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Characterizing Non-Industrial Private Forest Landowners' Forest Management Engagement and Advice Sources

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ABSTRACT

Non-industrial private forestland (NIPF) owners have options for engagement by following management strategies that reduce wildfire risk on their forestlands. Forest management engagement is a broad term with underlying categories and management implications. To better understand these categories, we examine interview data on the engagement of forest landowners from a case study of private forestland owner perspectives in northeast Oregon, USA. NIPF landowners outline two types of forest management engagement, one for property and one for community-focused forestland management. NIPF owners describe actions for engagement in public forestland management and how these actions differ from engagement in private management. Additionally, NIPF owners establish barriers to engagement in both public and private forestland management. Our findings can be used to better identify unengaged private forestland owners in the U.S. West, informing the design and implementation of extension and outreach for NIPF owners.

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Advice sources; engagement; forest management; forest ownership; Inland Northwest; working landscapes

Introduction

The Western United States contains 140 million hectares forested land, 30% of which are privately owned and managed; the remaining forests comprise public lands in national forests and state-owned lands (Oswalt and Smith 2014). Public forests and their management are a top priority nationwide for general public members from across the political spectrum and for forest landowners in this region (Hamilton et al. 2012, 2014). Private forestland owners living adjacent to both public and private forestlands are influenced by the health and wildfire-vulnerability of neighboring forests (Abrams and Bliss 2013). These non-industrial private forest (NIPF) owners seek varying benefits from their land (DeCoster 1998, Kline, Alig, and Johnson 2000; Salmon, Brunson, and Kuhns 2006), which affects how they manage their lands, who they turn to for management advice, and how they engage in forest management.

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The definition of forest-management engagement for NIPF owners varies largely across the literature. In this study, we define forest-management engagement for NIPF owners as a meaningful involvement in the management of local forests, both public and privately-owned (including their own). Engaged NIPF owners actively participate in all stages of forest management, from planning to the implementation of decisions (Burns, Sperry, and Hodgson 2002; Fernandez-Gimenez, Ballard, and Sturtevant 2008; Kruger and Shannon 2000). Forest-management engagement builds upon the concept of active management to include nearby public and private forests. Active management is the decision-making process to maximize benefits through forest management on NIPF-owned lands (Salmon, Brunson, and Kuhns 2006). When examining NIPF owners' roles in community-based forest-management groups and case studies, "engagement", "involvement", and "participation" are used interchangeably (Burns, Sperry, and Hodgson 2002; Fernandez-Gimenez, Ballard, and Sturtevant 2008; Hartter et al. 2015; McGee 2011; Meadows, Herbohn, and Emtage 2013; Ryan and Hamin 2008). NIPF owners gain intimate, experience-based knowledge about risk and forest management on local lands (Domínguez and Shannon 2011; Wilmsen et al. 2008), and often studies recommend NIPF-owner engagement for improving community and private forestland management (e.g., Meadows, Herbohn, and Emtage 2013; McGee 2011; Ryan and Hamin 2008; Shindler and Cheek 1999). Building strong networks of engaged stakeholders with local forest-management knowledge can help foster adaptive planning and management to reduce community risk in wildfire-prone regions (Fischer et al. 2016; Fischer and Jasny 2017).

NIPF owners, their forests, and their communities can benefit directly from forest-management engagement, especially in wildfire-prone regions where engagement has forest-management implications for both individual properties and larger landscapes. Many NIPF lands are situated in the wildland-urban interface (WUI), and over 50% of WUI area in the West intermixes with forests vulnerable to uncontrollable, severe fires (Schoennagel et al. 2017; Theobald and Romme 2007). In these regions, human or natural-induced wildfires ignited on public forestlands can spread onto neighboring private lands (Ager et al. 2012; Fischer 2011; Fischer 2012). Engaged NIPF owners, compared to those not engaged, are more likely to manage their land's risk because their perceived risk of fire disturbance influences their management response (Amacher, Malik, and Haight 2005; Beebe and Omi 1993; Domínguez and Shannon 2011; Fischer 2011; Fischer and Charnley 2012; Fried, Winter, and Gillies 1999; Hamilton et al. 2012; Hartter et al. 2015; Jarrett et al. 2009). NIPF owners' perceived fire risk on their land is influenced by their social networks, fire experience, personal attitudes, scientific knowledge, and engagement in stakeholder groups (Brummel et al. 2010; Cheng 2002; Hamilton et al. 2014; Paton and Tedim 2013; Smit and Wandel 2006). Therefore, engaged NIPF owners in wildfire-prone regions manage their private forestlands to reduce wildfire risk in addition to meeting their other management objectives. Management aids in mitigating the overall wildfire risk of private lands and forest-dependent communities.

