

It's the Network: How Personal Connections Shape Decisions about Private Forest Use

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ABSTRACT

Most private landowners do not have management plans or avail themselves of professional advice before the sale of timber. We designed a pilot study to determine the extent to which they rely on social networks of professionals, peer landowners, neighbors, relatives, friends, and others for information before making decisions to either sell timber or place an easement on their land. We estimated that informal networks of 7–10 people may in some way be related to an owner's land and a subset of 1 or 2 are influential in a timber sale or easement decision. The size of the network may not be related to decision satisfaction. Peer landowners, local people from the community, and professionals play important roles in decisionmaking.

Keywords: social network, private woodland owners, peers

Forested landscapes in the northeastern United States provide invaluable public ecosystem services (e.g., clean water, habitat, outdoor recreation, and wood). Sustained provision of these depends on resilient and fully functioning forest ecosystems. However, the majority of forest in the eastern United States is a mosaic of small, private landholdings (<50 acres), for which management is largely uncoordinated and hence not at spatial scales compatible with ecosystem function and service. Decentralized and often uncoordinated decisions by landowners define current and future landscape patterns and the resulting mix of ecosystem services. Most landowners have neither a professionally prepared management plan nor professional advice before the sale of timber (Butler 2008). It is difficult for them to make informed decisions, much less more fully understand the complicated ecosystem-scale consequences of their decisions.

We designed an exploratory study to investigate the social networks of private landowners in the context of specific land management decisions. Social networks are the connections between people through which information, values, and opinions are transmitted. Prell et al. (2008) described the role of networks in the dissemination of information: "Knowledge is seen as embedded in social ties, not just formal channels such as books, the media, and formal institutions." We specifically considered those people who serve as sources of information for landowners and explored the role they might play in land management decisions. Our objectives were to characterize and compare the individual egocentric networks (i.e., those that surround single landowners) that inform landowners' timber sale and conservation easement decisions. Landowner decisions to harvest timber or participate in a conservation easement program were thought to have long-term impacts on ecosystem services delivered from these lands; however, potentially different

social influences could be related to these types of decisions. Our exploratory study evaluated the egocentric networks around individual landowners, in which landowners and their networks are considered independent of one another. We did not identify how these individual networks might be connected in a greater social network more regionally, which was outside the scope of this study. Because most landowners do not have contact with professional foresters (Butler 2008), yet we know they are making decisions about their land (e.g., they sell timber [McDonald et al. 2006] and sell/subdivide their land [Stein et al. 2005]), it is worth exploring other sources from which landowners acquire information and by which their behaviors may be influenced.

Background

Experts and peers are important sources of information in decisionmaking, and this is true for private landowners (e.g., see West et al. 1988, Sisock 2007). Experts are those with professional training (e.g., foresters, ecologists, and land trust staff) or experience (e.g., loggers), who often charge landowners for their services. Landowners may pay for these services, but this is not always the case, because some experts could instead be employed by public agencies, sawmills, or nonprofit conservation organizations to serve or influence landowners. Peers generally do not have professional standing although they could have information relevant to landowners considering an action based on their first- or second-hand experience.

Research has shown that decisionmakers may consider several qualities associated with an information source, including expertise, similarity in outlook or perspective, accessibility, information quality, trust, and cost of purchasing the service or advice (e.g., Borgatti and Cross 2003, Rogers 2003, Cross and Sproull 2004, Levin and Cross 2004). When landowners work with experts, concerns may

