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Journal of Environmental Planning and Management

ISSN: 0964-0568 (Print) 1360-0559 (Online) Journal homepage: http://www.tandfonline.com/loi/cjep20

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To cite this article: Jesse Abrams, Max Nielsen-Pincus, Travis Paveglio & Cassandra Moseley (2016) Community wildfire protection planning in the American West: homogeneity within diversity?, Journal of Environmental Planning and Management, 59:3, 557-572, DOI: 10.1080/09640568.2015.1030498

To link to this article: http://dx.doi.org/10.1080/09640568.2015.1030498

Journal of Environmental Planning and Management, 2016
Vol. 59, No. 3, 557–572, http://dx.doi.org/10.1080/09640568.2015.1030498

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Community wildfire protection planning in the American West: homogeneity within diversity?

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(*Received 21 March 2014; final version received 12 March 2015*)

As large wildfires have become common across the American West, federal policies such as the Healthy Forests Restoration Act have empowered local communities to plan for their own wildfire protection. Here, we present an analysis of 113 community wildfire protection plans from 10 western states where large fires have recently occurred. These plans contain wide diversity in terms of specific plan elements and dimensions, yet less diversity in the paradigms underlying their fire protection approaches. These patterns held true across both plans constructed solely by local actors as well as those constructed with the help of outside consultant expertise.

Keywords: wildfire; collaborative planning; devolved governance; consultants; community planning

1. Introduction

Wildfire has emerged as a pressing, complex, and expensive hazard in the American West. The growing incidence, extent, severity, and cost of wildfires result from interactions among three primary drivers: (1) the ongoing construction of residential structures in formerly uninhabited or sparsely inhabited areas, creating an expanding "wildland-urban interface" (WUI) in which both values at risk (e.g., private property, built infrastructure) and ignition sources are greatly increased (Hammer, Stewart, and Radeloff 2009; Syphard *et al.* 2007); (2) a post-EuroAmerican settlement history of land uses and management practices that have left many wildland habitats, particularly forests, prone to uncharacteristically intense and destructive fires (Cooper 1960; Covington and Moore 1994; Hessburg and Agee 2003); and (3) climatic trends in which both episodic and long-term periods of warming are associated with more frequent and larger fires and protracted fire seasons (Kitzberger, Swetnam, and Veblen 2001; Westerling *et al.* 2006). The wildfire dilemma is reflected in the growing incidence of large fires; the National Interagency Fire Center reports that, since 2000, the states of Arizona, New Mexico, Oregon, and Colorado have each experienced some of their largest fires on record, and landscape-scale fires have occurred elsewhere across the West. Rural communities, exurban subdivisions, suburbs, and even urbanized areas such as Colorado Springs, Colorado and San Diego, California have experienced evacuations, loss of life and property, and substantial visual and ecological changes to surrounding landscapes due to recent large fires.

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The increasing incidence of large fire events has spurred policy responses at local to national levels. The federal government has a particular interest in reducing the financial, environmental, and social impacts of fires due to its role as owner and manager of the majority of western lands and the lead entity responsible for suppression of and recovery following large fire events (Toman *et al.* 2013). The Healthy Forests Restoration Act (HFRA, P.L. 108-148), passed in 2003 in the wake of the destructive California fire season, is emblematic of contemporary federal wildfire policy in its focus on encouraging local communities to become more aware of, prepared for, and resilient to fire events. HFRA empowers local communities to create community wildfire protection plans (CWPPs) that: identify priorities and treatment strategies across the mixed-ownership landscapes within their respective WUI zones; identify means of reducing fire risk to homes and other properties; and improve local capacity to prepare for and respond to fire (Steelman and Burke 2007). CWPPs were conceived of as means for at-risk communities to collaboratively identify and prioritize local values at risk, resources, and action steps to protect people, property, and critical infrastructure on a site-specific basis. The National Association of State Foresters reports that, as of the end of FY2013, 17,060 CWPPs had been completed nationwide, covering 23% of identified communities at risk; 6,108 of these CWPPs were in the West (National Association of State Foresters 2014).

While previous studies have provided in-depth explorations of small numbers of CWPP processes and plans (Brummel *et al.* 2010; Fleeger and Becker 2010; Grayzeck-Souter *et al.* 2009; Jakes *et al.* 2007; Jakes and Sturtevant 2013; Williams *et al.* 2012), to date no studies have gathered consistent data on large numbers of plans across a broad geographic range. Here, we present the first such examination of plan content by analyzing 113 individual CWPPs across 10 western states, focusing on places that have experienced large fires since 2004. We use these data to better understand what objectives and strategies CWPPs contain, how much inter-plan variability exists, and to what extent the presence or absence of third-party consultants influences plan outcomes. We consider whether and how communities have taken advantage of the flexibility contained in the CWPP model to craft site-specific plans reflecting a diversity of contexts and management approaches.

