



Research

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Using community archetypes to better understand differential community adaptation to wildfire risk

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One of the immediate challenges of wildfire management concerns threats to human safety and property in residential areas adjacent to non-cultivated vegetation. One approach for relieving this problem is to increase human community 'adaptiveness' to deal with the risk and reality of fire in a variety of landscapes. The challenge in creating 'fire-adapted communities' (FACs) is the great diversity in character and make-up of populations at risk from wildfire. This paper outlines a recently developed categorization scheme for Wildland–Urban Interface (WUI) communities based on a larger conceptual approach for understanding how social diversity is likely to influence the creation of FACs. The WUI categorization scheme situates four community archetypes on a continuum that recognizes dynamic change in human community functioning. We use results from the WUI classification scheme to outline key characteristics associated with each archetype and results from recent case studies to demonstrate the diversity across WUI communities. Differences among key characteristics of local social context will likely result in the need for different adaptation strategies to wildfire. While the WUI archetypes described here may not be broadly applicable to other parts of the world, we argue that the conceptual approach and strategies for systematically documenting local influences on wildfire adaptation have potential for broad application.

This article is part of the themed issue 'The interaction of fire and mankind'.

1. Introduction

The occurrence of wildfire in many populated areas of the world creates a myriad of challenges for local populations and their governments. Managing wildfire risk is complicated and contested in many settings, both in terms of characterizing root causes and when dealing with the practicalities of its present manifestation [1–3]. Despite this complexity, which is manifest differently in different social–ecological systems across the world, the challenges wildfire poses for relevant communities and authorities can often be summarized simply. A very small fraction of fire starts evade initial suppression control and become larger conflagrations that threaten not only surrounding forests and grasslands, but also human safety and infrastructure. This can lead to a number of consequences, many of which reinforce or perpetuate a system of what is increasingly seen as unsustainable wildfire suppression [3–5].

One set of growing consequences from wildfire is life disruption, property damage and sometimes physical danger for those near or within burned areas. Another set of consequences is the ever-growing need for firefighting resources and growing firefighting expenditures in many countries [6–8]. These growing suppression burdens can distort the budgets and priorities of land management agencies, whose principle legal mandates are often to manage public lands, but who find themselves devoting seemingly ever-increasing amounts of resources and personnel time to protecting human communities from wildland fires [9,10]. Residential areas at risk from or focused on in wildfire policy are often referred to collectively as the Wildland–Urban Interface (WUI) or peri-urban areas [11,12]. Such areas are adjacent to or intermixed with vegetation where

wildfire is likely to occur, but historic definitions of those designations make few efforts to segment the diversity of communities that fit in either category. Our goal in this paper is to outline recent conceptual and methodological advances for characterizing the diversity of WUI or peri-urban communities in the USA and to explain how such efforts should be incorporated in policy or planning related to progress on addressing the wildfire problem. We also suggest that while details will differ, this general approach has great potential to be useful for understanding how local social diversity and historical context influence the need for unique approaches to fire management.

Increasing suppression efforts, however locally important in the short term, are clearly not the one, overarching solution to the wildfire problem. In fact, there is fairly broad scientific consensus that decades of increased fire suppression in many regions of the world also influence the growing size and impact of wildfires [13,14]. This is due in part to a build-up of fuels in some forest types which are fire adapted but burn with increased severity when fire is less frequent than has been historically the case [15,16]. It also is exacerbated by climate change [17]. Likewise, the ever-increasing focus on simulating potential wildfire risk to prioritize resources and suppression efforts in areas of potential catastrophic loss from wildfires are useful, but incomplete [7,18,19]. Such efforts often do not directly address what may be the most dynamic and variable facet influencing the wildfire problem—historic and ongoing human behaviours, including collective action among at-risk populations that could help significantly alleviate the suppression burden of public agencies.

