

## THE COLLABORATIVE PRACTICES OF INDIANA DISTRICT FORESTERS

Tatyana B. Ruseva<sup>1</sup>, Burney C. Fischer<sup>2</sup>, and Michael McGuire<sup>2</sup>

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### ABSTRACT

Direct contact with a forester or a natural resource professional, via technical assistance, cost-sharing, and planning has been shown to enhance forest stewardship on private lands (Kilgore et al. 2007:185; Greene et al. 2005; Egan 1999). Public professional foresters channel technical and financial resources in order to sustain the capacity of private forests to provide a range of forest goods and services. Few studies to date have empirically examined how public professional foresters, situated between the policy realm and private forest owners shape responses to new social and environmental challenges (Primmer and Karpinnen 2010, Pregernig 2001, Kindstrand et al. 2008, Koontz and Bodine 2008, Kaufman 1960). In this paper, we examine the collaborative efforts of public professional (district) foresters in the state of Indiana, in the Midwest United States. A survey of and interviews with Indiana district foresters suggest that the work of public professional foresters is increasingly reformulated by programmatic changes in the state forestry administration, as well as challenged by larger socio-economic forces (forest fragmentation, changing ownership, ex-urban development). The results from the analysis have direct implications for the provision of technical assistance as a form of public investment in private forests. More broadly, the paper informs our understanding of the changing nature of natural resource bureaucracies at the state and local levels.

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**\*DRAFT: Please, do not cite without permission.** Questions can be sent to: rusevatb@appstate.edu

<sup>1</sup> Assistant Professor, Department of Government and Justice Studies, Appalachian State University

<sup>2</sup> Professor, School of Public and Environmental Affairs, Indiana University

## **1. INTRODUCTION**

The health and sustainability of privately-owned forests is challenged by increasing human and environmental pressures, such as generational transfer, urbanization, fire and invasive species. Sustainable forest management on private lands is an issue charged with a high level of salience, however, low public visibility. Society enjoys an array of ecological, social, and economic benefits from private forests, yet the property rights regime over this resource stock hinder the effectiveness of conventional policy approaches. At present, most states in the United States rely on education and incentive programs to encourage the sustainable management of privately-owned forests (Kilgore and Blinn 2004; Ellefson et al. 2007).

Research shows that direct contact with a forester or a natural resource professional, via technical assistance, cost-sharing, and planning, enhances forest stewardship practices on private lands (Kilgore et al. 2007:185; Greene et al. 2005; Egan 1999). Rarely, however, is a distinction made in interactions with different resource professionals (public, private, industry). Both public and private foresters serve the interests of forestland owners, yet, they may operate under different incentives and engage in distinctive activities (Fischer and Ruseva 2010). Few studies to date have empirically examined how public professional foresters, situated between the policy realm and private forest owners shape responses to new challenges (Primmer and Karpinnen 2010, Pregernig 2001, Kindstrand et al. 2008, Koontz and Bondine 2008, Kaufman 1960). This paper explores the activities and interactions of public professional foresters with other actors in private forestry.

### **1.1 Why study district foresters?**

There is a diversity of actors, including landowners, public and private foresters, other resource managers, neighbors, relatives, loggers, and others, involved in forest management

decisions and practices. Collaboration among these actors is an important consideration in any approach to sustainable resource management. Public professional foresters, by nature of their legitimacy and competency (as forestry professionals), community role (as boundary spanners) and managerial attributes (as public managers), have a capacity to fill a unique niche in the collaborative work among these actors. As scholars observe, collaboration emerges around “key persons who share some common interests, although they represent different stakeholder groups” (Olsson et al. 2007). District foresters are such key persons, responsible and accountable to different sets of interests: their professional standards, the private landowners they serve, and the state agency they represent.

District foresters<sup>3</sup> are professionally trained foresters employed by state forestry agencies to advise and assist landowners in the management of their forests<sup>4</sup>. District or state service foresters have historically played a key role in administering US federal and state programs for financial and technical assistance to private landowners. In the state of Indiana, district foresters have been providing forestry<sup>5</sup> assistance since the early 1930s, as authorized under the federal Clarke-McNary Act (1924) and the 1930 Memorandum of Understanding between the Indiana Division of Forestry and Purdue University Extension (Hubbard et al. 2001).

In collaborative efforts with others, district foresters channel technical and financial resources in order to sustain the capacity of private forests to provide a range of ecosystem goods

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<sup>3</sup> State-employed service foresters exist under different titles in different states. The most common ones are: district foresters (Indiana, Maine), stewardship foresters (Oregon), and state service foresters (Wisconsin, Maryland, Pennsylvania). In this paper district forester and service forester are used interchangeably.

<sup>4</sup> A district forester, according to the Indiana Administrative Code, is a state employee who “holds a bachelor of science degree in forest management or a closely related forestry curriculum from a college or a university accredited by the Society of American foresters” (<http://www.in.gov/legislative/iac/T03120/A00150.pdf>). District foresters are part of the broader group of professional foresters, which also includes private consulting foresters and industrial foresters.

<sup>5</sup> Forestry refers to “the science and practice of managing forested landscapes and the treatment of the forest cover in general...” (California State Board of Forestry and Fire Protection, *The Professional Foresters Law and the Role of Registered Professional Forester in Managing California’s Forests*, 2003, page 2. Accessed on October 13, 2010 at: [http://www.bof.fire.ca.gov/professional\\_foresters\\_registration/about\\_registration/seebox/roleofrpf2005version.pdf](http://www.bof.fire.ca.gov/professional_foresters_registration/about_registration/seebox/roleofrpf2005version.pdf))

and services. They offer direct technical assistance and professional guidance to landowners, and indirectly ‘generate’ public value in the form of forest ecosystem benefits (Goldsmith and Eggers 2004:8; de Groot et al. 2002). Through informal conversations and consultations, district foresters provide professional guidance to private landowners in making informed decisions about the management of their forests; they walk the land with landowners and make referrals to other natural resource professionals regarding resources needed to achieve forest management objectives.

It is these forestry professionals, who are less studied, and who merit our attention (Primmer and Karppinen, 2010:137). District foresters apply professional expertise, bridge the public-private boundaries, and manage public resources (Goldsmith and Eggers 2004:8). In the process, they interact with a variety of individuals and organizations, including: private landowners, private consulting foresters, wildlife biologists, soil conservationists, and others. These forestry experts are the focus of this paper, and particularly their activities and collaborative practices in forging efforts to sustainably manage private forests. Two interrelated research questions guide this study: (1) *What role do district foresters play in collaboration with other public and private actors?* (2) *What are their collaborative practices in private forestry?*

## **1.2 Some definitions and a roadmap**

For this paper, collaboration entails working together to achieve a set of tasks and common objectives. More formally, collaboration means “to co-labor, to achieve common goals, often working across boundaries and in multi-sector and multi-actor relationships” (O’Leary et al. 2009a:3)<sup>6</sup>. In basic terms, collaboration is a multi-sector partnership to facilitate the long-term

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<sup>6</sup> There is no single or common lens to study collaboration. Numerous definitions have been proposed, most of which focusing on the preconditions, process and outcomes of collaborative relationships (O’Leary 2009a:3).

sustainability of private forestland, and to solve issues that cannot be solved or easily solved by a single entity (Agranoff and McGuire 2003a; IDNR 2008).

