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Social learning in a policy-mandated collaboration: community wildfire protection planning in the eastern United States

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Policies such as the US Healthy Forests Restoration Act (HFRA) mandate collaboration in planning to create benefits such as social learning and shared understanding among partners. However, some question the ability of top-down policy to foster successful local collaboration. Through in-depth interviews and document analysis, this paper investigates social learning and transformative learning in three case studies of Community Wildfire Protection Planning (CWPP), a policy-mandated collaboration under HFRA. Not all CWPP groups engaged in social learning. Those that *did* learned most about organisational priorities and values through communicative learning. Few participants gained new skills or knowledge through instrumental learning. CWPP groups had to commit to learning, but the design of the collaborative-mandate influenced the type of learning that was most likely to occur. This research suggests a potential role for top-down policy in setting the structural context for learning at the local level, but also confirms the importance of collaborative context and process in fostering social learning.

Keywords: social learning; mandated collaboration; collaborative planning, wildfire planning, wildfire policy

1. Introduction

Collaboration has emerged as a popular means to address complex environmental planning problems (Healey 1992, Ascher 2001). It is described as "a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible" (Gray 1989, p. 5). Early theorists viewed collaboration as one of the most participant-intensive in the range of participatory planning approaches, with expectations for extended stakeholder engagement and multiple opportunities for influence (Arnstein 1969). More recent scholars have found that this multi-stakeholder planning can diminish conflict, lead to creative decisions, and facilitate integration of diverse interests in a single plan (Gray 1989, Wondolleck and Yaffee

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2000, Margerum 1999). In the United States, policy makers have embraced integrative approaches by mandating collaboration within some environmental planning legislation. However, requiring collaboration within policy is a significant shift from the grassroots projects that popularised collaborative approaches. In fact, some assert that collaboration is emergent and voluntary by definition (Gray 1989). In the policy-mandated form, legislation is an external impetus for collaboration and policy sets the framework within which social interaction occurs. Catalysing collaboration from the top-down can be problematic: planning groups may be short-lived and the impacts of planning may be minimal due to the lack of local-ownership and/or local-relevance (Taylor and Schweitzer 2005, Genskow 2009). Thus some people question whether mandated collaboration will encourage effective planning in the same way as more organically-initiated collaborations (Rodriguez *et al*. 2007).

Regardless of the impetus – policy-mandated or emergent – planning research highlights social learning as integral to collaborative success (Schusler *et al*. 2003, Bouwen and Taillieu 2004, Pahl-Wostl and Hare 2004). However, some have argued that "learning cannot be legislated or prescribed" (Bull *et al*. 2008, p. 712). Since most agree learning is integral to creating positive collaborative outcomes, this study uses evidence of social learning to examine policy-mandated collaboration. Social learning is understood as " ... learning that occurs when people engage one another, sharing diverse perspectives and experiences to develop a common framework of understanding and basis for joint action" (Schusler *et al*. 2003, p. 311). A common thread within social learning theory is that groups of stakeholders are able to *transform* their perspectives, understanding, and behaviour through learning in collaborative contexts. Through 'transformative learning', people may find more integrated, sustainable solutions to difficult environmental problems (Sims and Sinclair 2008). Thus transformative learning theory (Mezirow 1991, 1994) provides an appropriate framework to investigate distinct social learning processes and outcomes that may occur in collaborative contexts.

Mezirow (1991, 1994) highlights both instrumental and communicative capacities as crucial to fostering transformative learning by changing participants' frames of reference towards being more inclusive, integrative and innovative. Instrumental learning involves gaining new skills and information related to the substance of an issue (Mezirow 1994, Bull *et al*. 2008, Sims and Sinclair 2008). Through interacting with new data, conducting joint fact finding or engaging with knowledge 'gatekeepers', participants can construct new cause-effect relationships (Mezirow 1994, Petts 2007, Sims and Sinclair 2008). Communicative learning involves learning about values and intentions, learning how to work together and building common identity (Mezirow 1994, Petts 2007). By way of dialogue and discourse, communicative learning gives people a better understanding of others' points of view and important normative concepts (Sims and Sinclair 2008). Supported by transformative learning, collaborators seek " ... solutions that go beyond [one's] own limited vision of what is possible" (Gray 1989, p. 5). Therefore, like others (Petts 2007, Bull *et al*. 2008, Sims and Sinclair 2008), this study explores social learning in participatory environmental planning through investigating transformative, instrumental and communicative learning.

Despite improving conceptual specification, scholars have called for additional empirical work on social learning in environmental planning contexts (Muro and Jeffrey 2008). The study examines social learning in multiple case studies of policy-mandated collaboration in wildfire management groups in the eastern United States, a region under-represented in wildfire studies. A multiple-case study design makes it

possible to draw conclusions across cases, as well as distinctions between contexts. Although some people have questioned whether promoting social learning is always worthwhile (Mostert *et al.* 2007), the trans-boundary, multi-objective nature of wildfire planning makes co-ordination and learning necessary (Dombeck *et al.* 2004). This research examines collaborative planning in a new context and delivers on calls for additional study of communities and institutions in wildfire management (Field and Jensen 2005). Finally, the study investigates the capacity of federal policy-mandated collaboration – a relatively unexamined innovation in public policy – to encourage learning-centred planning on the local level.

