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University of Tennessee - Knoxville

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To the Graduate Council:

I am submitting herewith a dissertation written by Miriam L.E. Steiner Davis entitled "Facilitating Private Forestland Management: Relating Landowners' Experience of their Forestland and their Conceptualization of Forest Management to their Management Behavior." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Natural Resources.

David Ostermeier, Major Professor

We have read this dissertation and recommend its acceptance:

Sherry Cable, Wayne Clatterbuck, Trena Paulus

Accepted for the Council:

Dixie L. Thompson

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Sherry Cable

Wayne Clatterbuck

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Provost and Dean of the
Graduate School

(Original signatures are on file with official student records.)

FACILITATING PRIVATE FORESTLAND MANAGEMENT:
RELATING LANDOWNERS' EXPERIENCE OF THEIR
FORESTLAND AND THEIR CONCEPTUALIZATION OF FOREST
MANAGEMENT TO THEIR MANAGEMENT BEHAVIOR

A Dissertation Presented for the
Doctor of Philosophy Degree
The University of Tennessee, Knoxville

Miriam L.E. Steiner Davis
May 2008

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BRIEF ABSTRACT

Privately owned forestland represents the majority of forested land in the US providing numerous benefits to its owners and society. Issues ranging from fragmentation and parcelization to increasing rates of development threaten to “unravel” the forest landscape. Active management of forestland is seen as one way to combat such threats and has been linked to factors such as private forest landowners’ (PFLs’) education level and familiarity with forest management, their goals, objectives, attitudes, values, beliefs, and socio-cultural identity and the size and tenure of their ownership. However, despite numerous efforts to understand private forest landowners (PFLs), educate them about, and provide assistance for, private forest management, most privately owned forestland is not managed and most landowners remain unaware of the available assistance and information. In addition, the primarily quantitative methods used have been criticized for producing diminishing returns and insufficiently updating survey instruments. Using mixed methods, this study, conducted in the Emory-Obed watershed of East Tennessee, examined how the meaning of PFLs’ experience of their forestland and their conceptualization of forest management, two variables previously unaddressed in the literature, relate to PFL management behavior.

PFLs formed strong personal attachments to their land related to the degree to which they actively engaged in forest management practices. The focus of the experience for actively managing PFLs is on the land, while the focus of the experience for non – actively managing PFLs is on the self. Private forestland was also experienced as place. Five components characteristic of the experience of forestland were identified. Strength of agreement that these components were meaningful and important was positively correlated to degree of PFL engagement in forestland management. Landowners conceptualized forest management as property maintenance, as creating and enhancing forest habitat and as making money. Strength of agreement that these components define forest management was positively correlated to degree of engagement in forest management activities. Most study participants believe they manage their forestland. Implications for professional forestry are based on recognizing the importance of the meaning of landowners’ experience of their forestland and their conceptualization of forest management to their engagement in forest management activities.

FULL ABSTRACT

Privately owned forestland accounts for the majority of forested land in the US and provides numerous ecological, economic and social benefits to its owners and society at large. However, numerous issues ranging from fragmentation and parcelization, to pressure from the forest products industry, to increasing land values for development and real estate interests threaten to “unravel” the forest landscape. Active management of forestland is seen as one way to combat such threats. Active management of private forestland has been linked to numerous factors such as private forest landowners’ (PFLs’) general education level and familiarity with forest management, their goals, interests, objectives, attitudes, values, beliefs, and socio-cultural identity and the size and tenure of their ownership, among others. However, despite numerous efforts to understand private forest landowners (PFLs) and their interests, goals and objectives in owning private forestland, and to educate them about, and provide assistance for, private forest management, most privately owned forestland is not managed and most landowners remain unaware of the assistance and information available to them. In addition, the primarily quantitative studies investigating how these factors relate to private forestland management have been criticized for producing diminishing returns and insufficiently updating survey instruments. Using a mixed methods study design, including both quantitative and qualitative approaches, this study, conducted in the Emory-Obed watershed of East Tennessee, examined how the meaning of PFLs’ experience of their forestland and their conceptualization of forest management, two variables previously unaddressed in the literature, relate to PFL management behavior.