The paper explores the collaborative activities of district foresters. The interactions of district foresters with others, including private landowners, consulting foresters, wildlife biologists, soil conservationists, and others, are explored in the context of private forest management in the state of Indiana, where twenty district foresters continue a long tradition of providing assistance to private landowners. At present, district foresters<sup>7</sup> in Indiana serve private landowners in twenty geographical districts, each several counties in size. The importance of private forests to the state economy, as well as, the long tradition of forestry-related conservation assistance in Indiana (e.g. the Classified Forest and Wildlands program, circa 1921) make this study site particularly interesting. The analysis relies on a structured questionnaire of Indiana district foresters, in-depth interviews, and document analysis.

Understanding how collaborative efforts by forestry professionals promote private forest stewardship is a timely endeavor, particularly as the public benefits provided by forests in the form of ecosystem services gain prominence in the policy realm and the share of privately owned forests remains significant, across the United States and other developed economies (FAO 2000). Under direct and indirect human pressures, and in the absence of incentives, these benefits are likely to be lost or undersupplied (NRC 1998; Ruhl et al. 2007). The paper is organized as follows: First, an overview of the conceptual approach is presented. The study site context and data collection are explained next. A discussion of the major findings and implications from this study follow. The analysis concludes with a description of the study's shortcomings and directions for future research.

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<sup>7</sup> Over time their name has changed from District Forester to Farm Forester, to Service Forester and back to District Forester.

## 2. A CONCEPTUAL APPROACH

Governance is a process characterized by the decisions and interactions among actors in the private forest sector. It includes “continuing interactions... caused by the need to exchange resources and negotiate shared purposes” (Rhodes 2007:1246). Private forest governance entails collaboration – collective decision-making and “co-laboring” across the public-private boundary over shared pursuits and common goals (Agranoff and McGuire 2003a; Ansell and Gash 2008:545).

Collaboration is a key dimension of multijurisdictional, multi-sectoral policy issues. In managing the nation’s natural resources, and in particular in private forestry, a diverse set of actors interact with one another on a spectrum of collaborative initiatives (wildlife habitat protection, watershed management, conservation easements, etc.), and across different sectors and levels (federal, state, local) (Koontz et al. 2004:174; Imperial 2005). In private forestry, public and private actors work together in multiple dynamic ways to conserve and keep forests healthy, so as to ensure a stream of forest ecosystem benefits. They collaboratively govern private forest lands. Thus, we can think of collaborative private forest governance as “a type of governance in which public and private actors work collectively in distinctive ways” (Ansell and Gash 2008:545).

The present analysis focuses on the role of governmental actors in collaborative forest governance. It adopts Ansell and Gash’s (2008:546) perspective of natural resource agencies as having “a distinctive leadership role in collaborative governance”.<sup>8</sup> Similarly, it aligns with the conceptual lens of scholars interested in “the means through which governmental actions and

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<sup>8</sup> The concept of collaborative governance is broader and more encompassing than the related concept of collaborative management. It goes beyond principal-agent relations and addresses collaboration as a more or less effective approach to both public policy making and public management (Ansell and Gash 2008; Tang and Mazmanian 2009). In essence, collaborative management is encompassed within the idea and practice of collaborative governance.

efforts facilitate or hinder collaboration in the management of environmental issues” (Koontz et al. 2004:21). Hence, the focus is on district foresters as centrally-positioned actors in the collaborative governance of private forests. The *thesis* of this study is that: district foresters, based on their legitimacy and reputation (as professionals), managerial attributes (as public servants), and community role (as boundary-spanners) facilitate collaboration in the governance of private forests.

### **3. THE ROLE OF DISTRICT FORESTERS IN COLLABORATION**

District foresters are the focus of this study because of their multiple roles in promoting forest stewardship practices on private forest lands.<sup>9</sup> Given the nature of their work, knowledge, skill and judgment, professional foresters can have a great impact on the environment (PCPF, 2010)<sup>10</sup>. They are the advisers of the nation’s private forests. Of particular interest to this study is the role of district foresters as professionals, boundary-spanners and public managers.<sup>11</sup>

#### **3.1 The professional side of district foresters**

District foresters are professionals by means of their specialized training in forest biology and management, technical expertise, and adherence to professional norms (Wilensky 1964:138).<sup>12</sup> Similar to other professions (e.g. doctors who apply their training to better the health of patients), foresters “apply their scientific training to ensure the survival of species and the integrity of ecosystems” (Thomas 2003:37). In essence, district foresters use their

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<sup>9</sup> There are few states without district foresters, such as New Jersey, Michigan and others.

<sup>10</sup> Pennsylvania Council of Professional Foresters (PCPF), Accessed on October 13, 2010 at: [www.paforesters.org](http://www.paforesters.org).

<sup>11</sup> A non-exhaustive list of district foresters’ roles includes: natural resource professionals, public managers, state forestry field staff, street-level bureaucrats (Lipsky 1980), “soil-level bureaucrats” (Thomas 2003), boundary spanners, co-providers of ecosystem services (Oakerson 1999), experts, and advisers.

<sup>12</sup> The literature on professionals in organizations cites six characteristics denoting a professional status: 1) expertise; 2) autonomy; 3) commitment; 4) identification; 5) ethics; and 6) standards (Raelin 1991:11).

knowledge and on-the-ground experience to support and guide the complex decisions necessary to sustain forest goods and services (Moore 1995 in Agranoff 2008:162; Smith 2010:307).

What makes a district forester part of the professional guild<sup>13</sup> is their day-to-day application of a special body of knowledge (forestry), as well as technical expertise in assessing and addressing landowners' needs. A professional forester is trained to perform such tasks as: timber and forest resource measurements, supervision of harvesting operations, surveying, regeneration, and timber sales transactions. Additional duties include the development of forest management plans that focus on complex ecological processes, forest restoration, financial planning and other activities. A credential-awarding system<sup>14</sup> provides the public with a guarantee of the trustworthiness and qualifications of professional foresters.

As public-sector professionals, district foresters have dual loyalty: to their professional field of forestry and to the state forestry agency. Scholars note that professionals are influenced by professional standards more so than by the bureaucratic system (Thomas 2003). As noted: "Regardless of where professionals work, their primary loyalty is to their profession, which shapes their attitudes on many issues" (Rourke 1969:95-99 in Thomas 2003:28). Much along the same line are the findings of Hodges and Durant (1989), who examined the relative impact of professional networking on the behavior of forestry professionals in three different sectors (state, private consulting, and industry). Their study suggests that "participation in professional networks was a pronouncedly more powerful and significant predictor of forester behavior than bureaucratic factors" (Hodges and Durant 1989:481).