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arise according to agency theory due to asymmetric information (e.g., experts knowing much more about markets and prices than landowners who do not often sell timber) and/or misaligned objectives (e.g., loggers and foresters wanting to generate timber revenue, but landowners more interested in wildlife habitat or recreation; Eisenhardt 1989). Consequently, it may be challenging for landowners to judge the quality and usefulness of expert-derived information. Gootee et al. (2010) described their finding that some landowners lack confidence in their ability to evaluate forestry information and therefore rely on those they consider to be trustworthy sources. Furthermore, the authors noted that some landowners find the information from professionals to lack credible relevance to their individual situations and as a result turn to those trusted peers or other informal sources for information. Rickenbach (2009) identified the role peers (e.g., neighbors, kin, and other landowners) play in the social networks of owners and acquisition of information. More specifically, "social ties, whether with peers or experts, influence landowners' decisionmaking and the potential environmental legacy of their decisions" (Knoot and Rickenbach 2011). Korhonen et al. (2012) and Ma et al. (2012) found evidence that forest owners active in timber management could be influential channels of information for more passive, less experienced owners. Social networks have been shown to be important information conduits not only for individuals but also for groups. Floress et al. (2011) observed that for watershed associations, "social capital, as network ties that people can access, functions to help groups achieve outcomes." Granovetter (1983) referred to the role of so-called weak ties (e.g., as opposed to strong ties between family and close friends) as being potentially more beneficial, given that they can connect individuals to diverse sources of information, and appear more independent or impartial. Weak ties may be especially important in the case of decisions such as timber sales and conservation easements that may require sources of information outside of one's immediate social circle.

Periodically, and often on an unexpected basis, possibly triggered by exogenous factors (e.g., divorce, death in the family, or a sudden unplanned need for ready cash), landowners find themselves needing to make a decision about the future of their land involving the generation of income (i.e., the sale of timber, land, or a conservation easement). In the absence of a management plan or professional advice, decisions are made more on a reactive than informed or deliberate basis. Not only are peers easier to tap than professionals but also landowners may trust the information more because it comes from a source who may have no vested interest in the outcome (e.g., Gootee et al. 2010). People commonly consult with peers or nonprofessionals when they make decisions about a health care procedure or provider, the purchase of a home, or the purchase of a car. Our study addresses the question: What is the role of informal egocentric social networks when it comes to reactive decisions owners make about their land?

Study Area

We worked in northcentral Massachusetts, in 19 contiguous towns of roughly 650 square miles. The area is approximately 75% forested, is dominated by private landownership, and is located 75 miles west of the Boston metropolitan area. The region is typified by small town centers and modest farms and has a rural character. An estimated 2,500 private family forest owners collectively own 60% of the forest, with an average ownership size of 20 acres (Kittredge et al. 2008). Private and public land conservation and management

activities have been a subject of integrated study in this area for more than 10 years, related in part to the Harvard Forest (e.g., Golodetz and Foster 1997, Kittredge et al. 2003, Kittredge 2005, Finley et al. 2006, McDonald et al. 2006). This work builds on numerous studies of the region's landowners (e.g., Rickenbach et al. 1998, Belin et al. 2005, Finley et al. 2006). Because of this integrated research, the area provides an excellent location to further extend our understanding of the connection between people and their landscapes.

Methods

We conducted structured interviews with private landowners who recently sold timber ($n = 22$) or placed a conservation easement on their property ($n = 25$) in the preceding 2 years, hereafter referred to as either timber sale participants or easement participants. Landowners face a variety of decisions concerning their land (e.g., post it against trespassing, allow hunting or motorized recreation, control invasive plants or insects, and allow the collection of nontimber forest products). We focused on the decision points of timber sale and conservation easements for four reasons: (1) these two decisions have a tangible effect on land and ecosystem services, currently and into the future; (2) these activities may alter composition or eliminate forest altogether; (3) because timber sales and easements are both subject to regulation and state approval in Massachusetts, lists of landowners who have participated in these decisions are more readily available; and (4) these two decisions have been the subject of other research on landowner behavior (e.g., Kittredge 2004, McDonald et al. 2006, Thompson et al. 2011). We limited our sample to people who made a decision in the previous 2 years to minimize the challenge of recalling the decision process for landowners.

