. Workshop activities entailed progressive steps to identify and better characterize the role of KFACC in designing fire adaptation pathways for distinct communities in their landscape (see Paveglio et al., 2022; Paveglio, 2023). This workshop also included participatory mapping efforts to identify distinct communities and systematic documentation of social context characteristics defining prioritized communities using the interactional approach to adaptive capacity (see Cochrane and Corbett, 2020 for a discussion of participatory mapping). Additional discussion explored the extent to which KFACC members were already interacting with each community identified, and identification of logical next steps that bridged community conditions with KFACC resources and capacity. Both workshops were audio recorded with participants' permission. Worksheets and flip chart notes gathered as part of participatory activities were also retained to ensure that discussions and ideas from group reflection, breakout groups and individual reflections were captured.

3.3. Analysis

All interview and workshop recordings were transcribed verbatim for analysis. The lead author used NVivo, a social science data analysis software, to qualitatively code recordings. Notetaking and discussions between both authors in the field following each interview or workshop indicated strong parallels between KFACC efforts, needs or perceived roles and Paveglio's (2021) description of board hopping. Thus, we employed concepts from that synthesis as a guiding framework in the development of two iterative rounds of coding (Saldaña, 2015). First, transcripts were descriptively coded for key factors that advance wildfire adaptation as identified in Paveglio (2021). Descriptive codes summarize topics of discussion to produce a foundational understanding of data content that subsequent coding rounds can build upon (Saldaña, 2015). This resulted in codes such as "power dynamics between KFACC members," "board hopping activities," and "shared values" that denoted factors influencing capacity to advance wildfire adaptation, in addition to basic descriptive codes that helped characterize KFACC as an organization (e.g., "KFACC decision making processes," and "barriers to adaptation").

The descriptive round of coding helped to broadly characterize what KFACC members perceived as the social context of different groups or individuals (i.e., chess 'pieces') operating in their shared landscape (what Paveglio calls 'understanding the club rules'). It also allowed the authors to identify the most prominent considerations affecting wildfire adaptation progress in the Kittitas County landscape. The second round of coding focused on development of thematic codes across adaptation efforts articulated by KFACC participants and partners using analytic induction and thematic analysis (Gibbs, 2007). Themes resulting from the second round of coding focused on characterizing the various considerations influencing KFACC members' ability to 'board hop' within and beyond Kittitas County, including the opportunities, challenges, or resources they leverage to help guide allocation of fire adaptation resources among diverse communities or translate lessons about local adaptation efforts to policymakers. Thus, the thematic coding allows for a more detailed analysis to derive lessons implicated in research questions 1 and 2. Both authors independently coded a subset of interview transcripts for comparison to ensure consistency in data interpretation; this process is often referred to as intercoder reliability (O'Connor and Joffe, 2020). Upon completion of the coding process, representative quotes were identified for each theme to support key findings presented in the next section (Boyatzis, 1998).

4. Findings

4.1. KFACT formation in the Kittitas landscape

Interviewees characterized Kittitas County as a socially complex landscape featuring a diverse array of human populations. They described how an influx of new residents moving to the area from Seattle and other populated areas on the “westside” of Washington during the past five years were a primary source of change and growth in the county. The continued influx of migrants from more populated areas meant newcomers often had different beliefs or values about land management and use compared to existing residents. Migration to the area also corresponded with an increase in outdoor recreation and tourism on public lands, including an increase in potential fire ignitions. One longtime resident and KFACT member described the shift as such:

A lot of the people that actually live here full-time, really support the active management of the landscape versus the folks that are coming in and see it say, why would you mess with it? It's already perfect. And they just don't have that historical context of 100 years' worth of our alteration of these landscapes from the river to the ridge line. We've altered the way this forest used to look and how it used to function and now it's not resilient to climate change and resilient to all these other things we've got going on.

Participants described how the increased diversity of resident perspectives about resource use and management produced a challenging set of conditions for advancing fire adaptation issues at the local scale. For instance, large landowners who had once farmed or harvested timber had and continued to sell their land, which was then subdivided into smaller residential plots that created diverse settlement patterns. Many interviewees described this social and land “fragmentation” as motivating an exploration of adaptation options at broader scales. Collective action, or any action at all, was described as difficult to achieve through individual organizations engaging with communities across the county. Working strategically to coordinate efforts or resources across organizations and agencies was seen as a critical way to engage communities more effectively and intentionally because it increased avenues for engagement that might spur diverse local interest in fire adaptation (e. g., evacuation planning, fuel treatment planning, environmental restoration). The 2017 Jolly Mountain Fire provided one catalyst for formation of the organization by spurring discussions about shared values, coordination among fire and fire-adjacent organizations, and the characterization of different tools or resources among members for “scaling up” fire adaptation across the county. As one interviewee described:

We're working at a scale that a lot more things operate at, right? In the sense of prescribed fire, connectivity, water, recreation ... But in the sense of, how do we have that context to put forward a project in the sense of that landscape context? The other thing is, from years of collaboration, you walk into a forest stand with 20 people with different ideas. You never walk out with consensus. You start from a place of here. People see where their values fit across it, and then start seeing how these puzzle pieces fit.

KFACT members viewed the formation of their organization as a platform for overcoming differences in approaches and capacities to community interaction. The eventual goal was the establishment of shared goals at the landscape level across those communities. KFACT also served as an opportunity to address what many interviewees viewed as a historical lack of communication between agencies and organizations. One interviewee described the benefits of that open communication as follows:

I think coming together as a group and trying to figure out what is best for everyone rather than, "I don't care about you. I'm worried about what's happening to me, and I'm going to go hide my head in the sand." I think

that a group getting together and trying to figure things out is probably the best way to do it. Then you can get together and make those agreements. You can get together and talk about what kind of toys do you bring to the sandbox?

Thus, initial KFACT meetings allowed the creation of a space for identifying shared values across different interests in the county, and created more transparency regarding capacity and availability of resources from each participating entity. In turn, strategic collaboration among KFACT members early in the formation of the organization led to the establishment or completion of adaptation efforts that would not have been possible without collaboration. The growing momentum from those efforts spurred further growth and investment in the emergence of KFACT as a useful innovation. For instance, an interviewee explained how KFACT's formation allowed its members to collectively advocate for a change in state law to improve opportunities for prescribed fire use:

So Roslyn, for example, we want to burn the Roslyn Urban Forest, which is a municipally-owned unit right up to town. Surrounds town. And a bad fuel situation. When the Jolly Mountain Fire was going, the incident management map showed more than half of Roslyn as non-defensible because of how thick that forest was. The IC [Incident Commander] told our mayor, "You'd better get that thinned." It's been thinned, now, but we weren't allowed to do prescribed burn because, in state law, there's a ban on burning in a UGA [urban growth area]. Through KFACT, we got that law changed.

Changes in laws like the example outlined above emerged because initial KFACT members and on-the-ground partners met with policy makers and attended meetings to communicate limitations related to existing laws and regulations. Some described this as a directed form of advocacy intended to improve landscape level conditions for fire adaptation through interaction with policy makers at different scales to motivate change.