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<sup>13</sup> The professionalization of foresters within the public administration system is not an exceptional phenomenon, because "nearly one-third of today's public workforce claims professional or technical expertise in an identifiable and specialized occupation that requires at least a college degree and offers a lifetime career to its practitioners" (Hodges and Durant 1989:474).

<sup>14</sup> Colleges and universities accredited by the Society of American Foresters (SAF); individual foresters can become SAF certified foresters.

The prevalence of professional norms and attitudes suggests the existence of a shared culture or macroculture in private forestry. A macroculture is defined as: “a system of widely shared assumptions and values, comprising industry-specific, occupational or professional knowledge, that guide actions and create typical behavior patterns among independent entities” (Jones et al. 1997:929). It is a set of shared conventions, roles, and role relationships among participants in a professional field or occupation (Jones et al. 1997).

The more connected and frequently interacting professional foresters are, the more likely they are to share values, assumptions, and role understandings (Jones et al. 1997). In addition, the presence of a shared culture is likely to reduce the coordination costs of completing common tasks, and the transaction costs associated with resource and information exchanges (Jones et al. 1997:930; Kaufman 1960). Thus, at a broad level, one can speculate that a shared professional culture facilitates collaborations between district foresters and other natural resource professionals in private forestry.

### **3.2 District foresters as boundary-spanning actors**

Empirical and theoretical work suggests that public professional foresters can bridge the public-private and the private-private boundary (e.g. among neighboring landowners in local forest management) (Gass et al. 2009; Rickenbach and Jahnke, 2006). As boundary-spanning actors, district foresters possess a set of key competencies, such as: ability to build sustainable relationships, manage through negotiation, address complexity, interdependencies, and motivations (Cash 2001; Williams 2002 cited in McGuire 2006:38).

District foresters cross borders, link different policy levels (local with state and federal), and harness meaningful conversations “between laypeople and experts - that turn information into knowledge and allow the negotiation of different frames” (Heiskanen 2006:7). Such interactions

encourage forest conservation and restoration on private lands by altering particular frames of ‘knowing’ and ‘doing’ and creating communities of practice (Heiskanen 2006:7; Feldman et al. 2006). As observed: “Family forest owners believe they know their land better than anyone else, but lack the technical knowledge to maximize the land’s potential. Having a forester walk the land with them builds this bridge between an in-depth understanding of the land’s characteristics and forest management possibilities.” (Greene et al. 2005). There is a need to manage forest resources not plot by plot, but in an integrative fashion and sometimes cross-boundary coordination (Gass et al. 2009; Goldman et al. 2007).

Communities of practice established through purposeful interaction are forms of social capital that enhances the value of both human and environmental resources (Zhang and Dawes 2006). As noted, “positive sharing experiences can help government professionals build and reinforce professional networks and communities of practice, which can be valuable resources of information about programs, best practices,..., and environmental changes” (Zhang and Dawes 2006:436).

### **3.3 District foresters as public managers**

District foresters administer state and federal programs for non-industrial private forest (NIPF) assistance. They carry out the collective-choice decisions at the local level and make “considered judgment about how to advance the public good within the scope of their delegated authority” (Bingham and O’Leary 2008:272). In the context of NIPF management, this delegated authority includes: (i) technical assistance and land management advice to forest owners in order to meet landowners’ management goals; and (ii) advancing the public interest – specifically, promoting forest stewardship practices on private lands with the goal of protecting

and keeping forest resources healthy<sup>15</sup>. In essence, district foresters have a dual responsibility: to the clients they serve (private forest landowners), and the public at large. Besides balancing the private with the public interest, district foresters are accountable to the state forestry agency.

The success of state and federal NIPF assistance programs depends on how they are implemented by public managers on the ground in coordination with private forest owners, and in collaborative engagements with other public and private actors (e.g. private consulting foresters, federal agencies, local non-profit organizations, governments, and forest landowner associations<sup>16</sup>). Program implementation and service delivery are influenced by how the respective managerial tasks and functions are carried out by “the persons at the lowest level of the administrative hierarchy” (Simon 1947 cited in Kaufman 2006:3). In the private forest sector these people are the district foresters. They are street-level (Lipsky 1980) or ‘soil-based bureaucrats’ (Thomas 2003) responsible for the delivery of technical assistance and professional advice to private landowners.

As public managers, district foresters provide information, secure resources, and implement federal and state programs (Koontz et al. 2004:160). They serve as ‘conduits’ between collaborative efforts and the agencies they represent (Koontz et al. 2004:162). Collaborative activities arise when managers recognize a “need to collaborate with partners” in order to achieve a policy goal or objective (Bingham and O’Leary 2008:275, McGuire 2009). To meet the objectives of state and federal programs for NIPF assistance, district foresters need to collaborate primarily with forest owners, but also with other actors, such as, local, state, and federal agency representatives, whose services or involvement they recognize as important.

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<sup>15</sup> These two duties may not always agree with one another. With respect to the production of ecosystem services, for instance, the two could be in disharmony (e.g. where timber harvest practices prevail).

<sup>16</sup> This is a unique organization in each state. In the state of Indiana, this is the Indiana Forestry and Woodland Owners Association (IFWOA).

Thus, the meaning and outputs of collaboration may vary based on the type of collaborative partner.

District foresters work with an increasing and ever more diverse group of forest owners (Kilgore et al. 2007). Forest fragmentation and parcelization processes affect the characteristics and structure of private forest ownership (Kittredge 2005). There are more forest owners of smaller parcels, while the number of state service foresters remains insufficient. This skewed ratio has important consequences for the interactions between district foresters and forest owners, neighboring households and local communities.

As noted earlier, district foresters together with forest owners walk the land and discuss management strategies, improvement options, and opportunities for government assistance. They exchange information for mutual gains, in the process of which, they develop relationships governed by norms of reciprocity and trust (Larson 1992 cited in Thomas 2003:41). Similarly, the development of trust is enhanced by frequent interactions and face-to-face contact. Social norms, such as trust, reciprocity, and shared purpose reduce the transaction costs of exchanges among actors and facilitate collaboration (Ostrom 1998; Thomson, Perry, and Miller 2008:106). Joint-decision making, such as the development of a forest management plan as a ‘shared creation’, also contributes to the development of trust and mutuality. This in turn, improves the likelihood of positive social (trust and mutuality) and environmental (forest improvement) outputs from collaboration.

To sum, we can expect public professional foresters to be central actors in forging collaborative practices in private forestry. District foresters identify and incorporate the right people and resources needed to achieve program goals. They frame and define issues (e.g. non-timber vs. timber use of forests), mobilize support, provide resources (indirectly), and build trust

through purposeful interactions. In short, as public managers they activate and shape collaboration through a set of strategic management behaviors. To better understand the collaborative activities of professional foresters this study looks at the behavior, decisions and practices of Indiana district foresters.

#### **4. METHODS**

This section provides an overview of the study site and data employed in the analysis. The context of the study is the state of Indiana, in the Midwest United States, where district foresters continue a long tradition of providing forest management advice to private landowners.