Participants were selected from lists of timber cutting notices or deed changes filed at town halls. We first contacted people by mail to explain the project ($n = 47$ people who had made an easement decision and 75 people who had sold timber in the previous 2 years). After 3 days, we successfully contacted a subset of them by phone ($n = 35$ easement landowners and 55 timber sale landowners), and if they were amenable, we scheduled an interview. Through a screening question or comparison to existing lists, if the person was known to be a forester or logger, he or she was not contacted. Interviews were conducted in person and elicited data on information sources and the size of the participant's egocentric network through a series of "name generator" questions that were sensitive to the potential pitfalls of this technique (e.g., interview subjects may not provide a total recall of their contacts in one sitting; phrasing of the questions is important; Marsden 2005). Timber sale and easement participants were given a blank piece of paper and asked to write down the names of people who might have a relationship to them in the context of their woodlands and were prompted with these questions: Who do you talk to about your land? Who do you get information or help from? Did anyone talk to you about your land? Was there anyone that was involved in or influenced the decision or process of the timber sale/easement? Did you talk to anyone or did anyone talk to you about the timber sale/easement? Participants were then asked to indicate those who were either involved in the timber sale/easement, assisted them with an understanding of completing the timber sale/easement, or influenced how they approached the timber sale/easement (hereafter termed "influentials"). It was stressed that involvement may not be limited to knowledge sharing, technical advice, or actual effort. It could also reflect someone's

Table 1. Participant characteristics.

	Timber sale participants (<i>n</i> = 16)			Easement participants (<i>n</i> = 24)			All participants (<i>n</i> = 40)		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Age (yr)	64.8	10.6	42–81	61.8	7.9	48–79	63.0	9.1	42–81
Ownership size (ac)	95.3	116.4	17–498	98.6	91.2	7–400	97.3	100.6	7–498
Ownership tenure (yr)	27.2	15.5	4–52	21.8	13.4	2–43	23.9	14.3	2–52

“moral support” or assistance in helping them “think through” the process.

As part of the interview process, using a categorical Likert scale, participants evaluated each influential’s expertise, trust, accessibility, information quality, perceived similarity to the participant, and overall contribution to the decision; indicated whether they paid for services; and provided other basic background information (e.g., “identity” as relative, friend, landowner, or neighbor; “local” [i.e., living nearby or in the same community], and “type of influential” as professional forester, land protection specialist, or logger). It was possible for an influential to have more than one role. Assessment of influentials was performed with a 7-point Likert scale, ranging from –3 (extremely negative) to 3 (extremely positive), which was transformed to a scale ranging from 1 to 7 to enable statistical analysis. The mean of each influential’s transformed evaluation scores (i.e., mean expertise, mean trust, mean accessibility, and so on) was used to describe the perceived relationship between each participant and his or her collective influentials (e.g., the mean influential trust score was the mean of the trust rating for influentials in a participants’ egocentric network). Participants were also asked to provide an overall assessment of the particular decision (e.g., positive/negative outcome and fit with expectations) using the same 7-point Likert scale.

In addition to probing for network size, influentials, and satisfaction with the timber sale or easement decision, participants were asked a number of questions concerning themselves or their land: tenure of their ownership, ownership size, age, distance between their residence and their land, level of education attained, annual household income, and existence of a management plan for their land. Participants were also provided with seven frequently cited reasons for landownership (after Butler 2008) and asked to evaluate each on a 4-point scale ranging from 0 (not important) to 3 (extremely important).

The interviews generally lasted 30 minutes. One researcher asked the questions, while another recorded data. If the participant was unwilling to provide network contacts or offer an evaluation and other background information related to their contacts, yet it was evident that a network of contacts did exist, the interview data were discarded. If the timber sale or easement had not actually been completed, the interview data were also discarded.

Descriptive statistics were generated and are reported for the characteristics of participants (e.g., age, ownership tenure, ownership size, education level attained, location of residence, and income level), their reasons for ownership, the size and nature of their networks, and satisfaction with their decisions. We also used a one-way analysis of variance (ANOVA) to test for differences between the number of people and number of influentials in egocentric networks of timber sale and easement participants. Cramer’s V statistic (Vaske 2008) was used to compare differences for categorical variables (e.g., the presence or absence of various kinds of influentials in egocentric networks). Spearman correlation (i.e., a nonparametric test for

Table 2. Participant characteristics (count).