4.2. Establishing an organizational identity

Despite the initial benefits of KFACT, one overarching barrier described by interviewees was a lack of cohesion around organizational identity. Much of the initial work and opportunities undertaken by KFACT members entailed broader education efforts intended to establish the organizational presence in local fire adaptation efforts while connecting with members of the public. This included the development of videos and tabling events at farmers markets focused on Firewise activities or production of short videos to share on social media. Participants indicated that these earlier strategies were possible during an initial period with less agreement around values and strategies—existing programs and templates could be helpful during a time of lower capacity or resource availability. As time went on, however, the need to clarify the role KFACT would play amongst other ongoing adaptation efforts and organizational networks at different scales raised several needs for strategic clarification. The first of these was uncertainty about who the audience for KFACT adaptation efforts was and how to engage them. Participants described a general agreement that communication about fire adaptation was part of the KFACT mission, but it was not clear to whom, or in what form. Some felt that this was a community-oriented organization tasked with public engagement; however, numerous interviewees perceived the education efforts they had engaged in to date as having a limited effect:

We've actually struggled in this group. You can create a lot of education materials. You heard about meetings where six people show up. There's more staff than there is community members. So I question our return on investment with that model. Now, engagement, yes. We should engage people, but how? ... I don't think we need to educate people. Somehow, we need to figure out how to engage people if we can start to have a narrative about this work, who is involved, and who's doing what parts,

that it also starts to create this little, "Okay. People are doing things." I mean, and that seems so simple, but the reality is that people are so—they have a lot on their plate, right? And one of them is not working with your neighbor.

This transition from education to engagement was seen by interviewees as positive. Development of resident capacity for mitigation at the property level, shared initiatives or commitments for broader mitigation among communities, and collaboration of communities with KFACC were viewed as necessary to create lasting change, but it was not clear how to initiate this shift. Interviewees described the challenge as a product of unfamiliarity with the many communities and residents or landowners within their landscape and the extent to which agencies or organizations interacted with one another to serve the social diversity KFACC members had already identified. Many interviewees discussed the importance of local leaders or “spark plugs” in advancing partnerships between KFACC members and communities for fire adaptation, but one large challenge was identifying these individuals in more rural, dispersed communities that didn’t have HOAs or other formal structures. Additionally, identification of such individuals did not necessarily translate into partnerships or action due to the social complexity of each population, as one individual described:

How do you find the local leaders? Try to empower them to grow something? And then support them in doing that? The places we’ve tried to go because it’s a funding mandate or a geography, it’s way messier. We’re finding, we’re trying to untangle all these things and relationships and whether it’s going to go or not ...

Fostering traction among communities where local conditions aligned with funding restrictions repeatedly emerged as a challenge. Participants indicated that identifying new communities to partner with and disburse funds to took far longer than typical funding windows allowed, which often resulted in funds being provided to communities that already had existing relations with the funding agency.

Distribution of efforts raised a second core challenge for establishing a cohesive KFACC identity: the processes through which the organization would prioritize work across Kittitas County. Responsibility for recruiting landowners to participate in adaptation programs focused on fuels reduction and forest health was often undertaken by the Conservation District, meaning that many KFACC members directed interested parties towards that organization. The part-time coordinator also was housed at the Conservation District and was seen as critical to the success of the group. However, that coordinator had recently accepted a position working at another entity and could no longer contribute in this role. KFACC interviewees acknowledged the necessity of the coordinator position in keeping momentum for the group, but they also recognized that it took an individual (or more likely multiple individuals) with particular skills to serve that important role. Responsibility for prioritization was described as slowly becoming redistributed across KFACC members, with some pointing towards state and agency level policies that could help guide project prioritization an unlock access to funding that augment coordinator capacity:

In my mind, there’s the 20-year [Washington State Department of Natural Resources] Forest Health Strategic Plan. Goal two of that deals with the community components more, and then there’s the 10-year Wildland Fire Strategic Plan, right? And there’s a lot of aspects in that as well that we’re engaging. So in my mind, if we can focus on a project area, to me, that’s where we’re going to get mileage, some focus.

4.3. Defining a shared purpose

Participants in the first workshop engaged in solutions-oriented processes to help them work through several key decisions identified during the interview phase of the research. For instance, the first process KFACC engaged in during workshops concerned the primary audience

for the organization. Other facilitated processes were designed to have members clarify where KFACC fit in the broader constellation of fire and forest management or adaptation actions across scales (e.g., among communities, beyond Kittitas County) to better characterize opportunities for expanding their organizational reach or communicate needs and values to policymakers. Participants indicated that questions about audience were critical for focusing their shared workload and prioritizing tasks or opportunities that aligned with their mission moving forward. Discussions during the workshop highlighted a disconnect among members regarding what they perceived as the purposes of KFACC. For instance, some members felt that the organizations should expand education and outreach to property owners in a more cohesive way:

I don’t know that they should be doing anything that’s contrary to what the documents say. KFACC shouldn’t be something that creates rules and regulations and laws and stuff like that. That’s up to the populace. But I see KFACC more as a, you go out to Joe Landowner and say, ‘Hey, this is what the law says and this is what you’re doing. Let’s see if we can get you guys closer together to what you should be doing.’ I see KFACC as being more educational of what’s there, not at creating more bureaucracy, creating more laws.

Other members felt that KFACC was in a unique position to insert itself into critical conversations about local land management occurring at higher levels. The varied membership and expertise organizational members had about fire adaptation afforded KFACC the opportunity to act as a “watch dog” about the use of science, feasibility of policy implementation, and outcomes of fuels management. The organization had already motivated policy and management change at community, county, and state levels by leveraging their collective expertise. For instance, in addition to the state level change to prescribed fire use, the organization had also influenced WUI code implementation at the county level:

They [Kittitas County] started tweaking the WUI Code, to make it work more smoothly or to be effective. A past Fire Marshall was giving people exemptions to still put cedar siding on their houses. The Fire Adapted Communities Coalition, we wrote a letter to the Fire Marshall and the fire chiefs ... and said, ‘Hey, we’d like you to stop doing this, because it’s creating a hazard.’ And so they said, ‘Okay,’ and they stopped doing it.

Efforts to influence the broader trajectory of fire adaptation to date had focused largely on advocacy at the local level within the Kittitas landscape. However, some members saw an opportunity to transcend that and engage more actively in policy-making processes at both smaller (e.g., community) and larger (e.g., state) scales. One barrier to this appeared to be a lack of capacity, despite interest:

I think where the group may struggle is, are we going to move beyond advocacy? And then implementation and if so, what does that look like and how does that work? What I’m concerned about and what my question would be, is it going to look kind of like the leadership discussion, are we going to end up back in a like ‘Well, I’m busy, I’m busy, I’m busy, I can’t take that on.’ So therefore, are we going to fall short, or are we going to find a path where we stick with advocacy?.. Is there a path inbetween a group that’s taking direct action, and a group that’s merely advocating?

The divergent opportunities outlined above led the group to discuss their interest in engaging in both the education and advocacy realms during the workshops. Ultimately, they concluded that their primary focus would be at the county level, with a priority for supporting local interests and holding other stakeholders in their shared space accountable. Participants indicated that this level of focus was warranted due to capacity limitations, and because this was the scale at which they could currently be useful in “scaling up” varied, but coordinated local efforts. The decision allowed them to continue their education efforts but go beyond to engage more intentionally in local conversations.

4.4. Establishing a collective path forward

Participants engaged in the KFACC workshops in part to forge a shared decision-making process that could increase their capacity for working across their landscape. For instance, the first workshop involved a shared ranking activity that helped members prioritize which components of their strategic plan were most important. Participants identified tasks associated with building “fire adapted communities” as a component the organization was best suited to advance and that should become the focus moving forward. Workshop participants frequently reframed the issues facing KFACC as dependent on the changing social conditions that influenced how local peoples’ relationships with the landscape (both past and future) dictated their fire risk. They also focused on the reintroduction of small-scale ecosystem management economies, use of fire, or promotion of healthy ecosystems. As a result, one key outcome of the workshops was the need for a more cohesive conceptualization of what “community” meant in their landscape, and how to understand, characterize or work with the various communities inhabiting the areas where the organization wanted to conduct their work. For example, one workshop participant began to parse out differences in how communities were conceptualized of across the county and the implications that had for KFACC:

In this county, we call them communities but they're not. They're mandatory communities. The HOA is using it as a unit. They don't know each other. And then maybe in some cases, we're just, we're left with individual responsibility. And how do we move forward with that aspect?