##### **4.1 Study site**

Non-industrial private forests (NIPF) comprise 86 percent of all forested land in Indiana in 2006 (Table 1). According to the official 2010 webpage of the Indiana Department of Natural Resources (IDNR) Division of Forestry, the state has “over 4.2 million acres of forestland that grow some of the finest hardwoods in the world” (IDNR 2010)<sup>17</sup>. Over the past century, forest land in Indiana has grown from 6 to 20 percent of the state’s area, with most of the re-growth occurring on small, private parcels owned by approximately 190,000 landholders (Butler 2008; Hubbard et al. 2001). A focus on the Midwest United States, and particularly Indiana, is justified by previous empirical work indicating trends of private smallholder-driven forest restoration (Munroe and York 2003). The importance of private forests to the state economy, as well as the long tradition of forestry-related conservation assistance in Indiana, through the Classified Forest and Wildlands program (circa 1921), makes this site particularly relevant to the study’s objectives.

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<sup>17</sup> Indiana Department of Natural Resources (IDNR) Division of Forestry. District Foresters Overview. Accessed on March 15, 2010. <http://www.in.gov/dnr/forestry/4750.htm>

**Table 1: Forest area by ownership type in the state of Indiana** (Source: USDA Forest Inventory Analysis Data 2006)

	Federal	State	County, Municipal	Family or Private
Percent	8.27	5.40	.68	85.65
Acres	385,010	251,397	31,657	3,987,436

The Indiana Department of Natural Resources Division of Forestry employs 20 district foresters<sup>18</sup>, who administer state and federal programs for NIPF assistance (Figure 4.1). These programs provide technical assistance, cost-sharing and property tax incentives for sustainable forest management. The geographical area of district foresters varies from 2 to 11 counties, with more counties per district in the North where forestland is sparse.



**Figure 1: Map of Indiana District Foresters’ Districts** (Source: Indiana Department of Natural Resources, Division of Forestry Cooperative Forest Programs)

The office location of district foresters varies: some are housed within a state forest headquarters; others are located in state Fish and Wildlife areas, and still others have offices in inner-city office buildings. District foresters are predominantly white males, with an average age

<sup>18</sup> This number is comparable to the number of state service foresters in similar Midwestern states: 22 in Ohio, 16 in Iowa, 16 in Illinois, and 10 in Kansas.

of 50, educated in the leading state institution granting professional degree in forestry. Many of them reside in close physical proximity to the districts they serve.<sup>19</sup>

## **4.2 Data and analysis**

Data for this study come from a written questionnaire, in-depth interviews, and document analysis. The research followed standard social science protocols, including development and testing of original data collection instruments.<sup>20</sup> A written questionnaire was completed by Indiana district foresters in June 2009 at a quarterly meeting of the Cooperative Forestry program of the IDNR Division of Forestry. In addition to questions on collaboration, the questionnaire covered issues related to: activities, attitudes, professional engagement, personal background, and perceived influence on the decisions of others (e.g. landowners, other professional foresters, wildlife biologists, policy-makers, etc.). It included a total of 21 questions. The ten-page questionnaire was handed in person to each forester, following a brief introduction of the study and its purpose. The researcher then collected the completed questionnaires in person. The average time for completion was thirty minutes. Only 19 district foresters were present at the meeting, which resulted in a 95 percent response rate<sup>21</sup>.

The questionnaire provided information about the collaborative activities between district foresters and other actors in private forestry. Based on document analysis and past empirical research (Rickenbach and Schmoldt 2006), twelve types of actors were identified as important stakeholders in private forestry (the list of collaborative actors is displayed in Table 2). District foresters were presented with a roster of the twelve stakeholder groups<sup>22</sup> and asked to report on

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<sup>19</sup> In addition to the state-employed professional foresters, there are 42 private consulting foresters and 16 industrial foresters operating in the state of Indiana (IFWOA, 2009-2010 Directory of Professional Foresters, <http://www.findianaforester.org/media/directory/ForestersDirectory.pdf>).

<sup>20</sup> Details about development and the actual instruments are available upon request.

<sup>21</sup> This was due to the absence of one district forester following his retirement without immediate replacement.

<sup>22</sup> “Other actors (please, specify)” was included as an option under the roster of partners.

three types of relationships with each of them, namely: exchange information and resources, make joint decisions, and engage in joint activities that affect private forest lands. Lastly, the questionnaire included information about district foresters' attributes and background (gender, age, tenure, prior professional experience, and geographical span of activities).

To gain further insights into the collaborative structures around district foresters, the researchers conducted in-depth interviews with five district foresters. The five districts selected for in-depth analysis were in the south-central part of the state, and included districts six, eight, fourteen, eighteen and twenty (Figure 1). They were chosen based on: (i) observable variation across foresters' tenure, size of districts, and geographical proximity to each other; and, (ii) biophysical conditions - most of the forested landscapes are in the south-central part of the state.

Interviews were recorded upon respondent's consent, transcribed and coded. Issues and themes were based on precodes (Simons 2009:122) or orienting concepts (Layder 1998; Patton 2002), developed from collaborative management research (Wasserman & Faust 1994; Borgatti et al. 2009; Agranoff 2003). These concepts were useful for understanding how collaboration is practiced by district foresters, the diverse people foresters work with, and the nature and regularity of their interactions.

Final sources of data were official documents and government reports. Documents pertaining to programmatic goals, INDR Division of Forestry reports, publications and program descriptions were collected and used as supplemental data sources.<sup>23</sup> Information from documents was helpful in filling gaps, verifying facts, and enriching the analysis (Simons 2009).

The analysis provides a discussion of collaboration in private forestry, focusing on district foresters' collaborative partners and activities, motivations for collaboration, antecedents to and

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<sup>23</sup> Publicly available documents were collected through online searches. Other archival data and summary reports were provided by IDNR Division of Forestry, Cooperative Forestry Program Director (June 2009).

outputs from collaborations. These theoretically- and empirically-informed themes serve as the basis for describing and interpreting the process of collaboration in private forestry (Boyatzis 1998; Patton 2002). Together they sketch a preliminary picture of private forestry collaborations, seen from the perspective of district foresters. In addition, an in-depth look at the roles of five district foresters is presented (Yin 2003). The cross-case comparison discusses forester behaviors and attitudes (profiles). The discussion is exploratory and descriptive in the sense that it suggests associations, and does not make causal claims.

## **5. COLLABORATION IN PRIVATE FORESTRY**

This section presents results from the analysis of district foresters' questionnaire responses. Collaboration is operationalized as "co-laboring" or working with others in completing a set of tasks. It is measured as a set of actors and a set of collaborative activities (McGuire 2009; Agranoff and McGuire 2003; O'Toole and Meier 2004). District foresters work with private individuals (forest landowners and their neighbors), public officials (e.g. NRCS district conservationists), non-profit (land trusts, community outreach), and for-profit actors (consulting foresters, forest product industry) on a range of forestry-related activities (Table 2). Public officials represent agencies, such as: the Natural Resource Conservation Service (NRCS), the Indiana Department of Natural Resources (IDNR), and the Soil and Water Conservation Districts (SWCD). What precedes and follows these collaborative activities (the antecedents and outputs of collaboration) has implications for the frequency, quality, and future level of collaboration. Indirectly, there are consequences for forest sustainability, including lack of management or inappropriate management of forests (best management practices (BMPs)), forest fragmentation, invasive species, and forest health.