2. Background and literature review

The advent of community-led wildfire protection planning signaled an important, if somewhat circumscribed, shift in the governance of fire-prone landscapes. HFRA provides substantial authority to local communities to identify valued natural and/or cultural assets at risk from wildfire and to establish the boundaries of their respective WUI areas, as well as to set management priorities for fire protection (Ganz, Troy, and Saah 2007). CWPPs hold particular relevance and import for inhabitants of western states, where federal land predominates. Federal land managers are required under HFRA to give priority to fuel reduction activities within the WUI (either as defined by the community or by default definitions within the Act) and to consider community priorities as land management alternatives within the planning process for federal lands. Further, HFRA provides for diminution of both environmental analysis and procedural requirements for fuel reduction activities on federal lands within the designated WUI (Steelman and Burke 2007). Through initiatives such as the National Fire Plan, federal money has been made available to support CWPP creation and wildfire risk mitigation. CWPPs are not mandatory for communities to complete, but access to state or federal funds to assist with a variety of wildfire mitigation activities incentivizes their creation by

prioritizing and privileging activities identified within a CWPP (Steelman and DuMond 2009).

HFRA presents local communities "a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands and how additional federal funds may be distributed for projects on nonfederal lands" (Society of American Foresters 2004, n.p.). This approach represents a form of environmental governance that is both collaborative, signifying a reliance on multi-stakeholder forums (including both public and non-state entities) for deliberative processes (Ansell and Gash 2008; Conley and Moote 2003), and community-based, meaning that stakeholders at the local scale are vested with some degree of decision-making authority within a multilevel governance system (Lurie and Hibbard 2008; Reed and Bruyneel 2010). Lane and McDonald (2005) identify multiple purported advantages of community-based planning, including: the inclusion of local or indigenous knowledge; a greater responsiveness to local conditions, constraints, values, and needs; improved implementation through the recruitment and engagement of local actors; a heightened level of democratic participation in planning processes; and greater attention to distributional equity concerns. Viewing the community wildfire planning process as an example of collaborative community-based governance raises questions regarding the extent to which planning efforts have taken advantage of the flexibility afforded by HFRA to craft truly site-specific plans that reflect the unique values, conditions, capacities, interests, and bodies of knowledge of their respective communities.

HFRA describes only three fundamental requirements for CWPPs; they must: (1) be collaboratively developed; (2) prioritize areas for fuel reduction; and (3) recommend measures to decrease structural ignitability (Society of American Foresters 2004). Prescriptive requirements for CWPPs are minimal, allowing each plan to reflect the interests and specifics of its respective community. For example, the requirement that plans be "collaboratively developed" can be met by involving as few as three entities: local government, local fire department, and the state forest management agency (Society of American Foresters 2004). The flexibility of CWPPs is a defining characteristic and the basis behind continued research and recommendations on CWPP design across cases (Williams *et al.* 2012). This flexibility also provides one of the most significant challenges for creation and implementation of the plans – the need to recognize, integrate, and adapt to existing local contexts (Jakes *et al.* 2007; Grayzeck-Souter *et al.* 2009). Existing research suggests that there is no one singular appropriate approach to developing a CWPP and that plans should reflect the scale, framing, and strategies that are most likely to resonate with unique populations involved in planning for wildfire risk (Jakes *et al.* 2012; Williams *et al.* 2012).

Jakes *et al.* (2011) argue that the vagueness of HFRA is "genius" given the opportunity it provides to realize the kinds of site- or community-specific benefits identified by Lane and McDonald (2005). Researchers studying the creation and use of CWPPs emphasize the importance of CWPPs as an ongoing process. They highlight the social learning that may occur among diverse stakeholders as a result of CWPP planning (Brummel *et al.* 2010; Fleeger 2008). However, the mere creation of a CWPP does not ensure that implementation of plan elements will take place or that the plan will directly influence fire response (Jakes *et al.* 2012; Toman *et al.* 2013). Jakes and Sturtevant (2013) found that direct benefits of CWPPs for fire response were only apparent to professionals and residents in one of their three case studies. Likewise, Fleeger and Becker (2010) and Lachapelle and McCool (2012) recognized that internal limitations, such as a lack of trust or agreement among stakeholders, and external limitations, such as

the availability of funds or restriction of management action by existing regulations, could all hinder the implementation of mitigation actions identified in CWPPs.

Previous case study comparisons of CWPPs have found tremendous variation in terms of the way that populations at risk are defined, the treatment strategies defined by stakeholders, and the extent to which plans have been implemented (Brummel *et al.* 2010; Williams *et al.* 2012). This variation is not necessarily a problem if the resulting plans are perceived to be useful among local populations or shown to decrease wildfire risk. For instance, Grayzeck-Souter *et al.* (2009) documented variation among CWPPs regarding whether, and in what ways, different communities defined the WUI.