Discerning between “mandatory” communities such as the example above and communities who were self-organizing to address their shared wildfire challenges were one example of participants’ interest in determining the social context influencing the potential for shared action across their landscape. Such stock taking using an adapted version of the interactional approach was also seen as an opportunity to more strategically pair resources to the distinct social context of different populations, as participants recognized how existing programs such as Firewise or mobile chipping days might need to take different forms depending on the formality of the communities they were dealing with. Participants acknowledged that some communities were not ready to work with KFACC yet or may not self-organize as a functional unit they could easily engage with on the landscape. As such, workshop participants’ agreement that unified characterization of social diversity across the landscape, using existing approaches for categorizing diverse social contexts (i.e., the interactional approach), provided a fruitful avenue for discussion about tools and techniques that could help the organization better adapt their resources to local conditions, and build capacity for different communities to help sustain efforts that reflected their changing relationships with wildfire or risk.

Discussions about the limits of current cross boundary efforts to characterize and advance fire adaptation revealed the influence of external organizations and organizations operating at larger scales. Some workshop participants described this as an opening to leverage the work of organizations thinking about fire adaptation beyond the landscape scale. However, they also noted that individuals and organizations operating at these larger scales often did not think about how to translate efforts to local practitioners. For instance, participants in a breakout activity during the workshops summarized their discussion about data availability, and the way that relationships among organizations could serve as both a barrier and an opportunity for increased adaptive capacity:

How is that information being used to help coordinate private fuel treatments in a prioritized list of treatments? Are we going to work better at a higher scale? We're [KFACC] at a broader scale to say 'this is that information. How is it getting used and how can it help us be more strategic and thoughtful about our investments we have to put dollars into?' And then making sure that there's a conversation between people who are

creating these [databases] and the people that actually do the work on the ground.

Workshop participants ultimately concluded that KFACC was well positioned to conduct work that sought to unify players in their landscape working on fire adaptation. However, one core challenge was that the work they envisioned, particularly related to prioritization of work within the landscape, often entailed actions and efforts that were not documented or accounted for in traditional funding and policy mechanisms. One interviewee described KFACC’s role in filling that important niche:

We've got to figure out ways to better facilitate communities becoming more fire adapted, I mean, at like different levels. 'Fire adapted communities' is such a huge umbrella thing, right, and so that's why I think that it's a lot, it's hard for a lot of people conceptualize and it's just confusing, they don't know what it is. Our [KFACC's] part of that is, like, us commenting on the county code to affect policy directly - all those different things you do that don't have, like, they don't fit into any box necessarily deliverable wise but are really important.

5. Discussion

I think we've stereotyped these communities ultimately, they're not a conglomeration like we previously talked about - there's differences, right. So each one of those [communities] needs a tailored outreach messaging strategy. That's something worth going after.

- KFACC member during Workshop #2

Recent policy supporting wildfire adaptation at broader geographic scales focuses on supporting and expanding action through mid-level organizations such as state networks and place-based collaboratives (Williams et al., 2012; Schultz and Moseley, 2019; Davis et al., 2022). Missing from research related to that work is a more nuanced understanding of how such organizations form, the purposes they serve within varied contexts and scales, and their ability to translate fire adaptation needs back to policy makers in ways that promote innovative policy (Kelly et al., 2019). The research presented here explored how one group of professionals and private citizens self-organized to increase local capacity and advance wildfire adaptation in a shared landscape. We sought to understand how organizations like KFACC can influence future adaptation processes and what insights their experiences reveal about ongoing directives to focus on landscape-level initiatives for living with fire. Despite their focus on the broader Kittitas County landscape, members of KFACC recognized that building shared action needed to attend to the diversity of populations that existing in their county, and to work creatively with different communities in the eventual pursuit of “building up.” They sought a way to define and prioritize different human populations and communities who require diverging adaptation strategies or who would organize differently across initiatives. In doing so, they hoped to find ways to bridge various bureaucratic boundaries or diverse values, but had difficulty conceptualizing of an approach or process for tailoring their efforts across populations. In the following sections we expand on these findings and demonstrate how they provide insight for other organizations or regions pursuing fire adaptation across broader landscapes, firesheds, or Wildfire Crisis Strategy landscapes by using and expanding an existing theoretical synthesis of the fire adaptation “landscape” (Paveglio, 2021).

5.1. Lessons learned and comparisons to existing literature

The establishment and evolution of KFACC in some ways mirrors the progression of other collaborative organizations documented in the broader natural resources literature (Bonnell and Koontz, 2007; Reed et al., 2013; Abrams et al., 2017). For instance, KFACC emerged in response to broader policy and funding opportunities designed to

engender broad scale change, but with less “bottom up” input or local knowledge that would be necessary to facilitate more lasting change across diverse places (Cyphers and Schultz, 2019). Organizational members ultimately gravitated toward efforts that informed how common fire adaptation initiatives might be operationalized at local levels, including finding key ways to advocate for changes that would help implement actions (e.g., ending exceptions for select building practices, opening up policy spaces for increased prescribed burning). In that respect, KFACC’s efforts could be seen as a mechanism through which to “scale down” fire adaptation initiatives through strategic efforts that fit within the parameters of state or national initiatives (Brenkert-Smith et al., 2017; Reid et al., 2018). Our results suggest that whatever success group members had in advancing fire adaptations were possible, in part, because the multifaceted representation of agencies, organizations and residents allowed the group of interested parties to think creatively and leverage their diverse relationships in strategic ways. That is, KFACC members developed an innovative vision of their group as a supplementary body that helped *facilitate*, rather than *force* collaborative action, by developing a space for common priorities and demonstrating shared support for an effort across a broad cross-section of expertise. We would suggest that such benefits have long been touted as a positive outcome of providing mechanisms for the incorporation of local knowledge or context into management processes, yet such calls are often made at the community level (see for instance discussion of CWPPs and adaptation of Firewise programs; Jakes et al., 2011; Paveglio and Kelly, 2018). Organizations such as KFACC may represent viable ways to institutionalize the potential for regional discussion of fire adaptation, or in ways that serve to bridge broad policy initiatives and initial consideration of their application to particular places. Yet our results and existing literature also suggest that significant local relationships, trust and understanding often precede the development of organizations such as KFACC, as they serve as a unifying “space” to operationalize collaborative initiatives that no one group has the authority, capacity, or resources to implement alone (Stern and Coleman, 2015; Walpole et al., 2017).

What was clear to KFACC members was that local resident needs were not necessarily being reflected in broader funding initiatives and policies, resulting in an inability for local professionals and groups to engage in activities that they felt were most likely to support the adaptation process. Interviewees described a shared recognition that fire adaptation at the landscape level would not advance without improved coordination and collaboration on these key issues emerging across local jurisdictions. That recognition reflects a common theme from existing literature suggesting that operationalizing landscape level priorities or translating local needs can represent a significant ‘scalar leap’ that requires directed effort (Evers et al., 2019; Leone et al., 2020). It also reflects a tendency for the provision of broad, “top down” priorities that may not reflect the reality of actions that will actually be perpetuated on a landscape. Our results and existing literature suggest that such scalar leaps require the establishment of formal or informal working groups who represent a broad cross section of local and regional interests, and whose collective understanding of diverse communities *and* organizational or agency opportunities/limitations allow them to promote a more realistic idea about collective action that can currently occur across places that comprise a larger landscape, and in which shared, uniform action cannot be taken as a given (Edgeley et al., 2020; Paveglio et al., 2018).

