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The Shared Leadership and Ownership of Our Private Forests

Insights From Forest Landowners' Personal Networks

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Over the last two decades, urban expansion, development, and forest conversion have called attention to the important role of private forestlands. Private forests in the United States have a dominant share relative to other countries rich in forest resources, such as Canada, Russia, and Brazil. Over half of all forestlands in the United States are in private ownership, managed by individuals, families, tribes, corporations, or the forest industry (Smith, Miles, Perry, & Pugh, 2009). These forestlands provide valuable economic, ecological, and social benefits to society in the form of timber, carbon storage, and clean water supplies, among others. With increased pressures for landowners to sell their land, develop it, or convert it to other land uses, these benefits are likely to deteriorate. From such a perspective, this chapter reviews the potential for sustainable forest management and stewardship.

Sustainable forest management becomes increasingly compounded when studied in the context of private ownership, where the decisions and actions of forest owners intersect with dynamic social and biophysical processes. The sustainability of private forests depends on a growing group of family forest owners who hold diverse attitudes, values, and management objectives (Butler, 2008). The choices these individuals make with regard to land management decisions and implementation strategies shape the capacity of forestlands to sustain important ecosystem functions, like flood and soil regulation; resist threats, such as invasive species and fire; and withstand natural disturbances during storms, floods, or tornadoes. With a growing number of family forest owners, the decisions of landowners become increasingly important for the sustainable management of this valuable natural resource. By means of their ownership rights and proximate authority to make choices, private landowners can become leaders in enhancing the public value of private forests. Their decisions and actions influence the flow of essential forest goods and services that affect present and future societies, environmentally, socially, and economically. This chapter, thus, considers family forest owners in the United States as

Authors' note: We gratefully acknowledge support from the Center for the Study of Institutions, Population, and Environmental Change, Indiana University, through funding from the Human and Social Dynamics program at the National Science Foundation (Grant BCS0624178). This support enabled the data collection and analysis presented in this chapter.

stewards and leaders of half of the nation's forestlands. As stewards, private landowners steer the direction and application of management practices at the parcel level. As leaders, forest owners collectively contribute to the quality and quantity of forestlands, and they shape landscape- and watershed-scale forest trajectories.

Private Forests in the United States

Private forests are important sources of timber and other forest products, herbs, medicinal plants, and mushrooms. More than half (58%) of the national timber supply comes from privately owned forests (Smith et al., 2009). Traditionally, these lands have served as important income and employment opportunities, as well as socially valuable recreation areas (National Research Council [NRC], 1998). Private forests provide habitats for fish and wildlife, contribute to soil conservation, and ensure stabilization of hydrological cycles (NRC, 1998). Increasingly, these lands are valued for their capacity to sequester carbon and regulate the climate. Forested areas also enhance public health, the quality of life of communities, and their landscape beauty (NRC, 1998). Together these amenity features of forests are known as forest ecosystem services. The Millennium Ecosystem Assessment (2005) defines ecosystem services as "the benefits people obtain from ecosystems," which include providing timber and food, cycling nutrients, regulating water quality, and benefiting human culture through spiritual values and aesthetics (p. v).

The U.S. Forest Service defines forestland as "land at least 120 feet wide and 1 acre in size with at least 10 percent cover (or equivalent stocking) by live trees of any size" (Smith et al., 2009, p. 142). Formerly forested land likely to return back to forest, either naturally or by planting trees, is also considered forestland (Smith et al., 2009). Both private and public actors own and manage forested lands. Public forests are lands owned by local, state, or federal governments and are typically restricted to development. Most public lands are in the Rocky Mountains and the western United States, whereas private forests are predominantly in the eastern part of the country. The focus of this chapter is on private forests owned by industrial and nonindustrial private landowners. The distinction between these two types of private landowners is based on whether they operate a wood-processing facility. Industrial forest owners include companies, individuals, and other private groups that own forestland and operate a wood-using plant. Nonindustrial private forest (NIPF) owners, on the other hand, are individuals, families, and other private groups who own forestland but do not operate a wood-processing facility (Butler, 2008).