**Table 2: Types of collaborative actors and activities in private forestry** (Survey of District Foresters, N=19)

<i>Collaborative Actors (n=12)</i>	<i>Collaborative Activities (n=8)</i>
Private landowners	Technical assistance
Private landowners' neighbors	Development of management plans
Policy-makers at county level	Communication and outreach activities to coordinate projects and common activities
Land trust organizations	Active participation in forest management (e.g. hands-on activities, timber marking, reforestation)
Community outreach groups	Work with land trust organizations (e.g. on land restoration, forest improvement practices)
Forest product industry	Exchange information and resources
Private consulting foresters	Make joint decisions that affect private forest lands
Wildlife biologists	Engage in joint activities that affect private forest lands
Other resource professionals	
NRCS conservationists	
Soil & Water Conservation District county supervisors	
IDNR Division of Forestry Central Office	

Note: There is no direct correspondence between actors and activities.

The frequency of collaboration by activity and time spent provides a tangible measure of commitment to collaborative relationships. It also offers a way to better understand the “the opportunity costs” that forestry experts face when deciding whether and how much time to invest in collaborating with others (Mullin and Daley 2010:763). A closer look at the activities of professional forestry administration reveals that district foresters in Indiana spend on average about 3 hours per week on on-the-ground forest management (e.g., timber stand improvement, timber marking). Most of their time is devoted to administering nonindustrial private forests assistance programs, writing management plans (12 hours/week), and working with landowners related to the Indiana Classified Forest and Wildlands (CFW) program (13 hours/week); leaving much of the on-the ground work to private consultants or landowners themselves (Table 3).

**Table 3: Activities of District Foresters by Hours per Week (June 2008-May 2009) (n=19)**

<b>District Foresters Activities</b>	<b>Minimum (hours/week)</b>	<b>Maximum (hours/week)</b>	<b>Mean (hours/week)</b>	<b>N</b>
<b>Work with private landowners</b> related to the Classified Forest & Wildlands (CFW) program	5	28	13	19
<b>Technical assistance:</b> direct interaction with private landowners in an advisory capacity, such as providing information, professional consultations, and walking the land with landowners.	1	18	6.9	19
<b>Active participation in forest management,</b> for example timber stand improvement, reforestation practices, timber marking, and other hands-on activities	0	12.5	2.8	18
<b>Office work,</b> for example administer NIPF assistance programs, develop management plans, manage resources, communicate with IDNR Central Office, etc.	5	20	12.3	19
<b>Communication and outreach</b> activities with others to coordinate projects and common activities	0.5	5	2.6	18
<b>Driving</b> to and from work related	0.25	10	5.5	17

This has important implications for the collective ability of public servants to deliver technical assistance and direct professional guidance to the growing and increasingly heterogeneous group of private landowners. Greater forester involvement in the future will depend on the extent, to which public foresters can ‘serve’ the needs of forest owners, as well as respond to the changing values in society (Luckert 2006:305). Annually an estimated 10,000 new forest owners are added to the group of roughly two hundred thousand forest owners in Indiana; less than a percent of the latter are assisted by district foresters annually (2,300 landowners in 2008, and 1,125 in 2009) (IDNR 2008, 2009). On average, this study finds that district foresters assisted 50 new landowners between May 2008 and June 2009. Direct interactions between foresters and landowners, including professional consultations, advising, and walking the land, amounted to an average of seven hours per week.

As existing scholarship notes, both institutional (external) and interpersonal (internal) factors affect collaborative relationships (O’Leary et al. 2009a, Agranoff 2006). Institutional changes

within the state's private forestland program did influence the extent and type of collaborative activities. To illustrate, timber marking on small parcels – traditionally conducted on a limited basis by district foresters – was charged to private consulting foresters in 2005, leaving fewer opportunities for district foresters to work one-on-one with landowners and forest product industry.

Starting in 2005, strategic planning by the Indiana DNR Division of Forestry introduced new directions for the Cooperative Forest Management (CFM) program that on one side reduced, and on the other, expanded the potential for collaborations. On-the-ground technical assistance to landowners of parcels less than 10 acres in size was eliminated, which took away opportunity to interact with approximately half of all forest owners in Indiana<sup>24</sup> (DNR DF 2005). The merging of two programs (Classified Forest and Classified Wildlife Habitat) into one, called Classified Forest and Wildlands Program imposed considerable time (up to 20 hours/week) and efficiency costs on forestry administration (Table 3). At the same time, the creation of 'demonstration forests' as examples of forest management created opportunities for outreach and educational partnerships with private landowners, conservation groups, community forests, and the Indiana Department of Agriculture. Similarly, the introduction of a customer feedback system, voluntary contribution for services provided, as well as a forestry commerce web site – to facilitate business networking with forest industry – opened new directions for collaborative endeavors (IDNR DF, 2005).

Relocating district foresters' offices in 2006, however, had mixed effects on collaboration, mostly because of the competing objectives of minimizing office space costs and continuing

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<sup>24</sup> Approximately half of the 100,000 private forest landowners own less than 10 acres of forestland. As noted "While these forests play an important role in the economic and environmental well-being of the State, they take a disproportional amount of time to service... A 'small landowner' literature distribution program, demonstration forests, and outreach events will replace current efforts" (IDNR DF Strategic Plan 2005-07, page 3)

customer access. In response to how office location facilitated collaborations with others in completing his daily tasks, a forester reported both affirmatively and negatively: *“Yes. Because I am close to Purdue and that provides me a lot of different resources. No, because my district is huge and I am quite far from many groups and individuals I work with.”* Three years after this change, accessibility to and from collaborative partners was a major factor. For some foresters relocation meant isolation from other natural resource professionals, reduced access and distance from high workload areas: *“I was forced to move my office to an area outside my district and therefore have no walk-in traffic and fewer phone calls”*. For others, two-thirds of foresters, a new office location facilitated and expanded collaborations with others: *“We have a major DNR office complex. Interactions between other professionals and landowners who come into our office lead to a wider exchange.”*

The institutional changes described above seem to have shaped the collaborative activities and interactions of district foresters. This is not unexpected, since the idea of collaboration is embedded in the mission statement of the Cooperative Forest Management (CFM) program<sup>25</sup>, and is reflected in the program principles and CFM procedures manual: *“The CFM [district] forester... represents the forest and works cooperatively with forest landowners, governmental agencies, conservation organizations and others to increase the stewardship of Indiana’s privately held forest resources.”* (DNR Division of Forestry, Strategic Plan 2008-2013, 11-12).