Increasing wildfire risks are driven significantly by the relationships (or couplings) between social and biophysical systems [4,20,21]. It is widely recognized that human development patterns, historic land management policies and the structure of firefighting administration in many places in the world are contributors to the challenges posed by wildfires and must be considered as part of any long-term ‘solutions’ [1,22]. Most professionals and scholars now readily acknowledge the important need to foster responsibility for wildfire management among local individuals and communities that can reduce the burden of fire suppression [23,24].

Recognition and incorporation are two different things. As suggested by the above literature, fostering private citizen responsibility for wildfire management has led to a renewed focus on methods for engaging populations in collaborative or coordinated processes that define wildfire risk, prioritize strategies to reduce fire impacts and implement adaptive actions that reincorporate fire as an ecosystem process. It also has led to an increase in studies that attempt to understand how to balance various private and public values at risk from wildfire.

In the USA for instance, making progress on the wildfire problem is difficult given a system of fire governance/suppression built on strict rules on the one hand and an American culture that celebrates individual freedoms on the other. Perhaps more importantly, social science has not yet determined a common set of predictors or incentives (in either the USA or globally) that can be harnessed to foster local responsibility and action in reducing wildfire risk [22,25,26]. Instead, longitudinal lessons from that research indicate that common predictors vary in their importance to the diverse human populations that live with, in and near the wildlands [27]. Wildfire science from locations across the world continues to recognize that the unique social and biophysical characteristics

of fire-prone environments, including historical approaches to land management, area culture, amenity migration, locals’ perceptions about wildfire and trust between stakeholders can all influence drastically different collective responses to wildfire risk [28–30]. Recognition of the ways in which local context influence response to wildfire expand and borrow from larger discourses on community adaptation to hazards or climate change using meta-concepts such as resilience, vulnerability, adaptive capacity, collaborative governance and pyrogeography [20,31,32]. While it is beyond the scope of this article to review the full breadth of that literature, a key point is that wildfire risk has critical local elements that will be important—and variable—when implementing any policies, programmes or larger efforts to adapt to wildfire.

The concept of ‘fire adapted’, which has long been used by ecologists in reference to certain plant associations, is now being applied to human communities in the WUI as a means to advance management of fire as a coupled social and ecological system [33,34]. The moniker of ‘fire-adapted communities’ (FACs) organizes disparate programmes and the broader goal of fostering local community or individual response for fire mitigation under a new and more comprehensive banner. The idea is to foster the ability of WUI communities to withstand the effects of a fire igniting in a wildland area and burning in the vicinity of such a settlement. While all the attributes of an FAC have yet to be fully defined, the root idea is that fire will be experienced in such a settlement as a more-or-less routine event that does not require much outside mitigation or suppression effort rather than a significant disturbance. Related benefits of promoting FACs are reduced needs for fire suppression and reintegration of periodic fires as a healthy component of landscapes that regulate ecosystem processes.

A given community attempting to become more ‘fire adapted’ might consider organizing itself to manage natural and human-created fuels around (and built into) buildings, neighbourhoods and/or the perimeter of the settlement area, address ingress and egress to residential areas, share key information both before and during a fire event, coordinate emergency (or at least event) preparedness including contingencies for evacuating or staying and defending, and have in place contingency plans for local structure protection and emergency medical care. Underlying this partial list of key adaptive characteristics however, is something more fundamental, namely a shared human understanding of the role of fire in local landscapes, agreement over how to best live with fire through adaptive actions, and a shared commitment to collaborate on any collective planning/strategies for addressing the issue [35]. As we note above, this list is only partial and somewhat speculative, but it begins to convey the wide array of attributes and actions that might comprise fire adaptation at the community level. To summarize, an FAC will be better off than a less well adapted one at living with and managing fire, and will exercise more agency to affect its own fate if and when an unwanted fire event occurs. In addition, the extent to which communities can manage their own fire risk is likely to reduce in some proportion the effort and expense outside agencies need to expend in defending communities when fires occur [33,34].