This group is increasingly referred to as family forest owners. A team of researchers from Yale University's Program on Private Forests observes that the literature on private forests has gradually adopted the term *family forest owners* in place of "nonindustrial private forest owners" (Hodgdon, Cusack, Smith, & Tyrrell, 2011). Changes in forest ownership have given rise to a categorization based on whether forest owners are legally incorporated. W. Brad Smith et al. (2009) distinguish between private corporate and noncorporate forestlands. The latter, owned by legally unincorporated entities, include family forests, as well as land owned by Native American tribes, estates, trusts, and other unincorporated individuals (Smith et al., 2009).

In the United States, private forests have a significant share of total forest area. Researchers from the U.S. Forest Service estimate that 56% (423 million acres) of all forests in the United States are collectively managed by 11 million private owners (Butler, 2008; Smith et al., 2009). The majority of them, 92%, are family forest owners. Proportionally, family forests represent 35% (264 million acres) of total forestland in the United States (Butler, 2008). In comparison with the rest of the world, where roughly 20% of the world's forests are owned by individuals, communities, or other private entities, private forests in the United States have a considerably larger role to play (Food and Agriculture Organization, 2011). Land ownership and the nature of property rights over forest resources, thus, become important.

Private Forest Ownership

Land ownership provides the social context within which forest management occurs. Burnell C. Fischer and Tatyana B. Ruseva (2010) note that property rights systems are significant drivers of the use and misuse of forest resources. In private forestry, individuals and other legal entities have control over one or more parcels of forestland, and they hold extensive and intensive property rights. From a legal perspective, this means that owners not only control the forested land but also the manner in which they can use it. Gerald Friedman (2003) explains that extensive rights designate the type of assets individuals own, such as land and water, whereas intensive rights specify what they can do with those assets. It is the intensive property rights over forestlands that raise questions about the social and ecological sustainability of forests.

Private forest ownership is dynamic and changing. Challenges to forest sustainability arise from human, as well as from nonhuman, factors (e.g., invasive species, wildfires, and other natural disturbances) (Stein et al., 2009). Socioeconomic processes, such as real estate and housing development, land market prices, and ownership turnover, contribute to the conversion of private forests to other land uses (Stein et al., 2009). In particular, changing patterns in land ownership lead to the division of forest tracts into multiple, smaller parcels—a process known as parcelization (Rickenbach, Schulte, Kittredge, Labich, & Shinneman, 2011). This process is driven by transformations in industrial ownership, generational changes among family forest owners, and a growing demand for forest

amenities (Stein at al., 2009). Parcelization is particularly detrimental to the health of forested landscapes as it usually leads to fragmentation of wildlife habitats, disruptions of ecological functions, and often further conversion of forests to development (Rickenbach et al., 2011; Stein et al., 2009). Changes in forest landscapes are a result of natural ecosystem cycles, as much as they are shaped by human activities. Forest stocks are a renewable resource and under proper management can be governed sustainably for both economic and noneconomic benefits.

Forest Stewardship

The sustainability of private forests rests on the decisions and actions of their stewards. The choices of private owners influence the capacity of forestlands to sustain important ecosystem functions and to resist human and nonhuman pressures. The actions of forest landowners directly affect the available stock, health, and productivity of forestlands. In basic terms, both the choices and actions of landowners shape the availability and future provision of forest goods and services. Private forest stewardship, therefore, entails decisions and practices undertaken at the private ownership parcel that positively influence forestlands and support a continued flow of forest benefits (Best & Wayburn, 2001; Kilgore, Snyder, Taff, & Schertz, 2008). These activities may include writing a forest stewardship management plan, applying ecologically sensitive harvesting techniques, and other best management practices (BMPs) recommended by state governments and forestry and natural resource professionals. According to Michael A. Kilgore et al. (2008), "Forest stewardship promotes an approach to forest management where a range of ecological, economic, and social benefits from and uses of the land are perpetuated" (p. 358).