In order to increase the effectiveness of CWPPs, Williams *et al.* (2012) recommend selecting a scale of planning that is likely to allow for local action among populations and justifying mitigation activities in ways that reflect existing local understandings of wildfire risk, including associated forest management. They also recommend sustaining CWPP planning as the first step in a process of implementing wildfire mitigation actions. This can be done by institutionalizing CWPPs in local practice, embedding CWPPs in existing planning efforts, and promoting early mitigation successes as a way to continue interest in the planning process. Another important component in CWPP effectiveness is land management agency participation and commitment to integrate collaborative decisions from the CWPP into their management priorities (Fleeger and Becker 2010; Jakes *et al.* 2011). Jakes *et al.* (2012) add that local leaders are critical in the development and progression of CWPPs, as are contractors or consultants who can connect stakeholders and organizations throughout the collaborative processes.

2.1. Consultants

A notable trend in community wildfire protection planning is the prominent role played by professional consultants in creating or managing the components behind many CWPPs (Jakes *et al.* 2012). Consultants have become common elements of the planning landscape across much of the world, at least in part as a result of declining governmental capacity to carry out both procedural and substantive components of planning (Prince 2012; Silverman, Taylor, and Crawford 2008). The roles and responsibilities of consultants in the planning process are diverse; they may be professional planners or they may come from backgrounds other than planning, such as land management (e.g., surveying, forestry), emergency response, or law. Many consultants operate in the context of private, for-profit businesses, while others may come from non-profit or academic institutions (Dewar and Isaac 1998; Silverman, Taylor, and Crawford 2008; Weitkamp and Longhurst 2012). They may be contracted to provide advice and assistance to individual landowners (Adams, May, and Pawson 1992), corporations (Campbell and Marshall 1998), municipalities (Silverman, Taylor, and Crawford 2008), or other public and non-state entities (Weitkamp and Longhurst 2012).

Consultants' increased visibility in public planning processes has prompted critical questions about their influence on public involvement, representation, and plan content (McCann 2001; Weitkamp and Longhurst 2012). These questions are particularly relevant in the context of devolved collaborative governance approaches, in which local communities are expected to play leadership roles and build capacity in the process. Some scholars have raised concerns regarding the effect of consultants (or those performing consultant-like roles) on community capacity building (Dewar and Isaac 1998; Stoecker 1999). It has been argued that the efficiency associated with consultant-led planning processes may come at the cost of community empowerment as community

members "become dependent on professional planning services and will not acquire local development skills" (Dewar and Isaac 1998, 343).

McCann (2001) views consultants as key components of neoliberal public–private partnerships which act to substitute limited and preconceived economic development discourses in place of more open and democratic public planning deliberations. Dewar and Isaac (1998, 343) concur that consultants "may serve as gatekeepers for admitting information, alternatives, and solutions into the planning process," thereby excluding important local sentiments and possibly reducing community commitment to the end product. These concerns are germane to the consideration of CWPPs, which carry at least the potential for social learning and capacity building to result from the planning process itself (Brummel *et al.* 2010; Jakes *et al.* 2012).

Weitkamp and Longhurst (2012) found that, on the whole, environmental consultants in the UK took a "tokenistic" approach to public participation. Consultants in their study:

> tended to be conservative, favouring easily controlled methods of consultation that minimized risks to the client and there was little evidence of innovation, with consultants preferring methods with which they were familiar and which were thought to produce results favourable to the client. (121)

These same consultants tended to place greater value on information associated with established institutions than on lay public knowledge, thereby working counter to many of the promises of community-based governance. Public sector entities traditionally responsible for environmental planning have also been criticized for failing to meaningfully foster and incorporate public opinions, preferences, and information (Predmore, Stern, and Mortimer 2011; Hoover and Stern 2014). Furthermore, public sector entities may ultimately drive the behavior of contracted consultants by emphasizing compliance with regulatory requirements rather than substantive public engagement (Weitkamp and Longhurst 2012). Consultants may, in fact, help to improve the quality of plans over what would have been produced through reliance on community members or public employees. For example, Bunnell and Jepson (2011) found that municipal plans prepared by consultants scored higher on overall plan quality measures than those prepared by local governments without consultant involvement. In this sense, consultants may play a role in advocating for people, issues, or approaches that would otherwise remain overlooked by local officials (Silverman, Taylor, and Crawford 2008).

2.2. Existing needs for research on CWPPs

Previous scholarship has produced a set of propositions about the role of CWPPs in wildfire preparation and response, institutionalizing collaboration, and social learning. However, a number of scholars have called for more explicit accounting of the goals and strategies present in the CWPP documents themselves (Jakes and Sturtevant 2013; Toman *et al.* 2013; Williams *et al.* 2012). Another significant question surrounding CWPPs is the extent to which plan elements and strategies differ across individual planning efforts. Existing research suggests that there is variation among individual CWPP elements, but Brummel *et al.* (2010) and Fleeger and Becker (2010) note that guidance on development of CWPPs and involvement of consultants with experience in creating CWPPs might lead toward standardized approaches that are less successful at emphasizing local context. The effort presented here seeks to provide a more comprehensive picture of CWPP plan components across diverse communities in the western US.