At the public and private forestland boundary, engaged forest landowners are integral in the successful implementation of cross-boundary and collaborative projects that reduce wildfire risk. Engaged NIPF owners connect with their local ecosystems through place-based knowledge, civic engagement, collaborative institutions and community stewardship (Burns, Sperry, and Hodgson 2002; Charnley, Fischer, and Jones 2007; Fischer and

Charnley 2012; Fischer et al. 2013; Gray, Enzer, and Kusel 2001). Engaged NIPF owners are more likely to collaborate, participate in cross-boundary forest management, and manage their private lands with place-based techniques (Hamilton et al. 2012; Hartter et al. 2015). One common mechanism for cross-boundary forest-management projects is the forest collaborative. Forest collaboratives rely on public stakeholder participation to achieve restoration goals while facilitating engagement in cross-boundary management and production of local knowledge (Armitage et al. 2009; Berkes 2009; Cheng and Randall-Parker 2017; Fischer et al. 2013; Fischer et al. 2016; Wilmsen et al. 2008). Collaborative projects (e.g., U.S. Fire Learning Network) facilitate multi-scalar connectivity and use an all-lands approach to establish cross-boundary forest management and community planning to reduce wildfire risk (Black et al. 2011; Butler and Goldstein 2010; Charnley, Kelly, and Wendel 2017; Fischer et al. 2016). Ecological restoration and fire mitigation projects (e.g., pre-commercial thinning) work toward reducing overall community vulnerability to wildfires through active management, which benefits individual NIPF owners, their lands, and their communities (Schoennagel et al. 2017).

NIPF owners engaged in forest management rely on their social networks for advice to make informed forest-management decisions. Private forest owners turn to forest management advice sources including friends, relatives, United States Department of Agriculture Forest Service (USFS), local extension agents, State, County, contractors, publications (Salmon, Brunson, and Kuhns 2006). Peer-to-peer and collaborative networks with land-management organizations facilitate learning for private forest landowners (Goldstein, Butler, and Hull 2010; Rickenbach 2009). Engaged NIPF owners share forest-management knowledge and learn management strategies from each other through informal conversations, NIPF-owner workshops, and formal collaborative cross-boundary management projects (Charnley, Fischer, and Jones 2007; Fischer and Charnley 2012; Goldstein, Butler, and Hull 2010; Rickenbach 2009; Salmon, Brunson, and Kuhns 2006). Forest-management advice from extension agents and foresters has limited influence on NIPF-owner active-management practices and can instead increase the perceived difficulty of forest management (Bliss and Martin 1989; Bieling 2004; Knoot and Rickenbach 2011). Whether NIPF owners manage for amenities, multiple-benefits, or opt not to actively manage will influence who, where, and if they seek forest-management advice (Salmon, Brunson, and Kuhns 2006). Increasing NIPF-owner forest-management engagement through advice networks is possible. Bieling (2004) found NIPF-owner engagement and active management can be encouraged through advice networks related to forestland interests and management benefits. However, due to the lack of understanding of uninterested and passive NIPF owners' management needs, Bieling (2004) recommended further examination using qualitative oral interviews.

We propose field-based categories of forest-management engagement and apply them to better understand those who are not engaged and the forms engagement takes for NIPF owners. Drawing upon forest landowner interviews from northeastern Oregon, we examine NIPF-owner narratives to address (1) how NIPF owners define forest-management engagement on private and public forestlands; (2) actions NIPF owners take to be engaged in private and public forestlands; (3) where they turn for management advice on their own forestlands; and (4) incentives and barriers to engagement in forest-management events and activities on private and public forestlands.