Over the years, researchers have examined the factors that promote forest stewardship on private lands (Best & Wayburn, 2001; Hodgdon et al., 2011). Both internal and external conditions shape the management decisions and practices of family forest owners. Among the internal factors are the attitudes and values of landowners and their objectives and motivations for forest ownership. Although there is a diversity of reasons for owning forestland, the most common motivations are not financial but based on aesthetics, nature protection, privacy, and investments for future generations (Butler, 2008; Smith et al., 2009). Landholding size and ownership duration are other important aspects of private forest stewardship (Butler, 2008). External factors that shape landowners' decisions include market forces, such as the price of timber and the market value of forestland; policy incentives, in the form of information, education, as well as technical and financial assistance; and changes in government and nongovernment programs, like tax codes, forest certification, and conservation easements. Together the internal and external factors, and the interlinkages among them, contribute to and shape the diversity of outcomes on private forestlands (Rickenbach et al., 2011; Smith et al., 2009).

Forest stewardship on private lands may be expected to vary based on the type of social ties and networking behavior of family forest owners. The decisions of forest owners are shaped, among other things, by personal contact and social interaction (Knoot & Rickenbach, 2011). Through personal contact, social influences can change attitudes and behaviors toward resource use and management. Increasingly, practitioners and researchers point to the importance of social influence, peer learning, and social networks in private forest management (Kittredge, Rickenbach, Erazo, Snellings, & Knoot, 2009; Knoot & Rickenbach, 2011; Rickenbach et al., 2011). The next section reviews the performance and potential of social networks for the stewardship and collective leadership of family forestlands.

Social Networks in Natural Resource Management

A social network perspective can be particularly illuminating in light of increased interconnectedness among people and places. Social network theory with its roots in sociology and anthropology posits that social structure has important consequences for individual behavior (Borgatti, Mehra, Brass, & Labianca, 2009; Pescosolido, 2006). A network is defined as a group of actors, such as individuals or organizations, and the ties among them (Borgatti et al., 2009). In basic terms, a network creates opportunities and constraints for human behavior and action. Social network analysis encompasses both the theory and methods for studying social structure.

Within natural resource management, social networks offer conceptual and analytical tools to understand how social structure influences the ability to address environmental and natural resource problems (Bodin & Crona, 2009). The basic premise is that the behavior of resource owners, and users, is influenced by their social environment (Bodin & Crona, 2009; Pescosolido, 2006). This environment, represented by the social network, can support learning, information sharing, and the exchange of resources (Bodin & Crona, 2009; Janssen et al., 2006). Lynn Mandarano (2009) describes social networks as an important form of social capital that aids collaborative efforts, provides the capacity to address resource challenges, and generates individual and collective benefits. Researchers from Stockholm University's Resilience Center have used social network approaches to understand the effects of structure on knowledge distribution among resource users, and the ability to manage natural resources adaptively (Bodin & Crona, 2009; Janssen et al., 2006). Their efforts focus on how network features and functions enhance the likelihood for collective action in the governance of social-ecological systems, like fisheries,

wetlands, forest ecosystems, and rangelands, among others (Bodin & Crona, 2009; Janssen et al., 2006).

Features of a Social Network

Three features of social networks are important: their structure, content, and function (Pescosolido, 2006). The structure is the social architecture of the network and is described by the size, density, diversity, and type of relations in a network (Pescosolido, 2006). It represents the basic mechanism supporting the life of a network. The content is what flows through the relational ties among members of a network. The network's function is what keeps it active, for example, to provide emotional and financial support, resources, or instrumental aid (Pescosolido, 2006). The interplay among these network characteristics, and particularly between structure and content, shapes network influences. To illustrate, the size and diversity of a landowner's network can suggest its potential for influence, whereas the content and flow of information designates the direction of that influence. As a result, a social network may guide landowners toward or away from certain management choices and practices (Pescosolido, 2006).

Types of Social Network Studies

Social network studies typically follow one of four approaches: complete networks, personal networks, social support, and social capital studies (Borgatti et al., 2009; Pescosolido, 2006). The complete or sociocentric network approach assumes that all members of the network are identifiable and, therefore, seeks to map the structure of a network using advanced quantitative techniques (Pescosolido, 2006). The personal or ego-centered network tradition examines the network from the perspective of a focal respondent and his or her ties to other social actors (Pescosolido, 2006). The social support tradition focuses on the features of social relationships that help individuals deal with adverse life events, and the social capital perspective centers on the relational qualities among people in a network, such as trust, cooperation, and reciprocity (Pescosolido 2006). Although all four traditions are equally valuable, the egocentric network approach seems most fitting to the study of private forest stewardship. The remaining part of this section reviews the personal network tradition, and its applications to private forest management and decision making.