Based on their experiences with their land, PFLs were found to form strong personal attachments to their land. Both the strength and the nature of these attachments varied relative to the degree to which PFLs actively engaged in forest management practices. The experience of those who actively engage in forest management activities is focused on the land and its condition, while the experience of those who do not actively engage in forest management activities is focused on themselves and how the experience makes them feel. Private forestland was also experienced as place. When these ways of experiencing forestland were quantified, a set of five components characteristic of the experience of forestland were identified: emotional connection to forestland, connection to nature via forestland, connection to family via forestland, forestland provision of PFL personal and financial gain, and forestland provision of financial investment. The more actively engaged with private forest land management PFLs were, the more strongly they agreed that each of these components was both meaningful and important to them.

Landowners also varied in the ways in which they understood the forest management concept. Landowners simultaneously conceptualized forest

management as property maintenance, as creating and enhancing forest habitat and as making money. As with the meaning of PFLs experience of their forestland, the more actively engaged in forest management activities PFLs were, the more strongly they agreed each of these components defined forest management. Lastly, the vast majority of PFLs participating in this study stated they believe they manage their forestland. This is in stark contrast to conclusions reported in the literature concerning the percentage of PFLs actually managing their forestland and is attributed in part to lack of standardization in the operationalization of forest management participation measures reported in the literature. Several implications of the findings for professional forestry practice, research, outreach and education are made based on recognizing the importance of the meaning of landowners' experience of their forestland and their conceptualization of forest management to their interest in and engagement in forest management activities. For example, as the findings indicate PFLs may not see a relationship between the ways their forestland is meaningful to them and their understanding of what it means to manage their forestland, forest landowner educational opportunities and events capitalizing on the strong personal attachments PFLs feel to their land and utilizing language similar to their own ways of speaking about these attachments such as, "Getting to Know Your Woods", "The Woods in Your Backyard: What's There and Why You Should Care" and "Having Your Cake and Eating It Too: Enjoying *and* Profiting From Your Forestland" may prove more effective than traditional programs.

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INTRODUCTION

Background and Context

Private forest landowners, traditionally referred to as non-industrial private forest landowners, and the forests they control are a significant component in the continued existence and health of US forestland. Definitions of non-industrial private forestland and landowners vary, but basically agree the land is privately owned (this may include incorporated bodies such as family partnerships), and excludes forest industry ownerships and leases. Non-industrial private forest landowners are also considered individuals owning forested land, but not owning, or operating, any wood processing facilities on the forestland property itself. Following Finley et al. (2001), these landowners are here referred to as private forest landowners (PFLs).

Private forest lands account for a significant proportion of forested land both regionally and nationally (Egan and Jones 1993; Best and Wayburn 2001). National estimates vary due to differences in measurement criteria and data sources, but reports generally conclude approximately 50 – 60% of the forested land in the US is in private, non-industrial, ownership (Egan and Jones 1993; Butler and Leatherberry 2004). In Tennessee, the Agricultural Extension Service reports 400,000 PFLs owning over 82% of the state's 10.5 million forested acres (The University of Tennessee Institute of Agriculture 2003). Nationally, and regionally, there is widespread recognition that the social and biological landscape of private forests are changing rapidly and experiencing increased, diverse, and novel pressures ranging from increased interest from the forest

products industry, to concerns over landowner succession, to increased societal value placed on non-commodity forest resources. Summarizing these concerns in their review of the state of America's private forests, Best and Wayburn (2001) conclude, "the forest landscape is unraveling." As private forestland is a critical and significant component of America's forested landscape, landscape level forest issues such as fragmentation, invasive species, fire management, and sustainability can only be addressed via improved management of both public and private forestlands and via improved communication between landowners and natural resource professionals. Improving both the management of private forestland and communication between landowners and natural resource professionals is the goal of the research presented in this dissertation.