The intersection of research provided above presents both opportunities and challenges for the realization of FACs in diverse social and ecological conditions. While the overarching thrust for FACs is to promote populations who can better minimize negative wildfire impacts while allowing some fires

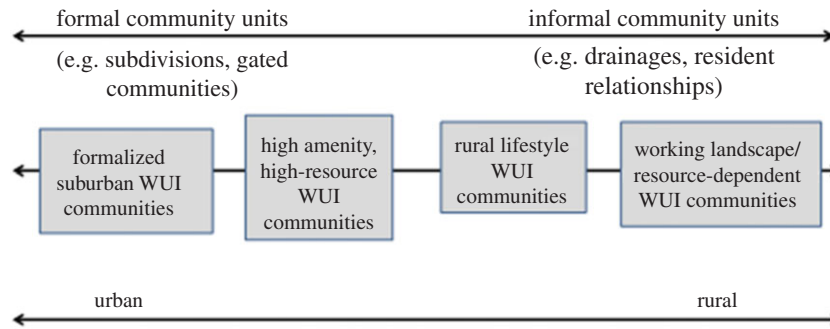


Figure 1. Depiction of the WUI community archetypes (adapted from Paveglio *et al.* [27]). (Online version in colour.)

to serve valuable ecological processes, the details of how a given community can adapt itself to achieve and maintain such a condition will vary widely depending on the characteristics of the community itself (including their relationship to the landscape). While this is being increasingly recognized, it is not well articulated in terms of the strategies for achieving FACs or potential outcomes that guide that goal. That is, the science of wildfire has spent comparably less time attempting to understand the factors that will allow for flexible application of wildfire mitigation policies, programmes and planning for a variety of communities [36,37].

Given our above argument, one critical place to make progress on the ‘fire problem’ is at the community level—yet WUI or peri-urban communities are diverse and complex. Thus, it follows that a systematic understanding of the key characteristics that differentially influence community adaptation to fire risk is needed [36,37]. The documentation of these key characteristics across communities can help professionals and residents better understand how policies and programmes for managing fire risk can be flexibly adapted to meet the unique needs and benefits sought by a variety of populations. The present authors, along with other colleagues, have been developing the insights, frameworks and conceptual approaches that address this need. We recently published a scheme for beginning to classify WUI communities as a way of better understanding how communities with different key characteristics may approach the problem of becoming more fire adapted in different ways [27]. That typology is based on a meta-analysis of 20 years of previously published case studies of fire-prone communities in the US West [24,27,36–39]. Corresponding reviews of the wildland fire social science literature, in which these studies were embedded, also found a great deal of variability in the composition of WUI communities and their approaches to dealing with fire risk [27].

One purpose of this paper is to outline some key features of our WUI typology, which can be portrayed as four points in a continuum, and not as mutually exclusive categories. We do this by briefly summarizing the community ‘archetypes’ that our recent meta-analysis produced [27]. Our continuum approach highlights how the social context of communities changes over time, and recognizes that documenting ongoing changes in the relationships among at-risk populations, and with their landscape, will continue to drive wildfire management approaches. In a broad sense, the WUI continuum recognizes and advances characterization of community life from rural to urban, and from highly dense developments to more broadly spaced agricultural or remote properties. It is the latest application of our conceptual approach for developing more systematic understandings of the complexity of fire-prone WUI communities.

Another purpose of this paper is to suggest the usefulness of our approach for better understanding how WUI communities can or likely will adapt to wildfire risk, and how professionals can contribute to those efforts. We outline two example communities that help articulate different archetypes and emphasize why their possible paths for increased fire adaptation are likely to be different from each other. Finally, we conclude by outlining some of the possible lessons our approach might have for other regions of the world (figure 1).

2. Wildland–urban interface community archetypes

Our recent analysis uncovered four community archetypes. We re-emphasize that the four archetypes are not meant to be seen as all-inclusive and mutually exclusive ‘watertight’ categories. Rather, they are meant to be seen as a heuristic device to suggest tendencies for types of communities to share characteristics and be likely to share commonalities in practical strategies for achieving greater fire adaptiveness. Below we outline some of the critical differences between ‘points’ in our continuum, while a more complete discussion of all differences can be found elsewhere [27].