Twentieth-century US wildfire policy has been critiqued as being based on an ineffective and expensive fire suppression approach (Busenberg 2004). More recently, US wildfire policy has moved towards integrative planning approaches that include hazardous fuels reduction, forest restoration and community partnerships (Jakes *et al.* 2003, Nelson *et al.* 2005, Sturtevant *et al.* 2005, Steelman and Burke 2007). One such policy – the Healthy Forests Restoration Act (HFRA) of 2003 – encourages local wildfire management planning through Community Wildfire Protection Plans (CWPPs). A CWPP is necessary for a community to receive federal funds through HFRA (Steelman and Burke 2007) and some states require a community to complete a CWPP to receive any state-distributed federal fire funding. Furthermore, HFRA mandates that CWPPs must be produced collaboratively. Legislation requires three entities – the local fire chief, the state forester and another relevant local official – to sign off on the CWPP for it to be considered valid collaboration. In addition, most CWPPs are prepared with participation from federal land management agencies. HFRA requires a CWPP group to "identif[y] and prioritiz[e] areas for hazardous fuel reduction treatments and recommen[d] the types and methods of treatment ... and recommen[d] measures to reduce structural ignitability throughout the at-risk community" (HFRA 2003, Title I, sec. 101(3)B). Transformative learning is particularly salient in this context since HFRA brings together participants with diverse perspectives on fire suppression, hazard reduction, emergency management and forest restoration. If transformation of wildfire planning approaches is necessary to improve management (Dombeck *et al.* 2004, Steelman and Burke 2007) and social learning is central to fostering collective action (Schusler *et al.* 2003, Pahl-Wostl and Hare 2004), the question remains whether policy-mandated collaboration can encourage learning, transformation, and joint action amongst planning partners. This study examines three case studies of CWPPs, asking:

(1) Do both instrumental and communicative social learning emerge from policy-mandated collaborations? Furthermore, do CWPP groups demonstrate evidence of transformative learning?
(2) Do planning groups come to a shared understanding of wildfire through collaboration? If so, what are the characteristics of shared understandings?
(3) Does the planning outcome – the wildfire plan – reflect these shared understandings?

2. Specifying the social learning concept

As a research model, we adapted Muro and Jeffrey's (2008) compound social learning model synthesised from the participatory environmental planning literature

(Figure 1). In this adapted model, policy sets the context by requiring interpersonal interaction among stakeholders, thus enabling social learning among interdependent participants. Particular collaborative context and process features – such as facilitation and diverse stakeholder participation – may foster social learning. Through social learning, participants may realise individual learning outcomes such as new skills. However, most relevant to collaborative planning, social learning can lead to collective learning outcomes such as shared understanding and mutual agreement. The model's conceptual links between learning context, process, outcome, and collective action inform our research questions and methodology.

The transformative learning framework is embedded within Muro and Jeffrey's model to structure the examination of social learning (Figure 1). Within this model, transformative learning "is learning that transforms problematic frames of reference—sets of fixed assumptions and expectations (habits of mind, meaning perspectives, mindsets)—to make them more inclusive, discriminating, open, reflective, and emotionally able to change" (Mezirow 2003, p. 58). Building instrumental and communicative capacities is crucial for transformation (Figure 1).