	Timber sale participants (<i>n</i> = 16)	Easement participants (<i>n</i> = 24)	All participants (<i>n</i> = 40)	% of all participants
Gender				
Female	6	7	13	32.5
Male	10	17	27	67.5
Education				
High school	2	1	3	7.5
Some college	6	2	8	20.0
College graduate	6	11	17	42.5
Graduate or professional school	2	10	12	30.0
Distance from land				
Live on it	12	17	29	72.5
1–10 miles	1	4	5	12.5
11–25 miles	0	1	1	2.5
26–50 miles	0	0	0	
51–100 miles	2	2	4	10.0
>100 miles	1	0	1	2.5
Time spent on land				
Once or more/week	6	17	23	59.0
Once or twice/month	4	5	9	23.1
Once or twice/3 months	1	0	1	2.5
Once or twice/year	0	2	2	5.0
Less than once/year	4	0	4	10.3
Annual Income level				
<\$25,000	1	3	4	10.0
\$25,000–\$49,000	0	2	2	5.0
\$50,000–\$74,000	9	9	18	45.0
\$75,000–\$99,000	1	4	5	12.5
\$100,000–\$149,000	2	2	4	10.0
>\$150,000	3	4	7	17.5
Management plan for land?				
Yes	13	13	26	65.0
No	2	11	13	32.5
I don’t know	1	0	1	2.5

Data are numbers of participants unless stated otherwise.

ranked, ordinal data) was used to examine decision satisfaction by influential type.

Results

Response or Participation Rate

Of the original pool of 47 easement landowners and 75 timber sale landowners, successful telephone contact was made with 35 and 55 owners, respectively. Those contacts resulted in 25 interviews of easement landowners and 22 interviews of owners who had timber sales in the previous 2 years. Comparison of phone calls with successfully conducted interviews resulted in response or participation rates of 71.4% for easement owners and 40.0% for timber sale owners. Because of a reluctance on the part of some participants to provide network information, our data consist of 16 egocentric networks for timber sale participants and 24 networks for easement participants.

General Descriptive Characteristics of Participants

Participants represented typical Massachusetts landowners based on existing demographic and economic information (Tables 1, 2, and 3) in terms of age, ownership tenure, attained education level, income level, and residence on their land (e.g., Belin et al. 2005,

Finley et al. 2006). Ownership size ranged from 7 to 498 acres (mean = 97.3 acres). This is larger than the state mean ownership in Massachusetts of 42.5 acres (for ownerships of 10 acres or more; Kittredge et al. 2008). Most interview participants lived on or very close to their land (Table 2). Our participants shared typical attitudes toward ownership that aligned well with those we have dis-

covered for Massachusetts and nationally (Butler 2008). They placed higher priorities on wildlife, protection of the environment, and scenery than on timber management or the generation of income (Table 3). Lastly, roughly 80% of our timber sale participants and half of the easement participants reported having a management plan. This is a meaningfully greater proportion than is found nationally for woodland owners (3.6% of all owners and 7.4% of all owners with greater than 10 acres; Butler et al. 2012) and for Massachusetts (i.e., 4.0% of all owners and 29.6% of owners with greater than 10 acres; Butler et al. 2012).

Table 3. Reasons for land ownership.

	Timber sale participants (<i>n</i> = 16)	Easement participants (<i>n</i> = 24)	All participants (<i>n</i> = 40)	% of all participants
Generate income				
Not at all important	8	12	20	50.0
Somewhat important	2	9	11	27.5
Very important	6	2	8	20.0
Extremely important	0	1	1	2.5
Recreation				
Not at all important	5	1	6	15.0
Somewhat important	2	3	5	12.5
Very important	7	17	24	60.0
Extremely important	2	3	5	12.5
Family legacy				
Not at all important	3	5	8	20.0
Somewhat important	0	8	8	20.0
Very important	10	7	17	42.5
Extremely important	3	4	7	17.5
Current home location				
Not at all important	3	3	6	15.4
Somewhat important	2	0	2	5.1
Very important	4	2	6	15.4
Extremely important	7	18	25	64.1
Protect wildlife				
Not at all important	0	0	0	0
Somewhat important	0	3	3	7.5
Very important	4	12	16	40.0
Extremely important	12	9	21	52.5
Protect environment				
Not at all important	0	0	0	0
Somewhat important	0	3	3	7.5
Very important	6	8	14	35.0
Extremely important	10	13	23	57.5
Enjoy scenery				
Not at all important	2	0	2	5.0
Somewhat important	0	2	2	5.0
Very important	7	8	15	37.5
Extremely important	7	14	21	52.5

Data are numbers of participants unless stated otherwise.