One side of the continuum is anchored by what we call Formalized Suburban (FS) WUI communities. People who live in this type of community tend to be relatively affluent, often commute to urban centres for work and live in relatively highly defined (e.g. gates, homeowners associations (HOAs), signed entrances) and often dense neighbourhoods. To the extent that they have a collective identity, it tends to centre at a small neighbourhood scale. Any collective action in such places tends to centre on social issues such as clubs and common areas, rather than broad landscape issues of public lands or ecosystem management. Residents of FS communities tend to be professional and typically lack highly developed skills required for reducing area vegetation or operating machinery. For example, if a firebreak is to be created, the tendency is to hire a contractor rather than to organize work parties of residents; yet, they are adept at writing for grants or performing planning exercises. Local organizations tend to be somewhat formal in such communities when compared with others described below. Experience and knowledge about the ecological role of wildfire in the landscape tends to be relatively low in this community type. Instead, regulations at neighbourhood, city or higher levels of governance are supported.

Moving along the continuum, one would encounter the High Amenity/High Resource (HAHR) WUI community. Like the previous type, HAHR residents tend to be

professional, but there is more heterogeneity in residents and additional skills such as resource or emergency management that can be brought to bear on the wildfire problem. Residents of the HAHR choose to live in a particular area because of visual and other outdoor recreation-linked opportunities. Thus, places such as this tend to be subject to considerable 'amenity migration' [40] with people moving in for the outdoor amenities, often from more urban settings and potentially contributing to added wildfire management complexity. Rather than being attached to small neighbourhoods, residents of this community type tend to place a high value on the outstanding landscapes in which their communities are embedded. Their collective identity is at the river/stream drainage or community scale, reflecting a relatively high level of residential concentration. Collective action in communities of this type tends to focus on environmental issues in the broader landscape and includes relatively high trust in government agencies managing nearby lands. As such, they tend to collaborate well with agencies and serve as good partners. Direct experience with fire in the landscape often tends to be low given the relatively large proportion of former urbanites in such places.

The third community type on the continuum is called a Rural Lifestyle (RL) WUI community. Life in such places tends to be more focused on rurality as a way of life rather than scenery or outdoor recreation, *per se*. Residents of these places tend to emphasize more physical self-reliance than those in the previously described categories and are less likely to live in a place just for its scenic amenities. Collective identity tends to focus on the whole community or landscape scale; it is tied to living in settings that are more rural and the challenges/opportunities of doing so. Collective action in such places tends to focus on challenges ranging from maintaining roads to keeping rural schools funded. Community organizations, to the extent that they exist in such places, tend to be informal. Amenity migration to these areas is prevalent, but at a slower rate than HRHA communities. There tends to be a plentiful mix of both professional skills and practical know-how in such communities. Paired with a preference for dealing with issues on their own and a reluctance to work with the government or impose regulations, efforts to reduce wildfire risk tend to be organized locally. Direct experience with fire and the stock of handed-down knowledge about it is higher than previously described archetypes due to slower in-migration and relatively long residential tenures.

The final community type on the continuum is called a Working Landscape/Resource Dependent (WLRD) WUI community. Such communities have their roots in what virtually all European-settled rural communities were like in the nineteenth and early twentieth centuries in the American West. People in such places often still derive their livelihoods from logging, farming, ranching, mining, etc., or at least had a parent that did so. These communities tend to have a strong emphasis on intergenerational ties and kinship; they have strong place-based traditions of 'working the land'. This is a contributor to and perpetuator of a well-defined local culture. Collective identity tends to focus at the community or county level; it is tied to resources. Such places tend not to be subject to amenity migration. While such communities often have strong traditions of neighbours working together to make a living from the land and solving rural problems, such action tends to be highly informal and unstructured. Such places are not characterized by large numbers of

formal community organizations or committees. Historical relationships with and evolving perspectives about the government or land management agencies mean that these residents are likely to distrust or lack support for government programmes that are not at the local level. Residents tend to be high in practical skills but lower in professional or more formalized ones. Direct experience with fire in the landscape tends to be prevalent in such communities, and they actively attempt to contribute to firefighting actions that pose risk to the landscape their livelihoods are tied to.