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<sup>25</sup> The mission statement of the CFM program reads: “It is the mission of Indiana’s Private Forestland Program to promote the stewardship of Indiana’s privately owned forests by providing forest management information and professional services to forest owners and others to insure sustainable forest benefits, both tangible and intangible for present and future generations. And, further to work cooperatively with private woodland owners and related citizens’ groups, and governmental agencies to accomplish on-the-ground forest management practices for the benefit of the landowner, the forest resource and the citizens of Indiana.” (DNR Division of Forestry, Strategic Plan 2008-2013, page 11).

Clearly, district foresters collaborate – they work cooperatively and provide “forest management information and professional services to forest owners and others to insure sustainable forest benefits, both tangible and intangible for present and future generations” (DNR Division of Forestry, 2008:11). In collaborating with others they often take on different roles and act on behalf of different groups: “By virtue of this publicly funded position, the CFM [District] Forester represents the State of Indiana, its government and its people. The CFM Forester is a professional forester by training, as described and required by the Indiana Classified Forest Act, and professional in behavior as exhibited by day to day operations” (DNR Division of Forestry, 2008:11-12). In essence, the public forester wears different ‘hats’, each embodying the authority and legitimacy of the state, the public, and the profession. It is these multiple hats, or roles, that allow district foresters to facilitate the collaborative stewardship of private forests, albeit with varying degree of success.

Active participation in forest management, through direct one-on-one interactions with private landowners, is one of the principal factors contributing to the collaboration success of district foresters. Table 4 below displays a summary of the different factors contributing to successful collaborations with others. Responses to questionnaire items related to the professional activities, boundary-spanning, and internal management practices of district foresters are grouped by the degree, to which they influence perceptions of successful collaboration. The majority of foresters recognize the importance of working directly with private landowners in active, on-the-ground forest management; and relatedly, report a need for more professional foresters (both private and public) to work actively with landowners. As boundary spanners, district foresters seem more effective when working with private individuals, and less so when it comes to working with non-governmental organizations (Table 4). Less than

half of district foresters have worked with land trust organizations on forest restoration and improvement projects, which possibly explains the perceived low levels of collaborative success with land trusts and community groups.

Available clerical assistance to manage the growing volume of administrative responsibilities was identified as an important condition for successful collaboration (Table 4.4). Both office assistance and office location were perceived as key, facilitating factors for working with others. In contrast, membership in professional societies, and interactions with forest product industry, has little to no effect on the collaboration success of state forestry administration. This suggests that as professionals, district foresters have some, but not a lot of leverage in facilitating collaboration.

**Table 4: Factors contributing to collaboration success (n=19)** (Survey of Indiana District Foresters, 2009)

<i>Contribution to Collaboration</i>	<i>A great deal (%)<sup>d</sup></i>	<i>Some or little (%)</i>
<i>Professionalization</i>		
Membership in professional forestry associations <sup>a</sup>	10.5	89.5
Interactions with other natural resource professionals <sup>b</sup>	42.1	57.9
Interactions with forest product industry <sup>b</sup>	0.0	100
<i>Boundary spanning</i>		
Active participation in forest management <sup>a</sup>	84.2	15.8
Participation in community-oriented activities <sup>a</sup>	15.8	84.2
Interactions with land trusts, citizen groups, and NGOs <sup>b</sup>	5.3	94.7
<i>Internal management</i>		
Available clerical assistance <sup>a</sup>	68.4	31.6
Office work and program management <sup>a</sup>	42.1	57.9
Office location <sup>c</sup>	72.2	27.8

<sup>a</sup>. Response to the question: Indicate how the following contribute to your collaboration success (A great deal=4; Some=3; Little=2; None=1).

<sup>b</sup>. Response to the question: To what extent do the following lead to collaborations with others in completing your daily tasks? (A great deal=4; Some=3; Little=2; None=1).

<sup>c</sup>. Response to question: Does your current office location facilitate collaborations with others in completing your daily tasks: Yes=1; No=0.

<sup>d</sup>. Percent valid in each category: A great deal=1; Some, little, or none =0.

It is in their managerial role, first and foremost, that district foresters see themselves collaborating effectively with others. The data highlight the perceived importance of internal management practices, and specifically the emphasis on office location and office assistance.

The ability to manage through influence and negotiation, as well as manage the roles and motivations of others are key competencies of managers who work across agency boundaries (Cash 2001; McGuire 2006). Boundary spanners as the literature points out are “program specialists who are involved in networks and... collaboration” and have considerable opportunities to influence decision-making (Agranoff 2006:57). In their collaborations with others, Indiana district foresters report having a considerable opportunity to influence the decisions of private and public stakeholders, in particular forest owners, Soil and Water Conservation District officers, NRCS district conservationists, and other natural resource professionals (Table 5).

Roughly two-thirds of foresters agree that they have a significant role in facilitating connections between forest landowners and other resource professionals, such as private consulting foresters, NRCS conservationists, and wildlife biologists. However, their responses are split equally between agreement and disagreement when it comes to facilitating peer-to-peer connections, i.e. between landowners they work with and other private landowners. The prevailing perception is that district foresters span more effectively the public-private and professional domains, than the private-private connections. About half of district foresters perceive some opportunity to influence the decisions of forest owners, but little such with respect to landowners’ neighbors and land trust organizations (Table 5). To a certain extent, they agree that the management decisions of private landowners are influenced by their immediate social circle (family, friends and neighbors) more so than by their interactions with district foresters.

**Table 5: Reported perceptions of opportunity to influence the decisions of collaborative partners<sup>a</sup>**  
(Survey of Indiana District Foresters, 2009)

<i>Collaborative Partner</i>	<i>A great deal</i>	<i>Quite a bit</i>	<i>Little</i>	<i>None</i>	<i>N</i>
Private landowners	42.1	52.6	5.3	--	19
Landowners' neighbors	--	42.1	52.6	5.3	19
Land trust organizations	5.6	5.6	61.1	27.8	18
NGOs and other community groups	5.3	42.1	36.8	15.8	19
NRCS conservationists	15.8	52.6	26.3	5.3	19
Soil and water conservation district offices	31.6	47.4	21.1	--	19
Private consulting foresters	5.3	15.8	63.2	15.8	19
Other natural resource professionals (e.g. biologists)	5.3	47.4	36.8	10.5	19
Policy-makers at county level	--	5.3	42.1	52.6	19
Policy-makers at state level	--	5.3	52.6	42.1	19
IDNR Division of Forestry Central Office	5.3	21.1	52.6	21.1	19

<sup>a</sup>. How much opportunity do you have to influence the decisions of: (*Circle the appropriate number*): A great deal=4; Quite a bit=3; Little =2; None=1;

Still, there is a noticeable awareness among professional foresters about the public benefits provided by privately-owned forests. The majority believe they can make an important contribution to the provision of public benefits from private forests, because of the special information, skill and unbiased information they possess. In their words: *“I can provide information and knowledge that private landowners can use to better manage their natural resources. Better forest management benefits everyone”*.