Table 4. Characteristics of egocentric networks.

	Timber sale participants (<i>n</i> = 16)			Easement participants (<i>n</i> = 24)			All participants (<i>n</i> = 40)		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Total no. of people	6.9	7.8	1–34	9.6	16.7	1–63	8.6	13.8	1–63
Influential people	2.2	0.8	1–3	1.9	1.2	1–6	2.0	1.1	1–6

Table 5. Presence of various kinds of people as influentials in egocentric networks.

Network component	Timber sale decision (<i>n</i> = 16)		Easement decision (<i>n</i> = 24)		All networks (<i>n</i> = 40)		Cramer's V	<i>P</i> value
	Count	% of harvest networks	Count	% of easement networks	Count	% of all networks		
Relative	2	12.5	2	8.3	4	10.0	0.068	0.667
Friend	8	50.0	5	20.8	13	32.5	0.305	0.054
Landowner	8	50.0	13	54.2	21	52.5	0.041	0.796
Neighbor	2	12.5	5	20.8	7	17.5	0.107	0.497
Local	7	43.8	12	50.0	19	47.5	0.061	0.698
Professional	14	87.5	15	62.5	29	72.5	0.274	0.083
Logger	12	75.0	0	0	12	30.0	NA ¹	NA ¹

¹No loggers were cited as influential for easement decisionmakers, making this statistical comparison between timber sale decisionmakers and easement decisionmakers not applicable (NA).

Table 6. Overall decision satisfaction by type of influential.

Type of influential	No. of networks in which this type appears, out of 40; (%)	Pearson χ^2	<i>P</i> value	Proportion of dissatisfaction (i.e., -3 on the scale of overall satisfaction); (%)	Spearman correlation between decision satisfaction and influential type (<i>P</i> value)
Landowner	21 (52.5)	1.085	0.781	2 of 21 (9.5)	0.00 (1.00)
Relative	4 (10.0)	11.081	0.008**	2 of 4 (50.0)	-0.289 (0.070)
Friend	13 (32.5)	9.887	0.020*	2 of 13 (15.4)	-0.409 (0.009)**
Neighbor	7 (17.5)	1.170	0.760	0 of 7 (0.0)	0.029 (0.861)
Local	19 (47.5)	0.920	0.825	1 of 19 (5.3)	0.046 (0.779)
Professional	29 (72.5)	2.762	0.430	2 of 29 (6.9)	-0.203 (0.210)
Logger	12 (30.0)	11.789	0.008**	3 of 12 (25.0)	-0.482 (0.002)**

* Significant at the 0.05 level.
 ** Significant at the 0.01 level.

Table 7. Relationship between influential characteristics and overall decision satisfaction.

Influential characteristics	Mean satisfaction	SD	Range	Pearson χ^2	<i>P</i> value	Spearman correlation coefficient between decision satisfaction and characteristics of influentials
Expertise	6.218	1.186	1-7	42.010	0.033	0.125
Trust	6.326	1.178	1-7	47.233	0.003	0.130
Accessibility	6.140	1.288	1-7	53.838	0.002	0.273
Information quality	6.248	1.171	1-7	48.735	0.001	0.222
Overall	6.282	1.207	1-7	36.487	0.049	0.251
Similarity	6.267	1.099	2-7	32.475	0.215	-0.007
Any payment ¹	0.40	0.496	0-1	5.113	0.159	-0.207

¹“Any payment” is a dichotomous variable indicating whether or not any of the influentials in a participant’s egocentric network were paid for their services.

half of reported networks had another landowner (52.5%) or local (i.e., living in the same town [47.5%]) as an influential. Roughly one in five networks had a neighbor as an influential (17.5%). Almost three of four reported networks had a professional as an influential. For timber sale participants ($n = 16$), 87% of networks had a forester as an influential and 75% reported a logger as an influential.