3. Methods

Our research on CWPPs is part of a larger study on the resilience of communities to recent large wildfires in the eleven states of the US West.[1] Consistent with previous research (Nielsen-Pincus, Moseley, and Gebert 2014), large wildfires were defined as those with suppression costs in excess of US $1 million. We began with a database of 346 large wildfires that occurred from 2004 to 2008 (Nielsen-Pincus, Moseley, and Gebert 2014) and expanded it to include 168 additional large wildfires that occurred in the western US between 2009 and 2011.[2] The 514 large wildfires in the final database occurred in 137 western US counties. We conducted online searches for CWPPs, plan updates, and reports from these counties and their respective sub-county geographies (e.g., communities, subdivisions). At the time of our search, no CWPPs were available online for communities in Wyoming that had been affected by large fires and our attempts to access these documents by directly contacting local officials in Wyoming were unsuccessful; therefore, no Wyoming CWPPs are included in our data-set.

We then filtered the 175 plans, updates, and associated reports we collected according to two criteria. Plans were retained for further analysis if they: (1) self-referred as a Community Wildfire Protection Plan in the title or body of the plan or otherwise implied that they were crafted in response to HFRA and (2) were complete, stand-alone documents. One hundred and thirteen documents satisfied these two criteria. Each plan document was coded for various attributes related to plan metadata, integration with other planning frameworks (e.g., natural hazard mitigation plans), the planning process, risk assessment, plan content, and implementation strategies. Specific coded attributes were derived from the plan requirements outlined in HFRA and from planning criteria in the National Fire Protection Association 1600 Standard on Disaster/Emergency Management and Business Continuity Program (National Fire Protection Association 2007). A team of four coders underwent an initial training to improve inter-coder reliability and the team met as a whole throughout the coding process to discuss any areas of discrepancy. A project manager reviewed every 10th plan to assure consistency and accuracy.

For this paper, we analyzed general elements included in each CWPP, such as the inclusion of goal or objective statements, the definition of the WUI, and identification of a CWPP implementation coordinator or implementation schedule, as well as specific attributes such as plan length, participating interests, recommended treatment activities, and institutional strategies. Plan length is defined as the number of pages contained within the CWPP downloaded from the Web. In most cases, plans included applicable appendices, but in some cases appendices were not available online. Participating interests are quantified in terms of the number of stakeholder categories represented on the plan development team. For example, if a plan included three members of the local county commission, two environmental representatives, two fire officials, and the state forester, the tally of distinct interests involved would be four (one each for county commission, environmental, local fire, and state forestry). Treatment activities are those plan elements that entail specific management actions applied to vegetation or infrastructure, while institutional strategies refer to more general programs and policies that are believed to enhance community fire protection (e.g., developing an evacuation plan). To tally the number of treatment activities and institutional strategies identified, our analysis template provided a list of the most common possible response categories and included additional answers under an “other” category. The template included seven predefined treatment activity categories and eight predefined institutional strategy categories. “Other” responses are not included in our quantified tallies and statistical

comparisons. Final coded data were imported into SPSS (IBM Corp. 2013) and summarized; we analyzed differences between CWPPs crafted with the involvement of at least one consultant and those that did not involve consultants using chi-square, Fisher's exact, and *t*-tests where appropriate. Chi-square tests were used for analyses of categorical data (e.g., the presence or absence of particular plan components) and *t*-tests were used for analyses of frequency data (e.g., number of entities participating in plan creation). Fisher's exact tests were used for categorical analyses where minimum cell count problems precluded the use of chi-square tests.

Our study contains some important limitations. While our set of 113 CWPPs represents the largest set of such documents analyzed in the scholarly literature to date, our data are limited to plans that were available online at the time of our search. Our focus on geographies that had experienced recent large fires means that the conclusions we draw may not necessarily apply to plans created in other social and ecological contexts. Furthermore, our analysis is based on the content of CWPPs, rather than on the larger processes guiding CWPP creation.

4. Results

Seventeen of the 113 plans in our database were updates of previously crafted CWPPs. The remaining 96 plans were "first generation" plans. As Table 1 shows, the CWPPs we analyzed were largely conducted at the county or sub-county scale, with the majority of plans conducted at the county level. The following states were represented in the data-set: California (34 plans), Oregon (24), Montana (11), Colorado (10), New Mexico (10), Washington (10), Arizona (8), Utah (4), Idaho (1), and Nevada (1). We first present an analysis of elements and components across coded plans, then explore differences between plans in which consultants were used and plans completed without consultants.