Research Problem, Purpose and Justification

Management of private forestland is a concern for many reasons including, for example, the sheer amount of private forestland nationally and regionally, the many benefits this privately controlled resource provides to the public, the general lack of policies and policy integration pertaining to private forestlands, the acceleration of land value for real estate development relative to the decline in returns on traditional forest values such as timber production, and the belief that managed forestland is more likely to stay forested, and continue to produce numerous desired benefits, than un-managed forestland (Bourke and Luloff 1994; Best and Wayburn 1995; Best and Wayburn 2001; Bliss 2001; Wolff and Hirschhorn 2001; McEvoy 2004; Wilcove 2004). Active management of

private forestlands has been linked to factors such as PFLs' general education level and knowledge about forest management, awareness of assistance and education programs, size of ownership, ownership tenure, availability and appropriateness of economic incentives, socio-cultural identity, reasons for ownership, and individual attitudes, values and beliefs concerning forest management (Bliss and Martin 1988; Esseks and Kraft 1988; Kingsley, Brock, and DeBald 1988; Rosen and Kaiser 1988; Bliss and Martin 1989; Snyder and Broderick 1992; Kuhns, Brunson, and Roberts 1998; Best and Wayburn 2001; Finley and Jacobson 2001; Mater 2001; Erickson, Ryan, and DeYoung 2002).

Numerous studies have been conducted to increase natural resource professionals' (NRPs') understanding of PFLs with the goal of increasing PFL engagement in forest management practices. Natural resource professionals, for the purposes of this dissertation, include researchers, educators, non-profit and for profit individuals whose efforts pertain to forest management including social, ecological, and economic aspects. Studies investigating factors related to private forestland management have primarily been limited to quantitative, especially survey, efforts aimed at characterizing and predicting landowner forest management behavior as well as relating both attitudes, values, motivations and objectives for land ownership and forest management and demographic variables to forest management behavior. Qualitative efforts to inform survey creation, identify categories and variables of interest, and add context to quantitative findings have been limited.

Findings from these studies reveal most private forestland is not actively managed, and despite numerous outreach, education, and assistance programs offered by NRPs, most PFLs remain uneducated about, or unaware of, the benefits and importance of forest management. The findings also indicate most PFLs' primary forestland interests include recreation, forest protection, view-sheds, and other forest values traditionally referred to as "non-commodity" forest values. In addition, the traditional methods employed and questions asked in these studies, have been criticized for producing diminishing returns and for stagnation in methodology (Kingsley, Brock, and DeBald 1988; Bliss and Martin 1989; Argow 1996; English et al. 1997; Elmendorf and Luloff 2001; Finley and Jacobson 2001; Finley et al. 2001; Erickson, Ryan, and DeYoung 2002; Hull, Robertson, and Buhyoff 2004).

Traditionally these findings have been attributed to the constraints PFLs face in managing their forestland. These include for example, the costs of managing forestland, the time involved in managing forestland, and the practicalities of managing the smaller acreages held by the majority of private forest landowners. While these issues certainly may prevent many PFLs from engaging in forest management, concerns have also been raised regarding the degree to which PFLs receive and understand messages about the value of forest management and the breadth and depth with which NRPs understand PFLs. For these reasons, some authors suggest NRPs re-examine their understanding of PFLs and the potential connections between what they value in

their forestland and what NRPs can offer in forest management by employing new approaches and perspectives in research and program development (Bliss and Martin 1989; Parker 1992; Jones, Luloff, and Finley 1995; Best and Wayburn 2001; Erickson, Ryan, and DeYoung 2002; Steiner 2003; Best 2004; Butler and Leatherberry 2004; Davis and Fly 2004; Hull, Robertson, and Buhyoff 2004; Kittredge 2004; Finley and Kittredge Jr. 2006). It is suggested that new approaches utilize dialogic forms of interaction, recognize the diversity within the PFL population and target the specific needs and desires of distinct groups, and reflect landowners internal motivations for management (Bliss and Martin 1988; Isaacs 1999; McNamee and Gergen 1999; Erickson, Ryan, and DeYoung 2002; Kittredge 2004; Finley and Kittredge Jr. 2006).