There were no differences in the relative composition of influentials by decision type according to the Cramer’s V statistic (Table 5). Participants reported relying on the same kinds of influentials, regardless of their decision. Landowners, locals, and professionals were the common influentials around a landowner who faced either a timber sale or easement decision. As might be expected, we found that loggers were present within the networks of those making timber sale decisions, and no loggers were part of the easement decisions for landowners. Although the difference is significant, an assessment of significance is not necessarily very informative because loggers are unique to the timber sale decision process, whereas the other types of influentials could be relevant across both decisions.

Network size may vary, depending on the presence or absence of a professional. For instance, networks that lack an influential professional may be larger because more people would be needed to provide the same level of knowledge. However, we found no correlation between the presence or absence of a professional as an influential and the absolute size of networks (Pearson correlation = -0.024, $P = 0.881$) or the presence or absence of a professional as an influential and the smaller subset of influentials (Pearson correlation = 0.261, $P = 0.104$). Networks that have a professional are not typically smaller or larger than other networks.

Satisfaction with the Decision

Overall satisfaction with participant decisions was expressed on a Likert scale ranging from -3 (very dissatisfied) to 3 (very satisfied). On this scale, our participants evaluated their satisfaction as either

-3, 1, 2, or 3 (i.e., no participant used -2 or -1). Satisfaction does not vary by whether or not a participant has a landowner, neighbor, local, or professional as an influential (Table 6). Decision satisfaction does vary significantly by whether or not participants have a relative, friend, or logger as an influential. For example, 50% of the time when participants reported a relative as an influential, they were highly dissatisfied. Similarly, 15.4% of the time that participants had a friend as an influential, they reported dissatisfaction with their decision. Likewise, 25% of the time a logger was an influential, participants reported dissatisfaction with their decision. Negative Spearman correlation coefficients also indicated this adverse effect on overall decision satisfaction.

Characteristics of the Influentials and Overall Decision Satisfaction

Participants evaluated their influentials highly in all ways (all means >6 on a 7-point scale; Table 7) with some exceptions (e.g., some participants rated their influentials with a very low score of 1). There was a strong significant relationship between the perceived characteristics of influentials, namely their ratings for perceived expertise, trust, accessibility, and information quality, and decision satisfaction, as described by the χ^2 values (Table 7). Interestingly, the perception of similarity is not significantly related to decision satisfaction. Participants do not have to perceive they are similar to their influentials to realize decision satisfaction. Also noteworthy is the fact that payment of influentials had no relationship with decision satisfaction. In the case of a timber sale, it would be common for landowners to pay a private consulting forester for their services. Payment for services is less obvious in the case of an easement decision, for which the participant may have worked with a local non-profit land trust.

Participants did not indicate significant differences in the characteristics of their influentials by decision type (Table 8). Mean

Table 8. Transformed assessment of influentials' characteristics by decision type using one-way ANOVA.

	Timber sale			Easement			<i>F</i>	<i>P</i> value
	Mean	SD	Range	Mean	SD	Range		
Expertise	6.1	1.4	1–7	6.3	1.0	4–7	0.230	0.634
Trust	6.2	1.5	1–7	6.4	0.9	4–7	0.597	0.445
Accessibility	6.0	1.5	1–7	6.2	1.1	2–7	0.165	0.687
Information quality	6.1	1.6	1–7	6.3	0.9	4–7	0.317	0.577
Similarity	6.2	1.4	2–7	6.3	0.8	4–7	0.065	0.800
Overall	6.0	1.5	1–7	6.5	0.9	4–7	1.283	0.264

Table 9. Transformed assessments of satisfaction of decision by decision type using one-way ANOVA.

	Timber sale			Easement			<i>F</i>	<i>P</i> value
	Mean	SD	Range	Mean	SD	Range		
Financially	4.3	1.9	1–7	5.5	1.5	2–7	5.132	0.029*
Ecologically	5.3	1.7	1–7	6.7	0.6	5–7	14.104	0.001**
Effort required	5.8	1.6	1–7	6.6	0.5	6–7	6.259	0.017*
Difficulty	5.3	1.9	1–7	4.7	1.7	2–7	0.873	0.356
Recommend to others	5.8	1.6	1–7	6.7	0.7	4–7	5.348	0.026*
Overall	5.2	2.2	1–7	6.7	0.5	6–7	10.902	0.002**

* Significant at the 0.05 level.