4.1. Trends across plans

A key, though not unexpected, finding is that there is great diversity in the form and content of CWPPs analyzed for the study. While some plans included extensive and detailed risk analyses, prioritizations of places and activities to receive treatments, and fire protection strategies, other plans were much more cursory in their scope and content. For example, some plans merely described the local topography, vegetation, layout of communities, and fire response resources, or referred to anticipated planning processes that would serve to prioritize and recommend treatments. Our process of filtering CWPPs revealed that some documents that included the term "community wildfire protection

Table 1. Scale at which CWPPs in this study ($n = 113$) were conducted.

Plan scale	% of plans
Single county	54.0%
Multiple counties	5.3%
Single community	9.7%
Multiple communities within a single county	17.7%
Multiple communities across multiple counties	1.8%
Other sub-county unit	7.1%
Other	4.4%

plan" in the title were CWPPs in name only, containing little more than the signatures of key officials and references to other planning documents. At the same time, some documents that fulfilled the roles and requirements of a CWPP did not contain the term "community wildfire protection plan" despite their close connection to the expectations laid out in HFRA. Such variability can be explained by several factors. First and foremost is HFRA's devolution of planning responsibility to actors at the individual county, community, and even neighborhood scale, allowing a high level of discretion to craft plans according to local need. Related to this is the diversity in management approaches to the CWPP process by individual states. For example, Idaho took a strong role in structuring the planning process for Idaho counties, leading to a collection of plans that are similar to one another but different from those produced in other state contexts. Only one of the Idaho plans included in our original set of 175 documents met the two criteria for inclusion for further analysis (self-reference as a CWPP and status as a complete, stand-alone document).

There was great variability in plan length among our 113 analyzed plans; the shortest CWPP was 9 pages long and the longest was 339 pages long (Table 2). While some CWPPs were created with participation from a large number of local, county, state, and/or federal emergency response specialists, analysts, and planners, others were completed by fewer entities and/or entities with more limited access to resources and expertise. As few as three, and as many as 26, distinct stakeholder categories were represented by participants in the development of these plans (Table 2). Three treatment activities were identified in the vast majority (>80%) of plans: creation of defensible space around residences and other structures (92.0%), creation of fuel breaks (86.7%), and thinning of forest stands (80.5%) (Table 3). These treatments all reflect the emphasis on alteration of vegetative fuels near communities that is a hallmark of HFRA and associated federal fire policies. Only slightly more than a quarter of all plans, however, specifically called for the use of fire-resistant residential landscaping on residential properties. There was more plan variability in terms of treatments associated with the use of prescribed fire and emergency response (improving access to water sources and ensuring emergency access), with between 54.9% and 65.5% of plans recommending these treatments, respectively (Table 3).

Education and outreach efforts represented the most common institutional strategy identified in the CWPPs studied (Table 4). More than 89% of plans contained some kind of guidance on the alteration of homeowner behavior, typically centered on providing

Table 2. Characteristics of CWPPs included in this study. Independent sample *t*-tests compare means for plans in which at least one consultant was present as plan preparer with plans in which no consultants were involved as preparers. For "Number of interests/entities involved in plan development," $n = 112$; for all other items, $n = 113$.

	Min	Max	Mean	Consultant-led	Non-consultant-led	*p*
Number of plan pages**	9	339	111.6	137.5	90.4	0.001
Number of interests/entities involved in plan development	3	26	9.9	9.9	9.8	0.967
Number of treatment types identified**	0	7	4.6	5.0	4.4	0.031
Number of institutional strategies identified**	0	8	3.7	4.1	3.2	0.015

** indicates significance at $p < 0.05$

Table 3. Treatment activities identified in CWPPs included in this study. Chi-square and Fisher's exact tests compare plans in which at least one consultant was present as plan preparer with plans in which no consultants were involved as preparers. For all items, $n = 113$.

	All Plans	Consultant-led	Non-consultant-led	p
Creation of defensible space by removing fuels	92.0%	94.1%	90.3%	0.510[a]
Creation of fuel breaks	86.7%	92.2%	82.3%	0.206
Thinning of forest stands**	80.5%	90.2%	72.6%	0.034
Use of prescribed fire	65.5%	72.5%	59.7%	0.217
Improvement of access to water sources	57.5%	56.9%	58.1%	1.000
Assuring access by emergency services	54.9%	56.9%	53.2%	0.844
Introduction of fire-resistant residential landscaping	25.7%	31.4%	21.0%	0.297

[a]Fisher's exact test was used due to violations of minimum cell count requirements in chi-square.
** indicates significance at $p < 0.05$.

outreach and education to encourage voluntary actions such as the creation of defensible space and the removal of accumulated fuels near structures. Slightly more than half of plans specifically identified Firewise community guidelines as a means of reducing risks to structures and community infrastructure. Much less common were strategies to encourage residents to volunteer for community actions (22.1%) or those creating homeowner certification standards for fire mitigation (3.5%). Less than a quarter (23.9%) of plans specifically identified the need to create regional programs to leverage resources and integrate planning frameworks across scales. The three emergency response strategies (emergency preparedness, improvement of protection capabilities, and improvement of interagency communication) were each identified in more than half but less than two-thirds of CWPPs (Table 4).