Personal Networks

Personal networks consist of the social relations of individuals. As a type of egocentric network, personal networks are different in important respects from the analysis of sociocentric networks (McCarty, Molina, Aguilar, & Rota, 2007). In the study of personal networks, the goal is to map the connections of an individual—an ego or a focal respondent—to others in his or her social environment, known as alters or network members. The personal network approach typically focuses on the type of relationships between a focal respondent and members in his or her network, the attributes of each member, and the influence he or she has on the respondent. Individuals have varying degrees of ability to create and maintain social ties with others. Such ties can entail: social relations, such as being a family member, a friend, or a neighbor; interactions with others like talking, providing advice, and help; flows of information, resources, or skills; as well as similarities among network members based on gender, attitudes, or location (Borgatti et al., 2009). In addition, relational ties can be categorized as weak or strong. Strong ties typically represent enduring relationships, such as emotional attachment or friendship, whereas weak ties equate to acquaintances (Borgatti et al., 2009; McCarty et al., 2007).

Egocentric or personal networks offer a way of identifying and understanding the environment within which private landowners acquire information and make resource use decisions. People make decisions about the care and management of their forestland within a certain social setting. That setting encompasses the connections a landowner has, both with the land and with others, such as family members, neighbors, friends, and natural resource professionals. Informal but personally meaningful social interactions, like conversations with neighbors or consultations with resource professionals, form a personal network of social relationships (Pescosolido, 2006). Such networks provide a context for shared, rather than for isolated, forest decision making and management. According to network theory, social interactions form the basic mechanism through which landowner beliefs, attitudes, behavior, and actions are shaped (Borgatti et al., 2009; Mitchell, 1969). Personal networks can arguably contribute to a better understanding of the role of social ties in the stewardship and collective leadership of private forests.

Shared Leadership as Interactive Influence

Forest stewardship coupled with the social relations of private landowners engenders a process of social learning, interpersonal exchanges, and an interactive process of shared leadership. The structural characteristics of a network, such as size and composition, shape its content, which in turn influences trust, learning, and leadership (Pescosolido, 2006). The latter have important implications for natural resource governance and sustainability (Bodin & Crona, 2009). Leadership, in particular, can encourage ecologically sound practices and facilitate choices that support the long-term conservation of forest resources at different levels of decision making (e.g., household, local, state, or federal government), and management (e.g., at the private ownership parcel, watershed, or landscape-based scale).

Leaders can contribute to the sustainability of private forests by ensuring adequate levels of resource stocks that can support the provision of forest ecosystem services and goods. Family forest owners are central actors within this group. As leaders, they not only command the structure and functions of forest resources but also the level of investment in forest health and conservation. By virtue of their ownership rights, each landowner has the proximate authority to decide on the level and type of engagement with the land. Land management as a type of human-nature interaction is essential, but so are the social interactions and casual conversations of forest owners with other people. Both types of interactions are decisive components of forest leadership, especially when defining and understanding leadership as influence (Carson, Tesluk, & Marrone, 2007; Yukl, 1989).

Interactive or interpersonal influences are essential to leadership (Pearce & Conger, 2003). They arise "when one influences what another thinks and subsequently does" (McDonald, 2011, p. 51). Influence processes, such as hiring a logger to harvest trees, acting upon a forester's advice (e.g., timber stand improvement), or providing information to neighbors, are all relational patterns that collectively shape the future of private forests.

The scholarship on leadership has evolved to encompass models and practices of leadership that are "dyadic, shared, relational, strategic," and universal (Avolio, Walumbwa, & Weber, 2009, p. 423). In private forestry, there are multiple sources of leadership with varying degrees of strength. The diversity among family forest owners, their preferences, goals, and ownership characteristics, was noted earlier in this chapter. There are nearly 11 million family forest owners, who collectively control private forestlands and share responsibilities and roles in the stewardship of these lands. In essence, forest "leadership is broadly distributed among a set of individuals instead of centralized in the hands of a single individual who acts in the role of a superior" (Pearce & Conger, 2003, p. 1). Shared or collective leadership, therefore, is an aspect of forest stewardship that arises from the distribution of influence across and between individual forest owners (Carson et al., 2007).