Members of KFACC initially struggled to identify their organizational niche within a broader “landscape” of wildfire adaptation activities created by increased funding and programmatic efforts focused on wildfire management (e.g., Joint Chief’s projects, forest collaboratives, individual agency funding). We would suggest that the potential for such confusion—that is, the unique positioning of networks, collaborative groups or organizations—will likely intensify across locations as additional funding for wildfire coordination continues (i.e., Infrastructure Bill, Inflation Reduction Act, etc.). For instance, some segments of

scholarship point to a potential “overcrowding” or disagreement between highly networked groups addressing environmental issues as leading to conflict and thus the potential for decreased efficiency in addressing wildfire adaptation challenges. Likewise, existing research illustrates the importance of understanding distinct roles and responsibilities during and after the establishment of natural resource-oriented collaborative efforts, which often occurs in the form of networking and information sharing at regular intervals (Heikkila and Gerlak, 2005; Bothwell, 2019). Thus, while our results suggest that KFACC was seen as a positive force in their landscape, its struggles are also a good reminder that simple mandates or goals of “collaboration” might not always yield appreciable gains in efficiency of action on-the-ground.

Collectively, our examination of KFACC decisions and actions suggest that similar organizations should fulfill several criteria to begin instigating positive change: (1) a diverse membership that incorporates varied knowledge and expertise, (2) establishment of a shared purpose that is situated in local conversations around wildfire adaptation, (3) ongoing development or improvement of the ability to influence local politics, policy, and regulation around wildfire adaptation, and (4) a willingness among members to come to the table and compromise to develop agreement on key priorities and strategies for accomplishing them. KFACC’s progress towards each of these criteria allowed them to discuss community diversity and the need to tailor efforts across those contexts in ways that supported further refinement of their organizational mission and operations over the coming years using varied funding sources. In doing so, the organization began to grapple with the disconnects between diverse local experience and state or policy directorates for fire adaptation that require ongoing feedback about how to operationalize broad targets in specific places. We turn to these aspects of KFACC in the next section.

5.2. Extending theoretical notions of fire adaptation and “board hopping” organizations

We were interested in how the development or functioning of KFACC reflected Paveglio’s (2021) notion of a “board hopping” organization. We were also interested in understanding whether his broader analogy of collaborative fire adaptation as a chess game might help explain the experiences of KFACC members as the organization developed. Paveglio outlines how progressing from considerations of local community adaptation to consider landscape-level approaches means considering a series of “moves” and an understanding of diverse conditions across a landscape. Board hopping organizations are one mechanism for cataloging those more strategic, locally tailored plans, with the goal of eventually serving as a conduit for emergent lessons or as a strategic force for scaling down broad initiatives and functions in ways that achieve local action. In particular, Paveglio (2021) outlines four critical steps that collaborators must take when considering landscape-level collective action for fire: (1) determining what chess “pieces” (i.e., groups, values, agencies, etc.) are still operating or emerging in the landscape; (2) what each piece on the board is capable of contributing to shared wildfire risk management (e.g., authority to incentivize fuels reduction, assistance or aid in establishing evacuation routes, etc.); (3) the potential influence different pieces might have on the movement of other pieces; and (4) an understanding of perceptions that guide future actions by each piece (or community) operating in the landscape. Such understandings are critical for reasoning through strategic actions adapted or articulated by “board hopping” organizations.

The ongoing experience of KFACC in many ways mirrors Paveglio’s considerations about approaching landscape level fire adaptation, though it also illuminates how developing such understanding takes time and directed efforts. To begin, overcoming initially disjointed efforts to address wildfire risk first required better clarification and representation of different players already engaged in adaptation work within Kittitas County, and clear delineation of different roles and

responsibilities among those players. Examples of this included the open attendance meetings that interviewees indicated were the origin of KFACC, frequent discussion about grant opportunities across members, and discussions about varied experiences with different communities across the landscape to build a clearer picture of "pieces" and their actions. The diversity of KFACC representatives at an early stage also provided a mechanism for shared learning about landscape complexity, resulting in comprehensive and continuous input on what role the organization would serve and how it might function as a translator of policy or practice (i.e., a board hopping organization). Collectively determining who was and was not at the table for important conversations about fire adaptation, and the influence those players had on stimulating change, therefore became a critical first step for improving effective partnerships across the landscape to accelerate the pace and scope of wildfire risk reduction on both public and private lands. Establishing a shared understanding of current fire adaptation players allowed KFACC to develop a clearer picture of what work was already completed, in progress, or planned across Kittitas County. Discussions among KFACC members in the early stages of its organization entailed compiling information about existing work, current and forthcoming resources, and barriers or opportunities in an effort to understand as many other entities as possible and the ways in which they enhance or limit one another's activities. These efforts helped illuminate a high degree of social fragmentation between and within communities across Kittitas County, drawing attention to the processes and interactions through which those conditions came to exist.

The identification of social fragmentation in other wildfire social science studies places emphasis on the establishment or strengthening of partnerships and collaboratives that have the capacity to translate information and actions across a diverse suite of local social conditions while also transmitting lessons up and down scales to motivate outcomes that are locally beneficial (Paveglio et al. 2019a,b; Billings et al., 2021). In turn, such board hopping organizations or groups can engage in meaningful community development by working with—and eventually across—different contexts. KFACC intentionally sought to increase community development support through their engagement of diverse representatives, organizations, and residents from numerous fragmented communities. In doing so, they provided a platform for shared meaning that could reduce opportunities for conflict that social fragmentation might otherwise introduce. Put in the language of Paveglio's analogy, KFACC was beginning to better understand or modify the 'club rules' of their landscape—how pieces on the board must work together toward the progression of shared goals. However, frequently revisiting discussions around these shared understandings also proved essential given that they required a deep understanding of different communities, and required more responsive partnerships with local populations in evolving landscapes.

Although they had now established mutual understandings about players and their actions, KFACC members struggled to situate their organization within the broader landscape of fire adaptation initiatives already occurring across scales or how they might meaningfully supplement those efforts. Those challenges reflect Paveglio's third consideration above, but also help support a long history of collaboration and governance literature pointing toward a critical need for new organizations to establish unique roles and contributions within complex social contexts (Steelman and Kunkel, 2004; Spencer et al., 2015). Lessons from that existing research suggest that one benefit of collaborative organizations like KFACC is a space for discussion and communication (Stern and Coleman, 2015; Schusler et al., 2003). However, there is also a possibility that an organization could 'plateau' and fall short of action without a shared purpose or process to organize around. Our results suggest that this difficulty emerged around KFACC members disagreement about which of two potential shared purposes the group should pursue: (1) a more traditional mission to "educate" the public about wildfire risk and related adaptation or a purpose centered around shared advocacy across communities and scales that would allow for the

promotion of actions that no one agency or organization could achieve without strategic catalysts. KFACC chose the latter, and our results suggest that choice stemmed from a collective understanding that education and awareness was not a central barrier to landscape adaptation. Instead, the group used their shared understanding of the broader landscape (i.e., an understanding of their board and 'club rules') to identify a lack of agency and authority to advance fire adaptation initiatives as a primary barrier to fire adaptation in Kittitas County.

Thus, KFACC experience as a new board hopping organization underscores the need for negotiation both internally and externally in each cyclical iteration to determine how the organization can best serve its audience (e.g., through changes to funding structure or engagement in specific committees or events). For example, KFACC had access to funding from federal sources, but how those funds could be used was restrictive. Engagement in state-level discussions regarding decisions about financial provisions and their limitations could shift funding into a format that allows for work that is better aligned with landscape-specific needs articulated by the organization. During these negotiations, our results suggest that board hopping organizations should likely ask questions about the scales at which they are best positioned to influence the most valuable outcomes for their landscape. KFACC work appeared most successful when they had greater authority and capacity to serve their audience; efforts to establish and support similar organizations must therefore act intentionally to align resources with these considerations if they are to be successful at bridging organizational divides.