3. The relevance of community differences

Analyses and experience of the current authors suggest that many of the differences between community types have a large influence on how a community can reasonably achieve greater levels of fire adaptiveness. For example, areas that share most commonalities with the FS archetype tend to be more accepting of formalized educational programmes. They also tend to be more accepting of formal codes or standards for regulating house placement and allowable vegetation in residential areas. Communities sharing commonalities with the RL and especially WLRD communities would not support and might actively oppose such standards. On the other hand, WLRD residents tend to be more trusting of local sources of information and lived experience about how to manage fuels around residences. Their local economies can potentially support costs for reducing fuel loadings that contribute to wildfire risk. HAHR communities are more likely to respond to messages about the positive role of fire management in restoring ecosystem health and protecting recreational activities than messages about protecting the timber resource for later extraction. These are just a few of many considerations we are exploring in terms of 'tailoring' fire management approaches to local contexts. The larger point is that adaptation to fire risk needs to resonate locally and generate local participation in ways that are compatible with the reasons people live in the places they do. If wildfire management is to be successfully organized, and if local people are to play a role in that organization, ongoing efforts need to take account of the cultures of communities and the ways they approach and solve problems.

(a) Case study examples

We now turn to brief descriptions of two recently published case studies of WUI communities and wildfire to illustrate why community differences matter in relation to adaptation strategies. Cases from opposite ends of the continuum were chosen to clearly illustrate differences. Recently published cases were chosen because of space limitations in the current article and so that the reader can readily refer to details that cannot be included here.

(i) Caughlin Ranch, Nevada

The Caughlin Ranch, Nevada, area embodies many of the characteristics of an FS WUI community. The named collection of subdivisions located near the city of Reno shares an overarching HOA and features smaller subdivisions, some of which are gated [25,32]. Residents of the Caughlin Ranch area tend to be professionals and retired professionals. There is a relatively high amount of turnover in residents, and very few of them grew up in or have high familiarity

with the local area. Caughlin Ranch is located on the periphery of the Humboldt-Toiyabe National Forest. The area experienced significant wildfires in 2007 and 2011, both of which resulted in a portion of community residents being evacuated. The latter fire destroyed 29 homes in adjacent settlements but none in Caughlin Ranch. Interview data suggested that many residents were not very familiar with wildland fire and its risk factors. Instead, they look to the local HOA to create standards and programmes for reducing wildfire risk. The nearby national forest had been conducting hazardous fuel reduction on lands within its jurisdiction by means of thinning and prescribed burning but local residents were largely unfamiliar with these activities or their purpose.

Interestingly, interviews also indicated that some Caughlin Ranch residents were unsure of even which federal agency administers the Humboldt-Toiyabe National Forest land that could be seen from their homes. The nearby state university extension arm had produced educational materials on reducing fire risk in residential areas and promoted its programme to develop locally driven wildfire planning. However, there was a lack of resources, interest and local capacity to perpetuate participation that would formalize the programme in the area. The most relevant local entity for potentially dealing with fire risk was the local HOA, which enforced strict rules regarding home design, yard appearance and other related matters. The HOA's role in fire risk reduction had both positives and negatives, however. On one hand, it had a history of encouraging the planting of junipers and placement of flammable cedar fencing that would increase risk. On the other, it also established fuel reduction in large common areas that reduced fire risk and forbid the use of highly combustible cedar shakes as roofing material. After recent fire events, the HOA changed some rules, now forbidding the use of bark mulch and allowing (but not requiring) the removal of dangerous yard vegetation. Interview data indicated that some more knowledgeable HOA members had attempted to introduce other risk reducing measures but were stymied by association governance rules and the complacency or opposition of other members. The case study also uncovered a lack of linkages between the HOA and other entities such as the state university and the US Forest Service (which administers the Humboldt-Toiyabe National Forest). Both the Forest Service and the state university have access to information and resources that could be used to make the community more fire adapted, but these relationships were hard to establish. All of this points to a need for more formal mechanisms and relationships that should be leveraged in order to advance wildfire management. Actions likely need to be mandated or required and the logic of those efforts articulated in terms of professional expertise in order to reduce wildfire risk and the burden on future professional firefighting efforts. This is a better tactic than the common approach of increasing resident awareness of wildfire risk in the hopes that more 'grassroots' community organizing will occur in an area where those tactics are not of much interest to locals.