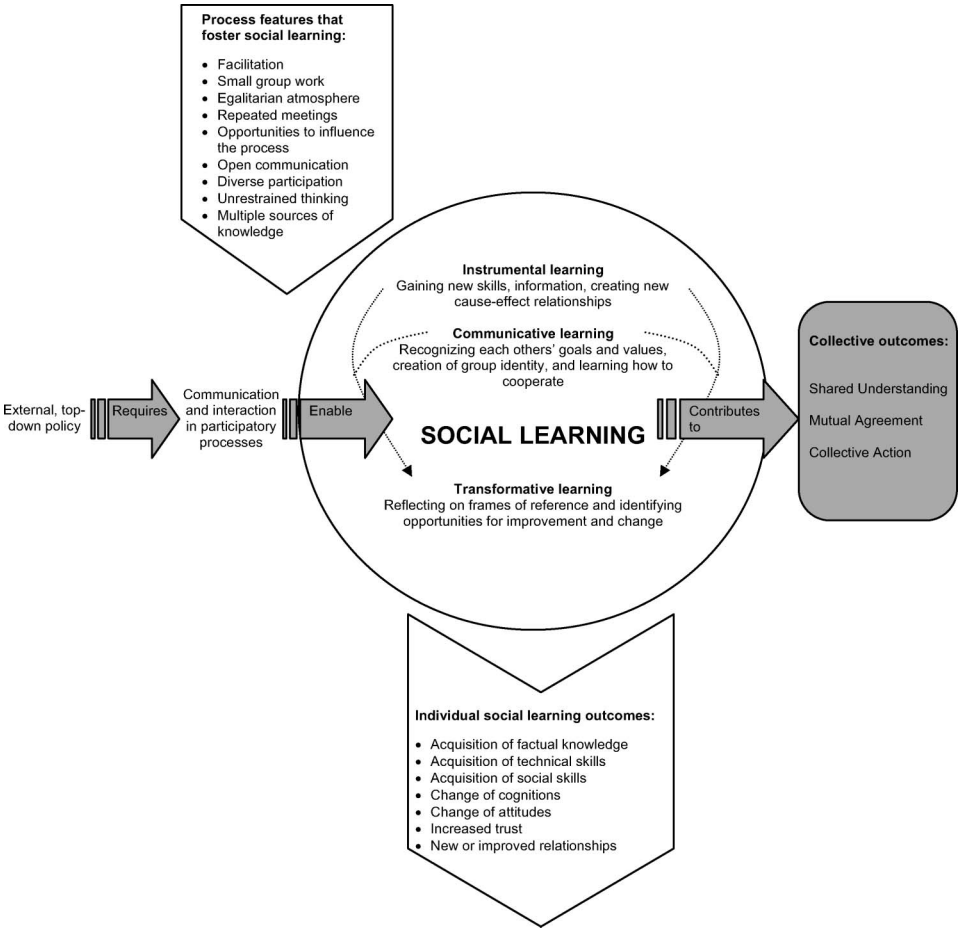

Figure 1. A conceptual model of social learning in collaborative environmental planning contexts modified from Muro and Jeffrey (2008).

In collaborative wildfire planning, transformative learning could occur when participants critically reflect upon their current management system, changing their perspective and identifying ways to accommodate that new perspective.

Several learning theories – such as experiential learning (Kolb 1984) and organisational learning (Argyris and Schön 1978) – have contributed to understanding social learning in participatory environmental planning contexts. The transformative learning framework is utilised to provide theoretical focus to this decidedly empirical research, while building on related studies that have done the same (e.g. Petts 2007, Bull *et al*. 2008, Sims and Sinclair 2008). Further, transformative learning theory provides a structure to characterise specific types learning processes and outcomes. This explicit approach is particularly important as practitioners, facilitators and policy makers seek to design policy and planning processes to achieve specific learning outcomes.

The adapted model also highlights shared understanding as a crucial outcome of social learning (Figure 1). Individual understanding may change through social learning, but in collaborative contexts it is important that individual understandings align across participants to form shared understanding (Schusler *et al*. 2003). For example, social learning *could* reaffirm to stakeholders that their individual interests conflict in ways they view as irreconcilable (Leeuwis 2000), thus impeding collective action. However, shared understanding is the belief that other members of the collaborative group hold a similar understanding. Therefore, shared understanding is treated as distinct from individual social learning outcomes to evaluate the capacity of mandated collaboration to foster collective action.

3. Methods

3.1. Data collection and analysis

Between June 2006 and February 2007, we investigated three CWPP groups in the eastern United States: Lake County, Minnesota (MN), Barnes-Drummond, Wisconsin (WI) and Taylor, Florida (FL) (Table 1). To identify these cases, we made contact with key informants in state and federal forestry agencies and selected groups that varied in ecological context and planning scale. The selection was limited to groups that had finished planning by the time of study, but it was possible to interview all participants within six months or less of CWPP completion.

We conducted a total of 36 semi-structured interviews with 'primary' participants from the three case study locations. 'Primary' participants were those actively involved with planning, operationally defined as attending three or more meetings. At each case study location, we spoke with planning representatives from the USDA Forest Service (USFS), the relevant state forestry agency, county land management, county emergency management, municipal government, and local fire departments. Ultimately,we interviewed an average of 85% of primary participants across cases. The interviews were structured to examine CWPP context, process and outcomes. Consistent with literature that informs the model in Figure 1, we designed the social learning interview questions to understand process factors, individual learning outcomes and collective learning outcomes. Measuring social learning can be challenging since researchers generally rely on participants' self-assessment of learning and change. However, in-depth, qualitative retrospective interviews are used

Table 1. Summary of collaborative context and process in three case studies of Community Wildfire Protection Planning conducted in 2006–2007.

Process factors	Lake County, Minnesota	Barnes-Drummond, Wisconsin	Taylor, Florida
CWPP group size*	20	18	9
Primary representation (number of representatives)	US Forest Service (8) MN Department of Natural Resources (4) Lake County Government (4) Volunteer Fire Departments (4)	US Forest Service (5) WI Department of Natural Resources (4) Town Boards (4) Bayfield County Government (3) Volunteer Fire Departments (2)	US Forest Service (2) FL Department of Forestry (2) Baker County Government (2) Baker County Fire Department (1) Town Representative (2)
Non-agency representation**	Volunteer Fire Departments	Volunteer Fire Departments Town Board Members	Town Pastor
Duration of process	16 months	8 months	3.5 months
Number of meetings	18	8	4
Size of planning area	1.34 million acres	171,056 acres	1,700 acres
Definition of planning area	Prior to planning, in a pattern of county-scale plans on the state level.	Defined collaboratively by the planning group	Defined by the planning group

Notes: *Group size is reported according to those who attended at least one-third of planning meetings and/or were identified by facilitators as primary participants.
**Only those non-agency representatives that were primary participants are reported.

widely within the social learning and participatory planning literature for this purpose (e.g. Schusler *et al*. 2003, Bull *et al*. 2008, Sims and Sinclair 2008). Mezirow (2003) in particular notes the suitability of qualitative approaches to investigating transformative learning. Interviews ranged between 25 minutes to 2 hours; all were digitally-recorded and transcribed verbatim.