An additional interpretation of these findings is to conclude PFLs are not disinterested in their forestland, but rather do not connect their understanding and perception of, or their conceptualization of, forest management with their interests in, and experience with, forestland. In other words, PFLs may not see a relationship between the ways their forestland is meaningful to them and their understanding of what it means to manage their forest. Two areas previously uninvestigated for their relationship to private forest landowner forest management are the meaning of landowners' experience of their forestland and their conceptualization of the term "forest management." Using a mixed methods approach, incorporating both quantitative and qualitative aspects, the purpose of this research is to increase NRPs' understanding of PFLs and inform the practice

of NRPs working with PFLs by examining the meaning of PFLs' experience of their forestland and their conceptualization of forest management such that NRPs are better able to engage PFLs in forest management and to identify opportunities and barriers for improved dialogue and practice with PFLs.

The meanings people associate with their experience of places and phenomena are useful in deepening and broadening one's understanding of others in regards to those places and phenomena, revealing previously undetected areas of importance, improving communication by revealing the language used to describe these experiences and their meanings, and understanding behavior (Creswell 1994; Pollio, Henley, and Thompson 1997; Creswell 1998; Stedman 2002; Creswell 2003). In addition, effective communication requires a shared understanding of terms and concepts. At least one author believes this is especially true when dealing with "emotionally sensitive topics such as the state and management of forest resources" (Lund 2002). Helms (2002a) contends greater consistency and clarity in the use of forestry terms has the potential for enhancing the science and practice of forestry, its education programs, and the effectiveness of dialogue between forestry and society regarding forest use. As a significant component of NRPs' practice with PFLs is ascertaining PFLs' interests and needs, and communicating with and educating them about forest management opportunities, benefits, and concepts, language, and language use, is an important area of interest in understanding PFLs' management of their forestland.

What language is used, and especially how it is used, also has important political ramifications within the field of forestry. “Successful implementation of national policies and international agreements requires a common understanding of what all terms mean” (Lund 2002). Stakeholders with varying agendas can and do use terms, and variations in their definitions, for political jockeying within complicated political debates over the use and management of natural resources (Gramling and Freudenberg 1996; Hull, Robertson, and Buhyoff 2004). In the complicated arena that is forest management, less division and more unity is needed if forests, especially private forests which have so far been outside the reach of national management policies, are to be managed successfully.

Structure of the Dissertation

This dissertation includes three parts, each written in manuscript form, describing three separate but related efforts addressing the research purpose. Given the relatedness of each separate effort, and the manuscript form of the dissertation, some redundancy in background material and literature review will be encountered by the reader. Part I addresses the need to understand PFLs better by applying a novel qualitative approach in forestry, phenomenology, to describe the meaning of landowners’ experience of their forestland. Part II builds upon Part I by incorporating qualitative findings concerning how private forest landowners’ speak about and conceptualize forest management into a quantitative effort relating variations in these conceptualizations to measures of PFLs’ engagement in forest management. In addition, forestry literature defining

“forest management” is reviewed as a comparative base. Part II also examines PFLs’ self perception of their engagement in forestland management, and its relationship to their reported forest management behaviors. Part III builds upon the qualitative efforts of Part I as well by incorporating findings concerning the meaning of PFLs’ experience of their forestland into a quantitative effort which then relates variations in these meanings and experiences to PFLs’ reported engagement with forestland management.

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PART I - UNDERSTANDING PRIVATE FOREST LANDOWNERS:
USING LANDOWNER EXPERIENCE TO IMPROVE
PROFESSIONAL PRACTICE

Introduction

The need to understand private forest landowners (PFLs) has received significant research attention especially in terms of applications to improvements in outreach and education efforts. Of particular interest has been the use of such an improved, or broadened, PFL understanding for the purposes of engaging greater numbers of PFLs in sound forest management practices especially as diverse pressures for a multitude of forest products and services are exerted on PFLs and the forestland they control. The reasons for such interest in PFLs, their forestland, and the relationship between the behavior of the former and the condition of the latter are well known and well documented (see Journal of Forestry October 2004 for a recent summary (see also Best and Wayburn 2001; Finley and Kittredge Jr. 2006). Significant factors include the fact that the majority of forestland in the U.S. is in private ownership, held by non-industrial private forest landowners specifically, here referred to as private forest landowners (PFLs) following Finley et. al. (2001), the fact that this land provides approximately 50% of the U.S. timber supply (Best and Wayburn 2001), and the rapidly changing and interconnected social and biophysical landscape of private forestland today (Best and Wayburn 2001; Hull, Robertson, and Buhyoff 2004; Kittredge 2004). Private forest landowners are a diverse group including, for example, real estate developers, timber investment organizations, hunting clubs, non-profit organizations, and private individuals or families sometimes referred to as family forest owners. The group here referred to as private forestland owners