Upon establishing advocacy in varied arenas as the purpose of the organization, KFACC members embraced their ability to create pressure for actionable outcomes, beginning with engagement in local WUI code discussions and modification of prescribed burning regulations. However, their efforts to search for strategic ways to enact or advocate for collective action sought by higher-level initiatives, or desired by different communities, indicated a lack of clarity about how to operationalize or act upon their ideas. More specifically, the group began engaging at the scales above and below them in order to translate needs into action and build capacity. They also began to recognize the diverse interests, values and actions that would be necessary to create action at smaller scales within their landscape, and the critical need to better understand the audiences they were serving through their advocacy at higher and lower levels.

The introduction of a structured decision-making process in the form of workshops around how to enact or augment shared purpose helped organization members move forward with momentum and intent. Workshops were designed to create time and space to hold discussions that elevate different perspectives on the operationalization of organizational missions in order to encourage consensus moving forward. Both our results and existing literature suggest that time to establish this shared "sensemaking" are a critical step in bridging calls to "scale up" fire adaptation by identifying the key ways that collaborative efforts can overcome barriers to implementation (Taylor et al., 2007; Bonnell and Koontz, 2007; Butler and Goldstein, 2010). Participants also articulated how workshop discussions were critical for generating member buy-in and building agreement about the parameters for conducting work beyond the local landscape and that could affect the most meaningful local change. In particular, the workshops helped KFACC members focus on their need to better articulate the varied audiences of their work.

Activities in the second workshop used existing frameworks and characteristics designed to help residents and professionals more quickly identify unique communities (i.e., audiences) and the place-specific social context that can often dictate what fire adaptations are most likely to be effective in promoting shared action surrounding wildfire risk. We found that these frameworks and existing schema (i.e., the interactional approach) helped the group identify a variety of audiences they are advocating for, and how they might navigate advocacy at larger scales in order to facilitate outcomes that best serve those populations' needs (see Paveglio et al., 2009, 2015; Paveglio, 2023). Yet KFACC members initially expressed difficulty balancing the need to make

progress with less cohesive or unengaged communities while also deepening connections with communities who had already begun work to adapt. Additional workshop presentation of considerations for community-specific fire adaptation “pathways,” that is, considerations and options for the types of messages, programs or approaches that might facilitate tailored fire adaptation among different communities, proved one way to help address KFACC member challenges by allowing them to envision varied actions among the diverse audiences in their landscape (see Paveglio et al., 2018, 2019b, 2023).

Together, participants in the workshops indicated that their discussions encouraged unification across different realms of fire adaption (e. g., fuels treatment, policy development, community engagement). Furthermore, their prioritization efforts create organizational ability to better navigate social fragmentation within the KFACC landscape, allowing the organization to return to its roots by becoming more responsive to local conditions and adaptation efforts that align with them. Characterizing the social diversity of the Kittitas landscape thus allowed KFACC to review the challenges and successes of previous adaptation efforts and determine the most appropriate strategic ‘next moves’ that they could embark on together in a variety of communities that have different needs or are at different stages of becoming “fire adapted.” However, KFACC members needed external support through workshops to navigate this conversation. This process and the need for external input indicates the value of frequent reevaluation of goals and approaches to ensure that organizational missions still align with the efforts of members and those who their organization serves. During such assessments, board hopping organizations can focus on identifying next steps in achieving goals that are unattainable when members work independently of one another. Thus, leveraging connections and capacity within groups in new ways across larger landscapes provides one of the clearest opportunities for board hopping and advocacy for local needs.

6. Conclusion

Calls for board hopping organizations that engage and support wildfire adaptation or resilience efforts are likely to continue given expansive funding for landscape-level fire adaptation and biophysical research identifying large areas where people may share common wildfire risk (USDA Forest Service, 2022). This study explored the role of the Kittitas Fire Adapted Communities Coalition, a county-level organization, in cultivating action to address wildfire adaptation at the landscape scale. We sought to understand how KFACC could identify a path forward that looks beyond establishment to determine a honed identity, audience, and strategic process for engaging communities relative to funding availability. KFACC facilitated regular coordination among diverse entities and organizations operating across the county, but members also recognized that the organization was nearing a critical point in its evolution that necessitated moving beyond communication into cohesive action. The authors engaged KFACC members in a facilitated process that allowed them to develop more coherent ideas of how their organization serves as a “board hopping” organization, including serving as a two-way conduit of lessons and information from human populations in their landscape, while also influencing the structure of broader policies or approaches designed at higher scales and which may not always be implemented in practice.

Our results illuminate how the first two years of an organization such as KFACC includes regular pressure to evolve in response to the unique needs of local groups, agencies and residents attempting to produce meaningful change across their landscape and among policymakers influencing the ways they can adapt to wildfire. Key factors influencing the ability of KFACC to promote wildfire adaption included their focus on a grassroots efforts that recognized local diversity in order to “build up” to landscape level adaptation, their ability to leverage diverse members’ knowledge and resources to increase capacity across communities, and their unified efforts to advocate for change among actors

or institutions at higher scales such as a state legislature. All of these efforts drew greater attention and engendered broader capacity because members discussed, strategized and worked together to better understand their sphere of influence. Board hopping organizations such as KFACC will likely need to engage in structured processes that help them establish an identity, define shared values, and determine their next steps at regular intervals. Without frequent and intentional reflection on organizational purpose and direction, groups such as KFACC (and perhaps other collaboratives) risk becoming stagnant, limited in their ability to support meaningful wildfire adaptation, or failing to understanding the shifting patterns of local context that greatly influence ongoing relationships with wildfire. This study indicates that creating opportunities for organizations like KFACC to engage in facilitated processes for understanding the unique “niches” they may serve in their landscape, including approaches for systematically understanding and communicating the needs of diverse communities, can support capacity and resources for more tailored and efficient wildfire adaptation.

The recent wave of federal policy such as the Bipartisan Infrastructure Law and the Inflation Reduction Act have produced an influx of funding to support wildfire risk reduction at the landscape scale. Collaboratives operating as “board hoppers” are uniquely positioned to capitalize on this funding, as they have already been exploring local operating structures and work on increasing capacity to access and funnel such funds in intentional or strategic ways. Board hoppers can also be detrimental if they do not make efforts to think strategically about the best ways to represent the unique needs of communities in their regions, or if they only use that additional funding to bolster a limited portfolio of activities without thinking creatively about where their efforts can build capacity for more coordinated efforts. Some landscapes may not currently have organizations such as KFACC, and thus may lack capacities to fully use the influx of funds for wildfire management focused at landscape scales. In these cases, progress and outputs must first including the building of connections and development of agreed upon processes for prioritizing and effectively translating funds into more sustainable, coordinated efforts that outlast initial investments. Regardless of existing capacity, it will likely be important for local people to realize that efforts to “scale up” are most useful when they faithfully and accurately reflect their unique circumstances—by striving for critical reflection and dialog that adapts or communicates the real world needs or lessons that broader programs, best practices or funding directorates hope will engender action. Not all “board hopping” organizations will look or function exactly like KFACC, and that is a good thing. KFACC was a response to the unique needs and relationships of diverse people who the organization is trying to serve. Since this study was completed, members of KFACC have been successful at accessing Community Wildfire Defense Grants and other funding opportunities at higher rates than many other locations within Washington state. As such, this case study underscores the importance of proactive collaboration, both prior to fire events and ahead of possible funding opportunities, in order to ensure that local capacity is well developed in ways that facilitate opportunistic steps toward landscape-level wildfire adaptation.