Shared leadership is relational, lateral, and dynamic (Pearce & Conger, 2003). It is encouraged through a series of human-environment interactions and social exchanges among actors in private forestry. Shared leadership begins with individual landowners in private forestry and their decisions and actions pertaining to the direction (what, how to manage), motivations (preferences, goals), and support (skill, knowledge) needed to manage forestlands (Carson et al., 2007; Yukl, 1989). Social support and personal networks are key mechanisms in this process, as they facilitate and encourage the collective leadership of forested landscapes. The social interactions of forest owners with others provide a starting point for mutual, lateral influences, or peer influences—an inherent feature of shared leadership (Pearce & Conger, 2003). In sum, the concept of shared leadership allows and naturally extends the application of social network approaches to the study of private forest management.

Social Interactions in Private Forestry

Interpersonal contact and informal communication are important for the diffusion of innovations and management practices in private forestry (West, Fly, Blahna, & Carpenter, 1988). Patrick C. West et al. found that personal contact was effective in the distribution and adoption of management advice among private forest owners. Relatives, neighbors, and friends were instrumental in the transmission of such information. The authors, thus, recommend that public investment in private forests incorporate "targeted personal contact" as a way to encourage the adoption of management techniques among private landowners (West et al., 1988, p. 265).

Recent studies confirm earlier observations that landowners rarely make decisions in isolation. Mark Rickenbach (2009) and his colleagues (Kittredge et al., 2009) examined the social networks of members in a forest landowner cooperative, cooperation among adjacent landowners, and peer-to-peer learning among family forest owners. In an exploratory study of egocentric networks of members of a landowner cooperative in Wisconsin, Rickenbach (2009) found that on average people discuss their land with three others, primarily natural resource professionals and cooperative staff. A considerable variation in the number of network members was found among landowners who had harvested timber or developed a conservation easement on their land, however, with no detectable difference in network size relative to type of management decision (Kittredge et al., 2009).

Another study, by Tricia Knoot and Rickenbach (2011), explored the egocentric networks of private landowners, again in Wisconsin, to assess the influence of forestry experts and peers in the context of conducting a timber harvest. The networks of the 43 landowners in this study ranged from one to nine people, with an average of four alters (Knoot & Rickenbach, 2011). The authors report that peers shaped landowner decision making, and that contacts with forestry professionals were linked to increased application of best management practices (Knoot & Rickenbach, 2011). Personal relationships were important for encouraging cross-boundary cooperation among landowners in America (Rickenbach et al., 2011), as well as for communication and peer networking among private forest owners in Finland (Hujala & Tikkanen, 2008).

Related interest in peer influence and peer learning has produced several recent case studies in the United States and Australia: the Kickapoo Woods Cooperative in Wisconsin; Oregon's Mater Woodland Manager Program; the Grayson Landcare Community in Virginia; and Australia's Dalrymple Landcare Committee, and Trees for

the Evelyn and Atherton Tablelands (Kueper & Sagor, 2011). According to Amanda M. Kueper and Eli S. Sagor, the common function of these networks is to offer a "space for landowners to come together, access resources, learn, socialize, and share ideas" (p. 7). Based on the case study of these five networks, a set of strategies for enhancing peer-learning have been identified that include meeting frequently; providing informal occasions for socializing; encouraging interactive, "hands-on" learning; incorporating local knowledge; and offering opportunities for peer leadership and networking (Kueper & Sagor, 2011, pp. 10–11).

Peer leadership is supported by landowner experience, professional backgrounds, and influence among others (Kueper & Sagor, 2011). Collectively, the social interactions and networking practices of private landowners offer insights into the interactive and dynamic influences arising from the shared leadership of America's private forests. The next section provides an example of the application of egocentric networks in the context of private forest management. It illustrates the relative importance and influence of landowners' personal networks produced by the interplay of network structure, content, and function.