We analysed interviews for social learning-related themes, coding for evidence of instrumental, communicative or transformative learning based on definitions from the literature (Mezirow 1991, 1994, 2003). Previous studies on transformative learning in participatory environmental management contexts have taken a similar analytical approach (e.g. Petts 2007, Bull *et al*. 2008, Sims and Sinclair 2008). For instrumental learning, we coded when participants specifically noted *new* substantive knowledge or skills resulting from the planning process. We identified communicative learning when participants noted improved understanding of others' values, priorities and intentions, when they indicated new knowledge of how to co-operate, or when they described developing shared identity. Finally, we coded for transformative learning when interviewees noted reflection, identified opportunities for improvement in the wildfire management status quo, indicated a new way to address that issue, and discussed how that change might affect the wildfire management system. Learning categories were coded as mutually exclusive so that no one mention of learning could be coded as more than one learning type.

Additionally, we evaluated whether participants described a shared understanding of the wildfire problem based on the planning process and accessed the characteristics of their description. We defined understanding as 'shared' when the participant reported a learning outcome, indicated that others in the planning group shared this understanding, and when that understanding was reported consistently across interviewees. One researcher conducted the first analysis and coding was verified by a second researcher. Finally, we reviewed planning documents from each CWPP group, examining proposed actions and evaluating whether these actions reflected participant-reported shared understandings.

3.2. Case studies

3.2.1. Lake County, Minnesota

Lake County is in rural northeast Minnesota in the US Midwest. The county is bound by Canada on the north and Lake Superior on the south, with most of the 11,000 residents concentrated in small towns near the lakeshore. Seventy-eight per cent of the 1.34 million acres of Lake County are publicly owned and 90% of the county is forested with northern hardwood, pine and boreal forest types. Fire occurrence is cyclical with droughts, and wind-felled trees from a 1999 blow-down event continue to be a management concern.

This CWPP was initiated by USFS representatives from the Superior National Forest, with a strong local partnership from the County Commissioners' office. Additional participants represented government organisations, including eight volunteer fire departments, the Minnesota Department of Natural Resources (DNR), Lake County Forestry, and Lake County Emergency Management. The CWPP was facilitated by the partnership co-ordinator from the Superior National Forest and a fire planner from the Minnesota Interagency Fire Center.

3.2.2. Barnes-Drummond, Wisconsin

Barnes and Drummond – population 610 and 541, respectively – are two adjacent communities in northwest Wisconsin. Drummond is a gateway community to the Chequamegon-Nicolet National Forest and is surrounded by mixed hardwood forests. The forests surrounding the town of Barnes are populated by jack pine and red pine stands, most of which is under county management or is industrially-owned.

This CWPP was initiated locally through discussions between the USFS District Ranger and the DNR Area Forester. Simultaneously, Wisconsin's central DNR office was considering introducing CWPPs into the state, so Barnes-Drummond became the pilot CWPP for Wisconsin. The group hired a professional planner/facilitator from the Wisconsin Northwest Regional Planning Commission, a quasi-governmental organisation that contracts with local government. The planning area included the towns as well as surrounding federal, county, private and industrial forest land. The CWPP was completed with partnership from the USFS, Wisconsin DNR, Bayfield County Forestry, County Emergency Management, as well as representatives from the town boards and volunteer fire departments.

3.2.3. Taylor, Florida

Taylor is a small, unincorporated community surrounded by federal, state and private industrial forest in north-central Florida. Baker County estimates the Taylor area houses approximately 1500 residents and contains 425 building structures, such as private homes. The primary forest type is longleaf pine or cultivated slash-pine, both of which pose a high fire risk. In the past 10 years, four major fires have threatened Taylor, although there has been no major structural damage.

In response to HFRA, the Florida Department of Forestry initiated the Taylor CWPP in collaboration with representatives from the Osceola National Forest, Baker County Fire & Emergency Management, and a forester from an adjacent industrial forest. Planning was heavily agency-driven, but the core group later brought in a Taylor pastor and the volunteer fire chief to act as community liaisons.

4. Results

This study of policy-mandated collaboration examined (1) the emergence of social learning from planning groups; (2) the development of shared understanding amongst participants; and (3) whether shared understanding is reflected in wildfire plans. Although the three groups investigated operated under the same political mandate for collaborative wildfire planning, process factors (duration of planning, number of participants, scale of planning area, and number of meetings) varied quite widely (Table 1). The Lake County, MN and Barnes-Drummond, WI CWPP groups demonstrated evidence of social learning and developed a shared understanding through collaborative planning. However, participants in Taylor, FL indicated that they entered the CWPP process with a pre-existing shared understanding of wildfire management and that social learning was not a strong aspect of the planning process (Table 2). Below we organise our findings around our three research areas.

Table 2. Evidence of learning types in case studies of Community Wildfire Protection Planning conducted in 2006 and 2007. The Table reports (1) the number of individuals showing evidence of each learning type; and (2) percentage of total interviewees from each case study showing evidence of each learning type to enable comparison across cases.