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CRediT authorship contribution statement

Catrin M. Edgeley: Conceptualization, Methodology, Formal analysis, Writing - original draft, Project administration. **Travis B. Paveglio:** Conceptualization, Methodology, Writing - review & editing, Funding acquisition, Project administration.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

References

- Abrams, J.B., Huber-Stearns, H.R., Bone, C., Grummon, C.A., Moseley, C., 2017. Adaptation to a landscape-scale mountain pine beetle epidemic in the era of networked governance. *Ecol. Soc.* 22 (4).
- Abrams, J.B., Knapp, M., Paveglio, T.B., Ellison, A., Moseley, C., Nielsen-Pincus, M., Carroll, M.S., 2015. Re-envisioning community-wildfire relations in the US West as adaptive governance. *Ecol. Soc.* 20 (3).
- Abrams, J.B., Wollstein, K., Davis, E.J., 2018. State lines, fire lines, and lines of authority: rangeland fire management and bottom-up cooperative federalism. *Land Use Pol.* 75, 252–259.
- Ager, A.A., Palaiologou, P., Evers, C.R., Day, M.A., Ringo, C., Short, K., 2019. Wildfire exposure to the wildland urban interface in the western US. *Appl. Geogr.* 111, 102059.
- Billings, M., Carroll, M., Paveglio, T., Whitman, K., 2021. "Us versus them;" local social fragmentation and its potential effects on building pathways to adapting to wildfire. *Fire* 4 (4), 96.
- Billings, M., Carroll, M., Paveglio, T., 2023. Unprotected lands: a case study of a wildland-urban interface community in "No-Man's land". *J. Environ. Manag.* 330, 117193.
- Bonnell, J.E., Koontz, T.M., 2007. Stumbling forward: the organizational challenges of building and sustaining collaborative watershed management. *Soc. Nat. Resour.* 20 (2), 153–167.
- Bothwell, K.N., 2019. Practicing collaborative natural resource management with federal agencies: keys to success across partnership structures. *J. For.* 117 (3), 226–233.
- Bowen, G.A., 2009. Document analysis as a qualitative research method. *Qual. Res. J.* 9 (2), 27–40.
- Boyatzis, R.E., 1998. *Transforming Qualitative Information: Thematic Analysis and Code Development*. Sage, Thousand Oaks, CA.
- Breckenridge, J., Jones, D., 2009. Demystifying theoretical sampling in grounded theory research. *Grounded Theory Review* 8 (2).
- Brenkert-Smith, H., Meldrum, J.R., Champ, P.A., Barth, C.M., 2017. Where you stand depends on where you sit: qualitative inquiry into notions of fire adaptation. *Ecol. Soc.* 22 (3).
- Brinkmann, S., 2014. Unstructured and semi-structured interviewing. *The Oxford handbook of qualitative research* 2, 277–299.
- Brooks-Harris, J.E., Stock-Ward, S.R., 1999. *Workshops: Designing and Facilitating Experiential Learning*. Sage Publications, Thousand Oaks CA.
- Brummel, R.F., Nelson, K.C., Souter, S.G., Jakes, P.J., Williams, D.R., 2010. Social learning in a policy-mandated collaboration: community wildfire protection planning in the eastern United States. *J. Environ. Plann. Manag.* 53 (6), 681–699.
- Butler, W.H., Goldstein, B.E., 2010. The US Fire Learning Network: springing a rigidity trap through multiscale collaborative networks. *Ecol. Soc.* 15 (3).
- Carroll, M.S., Higgins, L.L., Cohn, P.J., Burchfield, J., 2006. Community wildfire events as a source of social conflict. *Rural Sociology* 71 (2), 261–280.
- Carroll, M., Paveglio, T., 2016. Using community archetypes to better understand differential community adaptation to wildfire risk. *Philosophical Transactions of the Royal Society B: Biological Sciences* 371 (1696), 20150344.
- Charmaz, K., 2000. Grounded theory: Objectivist and constructivist methods. *Handbook of Qualitative Research* 2 (1), 509–535.
- Charnley, S., Kelly, E.C., Fischer, A.P., 2020. Fostering collective action to reduce wildfire risk across property boundaries in the American West. *Environ. Res. Lett.* 15 (2), 025007.
- Cheng, A.S., Dale, L., 2020. Achieving adaptive governance of forest wildfire risk using competitive grants: insights from the Colorado Wildfire Risk Reduction Grant Program. *Rev. Pol. Res.* 37 (5), 657–686.
- Cheng, A.S., Sturtevant, V.E., 2012. A framework for assessing collaborative capacity in community-based public forest management. *Environ. Manag.* 49, 675–689.
- Cochrane, L., Corbett, J., 2020. Participatory mapping. *Handbook of Communication for Development and Social Change*, pp. 705–713.
- Colonico, M., Tomao, A., Ascoli, D., Corona, P., Giannino, F., Moris, J.V., et al., 2022. Rural development funding and wildfire prevention: evidences of spatial mismatches with fire activity. *Land Use Pol.* 117, 106079.
- Creswell, J.W., Plano Clark, V.L., 2018. *Designing and conducting mixed methods research*, 3rd edition. SAGE, Los Angeles, CA.
- Cyphers, L.A., Schultz, C.A., 2019. Policy design to support cross-boundary land management. The example of the Joint Chiefs Landscape Restoration Partnership. *Land Use Pol.* 80, 362–369.
- Davis, E.J., Huber-Stearns, H., Cheng, A.S., Jacobson, M., 2021. Transcending parallel play: boundary spanning for collective action in wildfire management. *Fire* 4 (3), 41.
- Davis, E.J., Huber-Stearns, H., Caggiano, M., McAvoy, D., Cheng, A.S., Deak, A., Evans, A., 2022. Managed wildfire: a strategy facilitated by civil society partnerships and interagency cooperation. *Soc. Nat. Resour.* 35 (8), 914–932.
- Diaz-Kope, L., Morris, J.C., 2022. Why collaborate? Exploring the role of organizational motivations in cross-sector watershed collaboration. *Polit. Pol.* 50 (3), 516–539.
- Dickinson, K.L., Brenkert-Smith, H., Madonia, G., Flores, N.E., 2020. Risk interdependency, social norms, and wildfire mitigation: a choice experiment. *Nat. Hazards* 103, 1327–1354.