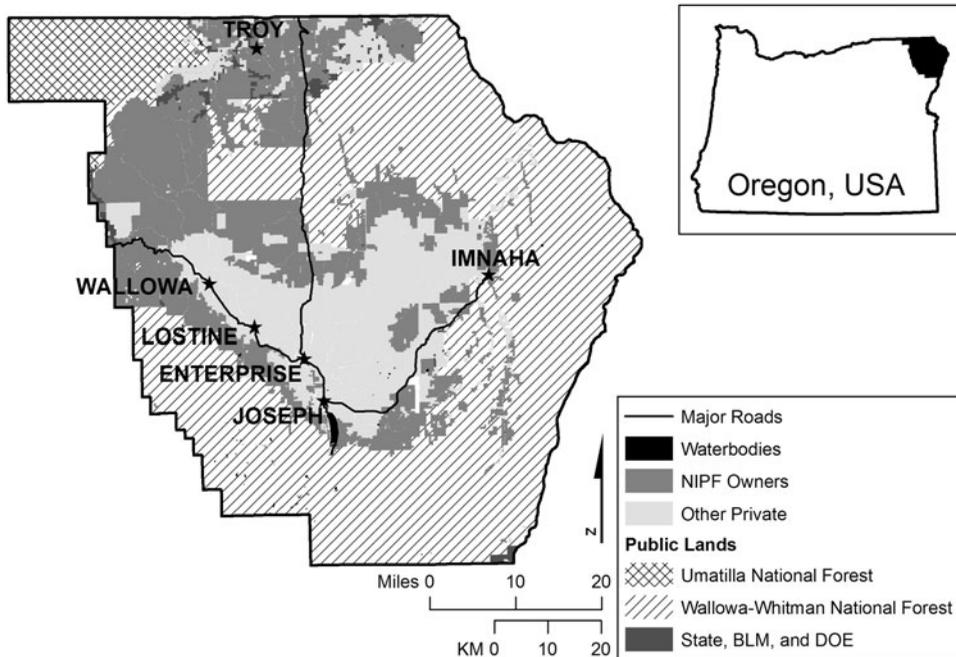


Figure 1. Wallowa County Non-Industrial Private Forest Landowner map with Private Forestlands determined as parcels with 4+ hectares (10+ acres) measured by the Timber Fire Patrol Tax for Oregon Department of Forestry (Wallowa County 2013).

Study Site

Wallowa County in northeast Oregon, USA, exemplifies the challenges of working landscapes impacted by changing economies, demographic trends, and forest conditions due to large portions of privately-owned timberlands adjacent to the Wallowa-Whitman National Forest (WWNF, 4,400km²) (Abrams and Bliss 2013). Wallowa County spans over 7,500 km² with 57% managed federally as WWNF (Figure 1). Within Wallowa County, over 80% of 8-hectare or larger parcels sold since 1995 have been subdivided and purchased by new out-of-county owners (Abrams and Bliss 2013), exemplifying transitions faced by amenity-rich rural communities. In-migrants can have unintended consequences on fire management techniques, community perceptions, and land-management values in transitioning rural communities like Wallowa County (Abrams et al. 2012). Forestry and wood products from timber harvested from the WWNF were historically a major contributor to the economy of Wallowa County (Jones and Christoffersen 2016). This sector declined dramatically in the mid-1990s as federal forest harvests on the WWNF dropped by 95% and have remained low since that time. The reduction in federal-forest harvests and resulting mill closures, changes in global forest-product markets, and changes in the U.S. housing market have impacted the formerly resource-based economy of Wallowa County (Boag et al. 2015).

Residents of Wallowa County pursued collaborative stewardship efforts to increase management engagement on the county's forestlands (Fernandez-Gimenez, Ballard, and Sturtevant 2008). These efforts have been led by Wallowa Resources, a community-based organization, and Wallowa County's Natural Resource Advisory Committee.

Wallowa Resources has facilitated a number of locally-based collaborative forestry monitoring and restoration projects on public and private lands with participation from a significant proportion of the community (Fernandez-Gimenez, Ballard, and Sturtevant 2008; Parker et al. 2017). Wallowa County community-based organizations turned to collaborative land restoration projects as part of resilience-based stewardship to reach social and ecological sustainability for forest stakeholders. In 2012, the first meeting of the Wallowa-Whitman Forest Collaborative (WWFC) was held jointly by 29 diverse stakeholder groups (Jones and Christoffersen 2016). The mission of the WWFC is “to improve the social, economic, and ecological resiliency of the WWNF and local communities through collaboration by a diverse group of stakeholders” (Christoffersen 2013, 4). The WWFC focuses on restoration projects within the WWNF, and some private forestland owners attend and participate in WWFC meetings.

Methods

Through interviews, we recorded perspectives of forest landowners in Wallow County regarding private and public forestland management, engagement, and advice sources. NIPF owners from Wallowa County were selected due to the county’s wildfire-prone public and private forestlands and the widespread stewardship efforts on them. Forest landowners were defined as title holders, members of a family trust or limited liability company (LLC) owning 4+ hectares of forest, a definition used in previous research (Boag et al. 2015; Hamilton et al. 2012, Hartter et al. 2014; Hartter et al. 2015). Forestland attributed to NIPF owners was assessed using the Oregon Department of Forestry (ODF) Timber Patrol measure from 2013 (Abrams and Bliss 2013; Wallowa County tax lot data 2013). In July 2014, there were 455 NIPF owners in Wallowa County. Of these NIPF owners, 236 forest landowners had out-of-county postal addresses (625 forested parcels, 77,828 forested hectares) and 219 had in-county postal addresses (493 forested parcels, 20,462 forested hectares).