Case (# participants)	Instrumental learning Freq. (%)	Communicative learning Freq. (%)	Transformative learning Freq. (%)
Lake County, Minnesota (n = 15)	4 (27%)	12 (80%)	7 (47%)
Barnes-Drummond, Wisconsin (n = 12)	1 (8%)	9 (75%)	2 (17%)
Taylor, Florida (n = 9)	3 (33%)	1 (11%)	0

4.1. The emergence of social learning

4.1.1. Instrumental learning

CWPP participants generally did not gain new knowledge or skills related to wildfire management through instrumental learning. Less than one-third of participants in each case study provided examples of instrumental learning (Table 2) and all of these examples were from non-land management representatives. In Florida, where little learning occurred, instrumental learning was the most frequently reported learning type:

> I think the participation we had up [in Taylor] brought light to [the community]. I think they have a better picture of what the possibilities are and what steps we are trying to do to mitigate [the wildfire risk]. (Taylor, FL)

In all cases, the few examples of instrumental learning were either self-reported by community representatives or were observed by agency employees and attributed to community representatives.

4.1.2. Communicative learning

Communicative learning in CWPP groups involved learning about other parties' management interests and priorities and navigating group values to address the wildfire problem. In the Wisconsin and Minnesota CWPP groups, participants put forward examples of communicative learning most frequently (Table 2). Over three-quarters of the participants in both groups reported at least one example of communicative learning. This was true across participants' organisational sectors – federal, state and local.

> I guess everybody understands where everybody else is. You know, where they're coming from more now … and understand a little more how we can help each other too. (Lake County, MN)

> The one thing I have learned a lot about is that relationship … how the agencies play together, the politics of this sort of thing. (Barnes-Drummond, WI)

Participants attributed communicative learning to engaging in a collaborative risk assessment where they scored and ranked community values (such as

infrastructure values and ecological values) and determined relative risk in sub-planning areas:

> When we really started doing hazards and risks … there was a lot of discussion on just what high, low, medium hazards were. It went on and people talked about the areas and … as people spoke more, they got to know which [participants] know which areas better. (Lake County, MN)

Planning stakeholders also highlighted the importance of open discussion in enhancing communicative learning. In particular, interviewees noted the importance of facilitation:

> Well, I think having [name] in the role of facilitator [helped] … And, it's important that the facilitator come from the outside, without biases or opinions … You know, basically they just know how to keep everybody on track, and that in itself was a big help. (Barnes-Drummond, WI)

Communicative learning did not emerge strongly from the Taylor planning process.

4.1.3. Transformative learning

Transformative learning did not appear strongly across the three CWPP case study groups (Table 2). However, nearly half of the Lake County, MN interviewees noted at least one example of transformative learning arising from their planning process. In particular, participants broadened their view about what fire management could be in their region. This group redefined fire management as something that can happen outside federal land:

> And [the highest priority region] doesn't have a stitch of National Forest land, which I think is really cool. This is truly the idea of the Community Wildfire Protection Plan to work out in those areas. You don't always have to have a National Forest component or BLM component; it's all of us working together as a community. (Lake County, MN)

CWPP participants also identified opportunities to transform organisational co-ordination through the creation of a new position in the county:

> I think that there will be a county co-ordinator [for the] fire department[s] that will happen and would not have happened for a lot longer if it hadn't been for [the CWPP process]. It focused the county's attention on [the] need of the fire departments. They had heard a little bit of it here and there but [after the CWPP process] it was really unified. (Lake County, MN)

Lake County CWPP participants even altered their view of how to conduct business within their home organisations. For example, this agency representative developed a new view of how to work across departmental boundaries:

> I know within our agency, I perceived there to be a disconnect between different entities, like wildlife, and timber, and fire, and vegetation management. And now I think a lot folks within our agency are starting to think about 'wow' maybe we should be working more together on some of our projects to make them all-encompassing. (Lake County, MN)

Neither Barnes-Drummond nor Taylor participants highlighted many examples of transformative learning as emerging from the CWPP process.

4.2. *Shared understanding in collaborative planning*

4.2.1. *Changes in shared understanding*

Every interviewee indicated that their CWPP group had a shared understanding of the wildfire problem in their area. However, only participants in Lake County, MN and Barnes-Drummond, WI attributed that shared understanding to the CWPP process. Participants from Taylor, FL indicated that they came into the CWPP process with a pre-existing shared understanding of the wildfire problem in their area due to a history of wildfire occurrence across the mosaic of landownership:

> I think [the shared understanding] was probably already there because we've had so much experience in the past with [wildfire]. (Taylor, FL)

However, Taylor participants did note strengthening of their previous understanding, along with a new commitment to work with Taylor residents.

In Lake County, approximately three-quarters of participants indicated that the group came to a shared understanding of wildfire in their region as a result of the CWPP process. The remaining participants – four USFS representatives – believed the group had shared understanding prior to the CWPP process. In Barnes-Drummond, the vast majority of participants linked the development of their shared understanding to learning that occurred during the collaborative planning process.

4.2.2. *Components of shared understanding*

Shared understanding was comprised of two components in Lake County and Barnes-Drummond: substantive and relational understanding (Table 3). Substantive understanding influenced *what* issues the group addresses and the collective reasoning of *why* they chose to address them. Relational understanding influenced *how* the group acted to address those substantive issues.

4.2.2.1. Elements of substantive understanding. Planning participants in Lake County and Barnes-Drummond noted that the CWPP process allowed the group to collectively identify wildfire as a problem worth addressing in their region (Table 3).