- Dunn, C.J., D O'Connor, C., Abrams, J., Thompson, M.P., Calkin, D.E., Johnston, J.D., et al., 2020. Wildfire risk science facilitates adaptation of fire-prone social-ecological systems to the new fire reality. *Environ. Res. Lett.* 15 (2), 025001.
- Edgeley, C.M., Paveglio, T.B., Williams, D.R., 2020. Support for regulatory and voluntary approaches to wildfire adaptation among unincorporated wildland-urban interface communities. *Land Use Pol.* 91, 104394.
- Evers, C.R., Ager, A.A., Nielsen-Pincus, M., Palaiologou, P., Bunzel, K., 2019. Archetypes of community wildfire exposure from national forests of the western US. *Landscape Urban Plann.* 182, 55–66.
- Every, D., Bearman, C., Matthews, R., Reynolds, A., O'Donohue, P., 2016. Contacts versus connectors: the role of community fire safe group coordinators in achieving positive bushfire safety outcomes. *Int. J. Disaster Risk Reduc.* 19, 390–398.
- Fischer, A.P., Jasny, L., 2017. Capacity to adapt to environmental change: evidence from a network of organizations concerned with increasing wildfire risk. *Ecol. Soc.* 22 (1).
- Glaser, B., Strauss, A., 1967. *Discovery of Grounded Theory: Strategies for Qualitative Research*. Routledge.
- Gibbs, G.R., 2007. Thematic coding and categorizing. *Analyzing qualitative data* 703, 38–56.
- Gosnell, H., Kennedy, R., Harris, T., Abrams, J., 2020. A land systems science approach to assessing forest governance and characterizing the emergence of social forestry in the Western Cascades of Oregon. *Environ. Res. Lett.* 15 (5), 055003.
- Guest, G., Bunz, A., Johnson, L., 2006. How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 18 (1), 59e82.
- Hamilton, M., Fischer, A.P., Jasny, L., 2021. Bridging collaboration gaps in fragmented environmental governance systems. *Environ. Sci. Pol.* 124, 461–470.
- Hamilton, M., Nielsen-Pincus, M., Evers, C., 2023. Wildfire Risk Governance from the Bottom up: Linking Local Planning Processes in Fragmented Landscapes. *Ecology and Society*.
- Hamilton, M., Salerno, J., Fischer, A.P., 2019. Cognition of complexity and trade-offs in a wildfire-prone socioecological system. *Environ. Res. Lett.* 14 (12), 125017.
- Heikkilä, T., Gerlak, A.K., 2005. The formation of large-scale collaborative resource management institutions: clarifying the roles of stakeholders, science, and institutions. *Pol. Stud. J.* 33 (4), 583–612.
- Huber-Stearns, H.R., Davis, E.J., Cheng, A.S., Deak, A., 2022. Collective action for managing wildfire risk across boundaries in forest and range landscapes: lessons from case studies in the western United States. *Int. J. Wildland Fire* 31 (10), 936–948.
- Huber-Stearns, H.R., Santo, A.R., Schultz, C.A., McCaffrey, S.M., 2021. Network governance in the use of prescribed fire: roles for bridging organizations and other actors in the Western United States. *Reg. Environ. Change* 21, 1–17.
- Jakes, P.J., Nelson, K.C., Enzler, S.A., Burns, S., Cheng, A.S., Sturtevant, V., et al., 2011. Community wildfire protection planning: is the Healthy Forests Restoration Act's vagueness genius? *Int. J. Wildland Fire* 20 (3), 350–363.
- Kelly, E.C., Charnley, S., Pixley, J.T., 2019. Polycentric systems for wildfire governance in the Western United States. *Land Use Pol.* 89, 104214.
- Kittitas County Conservation District, 2018. *Kittitas County Community Wildfire Protection Plan*. Kittitas County, pp167, 9/3/2023. https://www.co.kittitas.wa.us/ uploads/documents/cds/fire-marshall/Kittitas_County_CWPP_Update_10-9-2018.pdf.
- Koebele, E., Crow, D.A., Lawhon, L.A., Kroepsch, A., Schild, R., Clifford, K., 2015. Wildfire outreach and citizen entrepreneurs in the wildland–urban interface: a cross-case analysis in Colorado. *Soc. Nat. Resour.* 28 (8), 918–923.
- Lachapelle, P.R., McCool, S.F., 2012. The role of trust in community wildland fire protection planning. *Soc. Nat. Resour.* 25 (4), 321–335.
- Leone, V., Tedim, F., Xanthopoulos, G., 2020. Fire Smart Territory as an innovative approach to wildfire risk reduction. In: *Extreme Wildfire Events and Disasters*. Elsevier, pp. 201–215.
- Lindof, T.R., Taylor, B.C., 2002. *Qualitative Communication Research Methods*, Second ed. Sage Publications, Thousand Oaks, CA.
- Lofland, J., 1984. *Analyzing Social Settings: A Guide to Qualitative Observation and Analysis*. Waveland Press.
- McKenna, S.A., Main, D.S., 2013. The role and influence of key informants in community-engaged research: a critical perspective. *Action Res.* 11 (2), 113–124.
- McLennan, B., Eburn, M., 2014. Exposing hidden-value trade-offs: sharing wildfire management responsibility between government and citizens. *Int. J. Wildland Fire* 24 (2), 162–169.
- Meldrum, J.R., Champ, P.A., Brenkert-Smith, H., Warziniack, T., Barth, C.M., Falk, L.C., 2015. Understanding gaps between the risk perceptions of wildland–urban interface (WUI) residents and wildfire professionals. *Risk Anal.* 35 (9), 1746–1761.
- Meldrum, J.R., Champ, P.A., Warziniack, T., Brenkert-Smith, H., Barth, C.M., Falk, L.C., 2014. Cost shared wildfire risk mitigation in Log Hill Mesa, Colorado: survey evidence on participation and willingness to pay. *Int. J. Wildland Fire* 23 (4), 567–576.
- Meldrum, J.R., Brenkert-Smith, H., Champ, P.A., Falk, L., Wilson, P., Barth, C.M., 2018. Wildland–urban interface residents' relationships with wildfire: variation within and across communities. *Soc. Nat. Resour.* 31 (10), 1132–1148.
- Moritz, M.A., Hazard, R., Johnston, K., Mayes, M., Mowery, M., Oran, K., et al., 2022. Beyond a focus on fuel reduction in the WUI: the Need for regional wildfire mitigation to address multiple risks. *Frontiers in Forests and Global Change* 5.