Collaborative relationships, thus, can have important effects and implications for the sustainable management of private forest lands. Some of the outputs resulting from these collaborations, according to district foresters are quite tangible (forest improvement, tree planting, etc.), others less so. More than half of Indiana district foresters believe that a great deal of their collaborative work with others leads to positive social outputs such as, trust and cooperation, as well as greater participation in NIPF assistance programs (Table 6). This is consistent with their boundary-spanning and managerial functions. Forest improvement is an

important environmental output of collaborative activities, as perceived by about two-thirds of district foresters. Less than half of foresters, however, point to tree planting projects and fulfillment of management plan objectives as significant outputs from collaborating with others.

Behind the collaborative practices and outputs in private forestry are both external and internal conditions. Motivations for collaborating with others oftentimes come from participants themselves (Table 6). Personal motivations are the key driver behind collaborative work, according to the majority of public foresters. Two-thirds of them agree that the motivations of private landowners lead, to a great degree, to collaborative activities; and, about half of them point to state and federal program requirements as shaping their collaborative partnerships (Table 6). In fact, policy guidelines may explain why interactions with forest product industry and land trust organizations have very little bearing on the collaborative behavior and management activities of professional forestry administration in Indiana.

Although subject to the same programmatic goals and guidelines (external conditions for collaboration), district foresters may give priority to one role over another as a result of personal motivations and perceptions (internal conditions) (Table 6). Variations exist with respect to their collaborative practices and perceptions of collaboration. Therefore, it is interesting to explore the role of district foresters in collaboration with respect to their perceptions of collaboration (i.e. their individual profile in collaborative relationships). We selected five cases in order to shed light on this question. A brief description of each district forester profile is provided next.

**Table 6: Motivations for Collaboration and Collaborative Outputs in Private Forestry** (Survey of Indiana District Foresters 2009, N=19)

<i>Motivations for Collaboration</i> <sup>a</sup>	<i>A great deal (%)</i> <sup>b</sup>	<i>Some or little (%)</i>	<i>Collaborative Outputs</i> <sup>c</sup>	<i>A great deal (%)</i> <sup>b</sup>	<i>Some or little (%)</i>
<i>Participant motivations (internal)</i>			<i>Social</i>		
Me and my own personal motivations	89.5	10.5	Development of trust and working relationships	68.4	31.6
Private landowner motivations	63.2	36.8	Participation in NIPF assistance programs	63.2	36.8
			Fulfillment of management plan objectives	42.1	57.9
<i>Policy guidelines (external)</i>			<i>Environmental</i>		
IDNR Central Office guidelines and directions	26.3	73.7	Forest improvement	63.2	36.8
NIPF state and federal program requirements	47.4	52.6	Tree planting projects	47.4	52.6
Federal policies	15.8	84.2	Timber harvesting	21.1	78.9
State policies	36.8	63.2	Wildlife habitat management	15.8	84.2
County rules and regulations	0.0	100.0	Long-term land conservation	5.3	94.7
			Adoption of forest stewardship practices	31.6	68.4

<sup>a</sup> To what extent do the following lead to *collaborations* with others in completing your daily tasks? (Fill in the appropriate number): A great deal=4; Some=3; Little=2; None=1.

<sup>b</sup> Percent valid in each category: A great deal=1; Some, little or none =0. There were zero responses to the category 'none'.

<sup>c</sup> To what extent have these collaborations led to outputs, such as? (Fill in the appropriate number): A great deal=4; Some=3; Little=2; None=1.

## **6. A COMPARISON OF FIVE DISTRICT FORESTERS**

### **6.1 Description of forester profiles**

District Forester One (DF1) has been at his current position for only two years. While his background as a state property resource specialist and over eight-years of experience working within the IDNR Division of Forestry system have been of value, he is still learning. In fact, two of his mentors are nearby district foresters, with whom he consults on a wide variety of topics. His district encompasses two counties, and his office is located within the boundaries of a state forest, which in his own words, facilitates collaborations with others, particularly NRCS and SWCD offices. Over the past twelve months, this forester has assisted 41 newly-contacted landowners, which relative to his tenure and service delivery record of other foresters, fares high.

There are two counties in the purview of District Forester Two (DF2). He is well established and known in the area, which he has served for 18 years. His office is within the state forest, however it is “fairly remote and not easily accessible”, in the words of the forester. This district forester has assisted 45 new landowners in the past one year. He has also been working with a well-known land trust organization in the area.

The third district forester (DF3) is a ‘veteran’ in the profession, having served as a district forester for 38 years straight. His wealth of experience and knowledge are prominent in almost any aspect of his work, attitudes and management. He currently serves four counties, where in the past twelve months he has assisted 60 new landowners. Similar to others, this forester works out of the state forest office in his district, which puts him in close proximity to other resource professionals and conservation officers.

District Forester Four (DF4) is 15 years into his service with the Indiana Division of Forestry. Both his residence and office are at the state forest in his district, which encompasses a

total of three counties. What is specific about this forester is that he shares an office with another district forester, which allows regular exchanges of information and resources. However, he still feels “isolated from other natural resource professionals”. DF4 has delivered technical assistance to 28 new landowners in the past one year.

Finally, District Forester Five (DF5) serves six counties and has 36 years of experience. Like his counterpart DF3, DF5 has assisted more than the average number of landowners, 66 in total, over the past twelve months. His office location is fairly disadvantageous, since it is not in the counties where his highest workload is. This makes it inconvenient or hard for people to visit, and inhibits direct one-on-one contact.

## 6.2 A cross-case comparison of forester profiles

The profiles of the five district foresters vary based on their collaborative practices and perceived role in collaboration. As reported in personal interviews, four of the five foresters see themselves as forestry experts<sup>26</sup>, first and foremost; and only then as boundary-spanners or public managers. DF2 is the only forester, who sees himself primarily as a public manager. Variations exist in individual forester perceptions of their role in private forestry (Table 7).

**Table 7: District foresters’ perceptions of their role in private forestry** (Source: Personal interviews)

Rank <sup>a</sup>	District forester 1	District forester 2	District forester 3	District forester 4	District forester 5
1	Forestry expert (natural resource manager)	Public manager	Forestry expert	Forestry expert	Forestry expert (educator)
2	Public manager (program administrator)	Forestry expert	Boundary spanner	Public manager <sup>c</sup>	Boundary-spanner
3	Boundary spanner	Boundary spanner	Public manager (fund manager) <sup>b</sup>	Boundary spanner	Public manager

<sup>a</sup> Response to question: How do you see your work in terms of the following three roles: forestry expert, public manager and boundary spanner? Please, rank these roles in terms of, who you see yourself as first, second and third. Individual comments and additions to each role are in brackets.

<sup>26</sup> Interviewees were asked: How do you see your work in terms of the following three roles: Forest expert, Public Manager and Boundary spanner? Please, rank these roles.

<sup>b</sup>. Clarification of role: “responsibility fluctuates without allocations”.

<sup>c</sup>. Clarification of role: “manage public programs, like the Classified Forest and Wildlands program, and cost-share programs”.

Additional clarifications to each role were provided by foresters during the interviews, and are included in brackets under each forester’s response. This added important nuances, such as the educational role of DF5, and the seemingly overlapping categories of resource manager and forestry professional of DF1.