> I think that the fire departments had a basic understanding of the concern, because there's ongoing education about that. I don't know that that was true for elected officials. I think we came to the same page kind of understanding [through the process]. (Barnes-Drummond, WI)

CWPP members also came to collective agreement about the nature of wildfire hazards on the landscape and agreed that hazards needed to be mitigated through management action. Participants highlighted the importance of the policy in instigating collective action:

> I think everybody understood that [wildfire] was [a] concern because the fuels were there … every year that went by got drier and drier, and that stuff's just laying around. Everybody was concerned about it, but until [the CWPP] came about, nobody did much about it. (Barnes-Drummond, WI)

Further, participants learned about each other's values and jointly assigned priority to wildfire management goals:

> Yeah, life, homes, property ... that's what our part of the whole big picture is ... in that order, lives, homes, property and resources. I mean, that's everybody's priority. (Lake County, MN)

Finally, each CWPP group jointly identified the course of action they would take to mitigate wildland fire hazards (Table 3).

4.2.2.2. Elements of relational understanding. Participants in Lake County, MN and Barnes-Drummond, WI reported greater understanding of organisational roles, capabilities and policies surrounding wildfire management.

> I think we got a better understanding of each other's capabilities, I think [that] was one of the biggest things ... I think just the discussions around the table mostly [helped us understand that]. (Lake County, MN).
>
> I think that in Lake County [the CWPP] really helped the partners come together and understand what everybody's role is as a whole. Looking at the big picture ... because everybody was just working on their own before. (Lake County, MN)

Thus, through gaining better knowledge of other organisations, participants created a system-level understanding of organisational interdependence in wildfire management. From that, participants created the understanding that inter-agency collaboration is important to wildfire management.

> I think people realise how important it is to communicate what your projects are and ... work together to solve a problem rather than work separately. (Lake County, MN)

In Taylor, participants stressed that the process did reconfirm the importance of cross-organisational relationships, but that this understanding was not new.

For those participants that attributed the creation of shared understanding to the CWPP process, both the policy and local leadership acted as catalysts for collective action on the local level:

> Everybody was concerned about [wildfire], but until [the CWPP] came about, nobody did much about it. Somebody had to get the ball rolling, I think. (Barnes-Drummond, WI)
>
> Well, it was one of those deals where it's about time we do something. I'm glad somebody brought us together. (Barnes-Drummond, WI)

However, in discussing shared understanding, some participants indicated that the primary motivation to complete a CWPP was to increase access to federal funding:

> Cut to the quick: it's money. To help this community and to help ourselves ... So I think that's what [the CWPP] looked like, something we needed to do, so we can do something better in the future. (Barnes-Drummond, WI)

Table 3. Evidence of substantive and relational understanding developed during the community wildfire protection planning (CWPP) process based on interviews and CWPP documents, for Lake County, Minnesota and Barnes-Drummond, Wisconsin, 2006 and 2007.

Components of shared understanding	Evidence of substantive and relational understanding			
	Lake County, Minnesota		Barnes-Drummond, Wisconsin	
Substantive understanding	Interviews	Planning document	Interviews	Planning document
Problem identification	"I think they do have a realization that there is a problem out there."	"The threats to life and property, the assets lost, and the cost for fighting fires are continuously escalating."	"I think everybody pretty much realized we have problems there, or potential problems."	"Residents and local community leaders have become increasingly aware of the tangible wildfire threat facing their communities."
Cause/hazard identification	Hazardous fuel build-up	Proposed actions to mitigate hazardous fuels	Fuels build-up, debris burning	Proposed fuel mitigation, regulation on burning permits to residents
Management approach	Protect "... life, homes, property, then the resource"	Infrastructural values rated higher than ecological values; priority actions in higher populated areas	Focus on highest risk areas, where housing and forest fuels meet	Proposed actions directed towards high-risk housing developments
Relational understanding	Interviews	Planning document	Interviews	Planning document
Agency roles, policy, capabilities	"Everybody's probably got a better understanding of who the players are, and what they do, maybe."	Includes a list of policies and statues that direct relevant land management agencies.	"Greater understanding of ... general operating... Different policies, different ways of doing things legally."	Includes lists of agency resources, current projects, and identifies land management responsibilities.
Inter-agency collaboration	"We got talking [about] working together to get the agencies working more closely together."	"Implementation of the Lake County CWPP will continue as a collaborative effort."	"... cooperation was needed from all the government units in order for it to be a success."	Implementation is assigned to individual agencies. Limited mention of future collaboration.

> You're viewing this as there's this carrot out there, called money ... and if we get this done, well that'll make us that much more in-line for getting some homeland security money and so on and [this CWPP] shows how interested we are in co-operatively working with everybody. (Lake County, MN)

So funding was viewed as a vehicle to community service and improved local resources for wildfire management.

4.3. From shared understanding to proposed action

CWPP planning documents were reviewed to determine whether participant-reported shared understandings were evident in proposed actions. We found evidence of each component of interviewee-identified shared understanding in Lake Country, MN and Barnes-Drummond, WI planning documents (Table 3). However, proposed actions were often outside of shared understandings reported in participant interviews. We did not include a review of the Taylor document as the group did not develop their shared understanding within the CWPP process.