After obtaining Institutional Review Board permission, we made contact with NIPF owners in Wallowa County first through recruitment letters. Recruitment letters were sent to 150 randomly selected forest landowners (divided evenly among in-county and out-of-county addresses registered to the parcel) from July–September 2014 for in-person interview participation. The mail-recruited participants recommended 50 additional in-county and out-of-county NIPF landowners, and nine participated from this snowball sample (Abrams and Bliss 2013; Biernacki and Waldorf 1981). We conducted 30 interviews (20 in-person, 9 phone, 1 with a logging contractor in lieu of owner) with 37 forest landowners (23 individual and 7 with joint owners) from July–November 2014. Interviews spanned over 1–2 h, and discussions focused on private forestland management objectives, perspectives of federal forestlands, and perspectives of forest-management engagement in community-based organizations. Overall, 10,600 forested hectares within 130 parcels were discussed with forestland owners (10.7% of 99,284 total private forested hectares, 2.4% of total 439,084 county forest hectares, and 5.2% of 2505 total number of parcels).

Qualitative interview data were analyzed to obtain clear categories of forest-management engagement, advice sources, and actions of engaged forest owners. Topic guides

were utilized to support the interviews to ensure the research objectives were addressed in each interview (Andrejczyk et al. 2016). Audio recordings of the interview responses and written notes were transcribed and analyzed using Atlas.ti (Atlas.ti, Mac Version 1.0.18, Berlin) following similar methods used to analyze interviews with NIPF owners about their forest management (e.g., Andrejczyk et al. 2016; Bliss and Martin 1989; Domínguez and Shannon 2011; Hujala and Tikkanen 2008; Hujala, Pykäläinen, and Tikkanen 2007). We followed the grounded theory and inductive approach for data collection and analyses until saturation point was recognized for each group and no new information was provided from additional interviews (Charmaz 2006; Domínguez and Shannon 2011; Glaser and Strauss 1967; Strauss and Corbin 1990). We constructed axial codes to derive interview-based themes and to establish consistent analyses (Andrejczyk et al. 2016; Creswell 1998; Domínguez and Shannon 2011; Saldaña 2009). First-level codes outlined NIPF owner conditions (including landowner background characteristics and land tenure), second-level codes outlined actions/interactions (e.g., such as their forest-management engagement, advice sources, and actions), and third-level outlined consequences (landowner perspectives and beliefs) (Charmaz 2006). The themes of NIPF-owner perceptions of forest-management engagement and types of engagement were synthesized throughout data-collection and analysis stages, following grounded theory approach (Domínguez and Shannon 2011).

Results

There are noted gaps between typologies of NIPF owners based on their values and actual management strategies (Dhubháin et al. 2006; Karppinen 1998; Novais and Canadas 2010). It is important to use typologies determined from segmentation of localized survey data rather than theoretical ideals to better analyze NIPF-owner needs, perspectives and to inform tailored recommendations (Dhubháin et al. 2006; Fischer 2012; Novais and Canadas 2010). Following interview transcription, we categorized the north-eastern Oregon NIPF owners and their responses by subgroups, which were extensively analyzed using both qualitative and quantitative methods by Fischer (2012). Abrams and Bliss (2013) examined land management strategies of private owners in Wallowa County, and highlighted “production” (i.e., land management objectives prioritize the production and sale of agricultural and forest resources and commodities from their land) and “amenity” owners (i.e., those who own land primarily for recreational or other amenities, not for agricultural or forest production). Therefore, each landowner was characterized *post hoc* as either “production oriented” or “amenity owners”. We noted residency statuses of absentee/seasonal NIPF owners in addition to their management values because NIPF owners who are absentee are less likely to be engaged in forest management and reduce hazardous fuels that increase their risks (Conway et al., 2003; Fischer 2011; Joshi and Arano, 2009; Vokoun, Amacher, and Wear 2006). The length of parcel ownership was not considered in our typologies because it was not found to influence forest-management strategies in a previous study of Oregon’s east side NIPF owners (Fischer 2011). The characteristics of respondents can be viewed in Table 1, whether production or amenity-oriented (mutually exclusive, with primary objectives identified by respondents used to categorize landowners), whether retired or employed full-time, and

Table 1. Characteristics of NIPF owners organized in totals for landowner types (in-county amenity and production, out-of-county amenity and production).

Employment status	In-County (18)		Out-of-County (12)	
	Amenity (7)	Production (11)	Amenity (6)	Production (6)
Retired	5	7	3	5
Employed	2	4	3	1

Experience managing forests at time of forest parcel purchase	In-County		Out-of-County	
	Amenity	Production	Amenity	Production
Yes	0	6	0	4
No	7	5	6	2

All numbers are total respondents by each type and overall category.