In their collaborative practices and behavior, the five district foresters vary even more. Notably, the most-experienced among the five foresters appears to have a well-defined and active boundary-spanning role (*DF3*). Professional tenure and size of professional network seem to be an important aspect of district foresters’ profile. The greater the tenure, the more effective and productive are professional foresters in collaboration, as seen by the amount of time spent on technical assistance (Table 8). The two most experienced foresters (*DF3* and *DF5*) exceed the average number and spend roughly 23 hours per week working with private landowners in an advisory capacity. In addition, the veteran in the profession asserts he has a great deal of influence over the decisions of landowners and other collaborative partners in general (he has the highest mean for reported leverage over the decisions of collaborative partners) (Table 8). He can truly be described as a boundary spanner, who is competent in building sustainable relationships and managing through influencing and negotiation (Williams 2002 cited in McGuire 2006:38). *DF3* has been widely recognized for his contributions to the profession and his ability to create a favorable environment for sustainable forest management. According to other foresters: “*He’s been a district forester forever...and that’s a big award [the National Tree Farm Association award], a good award, nationally-recognized... He basically got the Tree Farm program started in Indiana. And he’s the one that got it growing in Indiana, in my understanding...*” (Personal interview with a district forester, July 20, 2009).

State and federal programs serve as important drivers of collaborations: for instance, the federal Environmental Quality Improvement Program (EQIP) is administered through collaboration with local NRCS conservationists. Yet, the degree to which these programmatic guidelines lead to collaborative success is limited. Much of what foresters perceive as collaboration success relies on one-on-one interactions with others, hands-on participation in forest management, and resource availability (i.e. human resources and administrative assistance). Other conditions may not be perceived by district foresters as contributing to their collaboration with others, simply because they do not see them (e.g. state and federal policy guidelines) as part of their mission. Professional membership has marginal contribution to the collaboration success of early-career professionals, and a slightly more recognizable impact on the perceived success of collaboration for experienced foresters (Table 8).

On the other hand, both the social and environmental outputs of collaboration are of equal weight to a novice and a veteran alike. Development of trust and forest improvement is reportedly the most important collaborative output for professional foresters; with a somewhat different perspective shared by the self-described public manager (DF2). Last, but not least office location seems to have a role in shaping the level of communication and outreach activities district foresters engage in. From the perspective of facilitating collaboration, office locations that are remote or less advantageous, are associated with greater time and resources spent on outreach and communication (DF2 and DF5).

**Table 8: Cross-Case Comparison of Five District Forester Profiles**

Feature	District Forester 1	District Forester 2	District Forester 3	District Forester 4	District Forester 5
<i>DISTRICT FORESTER PROFILE</i>					
Primary role (self-reported) <sup>a</sup>	Forestry expert	Public manager	Forestry expert	Forestry expert	Forestry expert
Tenure (years)	2	18	38	15	36
Counties in district	2	2	4	3	6
Owners assisted in past 12 months	41	45	60	28	66
CFW program administration (hours/week)	8	10	10	8	10
Technical assistance in an advisory capacity (hour/week)	3.7	10	12	8	14
Active participation in forest management (hours/week)	3.7	4	2	4	0.6
Internal management (hours/week)	5	13	12	14	12
Communication and outreach activities (hours/week)	0.5	3	1	2	3
Factors contributing to collaboration success					
Boundary spanning (participation in forest management)	Little	Little	A great deal	A great deal	A great deal
Internal management (available clerical assistance)	Some	A great deal	A great deal	A great deal	A great deal
Professionalization (professional membership)	None	Little	Some	Some	Some
Motivations for collaboration					
Personal motivations (internal)	A great deal	None	A great deal	A great deal	A great deal
Private landowner motivations (internal)	Some	Some	A great deal	Some	A great deal
State and federal program requirements (external)	Little	Little	A great deal	Some	Some
Collaborative outputs					
Social: Trust and working relationships	A great deal	Some	A great deal	Some	A great deal
Environmental: Forest improvement	A great deal	Little	A great deal	Some	Some
Opportunity to influence the decisions of:					
Forest landowners	Quite a bit (3)	A great deal (4)	A great deal (4)	Little (2)	Quite a bit (3)
Other actors (mean)	Mean =1.7	Mean=1.7	Mean=2.6	Mean=1.4	Mean=2

<sup>a</sup> Response to the question: How do you see your work in terms of the following three roles: forest expert, public manager, and boundary spanner? Please, rank these roles in terms of, who you see yourself as first, second, and third.

## **7. DISCUSSION AND CONCLUSION**

This paper explores the role of public professional foresters as participants in collaborative efforts geared towards enhancing the health and sustainability of private forests. By means of their professional competency, authority and social legitimacy, district foresters have multiple, overlapping roles in the collaborative governance of private forests. District foresters in Indiana work with a variety of private and public actors on a range of collaborative activities, in the process of which, they represent different parties (the state, the people of Indiana, their profession and the objectives of forest owners), and employ different roles (professional forester, public servant, and boundary spanner).

The results of the analysis indicate that Indiana district foresters invest substantial time in the management of resources, information, and public programs. They act as public managers, first and foremost, even though by training and self-perceptions, they are forestry experts. The trade-off is less involvement in activities emphasizing the professional and boundary-spanning sides of their work, such as active forest management and community engagement. District foresters spend more time in collaborations with other natural resource professionals than in on-the-ground forest management with private landowners. The new frontier for district foresters, one could argue, is to capitalize on their management role in efforts to engage greater and more diverse stakeholders, such as land trusts, forest industry, and community groups.

The findings of this study suggest little collaboration between district foresters and forest owners at the immediate level of private landowner parcels. Significantly greater collaborations, however, occur between public professional foresters and other natural resource professionals at the program and policy level in private forestry.

A closer look at the collaborative activities of five district foresters further showed differences between perceived roles in collaboration. The motivational dimension and profile of district foresters shaped the degree to which district foresters manage to accomplish their work.

Given limited resources and staff, collaboration can create significant opportunity costs for district foresters, who currently face the challenge of balancing their professional commitment against growing administrative duties. The opportunity cost of time means that district foresters have to prioritize certain activities over others (e.g. working one-on-one with private landowners, active participation in forest management). Moreover, state and federal program guidelines shape many of the choices and activities of Indiana district foresters. Program changes in the Cooperative Forest Management program introduced in 2005 affected the extent and type of collaborative engagements of district foresters. This is consistent with the observation that structural conditions can support or inhibit collaborative relationships (Mullin and Daley 2010).

Lastly, the level of interdependence, interpersonal communication and trust among participants in collaborative processes shapes the nature of collaborative arrangements and outputs. Limitations in the data do not allow to fully evaluate the degree of interdependencies between district foresters, private landowners, private consulting foresters and other actors in private forestry. Thus, a major limitation of this study is the lack of information about the perceptions of district foresters' collaborative partners about the process of collaboration.

Future research will seek to better understand the roles of other actors in private forestry through additional data collection and interpretation. Information about the “whole” or complete network of actors in private forestry may reveal important differences in attitudes, perceptions and behaviors – and thus lead to different empirical observations.

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