4.3.1. Lake County, Minnesota CWPP

The primary decision-point in the Lake County CWPP document was the prioritisation of geographic areas for action; this focus is consistent with the increased group understanding of relative risk in various subsets of the broader planning area. The Lake County CWPP document contained evidence of all interviewee-identified elements of shared understanding (Table 3). For example, the Lake County CWPP planning document made strong statements about maintaining a collaborative approach into implementation and noted the creation of a committee to facilitate this intention.

The Lake County CWPP document expanded on shared understanding by focusing on public education as the primary strategy for wildfire prevention. In interviews, participants most commonly noted the build-up of 'hazardous fuels' in the forest as the major cause of wildfire, but only one of the actions in the Lake County CWPP document related directly to fuel mitigation. From interviews with the facilitators, it was known that this group used a template CWPP from a previous process in a nearby county. It is possible that this template influenced the Lake County group's adoption of education-based approaches to wildfire management.

4.3.2. Barnes-Drummond, Wisconsin CWPP

The action centrepiece of the Barnes-Drummond CWPP document was a list of specific wildfire prevention and suppression projects. Again, interview-identified elements of shared understanding were largely reflected in the CWPP document (Table 3). The exception was the emphasis in the interviews on inter-agency collaboration around wildfire – the document did not fully reflect this focus. For example, 14 of the 38 CWPP projects were initially created and situated within a single-agency and were listed as 'ongoing'. Thus the CWPP acted partially as a compiling document for pre-existing plans. In some ways, this approach is consistent with the shared understanding for the need for greater agency communication. However, the compilation approach also indicates a level of 'business as usual'

within wildfire management. In Barnes-Drummond, implementation responsibility was handed to individual agencies rather than a collaborative committee.

5. Discussion

Scholars and practitioners alike have called for collaborative governance (Gray 1989, Wondolleck and Yaffee 2000). However, research has demonstrated that mandating collaboration may lead to unintended consequences or ineffective outcomes such as limited impacts on regional planning outcomes (Taylor and Schweitzer 2005), collaboration that is not locally self-sustaining (Genskow 2009), or even damaged organisational relationships if collaboration is not supported by additional governance mechanisms (Rodriguez *et al*. 2007). This research found that policy-mandated collaboration set the institutional context for learning by convening key stakeholders, but that social learning and shared understanding are not automatic outcomes. As supported in other research (Grayzeck Souter *et al*. 2009), this study found that a flexible policy such as HFRA was met by diverse local contexts that influenced learning processes and outcomes within planning groups.

The two CWPP groups that demonstrated the strongest evidence of social learning engaged in communicative learning much more than instrumental learning. Thus, mandated collaborative wildfire planning did not foster the development of innovative substantive wildfire management practices as highlighted in some collaboration theory (Daniels and Walker 1996, Wondolleck and Yaffee 2000). CWPP participants continued using the same substantive approaches to wildfire planning as they did prior to collaboration. Research on wildfire policy indicates that this 'business as usual' approach reflects a larger trend in US wildland fire management (Steelman and Burke 2007). Since most participants were agency professionals with previous knowledge of fire and land management, it is not surprising that gaining new skills and knowledge was not a strong learning outcome. Non-agency community participants with less previous knowledge of wildfire accounted for the primary instrumental learning, most of which was basic information about fire behaviour and management. However, through the CWPP process, agencies became better co-ordinated, collectively identified fire management as crucial in their area, assigned value and risk across land tenure boundaries and created a new dedication to interagency co-ordination. Planning research highlights these benefits as important 'first and second order' consequences of collaboration (Innes and Booher 1999). In institutionally complex contexts, creating shared relational understanding of how to work across organisational boundaries is crucial to collaborative success (Bouwen and Taillieu 2004). It is noteworthy that positive communicative learning outcomes can emerge locally out of a policy-mandated collaboration from the federal level.

Transformative learning was not a strong learning outcome in the CWPP groups investigated. However, transformative learning occurred in Lake County, MN where partners committed to collaborative implementation of wildfire plans. This group also had the greatest number of participants, the longest planning process and the most meetings, once again highlighting the importance of process factors such as extended engagement and diverse stakeholder representation in fostering learning. Again, this learning primarily involved transforming institutional and organisational views of wildfire planning, rather than incorporating new substantive management practices. However, in dedicating resources to inter-agency implementation and

allowing the time for extended interaction, participants in Lake County were able to imagine opportunities for collaboration and transformation beyond the scope of the CWPP. Collaboration is often a time- and energy-consuming enterprise for agency representatives (Wondolleck and Yaffee 2000). Participants can extend, enrich and sustain the impact of collaboration by dedicating to a process of transformative learning that reaches beyond wildfire protection. Planning practitioners may broaden the influence of collaborative planning by constructing forums to promote learning by multiple partners on multiple scales. As Innes and Booher (1999, p. 415) suggest: ''Learning and change can be the most far-reaching effects of consensus building''

As other research on social learning highlights (Schusler *et al*. 2003, Pahl-Wostl and Hare 2004, Bull *et al*. 2008), we found that learning is a choice and not an automatic outcome of collaboration. In Taylor, FL, CWPP participants representing land management agencies entered the process with what they defined as a 'pre-existing' shared understanding of the wildfire problem and believed they possessed the knowledge to effectively manage wildfire. Agency representatives worked towards these pre-existing understandings and did not leave themselves fully open to learning new approaches to wildfire management. Further, collaborative elements such as the small agency-dominated planning group and the short planning process may have limited the potential for social learning in Taylor. These findings are consistent with previous studies which have found that agency-affiliated collaborations are apt to assume the management strategies of their home organisations (Bidwell and Ryan 2006) and that organisational representatives are often disinclined to consider viewpoints outside of their agencies' interests (Cheng and Daniels 2003). The CWPP groups investigated – all heavily agency-driven – did not seek out new science and innovation in wildfire management practice.