** Significant at the 0.01 level.

scores of influential expertise, trust, accessibility, information quality, similarity to the participant, and overall assessment were not significantly different. There was greater variation in assessment of influentials by timber sale participants (i.e., transformed range of assessment varied from 1 to 7 for timber sale participants and from 4 to 7 for easement participants). In general, influentials were judged to be equal in terms of the various characteristics.

Decision Satisfaction by Type

Significant differences in decision satisfaction emerged by decision type. Easement participants reported being significantly more satisfied than timber sale participants from the standpoint of financial and ecological outcomes, as well as the perceived effort required and overall outcome (Table 9). Likewise, easement participants were significantly more likely to recommend their decision to others than were timber sale participants. There was no difference in perceived difficulty of the decision.

Discussion

Possible Response or Participation Bias?

Owners who had made an easement decision in the past 2 years were relatively eager to participate in the interview process (i.e., 71.4% of those called), whereas fewer timber sale owners (40%) agreed to be interviewed. Easement participants were significantly more satisfied with the outcome of their decision than timber sale participants. It is possible that only the more satisfied owners agreed to be interviewed, and our exploratory results are more indicative of satisfied owners than of all owners. It is also possible that individuals who are less amenable to social contact might also be less inclined to participate in the study. In both timber sale and easement cases, however, egocentric network size was reported to be as small as one person. Thus, it does not seem that only gregarious people amenable to contact were participants. Based on other information about participants (e.g., ownership tenure, ownership objectives, location of residence with respect to the land, age, attained education level, and income level), they have much in common with Massachusetts landowners in general. Participants, however, have meaningfully

larger ownerships than the average Massachusetts owner, and a greater proportion of participants have professionally prepared management plans. This is probably due to the fact that participants were intentionally selected to have had timber sales and easements on their property. Both harvests and easements are more likely to have occurred on larger properties, for which the sale volumes or conservation benefit from an easement are greater. In general, the results from the 40 egocentric networks reported here may not be representative of the wider population of Massachusetts landowners and need to be interpreted accordingly.

Nature of the Network

Interestingly, Knoot and Rickenbach (2011) reported a mean egocentric network size of 4.1 (and range of 1 to 9 people) and a mean of 1.9 influentials in a study of Wisconsin woodland owners and their timber sale activity. Korhonen et al. (2012), in a recent study of Finnish woodland owners, found that “when planning a timber sale, forest owners have a connection on average with three persons or organizations.” Despite different methods to generate data and different programmatic and policy initiatives to reach landowners, there is evidence that the size of the network is roughly the same in Massachusetts, Wisconsin, and Finland. Without further research into this phenomenon, it would be too speculative to explain this observation, especially given the exploratory nature of the Massachusetts pilot study. It is worth noting that in three different locations, landowners behave similarly by consulting social networks before making decisions.

Decision Satisfaction

Conservation easements significantly influence the valuation of land for property and estate tax purposes, represent a potential charitable tax deduction or source of income, and permanently influence land use/management activities. Despite the transactions being highly complicated, easement participants expressed a significantly higher level of satisfaction with the outcome. This result raises several new questions: Is this because not enough time has passed for them to develop regrets or become dissatisfied? Do they perceive

greater satisfaction because their land has not changed in immediate appearance, the way it has following a timber sale? (This may be especially relevant because these people place a high importance on recreation and location of residence.) Are they more satisfied with the decision because they believe it resulted in a better environmental outcome? Do they get public recognition or thanks from the community or the local land trust when they place an easement on their land, but just a check from the logger when they sell timber? The motivations or underlying causes for this apparently greater decision satisfaction remain subject to future research. Likewise, it is important to improve our understanding of the apparent dissatisfaction after timber sales, because so much timber is owned by family forest owners and timber management can be a vital tool for managing for species of conservation concern (e.g., those species that depend on early successional conditions). If landowners are less satisfied with their decision to sell timber, they may be less likely to recommend harvesting to others (spillover issues) or engage in harvesting in the future.