(PFLs) includes individuals, families, and unincorporated private groups owning forestland, but not owning, or operating on the forestland, any wood processing facilities (Schweitzer 2000; Best and Wayburn 2001; Finley and Jacobson 2001).

Of particular concern, are the significant and rapidly increasing PFL population changes. PFLs increasingly own smaller and smaller parcels of land, are more frequently urban to rural migrants, are increasingly older, and increasingly place importance on aesthetic enjoyment, legacy values, and investment purposes rather than timber production (Butler and Leatherberry 2004). In addition, based on PFL participation rates in education and assistance programs, compared to numbers of individuals owning forestland, and anecdotal evidence from the field, the majority of PFLs can be considered non-participant private forest landowners. Non-participant PFLs are defined here as those landowners who are un-involved in forest management activities and un-represented in landowner assistance and education programs. Natural resource professionals (NRPs) have long known these landowners represent the majority of the PFL population and have long been frustrated in their attempts to reach them.

Despite numerous studies addressing these issues, extant methods for understanding PFLs yield troublesome and repetitive findings. Reports that non-commodity forest values such as view-sheds, family connections, recreation, and forest protection are among PFLs' primary interests are common across all studies. The data also reveal most private forestland is not under active

management, and the vast majority of PFLs are not aware of forest management in general or the availability of assistance programs (educational and monetary) pertaining to its practice (Argow 1996; English et al. 1997; Finley and Jacobson 2001; Finley et al. 2001; Erickson, Ryan, and DeYoung 2002; Hull, Robertson, and Buhyoff 2004).

Phenomenology, a combined philosophy and research discipline, is an appropriate methodological choice for addressing both the need to understand PFLs and some of the limitations in the findings and approaches of previous research. Phenomenology emphasizes the first person perspective and attempts to describe how individuals experience phenomena and the meaning of those experiences to them. It has been described as particularly useful in any field in which a “professional consultant seeks to discover the wishes and needs of a client” (Pollio, Henley, and Thompson 1997). By emphasizing the first person perspective, phenomenology allows the most salient aspects of an individuals’ experience to be revealed in their own words. This decreases the need for a priori assumptions on the part of researchers concerning significant constructs or variables. Emphasizing how individuals directly experience the world, rather than what they think about it, also significantly decreases the levels of abstraction required by participants in responding to questions about their forestland. The importance of experience in understanding the human relationship to forested environments has been emphasized by Schroeder (1996) who states, “If we want

to understand how people are related to environments such as forests, then we need to understand how people experience these environments.”

While many landowners have certainly been influenced by forestry outreach, and do manage their forestland well, taken together these factors and results suggest the time, energy and money spent reaching out to PFLs are not having as significant an impact among the broad PFL population as desired. They also suggest the standard research methods employed for understanding PFLs to date may be inadequate. Consequently, some authors contend natural resource professionals do not adequately understand PFLs and have called for new approaches and new perspectives in research and program development (Bliss and Martin 1989; Parker 1992; Jones, Luloff, and Finley 1995; Best and Wayburn 2001; Best 2004; Butler and Leatherberry 2004; Hull, Robertson, and Buhoff 2004; Kittredge 2004; Finley and Kittredge Jr. 2006). Others suggest “we have only begun to understand the implications” of the connections between PFLs’ values and the type of forest planning and management offered by NRPs (Erickson, Ryan, and DeYoung 2002). In an attempt to both address these issues and explore new approaches, this study employs phenomenological methodology to identify meaningful aspects of PFLs’ personal experiences with their forestland and uses these to inform the practice of natural resource professionals (NRPs) working with PFLs.