Table 2. Property vs. community-focused forest management categories described by NIPF owners.

Property	Community
Active management/monitoring on own lands	Participation in other private land management (e.g., giving advice to neighbors, providing demonstrations, participation in community groups)
Active learning/knowledge gathering on forest management issues (e.g., participation in extension, official and unofficial advice networks, visits by stewardship foresters)	Participation in public lands management issues (e.g., forest collaborative)
Participation in cost-share/grant programs	

whether seasonal/absentee with out-of-county addresses or year-round residents with in-county addresses (determined by postal address at time of the interview).

Classifying Two Categories of Forest-Management Engagement

Two types of forest-management engagement emerged from discussions with landowners: property versus. community (Table 2). Property-focused engagement includes forest-management engagement on private land, including but not limited to: active management or monitoring on NIPF own lands; active learning and knowledge gathering on forest-management issues through official and unofficial advice networks; participation in cost-share programs or grant programs. Community-focused engagement includes engagement in forest-management in the broader community, including but not limited to: participation in public lands management issues; participation in other private land management. Additional findings related to property engagement (i.e., private forestland management actions, advice sources) are described in subsection “Property Engagement”, and those related to community engagement (i.e., incentives/barriers for participation in public forestland activities, public forestland management actions, incentives/barriers for participation in private forestland activities) are presented in subsection “Community Engagement”.

Property Engagement

Actions of forest-management engagement on private lands. NIPF owners emphasized the importance of active management for engagement on their own lands. They

described actions of forest-management engagement on private lands as having awareness of the timber market, having some forestry knowledge, knowing their forest property, trusting land managers and contractors, having incentives such as cost-shares or subsidies, and having time to invest in managing. NIPF owners defined active management to include active monitoring of forest conditions when the timber market is down.

The respondents described having pride in being actively engaged in their own forest-land management, because engagement to landowners who did not use local forest contractors, “means being out on the ground, doing the work myself.” Even when active management is less possible due to increased costs, active monitoring is important and effective for private forest landowners. It is important for forest owners to know their “property ... monitor to know what changes are happening.” Private forest landowners must “be educated about pests and diseases, and markets,” and monitoring is important because “when things don’t look right, you ask around, you read.” Landowners emphasized how forest familiarity comes along with the length of ownership and forest-owning experience, emphasizing “long-term active participation in the management.” Many landowners described the time investment of engagement, for example, “if you want to do it right [it is] a lot of work”, and another noted spending 10+ h per week in winter clearing brush.

Respondents also described the importance of external contributions to forest-management engagement. NIPF owners highlighted the importance of trustworthy land managers and having financial incentives to manage properly. For example, “[it is] hard to get trust ... [but landowners must] find someone who knows what they’re doing, so they don’t mess it up.” Financial incentives facilitate engagement in management, and some NIPF owners had forest stewardship plans written through cost-share programs.

Forest-management advice sources for their own lands. Many forest landowners turn to official and unofficial advice sources for information about forest management. Official advice source entities include Oregon State University (OSU) College of Forestry Extension, ODF, Wallowa Resources, USFS, contract foresters, logging contractors, tree farmers, and their own experience. Official advice activities include attending community forestry workshops and tours. Unofficial advice sources include personal communication in informal capacities with friends, family, neighbors, and their own trial and error if they lack official experience/training. Most NIPF owners described using both official and unofficial advice sources whether they lived in-county or out-of-county (Table 3). A retired production-oriented, year-round landowner described using both official and unofficial sources for forest-management advice, saying “a lot of my friends around here are loggers... and from talking with my friends and neighbors.” Other year-round dwelling retired amenity owners, emphasized “we’ve been to a lot of classes... [but] a lot is learned by the school of hard knocks,” meaning, through trial and error. Some NIPF owners only turn to unofficial advice sources, including in-county and out-of-county owners. A production-oriented landowner who works full time on his land, said, “My dad was a logger ... so I was always going to the woods with him.” Fewer NIPF owners only turn to official advice sources, including primarily in-county owners versus fewer out-of-county owners.

Table 3. NIPF owner responses to interview questions in totals for landowner types (in-county amenity and production, out-of-county amenity and production).