Table 4. Institutional strategies identified in CWPPs included in this study. Chi-square and Fisher's exact tests compare plans in which at least one consultant was present as plan preparer with plans in which no consultants were involved as preparers. For all items, $n = 113$.

	All plans	Consultant-led	Non-consultant-led	p
Education and outreach	89.4%	93.5%	84.3%	0.201
Emergency preparedness**	61.9%	74.5%	51.6%	0.021
Improvement of protection capabilities*	60.2%	70.6%	51.6%	0.063
Inclusion of Firewise community guidelines	53.1%	54.9%	51.6%	0.873
Improvement of interagency communication	51.3%	60.8%	43.5%	0.102
Development of regional programs*	23.9%	15.0%	8.8%	0.056
Recruitment of volunteers	22.1%	29.4%	16.1%	0.143
Establishment of homeowner certification standards for fire mitigation	3.5%	3.9%	3.2%	1.000[a]

[a]Fisher's exact test was used due to violations of minimum cell count requirements in chi-square.
* indicates significance at $p < 0.10$.
** indicates significance at $p < 0.05$.

Table 5. Key plan elements of CWPPs included in this study. Chi-square tests compare plans in which at least one consultant was present as plan preparer with plans in which no consultants were involved as preparers. For "Identifies resources needed for implementation," $n = 110$. For all other items, $n = 113$.

	All plans	Consultant-led	Non-consultant-led	p
Identifies priority areas to receive fuel reduction treatments	85.8%	92.2%	80.6%	0.140
Provides a goal or objective statement	83.2%	88.2%	79.0%	0.294
Provides a definition of the wildland–urban interface*	82.3%	90.2%	75.8%	0.081
Includes a vision statement	59.3%	54.9%	62.9%	0.503
Identifies a CWPP implementation committee	35.4%	39.2%	32.3%	0.567
Identifies resources needed for implementation*	31.8%	42.0%	23.3%	0.059
Includes an anticipated implementation schedule**	29.2%	41.2%	19.4%	0.020
Identifies anticipated implementation costs**	20.4%	31.4%	11.3%	0.016
Identifies a lead coordinator to oversee plan implementation	19.5%	23.5%	16.1%	0.453

* indicates significance at $p < 0.10$.
** indicates significance at $p < 0.05$.

General CWPP elements analyzed in our sample include substantive elements (whether the plan identifies priority areas to receive fuel treatments, whether it defines the WUI), framing elements (vision and goal/objective statements), and implementation elements (identifying resources, costs, and schedules needed for implementation and identifying an implementation coordinator and/or committee). Of these, the four implementation elements were the least commonly encountered; they were represented in only one-fifth to just over one-third of all plans (Table 5). The vast majority of plans (85.8%) fulfilled the HFRA requirement to identify priority areas to receive fuel reduction treatments. Of those that did not, most referenced upcoming prioritization processes, identified relative risk levels of communities without specifically prioritizing associated fuel reduction activities, or provided prioritizations that were not spatially explicit. Ninety-three (82.3%) of the plans analyzed for the study included an explicit WUI definition. Of these 93 plans, 31 (33.3%) utilized or integrated the WUI definitions from HFRA into the CWPP definition; the remainder defined the WUI in a manner specific to their respective communities.

4.2. Assessing the influence of consultants

Of the 113 CWPPs in our database, 51 (45.1%) included at least one consultant as preparer and the remaining 62 (54.9%) did not. Sixteen of these 51 plans identified two separate consultant entities (organizations or private individuals) and five identified three separate consultant entities. In total, 52 unique consultant entities participated to some extent in the preparation of these 51 plans. Consultants included foresters, GIS specialists, professional environmental consulting organizations, and academic professionals and programs affiliated with universities at the local to regional scale. CWPP documents generally did not detail the specific roles of consultants in plan creation.

A number of interesting patterns emerged from a comparison of plans in which at least one consultant was involved in plan creation (hereafter termed "consultant-led" plans) with those that did not include consultants. Consultant-led plans were, on average, over 50% longer than non-consultant-led plans and contained a greater mean number of both recommended treatments and institutional strategies (Table 2). However, the only specific treatment that consultant-led plans were significantly more likely to recommend was the thinning of forest stands to reduce fuel loadings (Table 3). Regarding institutional strategies, consultant-led plans were more likely to emphasize emergency preparedness and somewhat more likely to recommend improving fire protection capabilities and the development of regional-scale fire protection programs (Table 4). Consultant-led plans were more likely to contain several key elements than non-consultant-led plans. In addition to more often containing an explicit definition of the WUI, consultant-led plans were more likely to contain three of the five implementation elements: (1) identifying implementation resources; (2) including an implementation schedule; and (3) identifying anticipated implementation costs (Table 5).