Application: Insights From Landowner Personal Networks

Background

A study of the personal networks of forest landowners was conducted in 2010 by researchers at Indiana University's Center for the Study of Institutions, Population and Environmental Change (CIPEC). The study employed an egocentric network approach to explore how the social networks of private landowners may shape forestland use decision making—an important aspect of the shared stewardship of private forests. In addition, the research examined variations in landowners' networks with regard to three aspects of forest stewardship: past management activity, information sources used, and local context.

Semistructured interviews were conducted with 42 private landowners in two counties in south-central Indiana, in the midwestern United States. Landowners were asked to consider the people they talk to about land management through a series of questions, such as follows: Who are the people you talk to when you think about land management activities like timber harvests, tree planting, and other forest management practices? Over the past five to seven years, what was the most pressing issue or issues you faced regarding the management and health of your woodland? Who did you turn to for advice and help in dealing with this issue? Responses were analyzed to uncover recurring patterns in the stories of landowners, and themes that inform an understanding of network content and function. In addition, quantitative measures of network structure were computed. Findings from the qualitative analysis are presented below as a way to offer some insights into the relative influence of personal networks.

Network Structure: Multiple Domains

Two characteristics of networks were used to understand the structure of landowners' personal networks: network size and composition. Both of these measures helped capture the extent to which a landowner's personal network connects him or her to a diverse set of social actors. Network size is the count of alters mentioned or reported by a landowner during the interview. It measures the number of people in the personal networks of forest owners. The personal networks of landowners in this study included four people on average. In other words, landowners had roughly four contacts with others related to the management of their forestland. The network size ranged from 0 to 11 others with whom a landowner had interacted. In addition, the study findings suggested that past experience with land management was, on average, linked to larger personal networks.

The compositional measure of landowner personal networks was operationalized as the diversity or heterogeneity of an ego's network. Network composition captures variation in the social attributes of alters. The study identified different groups of people with whom landowners have interacted or discussed issues related to the management of their forestland. Among these, most recurrent were timber buyers and loggers, neighbors, friends, and family members. Other groups represented in the personal networks of landowners included professional foresters, natural resource experts, and extension specialists from university centers, as well as local, state, and federal government agencies.

When a landowner's network was dominated by a certain group of alters (e.g., friends and family), it was found to be embedded in the domain of that group (Edwards, 2010). There were five broad domains in which landowner networks were embedded in this study: resource professionals, loggers, family, neighbors, and friends. Each domain was characterized by different types of interactions and accommodated different perceptions of network influence. Moreover, it was not uncommon for landowners to switch over time from one network domain to another, or to rely on multiple domains, as the story of this landowner suggests:

> The people I have contacted and think of contacting . . . for their opinions include: a landscape architect, whose father-in-law happened to timber land. We have received info in the mail. As far as tree planting goes I have contacted the DNR [Department of Natural Resources]. I have looked online. And I talk to family members. Well, we have a family member who's a neighbor—they are both a neighbor and a family. We receive letters periodically from people requesting or asking if

> we were interested in having our land timbered. And there's always a newsletter that comes in the mail.

This illustrates that social networks are dynamic, interactional, and multifaceted.

Many network contacts were elicited in the process of storytelling, when describing an activity or experience, such as tree planting or storm damage. This corresponds with existing explanations that individuals in response to a particular event choose to activate different parts of the multiple network domains within which they are embedded (Pescosolido, 1992). Occasionally, more permanent contacts supplemented the personal networks of forest owners, mainly when networks were dominated by family members or friends. Overall, landowners' networks represented different configurations of people who, in the landowners' accounts, were present or active at a specific point in time and place. The content of the network captured the information and resource exchanges that took place among these configurations of people. The purpose of these transfers represented the network's function, as discussed further below.

Network Content: Information and Expertise

The content of a landowner's personal network most frequently encompassed information and advice, expertise, and technical assistance. The latter was particularly prevalent in the context of physical labor activities, such as logging; cutting individual trees to thin the woods and facilitate the growth of other trees; cutting trees for timber production; erosion control; drainage work; and tree planting. Half of the landowners in this study pointed to technical knowledge and expertise as the reason for talking to or working with others. However, the majority of landowners mentioned information and various types of factual knowledge as the main content of their social interactions.