Advice sources (Property Engagement)				
	In-County (18)		Out-of-County (12)	
	Amenity (7)	Production (11)	Amenity (7)	Production (11)
Unofficial & Official	4	7	3	5
Unofficial Only	1	2	3	0
Official Only	2	2	0	1

Community forestry meeting attendance (Community Engagement)				
	In-County		Out-of-County	
	Amenity	Production	Amenity	Production
Yes	5	10	1	3
No	2	1	5	3

All numbers are total respondents by each type and overall category

Community Engagement

Incentives and barriers to engagement in private forest-management activities. Primarily in-county owners had attended official community forestry workshops or tours with other NIPF owners, while most out-of-county residents had not attended (Table 3). NIPF described incentives for engagement in activities for private forestland management such as workshops/meetings/tours with other private forestland owners. Respondents described educational benefits as the clearest incentive to attend. Other incentives include access to peer-to-peer resources, the social experience, and opportunity for hands-on learning. Many forest owners emphasized the social experience accompanying community forestry meetings. A landowner described “We met our neighbors, and became acquainted with them through the ones we went to,” and another emphasized the collective knowledge available “As a small woodlands owner, [it is] nice to have someone I can go ask a question.” Forest owners who have actively participated in OSU extension programs for many years said, “We needed to learn about forestry, and we made a lot of friends. We came for the trees and stayed for the people!”

NIPF owners described barriers to engagement in forest-management activities with other private forestland owners as the distance to the events, inconvenient scheduling of events, a lack of awareness, the time investment, the effort to be engaged, and not having much forest to manage. Despite not attending formal community forestry activities with other NIPF owners, one in-county forest owner noted “I usually know someone who’s been to them [community forestry workshops/meetings], so I go ask them [friends who attended] question.” thus implying the information from meetings still travels through advice networks. Seasonal residents who work full-time said they were not actively engaged in community forestry workshops or tours because they were not aware of any meetings, remarking “[it is] hard to participate from where I am,” and the “distance makes it difficult.”

Actions of forest-management engagement on public lands. Some NIPF owners were unsure how private forestland owners could be engaged in public forestland management, such as the WWNF. “How would that work?” one landowner asked, while another noted she has felt “pretty helpless because it is out of my control...”, but added “too many [private landowners] have their heads in the sand and don’t want to

learn about it ... [it is] a sad state of affairs.” Other landowners cast doubts on whether their views would be accepted if they were engaged and mentioned a lack of trust for the decision-makers (politicians, land managers, etc.). Some landowners said they didn’t “think our thoughts would be very welcome,” and another remarked, “I don’t have any trust that the Forest Service has any leadership that can bring any change.”

The remaining NIPF owners described their interpretations of engagement in public forestland management and mostly referenced general civic duties, echoing other NIPF owner’s uncertainty of public forest-management engagement entails. These landowners expressed an interest in engaging in public forest management but did not identify direct ways to be involved, aside from involvement in the WWFC. This option was particularly true for forest landowners adjacent to cross-boundary management projects. NIPF owners conceptualized engagement in public forestland management to include: awareness of forest policies, paying taxes, voting in elections, incentives for being engaged (e.g., such as owning property adjacent to public lands, having a job requirement), having time to invest, trusting decision-makers, involvement with the WWFC (if they had previous knowledge of it). Landowners described engaging by “voting for people who have similar views to ours ... politicians who have taken a stand on issues that we agree with.” Another landowner believed engagement means “paying attention to any [federal] land manager that you know [and meeting] over a beer.” Respondents suggested to be engaged in public forestland management, private forest landowners must trust decision-makers managing the public forestlands.

Incentives and barriers to engagement in public forest management. Landowners described incentives and barriers to engagement in public forestland management. A landowner specified engaged private landowners “generally have to have a reason to be involved,” such as owning adjoining property or participation as a job requirement. Similarly, another landowner noted engagement in public forest management, like engagement in private forest management, has to be economically viable. He noted the newly formed WWFC “is the only way to be participatory in forest management on public lands.” As a NIPF owner who is engaged in the WWFC, this landowner emphasized the potential for private landowners to be engaged in public forest management through participation in the WWFC.

Landowners clarified incentives for engagement in community forestry groups. Some incentives for involvement in community forestry groups such as WWFC include owning adjoining forest property to proposed restoration projects (i.e., Eastside Restoration project, Lower Joseph Creek project, Upper Joseph Creek project), the collective knowledge of the collaborative group, or having a job requirement to attend/engage. Noted barriers to engagement include lack of awareness, having different views from the community forestry group, uncertainty of outcomes from the projects, distrust of other stakeholders including the USFS, and the time investment. One landowner noted, “National forest management can have an effect on NIPF properties, such as heightened fire risk and insect outbreak ... participating in decision-making would help lower fire and other risks on private lands ... issues might be important to NIPF as well.”