- Nielsen-Pincus, M., Ribe, R.G., Johnson, B.R., 2015. Spatially and socially segmenting private landowner motivations, properties, and management: a typology for the wildland urban interface. *Landsc. Urban Plann.* 137, 1–12.
- O'Connor, C., Joffe, H., 2020. Intercoder reliability in qualitative research: debates and practical guidelines. *Int. J. Qual. Methods* 19, 1609406919899220.
- Ojerio, R., Moseley, C., Lynn, K., Bania, N., 2011. Limited involvement of socially vulnerable populations in federal programs to mitigate wildfire risk in Arizona. *Nat. Hazards Rev.* 12 (1), 28–36.
- Ostergren, D.M., Lowe, K.A., Abrams, J.B., Ruther, E.J., 2006. Public perceptions of forest management in north central Arizona: the paradox of demanding more involvement but allowing limits to legal action. *J. For.* 104 (7), 375–382.
- Palsa, E., Bauer, M., Evers, C., Hamilton, M., Nielsen-Pincus, M., 2022. Engagement in local and collaborative wildfire risk mitigation planning across the western US—evaluating participation and diversity in Community Wildfire Protection Plans. *PLoS One* 17 (2), e0263757.
- Paveglio, T.B., 2021. From checkers to chess: using social science lessons to advance wildfire adaptation processes. *J. For.* 119 (6), 618–639.
- Paveglio, T., 2023. The Interactional Approach to Adaptive Capacity: Researching Adaptation in Socially Diverse, Wildfire Prone Communities. *Local Development & Society*, pp. 1–24.
- Paveglio, T.B., Abrams, J.B., Ellison, A., 2016. Developing fire adapted communities: the importance of interactions among elements of local context. *Soc. Nat. Resour.* 20 (10), 1246–1261.
- Paveglio, T.B., Boyd, A.D., Carroll, M.S., 2017. Re-conceptualizing community in risk research. *J. Risk Res.* 20 (7), 931–951.
- Paveglio, T.B., Carroll, M.S., Stasiewicz, A.M., Edgeley, C.M., 2019a. Social fragmentation and wildfire management: exploring the scale of adaptive action. *Int. J. Disaster Risk Reduc.* 33, 131–141.
- Paveglio, T.B., Carroll, M.S., Stasiewicz, A.M., Williams, D.R., Becker, D.R., 2018. Incorporating social diversity into wildfire management: proposing “pathways” for fire adaptation. *For. Sci.* 64 (5), 515–532.
- Paveglio, T.B., Edgeley, C.M., 2020. Kittitas Fire Adapted Communities Coalition workshop report. Kittitas Fire Adapted Communities Coalition, pp20,, 9/3/2023. https://www.kccd.net/_files/ugd/b7e4d5_68ef553aff8242f983b6414e505a6aa5.pdf.
- Paveglio, T.B., Edgeley, C.M., 2023. Variable support and opposition to fuels treatments for wildfire risk reduction: Melding frameworks for local context and collaborative potential. *J. For.* 121 (4), 354–373.
- Paveglio, T.B., Edgeley, C.M., Carroll, M., Billings, M., Stasiewicz, A.M., 2019b. Exploring the influence of local social context on strategies for achieving fire adapted communities. *Fire* 2 (2), 26.
- Paveglio, T.B., Jakes, P.J., Carroll, M.S., Williams, D.R., 2009. Understanding social complexity within the wildland–urban interface: a new species of human habitation? *Environmental Management* 43, 1085–1095.
- Paveglio, T.B., Kelly, E., 2018. Influences on the adoption and implementation of a wildfire mitigation program in an Idaho city. *J. For.* 116 (1), 47–54.
- Paveglio, T.B., Schmidt, A., Medley-Daniel, M., 2023. The fire adapted communities pathways tool: facilitating social learning and a science of practice. *J. For.* fva044. <https://academic.oup.com/jof/advance-article/doi/10.1093/jofore/fva044/7289098>.
- Paveglio, T.B., Moseley, C., Carroll, M.S., Williams, D.R., Davis, E.J., Fischer, A.P., 2015. Categorizing the social context of the wildland urban interface: Adaptive capacity for wildfire and community “archetypes. *Forest Science* 61 (2), 298–310.
- Paveglio, T.B., Schmidt, A., Medley-Daniel, M., 2022. Fire adapted communities pathways tool. Fire Adapted Communities Learning Network. <https://fireadaptednetwork.org/resources/fac-pathways-tool/>.
- Reed, M.G., Henderson, A.E., Mendis-Millard, S., 2013. Shaping local context and outcomes: the role of governing agencies in collaborative natural resource management. *Hum. Dimens. Wildl.* 18 (4), 292–306.
- Reid, K., Beilin, R., McLennan, J., 2018. Shaping and sharing responsibility: social memory and social learning in the Australian rural bushfire landscape. *Soc. Nat. Resour.* 31 (4), 442–456.
- Roos, C.I., Scott, A.C., Belcher, C.M., Chaloner, W.G., Ayles, J., Bird, R.B., 2016. Living on a flammable planet: interdisciplinary, cross-scalar and varied cultural lessons, prospects and challenges. *Philos. Trans. R. Soc. B* 371 (1696), 20150469.
- Saldaña, J., 2015. *The Coding Manual for Qualitative Researchers*. Sage, Thousand Oaks, CA.
- Schultz, C.A., Moseley, C., 2019. Collaborations and capacities to transform fire management. *Science* 366 (6461), 38–40.
- Schusler, T.M., Decker, D.J., Pfeffer, M.J., 2003. Social learning for collaborative natural resource management. *Soc. Nat. Resour.* 16 (4), 309–326.
- Spencer, A.G., Schultz, C.A., Hoffman, C.M., 2015. Enhancing adaptive capacity for restoring fire-dependent ecosystems: the fire learning Network’s prescribed fire training exchanges. *Ecol. Soc.* 20 (3).
- Srivastava, P., Hopwood, N., 2009. A practical iterative framework for qualitative data analysis. *Int. J. Qual. Methods* 8 (1), 76–84.
- Stasiewicz, A.M., Paveglio, T.B., 2017. Factors influencing the development of Rangeland Fire Protection Associations: exploring fire mitigation programs for rural, resource-based communities. *Soc. Nat. Resour.* 30 (5), 627–641.
- Stasiewicz, A.M., Paveglio, T.B., 2018. Wildfire management across rangeland ownerships: factors influencing Rangeland Fire Protection Association establishment and functioning. *Rangel. Ecol. Manag.* 71, 727–736.
- Steelman, T., 2016. US wildfire governance as social ecological problem. *Ecol. Soc.* 21 (4), 1–14.
- Steelman, T.A., Kunkel, G.F., 2004. Effective community responses to wildfire threats: lessons from New Mexico. *Soc. Nat. Resour.* 17 (8), 679–699.
- Steelman, T.A., McCaffrey, S.M., 2011. What is limiting more flexible fire management—public or agency pressure? *J. For.* 109 (8), 454–461.
- Steelman, T., Nowell, B., 2019. Evidence of effectiveness in the Cohesive Strategy: Measuring and improving wildfire response. *Int. J. Wildland Fire* 28 (4), 267–274.
- Steinberg, M., 2011. Firewise forever? Voluntary community participation and retention in Firewise programs. P. 79 – 87. In: McCaffrey, S., Fisher, C.L. (Eds.), *Proc. Of the Second Conference on the Human Dimensions of Wildland Fire*, USDA Forest Service Gen. Tech. Rep. NRS-P-84., Northern Research Station, Newtown Square, PA.
- Stern, M.J., Coleman, K.J., 2015. The multidimensionality of trust: applications in collaborative natural resource management. *Soc. Nat. Resour.* 28 (2), 117–132.
- Susskind, L.E., McKearnen, S., Thomas-Lamar, J., 1999. *The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement*. Sage Publication, Thousand Oaks, CA.
- Suter, W.N., 2012. *Introduction to Educational Research: a Critical Thinking Approach*, second ed. Sage, Thousand Oaks, CA.
- Sword-Daniels, V., Eriksen, C., Hudson-Doyle, E.E., Alani, R., Adler, C., Schenk, T., Vallance, S., 2016. Embodied uncertainty: living with complexity and natural hazards. *J. Risk Res.* 21 (3), 290–397.
- Taylor, J.G., Gillette, S.C., Hodgson, R.W., Downing, J.L., Burns, M.R., Chavez, D.J., Hogan, J.T., 2007. Informing the network: improving communication with interface communities during wildland fire. *Hum. Ecol. Rev.* 198–211.
- Tedim, F., Leone, V., Xanthopoulos, G., 2016. A wildfire risk management concept based on a social-ecological approach in the European Union: fire Smart Territory. *Int. J. Disaster Risk Reduc.* 18, 138–153.
- US Department of Interior and US Department of Agriculture, 2014. *National Cohesive Wildland Fire Management Strategy*, pp101. Available at: <https://www.forestsandrangelands.gov/strategy/>.
- USDA Forest Service, 2022. *Confronting the Wildfire Crisis: a Strategy for Protecting Communities and Improving Resilience in America’s Forests*. US Department of Agriculture, Washington (DC).
- Uyttewaal, K., Prat-Guitart, N., Ludwig, F., Kroeze, C., Langer, E.R., 2023. Territories in Transition: how social contexts influence wildland fire adaptive capacity in rural Northwestern European Mediterranean areas. *Fire Ecology* 19 (1), 13.
- Vaughn, L.M., Jacquez, F., 2020. Participatory research methods—Choice points in the research process. *Journal of Participatory Research Methods* 1 (1).
- Walpole, E.H., Toman, E., Wilson, R.S., Stidham, M., 2017. Shared visions, future challenges: a case study of three Collaborative Forest Landscape Restoration Program locations. *Ecol. Soc.* 22 (2).
- Williams, D.R., Jakes, P.J., Burns, S., Cheng, A.S., Nelson, K.C., Sturtevant, V., et al., 2012. Community wildfire protection planning: the importance of framing, scale, and building sustainable capacity. *J. For.* 110 (8), 415–420.
- Wollstein, K., Creutzburg, M.K., Dunn, C., Johnson, D.D., O’Connor, C., Boyd, C.S., 2022. Toward integrated fire management to promote ecosystem resilience. *Rangelands* 44 (3), 227–234.