Information exchanges within the landowners' networks included information about timber prices and timber cutting; professional guidance and advice about forest management practices and tree cutting; contact referrals to natural resource professionals, loggers, and timber buyers; legal consultations and advice; land appraisals and surveys; and general advice and experience with forestland management pertaining to invasive species, pests, and tree seedlings. In her everyday networking practices, a landowner can receive, act on, and spread information from and to others, which has direct implication for forest stewardship:

> I've talked to a couple of professional foresters about what I should do to maximize my two goals, which are recreation and secondarily, timber. And basically they said there wasn't anything I needed to do. You know, the same thing other people had told me in the past. Basically regenerate, cut the grape vines out. So I've got a process now, when people come down I make them cut five beech trees before they leave, so they don't take over.

The type of information and resource flows in this landowner's network are indicative of the past and future influences on the land, its owner, and other users and visitors.

Approximately a third of private landowners in this study received or sought specific services that included legal consultation and enforcement related to timber theft, illegal hunting, or other activities; assistance with asset transactions; as well as grievances and remedies related to destructive timber harvesting and application of the eminent domain principle.

Network Function: Learning and Support

In the context of this study, landowner personal networks appeared to serve two main functions: learning and technical support. The need to learn how to manage their woodland better, how to support a healthy forest, or how to grow hardwood species, as well as who to contact or hire for a certain job, were all part of the learning function of networks. Interestingly, landowners who perceived themselves as fairly knowledgeable about forest management practices, and who placed greater value on the economic benefits of forests, were likely to describe their network as serving a purely practical function—specifically, to provide the technical equipment, knowledge, or other support necessary to select and cut trees, to control erosion in the woods, or to make trails. These activities capture the service or support function of landowners' networks.

An important part of this study's findings is that the two network functions were not mutually exclusive. Many landowners had looked for both learning and service in their interactions with others, as described in the story of this forest owner:

> We had some trees that really had to come down so the health of the rest of the trees could flourish. [But] we really didn't know what we were doing, so that's when my husband put the feelers out there, and then ended up contacting Brett. And then Brett helped us make the specific decisions which trees needed to come down, and how to approach that more specifically to our woods.

The reasons for turning to others for information and assistance were captured in the stories or lived experiences of landowners, and they provided an indicator of the purpose of their social interactions. The stories also helped uncover the influences on private forestlands emanating from individuals or groups outside of the specific household or ownership parcel. In aggregate, the size, composition, content, and function of landowners' personal networks portrayed a multitude of sources and levels of influence related to forestland stewardship. Such interactive and dynamic influence processes act as a starting point toward the collective stewardship and leadership of private forestlands.

Summary

Shared leadership recognizes the multiplicity and distribution of influence processes among different individuals or members of a group (Pearce & Conger, 2003). This chapter explored the collective leadership of private forests in the United States by borrowing ideas from social networks and the scholarship on shared leadership. Forest landowners are the stewards and leaders of America's private forests. Their decisions and practices, shaped by the influence of others, command the future of these lands, as well as the stream of ecosystem services and goods provided by forests. Social network approaches can thus offer useful concepts and tools to understand better the role of social influences and relations in the management of privately owned natural resources. Moreover, interactive influence processes, such as shared forest leadership, could offer a potential path for addressing the challenges, as well as for recognizing and embracing the opportunities for sustainable management of family forests.

The chapter provided an overview of the different features and types of social networks, and their application to the study of natural resource management. One type of social networks is the ego-centered network, which is defined by the perspectives and experiences of an individual actor. The egocentric network tradition was applied to a case study of private forest landowners in Indiana, in the midwestern United States, to understand the role of social networks as a source of influence in forest decision making. The three network components—network structure, content, and function—can be interpreted cumulatively to shape and steer the influence of social networks in private forestry. Studying the personal networks of forest landowners offers a way to tap into the social world and socially constructed patterns of resource use and decision making in private forestry.

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