Engaged forest owners involved in WWFC emphasized the lack of assurance of outcomes or deliverables of the collaborative forest-management groups as a disincentive to participate, along with distrust of decision-makers and other stakeholders, and

distrust their perspectives are heard and valued. A NIPF owner who is engaged in the WWFC, noted this importance, “If collaborative management [between WWFC and NIPF owners] goes through in Baker County, other areas will be able to compare and ... consider the possibilities in their own counties.” Another engaged landowner described uncertainty in the collaborative process, saying in summer 2014, “A tree has not been cut yet, so we shall see,” and another described “There is a tremendous amount of talk and not a lot of on the ground changes ... that takes time, and commitment, but I think the intent is admirable.”

Discussion

NIPF owners described varying ways they engage and manage forests, and these are synthesized into two not mutually exclusive categories of forest-management engagement: property and community. Property-focused forest-management engagement refers to engagement in NIPF owners’ own forests, including active management/monitoring on their own land, active learning and knowledge gathering, participation in cost-share/grant programs. NIPF owners’ emphasized the importance of monitoring when management is not possible, mirroring the active management definition in Salmon, Brunson, and Kuhns (2006). Community-focused forest-management engagement includes engagement in the broader community and working landscape, including participation in public lands management issues, participation in other private land management. It is important to differentiate between two types when referring to NIPF-owner engagement in public and private forestland management (objective 1). Community-based organizations encourage community-focused engagement in cross-boundary forest management for private forestland owners (Dilling and Lemos 2011; Fischer et al. 2016; Salmon, Brunson, and Kuhns 2006; Simpson et al. 2016; Wilmsen et al. 2008). Unofficial advice sources spread property and community-focused engagement through accessible advice and knowledge networks (Bieling 2004; Bliss and Martin 1989; Domínguez and Shannon 2011; Salmon, Brunson, and Kuhns 2006). The distinction between property and community-focused forest-management engagement can help tailor outreach campaigns, community-based organization platforms, individual landowner forest-management goals, etc. (Dilling et al. 2015). Future studies can examine the relationship between property and community-focused forest-management engagement for NIPF owners.

We explored the actions that NIPF owners take to be engaged in property and community engagement on private and public forestland management (objective 2) and found that the employed, amenity-oriented, seasonal/absentee forest landowners’ answers varied from those of their peers. In particular, we found that none of the employed, amenity-oriented, seasonal/absentee forest landowners were practicing active-management techniques, which is a component of property-focused forest-management engagement, and none of these landowners had experience managing forests at the time of purchasing the forested parcel. These findings support the broader literature that absentee, amenity-oriented NIPF owners have less land-management experience and are less likely to take actions to reduce hazardous fuels on their lands (Abrams and Bliss 2013; Conway et al., 2003; Fischer 2011; Joshi and Arano, 2009; Vokoun, Amacher, and

Wear 2006). These absentee landowners had never heard of the WWFC itself, its purpose and its programs for NIPF owners, including those with forest parcels adjacent to public forestlands. None of these landowners attended community forestry meetings because they had not heard of them. These landowners might have a gap in knowledge for active management or lack networks for knowledge of forest management and collaborative projects. It is important for outreach programs to understand the varying priorities of NIPF owners to better adapt forest-management advice, its dissemination, and to better engage these landowners in both property and community-focused engagement (Bieling 2004; DeCoster 1998; Fischer 2012; Kline, Alig, and Johnson 2000; Salmon, Brunson, and Kuhns 2006).

The interviews highlight the importance of unofficial advice sources (family, friends, neighbors) for engaging other NIPF owners in property and community-focused forest-management knowledge (objective 3). Many NIPF owners, whether seasonal or year-round, production-oriented or amenity, retired or employed, described the importance of unofficial advice sources such as family and friends, and peer-to-peer advice networks (e.g., Bieling 2004; Charnley, Fischer, and Jones 2007; Rickenbach 2009; Rickenbach, Zeuli, and Sturgess-Cleek 2005; Salmon, Brunson, and Kuhns 2006). Official advice source entities and activities described by respondents include OSU Extension, ODF, Wallowa Resources, USFS, contract foresters, logging contractors, tree farmers, and their own experience, and mirrored advice sources listed in forestland owner surveys by Hartter et al. (2014; 2015). Surprisingly, NIPF-owner involvement in community forestry groups was not identified as a factor of community-focused forest-management engagement, but involvement is a common source for official advice for management of their own forestlands. This is likely because unofficial advice sources provide neutral and non-technical channels for forest-management advice (Bieling 2004), and are perceived as less tedious networks to obtain forest-management advice compared to attending workshops or turning to official forestry experts (Knoot and Rickenbach 2011). These unofficial advice sources encourage property-focused forest-management engagement while drawing upon community-based knowledge (Charnley, Fischer, and Jones 2007; Rickenbach 2009; Rickenbach, Zeuli, and Sturgess-Cleek 2005; Salmon, Brunson, and Kuhns 2006).