(ii) Dayton, Washington

Dayton, Washington, is a rural community in the eastern part of the state, located near the Wallowa-Whitman National Forest and also near the foothills of the Blue Mountains. The Dayton area has a long history of agriculture and logging. The continued importance of farming to the local economy and way of life clearly locates the community in the WLRD

archetype. Members of the Dayton area have a long history of dealing with small and occasionally large fires. We studied the area in 2012 regarding the long-term community effects of a large fire that impacted the area in 2006 [41]. The 2006 fire burned more than 100 000 acres of grain, pasture and forests in the Dayton area, destroying 28 structures and one permanent home.

European settlement in the Dayton area was linked to timber harvest and wheat farming. Although the main street area of the town now contains some higher-end eateries and a regionally acclaimed hotel aimed at attracting tourist dollars, a significant portion of local life continues to be tied to its historical roots. These roots are all about extracting a living from the land. Thus, local culture is strongly utilitarian, highly integrated in the landscape and more than a little suspicious of non-local government.

The study turned up a long history of local self-sufficiency in terms of managing fuels around rural residences, barns and equipment sheds and also in relation to containing small- and medium-sized field or wildfires. These are seen as common-sense responsibilities of individual landowners and members of rural communities. As such, Dayton area residents see little need for formal programmes that would further 'educate' locals about how to reduce wildfire risk. There is considerable overlap between the farming population and the local volunteer fire department. Farmers often turn up with a tractor or 'cat' (bulldozer) at the first sign of smoke on their neighbour's land, and with few or no words spoken, begin to create a 'line' or fuel break around the burning area. Such activities are seen as a normal part of farming. There is a strong tradition of neighbour-to-neighbour reciprocity on such occasions.

The most striking theme that emerged in interviews conducted some 6 years after the fire was surviving feelings of local animosity over conflicts that occurred between locals and the external Incident Command (IC) teams (professional firefighters) that were called in to take over the suppression efforts when the fire became too large to be managed locally. The conflict was multi-faceted, but a number of themes influencing it emerged from the interviews. One was that the outside firefighters were perceived by locals as lacking the sense of urgency that local firefighters felt toward protecting their own community and simply did not move quickly or aggressively enough in the early stages of the fire. Another was that farmers and forest land owners felt the IC team did not place enough emphasis on protecting crop land and stands of trees which were seen by some owners as more valuable than their houses. The issue that brought the conflict to a head and made it into local newspapers was over local access to private land during the event; particularly by locals attempting to help neighbouring farmers protect their private lands and resources.

The story of Dayton is one of a much more self-sufficient community relative to dealing with fire risk than is the case for Caughlin Ranch. Additional fuel management around residences, particularly among 'in town' residents, was still needed in Dayton but the knowledge of what to do in this regard was far more widespread. However, that same confidence in local knowledge and self-sufficiency can result in a reluctance to work with outside entities or accept external aid that could make the community more fire adapted. Any additional steps towards community preparedness in Dayton would likely occur through informal means, and taking advantage of existing social networks in and around the community. Virtually no one in Dayton would tolerate being told how to

manage one's backyard by a HOA or even a locally passed ordinance. One challenge for Dayton is how to interact more effectively with outside firefighting entities in any future event to better protect resources relating to livelihoods as well as residences. In that regard, Dayton is potentially more vulnerable to large, infrequent wildfires, and they will need to adapt additional planning for those circumstances. The challenge for IC teams in places like Dayton is to better harness local knowledge and skills in places where this exists, so as not to be working at cross purposes with the very people it is trying to protect.