5. Discussion

In spite of the diversity of CWPP processes and content, some underlying trends became clear through this analysis. Nearly all CWPPs emphasized the reduction of fuels near communities through activities such as fuel removal around homes, creation of fuel breaks, and forest thinning. These activities, prevalent in western WUI protection planning, reflect a focus on altering fuel conditions in the wildland matrix surrounding residential structures as a means of reducing the risk of wildfire moving from natural areas into human communities (and, in some cases, as a means of reducing the potential for severe wildfire to degrade other values and resources outside communities). This approach contrasts with a model more common in places like Australia which focuses on the structures themselves, emphasizing fire-resistant roofing, construction materials, and landscaping and the removal of flammable debris on rooftops and in gutters (McCaffrey and Rhodes 2009). The Australian model of fire protection planning also emphasizes the development of local volunteer capacity for fire preparation and response rather than relying solely on professional entities (McCaffrey and Rhodes 2009).

While it is not surprising that US communities have followed US rather than Australian models of fire protection, the relative inattention to structural preparation and volunteerism in the CWPPs analyzed here suggests a certain paradigmatic homogeneity. Only 25.7% of the CWPPs in our data-set recommended use of fire-resistant residential landscaping, 22.1% recommended the recruitment of local volunteers, and a mere 3.5% recommended certifying residences as adequately fire-prepared, a process that would provide a clear benefit to firefighters tasked with structural protection. Just two of the 113 CWPPs in our data-set made reference to helping residents stay and defend their own structures. These findings suggest that, across a great diversity in planning contexts and processes, CWPPs reflect broadly shared assumptions regarding the roles, responsibilities, and activities thought to achieve community wildfire protection objectives. Specifically, greater emphasis is placed on altering forest conditions than on altering homeowner behavior, residential planning, or resident engagement in proactive emergency preparation activities. These findings echo those of Jakes *et al.* (2011), who found that generating community consensus regarding the need to reduce wildland fuels and create firebreaks near communities was easier than agreeing on requirements that homeowners take personal actions to reduce the ignitability of their properties.

These trends raise questions as to why we did not find greater variability in wildfire protection approaches given the wide latitude afforded communities in crafting site-specific CWPPs. Several factors contribute possible explanations. First, it is instructive to consider the particular way in which HFRA envisions and incentivizes collaborative community-based governance. Brummel *et al.* (2010) characterize HFRA's CWPP language as an example of "mandated" collaboration, an approach that can be expected to limit the realization of the benefits of collaborative governance. Second, the monetary incentives attached to CWPP creation may have encouraged some communities to prioritize plan completion over process, comprehensiveness, and inclusion of diverse perspectives (Brummel *et al.* 2010). To the extent that this pattern holds true, it helps to explain both an interest in involving consultants (to expedite plan construction) and the underlying lack of paradigmatic diversity detected in our analysis. Third, HFRA and related policies created very specific linkages between CWPP guidance and fuel reduction activities, particularly on federal lands, but parallel authorities were not created for other activities such as residential development planning or structuring of fire protection response. While HFRA may have been quite "vague" (Jakes *et al.* 2011) in terms of CWPP procedural and substantive expectations, the policy itself, the widely utilized implementation guide, and related policy guidance strongly reinforce an emphasis on wildland fuel reduction, voluntary homeowner preparedness, and professionalized fire response. That is, HFRA communicated a policy "narrative" (Roe 1994; Vaughn and Cortner 2005) that framed western wildfires as chiefly a problem of the accumulation of forest fuels, rather than, for example, as a problem of residential expansion into wildlands, of the structuring of fire protection responsibilities, or of climatic trends. Finally, the "first generation" nature of most of the plans analyzed here should also be highlighted as a potential contributing factor; it is entirely possible that future plan revisions will show more variability than was produced by the first round of planning, and more adaptation to the specifics of local context.

While various scholars have raised concerns regarding the potential effects of consultant involvement on community planning processes, we did not detect evidence that consultant-led plans were less inclusive or comprehensive, on the whole, than non-consultant-led plans. Consultant-led planning processes engaged the same number of interests as processes completed without consultant participation. Overall, consultant-led plans appeared to be more comprehensive than non-consultant-led plans, though not overwhelmingly so. For all 11 statistically significant comparisons, consultant-led plans were more likely to include the element or had a larger mean number of the metric measured. Particularly striking is the higher proportion of consultant-led plans that identify resources, costs, and schedules needed for plan implementation. This finding suggests that the inclusion of outside professional consultants may more often lead to plans that take into account the resource and organizational needs associated with plan implementation. These are important considerations for turning plans into actionable and sustainable documents, and, in general, implementation elements appeared to be lacking from most of the plans analyzed here. At the same time, many of the differences between consultant-led and non-consultant-led plans did not rise to the level of statistical significance, suggesting that, for most plan elements, the inclusion of consultants provided only marginal benefits. There is little evidence that inclusion of consultants in the planning process was associated with deviance from the standard US model of community wildfire protection discussed above.