Social learning scholars note difficulty in linking learning to action (Bull *et al*. 2008, Muro and Jeffrey 2008). We used planning documents as a record of intended action and found that shared understanding developed during collaboration was reflected in proposed wildfire management actions. Thus, this research supports the claim that social learning and the creation of shared understanding does indeed influence what players are likely to do (Innes and Booher 1999). However, CWPP planning documents also included actions that were beyond the scope of or were inconsistent with participant-identified shared understanding of wildfire management. Many of these actions were quite standard and could be jointly supported and promoted without engaging in a learning process. Thus, it is clear that social learning and shared understanding are not the sole determinants of collaborative action in wildfire planning groups.

Finally, HFRA dangles the carrot of funding as an incentive for initiating CWPP processes. Holding fund-seeking as the principal goal of the CWPP process does not preclude groups from engaging in social learning during planning. However, this incentive structure can lead to opportunistic use of the policy to accomplish action on the individual agency level without dedicating fully to a collaborative planning process. HFRA, in its current design, does not by itself encourage planning partners to engage in social learning to improve local co-ordination around wildfire management. Although policy provided the impetus for collaboration, stakeholders emphasised that 'somebody' had to bring them together locally. This point underscores the importance of meeting external requirements for collaboration with local leadership (Genskow 2009). Decisions by state and local fire management

leaders on how to frame and design the CWPP process strongly influence planning and learning outcomes.

Taken together, these findings suggest that the design of a collaboration-mandating policy influences learning processes and outcomes at the local level. Research on institutional design in natural resource management strongly supports this assertion (Ostrom 1990, Bidwell and Ryan 2006). Strong communicative and weak instrumental learning within CWPP groups is probably attributable to HFRA's collaboration-mandating policy strategy: HFRA focused on collaborative membership by requiring the participation of three individuals – the state forester, the local fire chief and another 'relevant' local official. These first two partners enter the collaborative planning arena with pre-existing institutionalised knowledge of wildfire; the attitude that the group already possesses sufficient knowledge may constrain participants from seeking out *new* knowledge on wildfire management practices (Bull *et al*. 2008). Further, the groups we investigated interpreted the policy-mandate quite narrowly, which may have precluded more significant transformational learning. HFRA's design is flexible in that it does not designate a lead agency, there is no required non-local oversight of planning, and membership is open beyond three partners. This flexibility could encourage broad interpretation, innovation and transformational learning at the local level. However, groups consisted of traditional agency partners and focused on existing management goals of fire suppression and fuels mitigation. Thus, the CWPP processes examined here were less about innovating practice and more about organisational co-ordination and creating collective momentum around fire management. However, this research also supports assertions by other scholars that elements of the planning process, such as number of participants and their previous knowledge, duration of planning and number of meetings, and presence of a facilitator influence social learning potential in a collaborative group (Schusler *et al*. 2003).

Since both legislation and local factors influence policy-mandated collaboration, future research could examine how the interplay between policy design and local context may influence planning outcomes. In addition, different collaboration-mandating strategies – such as institutional review of proposed plans by a non-local authority or requiring all collaborative groups to plan for wildfire according to a standardised template – may lead to different learning outcomes. Thus, studies may also investigate how varying policy strategies may affect learning processes and outcomes in mandated collaborations. Finally, despite short-term benefits, some have demonstrated limited impact of top-down, mandated collaboration over time (Genskow 2009). Longitudinal research may determine the impact of HFRA-mandated collaboration on learning and behaviour beyond the official end of the planning process.

6. Conclusions

This paper begins to answer the call for additional empirical research on social learning sounded by Muro and Jeffrey (2008) in this journal. We agree that 'learning cannot be legislated' (Bull *et al*. 2008), but have shown that policy-mandated collaboration can be a convening element and may set the structural context for social learning at the local level. However, local context and collaborative process are crucial and policy must be realised at this level through leadership, skilled facilitation, dedication to expanding participant pools to non-traditional

stakeholders such as community members and NGOs, and purposeful process design. Furthermore, the structure of legislation can influence the type of learning that is most likely to occur. We suggest a potential role for HFRA in enhancing inter-agency co-ordination, improving understanding of the broader wildfire management institutional system and creating shared vision, but not necessarily in promoting advancement or transformation of substantive management practices. It is possible that enhanced co-ordination may be the primary goal of HFRA. However, most wildfire scholars agree that innovation in practice, not just co-ordination, is necessary to improve management (Dombeck *et al*. 2004, Steelman and Burke 2007). If policy seeks to both spur innovation of substantive management practices and enhance co-operation through mandated collaborations, transformative learning must be set as an explicit planning objective at federal and local levels.

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