NIPF owners' refined descriptions of property and community-focused forest-management engagement help clarify incentives and barriers to active forest management/monitoring. Landowners identified barriers for both property and community-focused forest-management engagement (objective 4). Respondents who were not engaged in property-focused forest management had less time to invest time in hands-on management or monitoring. Barriers were described by those living outside of the county, employed full time, or not having a resource-dependent income. For community-focused cross-boundary forest-management engagement, NIPF-owner identified barriers to engagement including lack of trust for decision-makers, an uncertainty of the outcomes, not having time to invest, and not having clear incentives for engagement. These findings complement those of Bergmann and Bliss (2004) regarding factors that reduced private landowner willingness to cooperate in cross-boundary resource management in John Day Valley, Oregon. Following the summer 2014 interviews, the WWFC implemented active forest management for the East Face Project in neighboring

counties Baker and Union in 2017 and 2018. The landowners' apprehension in the interviews about management outcomes of the WWFC likely originated from other time-consuming or inactive collaborative projects (Goldstein and Hull 2008). Cross-boundary management projects are more successfully implemented if organizers understand the needs of engaged NIPF owners and communicate incentives for involvement to build trust amongst stakeholders (Cheng and Randall-Parker 2017; DeCoster 1998; Dilling et al. 2015; Kline, Alig, and Johnson 2000; Lurie and Hibbard 2008; Salmon, Brunson, and Kuhns 2006). When collaboration is necessary to achieve management goals (Goldstein and Hull 2008), engagement of NIPF owners in public forestland management can be fostered by willing organizations (Dilling and Lemos 2011; Simpson et al. 2016; Wilmsen et al. 2008).

Conclusion

In this study, we established a two-category definition of forest-management engagement, property and community-focused, based on NIPF-owner engagement actions, advice sources, and incentives and barriers to engagement. While defining and refining this characterization of NIPF-owner property and community-focused forest-management engagement, we were able to better understand the characteristics of landowners who were not engaged. Respondents not engaged in property or community-focused management had amenity-based interests for owning forestlands but lacked advice networks because of absentee ownership. Our findings build upon those of Fischer (2012), who categorized unengaged and uninterested absentee NIPF owners in eastern Oregon as "passive" NIPF owners, and called for more research to understand why these landowners are not engaged and whether their forestlands have increased risk. Our study suggests the passive NIPF owners are not engaged because they lack knowledge of active management, and lack advice networks to communicate risk, influence management decisions, and encourage both property and community-focused forest management. Previous studies have established NIPF-owner management decisions are influenced externally and internally by the norms of their social groups, personal or family identity, risk reduction, and economic factors (e.g., Bliss and Martin 1989; Domínguez and Shannon 2011). Similarly, NIPF-owner perceptions of fire risk are influenced by their social networks and engagement in stakeholder groups (e.g., Hamilton et al. 2014; Paton and Tedim 2013; Salmon, Brunson, and Kuhns 2006). Being relatively more distant and isolated, absentee landowners are less likely to connect with community forestry networks, which could otherwise share forest-management advice (e.g., Salmon, Brunson, and Kuhns 2006). We found that this challenge is compounded because these landowners live further away from their forestlands and often are employed full-time, thus limiting the time they have to devote to forest management and social-network building.

Previous research has suggested targeting outreach to these passive landowners with forest-management materials aimed at amenity-focused landowners to pique interests in forest management (Fischer 2012; Salmon, Brunson, and Kuhns 2006). In the study region, My Blue Mountains Woodland partnership was formed in 2015 to connect uninvolved private owners with public and nonprofit forest-management organizations

to reduce forestland fire risk for the Oregon counties Baker, Union, Umatilla, and Wallowa (Parker et al. 2017). Partnerships like these in other regions could facilitate new advice networks through accessible online resources, meeting materials, foresters and landowner volunteers. Counties could also provide printed or online materials about forest-management programs, partnerships, meetings, and resources for NIPF owners when purchasing timbered hectares or paying property/timber taxes to facilitate network building with potentially passive, unengaged, or uninterested NIPF owners.

Future studies could examine the forest-management advice networks of passive and unengaged NIPF owners and the impact network connectivity has on property and community-focused forest-management engagement, similar to methods used to examine networks for organizations involved in the management of fire-prone forests in Fischer et al. (2016) and Fischer and Jasny (2017). Additionally, future studies can examine the relationship between property and community-focused forest-management engagement for NIPF owners. Increasing advice networks for passive NIPF owners could provide an opportunity to increase property and community-focused forest-management engagement, thus working towards the reduction of community wildfire-risk overall.

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