Role of Foresters in Social Networks

The results of this pilot study shed light on the sources of information and support that landowners rely on when making decisions about their land. These sources are important because most landowners do not have professionally prepared management plans. Satisfaction with a decision to sell timber or ease property appears to be related to more than simply professional advice. Although it may seem obvious, private consulting foresters who can provide other landowners with a list of satisfied landowner clients in the local area may achieve greater success, because of the positive influence of local, nonprofessional peer opinion on landowner decisions. The more a private forester can be networked (e.g., volunteer with a local land trust, thereby improving visibility and the likelihood of contact with landowners and others) and widely known as a trusted source of information in an area the higher his or her chances of having satisfied landowner decisions might be. In addition, a relatively high proportion of timber sale participants had professionally prepared management plans, yet they appeared to be less satisfied with their timber sale decision than their easement counterparts. Whereas management plans and their technical information may assist foresters in making management decisions, they may be of less perceived value to landowners making decisions. Peer or locally derived informal contacts and information may have greater value to owners.

Relevance for Future Landowner Research

Because this was a pilot, exploratory study based on a small and nonrepresentative sample of landowners, some may choose to place less importance on the results of the analysis and more importance on the potential value of this methodology in future research. Traditional studies of landowner attitudes and behaviors are quantitative in nature (e.g., Rickenbach et al. 1998, Belin et al. 2005, Butler 2008, Butler et al. 2012), relying on large and representative samples of thousands of respondents. The structured interviews used in this study provide a novel window into the minds of owners, their sources of information (both conventional and unconventional), and their decision satisfaction. These results from conversations with individual owners can help inform the development of more quantitative methods and analysis. Mixed-method social science approaches to studies of landowners could benefit from exploring

landowner social network connections and seeking ways to quantify this phenomenon and relate it to behaviors and satisfaction. Specifically, it may be possible to solicit information about landowner social networks through a mail survey instrument to a large, random sample using the same kinds of prompting questions in this study. This method may be more effective for gathering data about the relative strength of ties, which might not surface through a more personal and nonanonymous structured interview, and thus would provide a powerful opportunity to analyze networks in a more robust, quantitative way. The greatest potential value from this pilot study may be a new method for the formulation of subsequent quantitative and representative studies.

Conclusions

In this exploratory study, we investigated the extent to which landowners relied on their social networks with respect to two land management decisions. Our results suggest that landowners may consider an informal network of 7–10 people to be related to their land in general, and this number varies considerably from individual to individual. A much smaller subset of people are influential to a specific decision. These influentials tend to be peer landowners, “local” sources of knowledge and experience, and professionals, rather than relatives, friends, and neighbors. Notably, professionals are often not the only people influential in a landowner decision.

There were no differences in the size of the network around timber or easement participants, yet satisfaction with these decisions was significantly different. Larger networks do not necessarily imply greater satisfaction. Size of the network may be less important than the kinds of people in the network. “Locals” and peer landowners, often considered weak ties or lacking relatively strong bonds, are often influentials involved in the decision. Family members and neighbors, often considered strong ties, appear to be much less involved with decisions. Weak ties in these social networks appear to be more influential than strong ties, aligning with the concept that weak ties connect one to those outside their immediate circle who may have novel information. The decision satisfaction may also influence future behavior and recommendations to others, given that we know the landowners are connected to locals and peers.

Decision satisfaction depends on more than professionals. Other kinds of people are often influential. In conditions for which most people do not use management plans or professional advice, there is an important role for locals and peer landowners in promoting informed conservation decisionmaking and connecting people to knowledgeable sources. We believe an important question is: In what ways can resource professionals and organizations enhance these informal networks and promote the sharing of experience and information among peers and locals? In addition, how can professionals become more involved in the decisions of landowners, and in helping create satisfied “customers”? Some attempts have been made to address these important questions (Ma et al. 2012), and it remains to be seen how an improved understanding of landowner information channels and decisionmaking might influence private forest programs and policy. There is clearly room to take messages from this study and use wider samples and quantitative methods to improve our understanding of the roles of social networks and landowner behavior. Aldo Leopold implied the importance of these connections when he declared: “Relegating conservation to government is like relegating virtue to the Sabbath. Turns over to professionals what should be the daily work of amateurs” (Leopold 1935).

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