4. Discussion

This paper attempts to make the case that while understanding the biophysical components of the 'fire problem' in the western USA and elsewhere is very important, so is coming to grips with the complexities of human communities evolving (or not) to live in wildfire-prone landscapes. Chief among those complexities are the ways that unique local cultures have and will continue to evolve, and the diverse strategies that will be needed to advance natural resource and fire management in ways that correspond to those different populations' values-at-risk [22,29,30].

As a whole, wildfire science and policy in many developed countries has been driven more by biophysical science—it was only relatively recently that focus has also shifted to understanding local peoples' perspectives and actions in relation to the hazard beyond their potential disruption [1]. Even then, social considerations are not fully embraced as potentially the most actionable and influential opportunity for change in wildfire-prone systems now dominated by human influence (e.g. policy, planning, resource management, local action).

Considerable wildfire social science has been conducted across the world during the past 25 years. It provides great insight into how management strategies can address wildfire risk and engender local support or action to that end [5,34]. However, close examination of that literature, and especially recent trends, demonstrates a particularly strong bent towards deductive strategies for understanding or predicting individual human behaviour. We suggest a parallel focus on collective behaviour at the community level, which is where there is great potential for innovation and adaptation [27,36,37]. Likewise, there is no shortage of recent efforts to develop a 'bigger picture' of wildfire dynamics and management in various countries or at a global level [4,5,42]. More rarely are these efforts locally grounded in systematic approaches for understanding and comparing the diverse set of populations who will 'live with fire' in very different ways.

Almost all of the theories, concepts and approaches applied to wildfire were developed for other hazards, resource management issues or social problems. Our efforts recognize that addressing the wildfire problem means learning from other disciplines, but it also requires the development of organic approaches. Advancement in the wildfire problem lies somewhere between legacy and change; it is rooted in particular places, and the result of dynamic interactions between people and places. Our long-term efforts are aimed at building a conceptual approach to understanding wildfire management from the 'bottom up'—recognizing that we need better and

systematic understandings for social systems in order to articulate their importance in reducing the wildfire problem. The archetypes presented here are the latest progression in that theoretical advancement, but the underlying characteristics that allow those comparisons are the means to collect uniform data on social conditions and compare them in ways that can generate theory.

The present authors would not presume that the archetypes presented here for the Western USA can be directly applied anywhere. In fact, it would be antithetical to our argument that approaches for wildfire management must be congruent with why people live in a given locale and with the existing social organization in such a place. For our region, the WUI typology is a step towards potentially better wildfire management and planning that avoids the problems of one-size-fits-all thinking.

We would argue however, that the logic of understanding local populations, and taking advantage of local knowledge and social organization in thinking through approaches to complex natural resource problems such as wildfire are broadly applicable. To that end we suggest that researchers in other regions consider developing a common corpus of local characteristics, dynamics, and influences that past and present researchers have indicated are potentially important contributors to action with regards to wildfire management [37]. A next step is to situate those characteristics within larger conceptual categories that indicate their relative role in terms of local community functioning [27,36,37]. Subsequent work can use this corpus of potential influences to document variance in the types and combination of factors that lead to differential support for or enactment and adaptation of strategies for managing wildfire and the lands potentially impacted by it. Comparison of these efforts, with a particular focus on the interaction between characteristics in promoting outcomes and an overall narrative for the places that emerge, can result in the development of archetypes unique to a region. As we have noted, future research efforts using our WUI archetypes will focus on developing and testing the applicability of different strategies for achieving fire adaptation that match existing populations' values and perspectives. The result will be the development of different 'pathways' for becoming fire adapted—and the potential for renegotiation of that definition—rather than its prescription ahead of understanding.

Authors' contributions. M.C. conducted many of the case studies that led up to the archetype analysis, participated in the archetype analysis, participated in the fieldwork for the Dayton case study presented in this paper and participated in the writing and editing of this paper. T.P. was the lead in the original analysis that led to the definition of the community archetypes, conducted many of the case studies that led up to the archetype analysis, and participated in fieldwork and analysis for both case studies presented in this paper. He participated in the writing and editing of this paper.

Competing interests. We declare we have no competing interests.

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