This analysis raises larger questions about the appropriate role for (usually) non-local consultants in what was envisioned as a locally led, grassroots community planning model.

One question is whether drawing upon consultants potentially short-circuits this devolution of planning authority by deferring to non-local professionals to craft both procedural and substantive plan elements. The answer almost certainly hinges on the specific role(s) consultants play in any given CWPP process. Previous research has described cases in which consultants assembled CWPPs in isolation, returning a finished "product" to the community for their sign-off at the end of the process (Jakes *et al.* 2011) or utilized a template that was never appropriately revised based on community-specific concerns and values (Jakes and Sturtevant 2013). While these approaches may efficiently create a finished product, they clearly forego the important opportunities for social learning and community capacity-building implied by a more inclusive process. On the other hand, the role of consultants in many other cases may be to facilitate community process, to bring important external resources to the table (e.g., analytic or mapping expertise), and/or to ensure the inclusion of key plan elements (Jakes *et al.* 2011). In other words, the mere presence or absence of consultants is likely less important in determining plan outcomes than their specific role(s) within the larger wildfire planning process.

6. Conclusions

Our purpose was to initiate a conversation about the contours of CWPPs in the western US, the role of consultants in the wildfire planning process, and the relationships between plan content and community action. The insights we are able to offer at this stage are preliminary, yet they do point toward some important considerations and themes. Although we found evidence supporting many of the findings from the last decade of case study research on CWPPs, we also found evidence that paints a more complex picture. Prior qualitative research on CWPP development has identified great variability in wildfire planning processes and outcomes, with attendant variability in social learning and community capacity-building (Brummel *et al.* 2010; Jakes *et al.* 2011). Our analysis also suggests a high degree of variability, as measured by indicators such as plan length, WUI definition, and presence or absence of specific implementation mechanisms. At the same time, we detected an underlying homogeneity in some of the basic assumptions and principles regarding how homeowners, residents, and public entities envision their own roles and the roles of CWPPs in creating safer and more resilient communities. This homogeneity suggests that, despite the potential for community wildfire protection planning to reflect the interests and priorities of diverse communities, the institutional context surrounding CWPP creation has led most communities to follow a fairly standardized wildfire protection model. Key components of this model include a focus on hazardous fuel reduction and professionalized fire response combined with relative inattention to residential development planning or the creation of local volunteer capacity.

We found that consultant-led plans covered more substantive and procedural elements than plans written without the leadership of a professional consultant. Our analysis shows that consultant-led plans are, in general, more comprehensive in some ways than those written solely by local entities. For example, consultant-led plans more often included explicit WUI definitions, recommended a greater number of treatments and activities, and identified resources needed for longer-term implementation. At the same time, a majority of plans constructed without consultant participation also included explicit WUI definitions, and the aforementioned implementation elements were each represented in less than half of the plans crafted by consultants. This suggests that the inclusion of consultants does not necessarily ensure a higher level of comprehensiveness in plan content. It is also important to acknowledge research showing that the inclusion of

consultants may, in some cases, lead to plans that meet HFRA expectations without providing either substantive or procedural benefits to affected communities (Jakes *et al.* 2011; Jakes and Sturtevant 2013). In the context of these earlier studies, our results suggest that the particular ways consultants engage in the wildfire planning process is more important than their mere presence or absence.

What remains to be understood is whether CWPPs can help reduce wildfire risk, overcome local socioeconomic vulnerabilities, or improve local resilience to wildfire. To what extent are the mitigation plans identified by CWPPs being implemented? Are some communities more effective in implementation than others? How are the relationships created or reinforced by the CWPP institutionalized over the longer term? Does the CWPP or the planning process that was engaged to create it affect the outcomes of a wildfire when one occurs? Answering these questions can help shed light on the role of planning and mitigation in overcoming more basic local vulnerabilities and improving local resilience to natural hazards like wildfire. Given that CWPPs were authorized a decade ago under HFRA, these questions and others about the ongoing impacts of CWPPs are now ripe for research. Their answers will be important in helping to improve local preparedness as communities across the country move into the next decade of community wildfire protection planning.

Acknowledgements

This work was supported by the USDA National Institute of Food and Agriculture under grant number 2011-67023-30695. We would also like to acknowledge the important contributions to this project made by Robert Parker, Josh Bruce, Balpreet Singh, and the students and staff associated with the Community Service Center at the University of Oregon.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

USDA National Institute of Food and Agriculture [grant number 2011-67023-30695].

Notes

1. Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Wyoming, and Washington.
2. Because actual cost data were not available for wildfires that occurred between 2009 and 2011 at the time of the research, we used estimated costs generated from National Interagency Situation Reports. 2004–2008 costs were derived from the US Forest Service's accounting systems.

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