Previous Research and Approaches

Numerous studies attempt to quantify and qualify the values and interests of private forest landowners. The majority use quantitative survey approaches to characterize and describe landowners and their ownership patterns, and to assess landowners' attitudes, values, motivations, and objectives in owning and managing forestland. Landowner behavior has also been a major focus of this work (Bliss and Martin 1988; Esseks and Kraft 1988; Bliss and Martin 1989; Snyder and Broderick 1992; Kuhns, Brunson, and Roberts 1998; Finley and Jacobson 2001; Mater 2001; Erickson, Ryan, and DeYoung 2002). These studies emphasize descriptive statistics, prioritization of landowners' forest values, and the predictive ability of correlating PFL attitudes, motivations, and past behaviors with a variety of possible future behaviors and forest conditions. As the PFL population diversifies and increases, several authors have used such studies to create landowner typologies based on a variety of factors such as management dispositions, harvest intentions, likelihood to consider cooperating with peers, reasons for owning forestland, forestland values, motivations and objectives in holding forestland, and valued benefits of land ownership (Kurtz and Lewis 1981; Brunson et al. 1996; Kluender and Walkingstick 2000; Finley and Kittredge Jr. 2006; Salmon, Brunson, and Kuhns 2006). Typologies, which categorize PFLs and can be used to predict potential behavior, enable the targeting of outreach efforts to population segments with specific and identified needs.

Although qualitative approaches have been noted by NRPs and others for their ability to provide context, enhance understanding of quantitative results, inform survey creation, and provide information previously undetected by survey research alone (Bliss and Martin 1989; Elmendorf and Luloff 2001; Siemer et al. 2001; Creswell 2003), few qualitative studies have been conducted (Kingsley, Brock, and DeBald 1988; Bliss and Martin 1989; Mater 2001). Those conducted have tended to focus on the same types of questions and concerns as have quantitative efforts. Furthermore, while allowing greater flexibility in participant response than surveys, these studies relied primarily on semi-structured interview techniques designed to address particular areas of interest pre-determined by the researcher. Examples of such studies include interviews conducted concerning PFL management motivations (Bliss and Martin 1988; Bliss and Martin 1989; Bliss 1992) and focus groups conducted concerning the motivations and interests of retired PFLs (Kingsley, Brock, and DeBald 1988). Mater's (2001) interview study utilized similar methods, but branched out from previous research by addressing a new population with new questions. This work examined non-joiner PFLs' decision drivers for fragmenting or converting forestland.

As mentioned above, past studies reveal most PFLs are not currently engaged in forest management activities and/or are unaware of their importance, of the educational and monetary assistance available for them, and how to get information about them if they were interested. For example, Butler and

Leatherberry (2004) report only 13% of PFLs in the 48 conterminous states have sought management advice in the past five years. Furthermore, only 4% have a written management plan. In the South, slightly fewer PFLs have a written management plan, 3% comprising 20% of the total forestland, while a slightly greater percentage, 16% comprising 43% of the total forestland, have sought management advice. For Tennessee specifically, the Tennessee State Stewardship Plan states many Tennessee forest landowners are unaware assistance in managing their land exists (USDA Forest Service 1990, 1997).

The few qualitative studies conducted point to aspects of owning and managing forestland that might explain PFLs' behavior in addition to those traditionally examined via quantitative techniques. These studies suggest internal motivating factors for forest management such as values related to the ethical use of forest resources and aspects of personal identity experienced through forest management may be more important than external factors such as incentive, technical, and forest tax programs (Bliss and Martin 1988), that PFLs have difficulty identifying one single dominant reason for owning forestland (a common survey question) (Kingsley, Brock and DeBald 1988) and that land can be an extension of personal lifetime and identity (Bliss and Martin 1988; Wagner 2002). In concluding her interview study of non-joiner PFLs in Eastern states, Mater (2001) makes the following recommendations for improving PFL outreach; understand that perception is as much a fact as a fact itself, shift outreach messages, and rethink effectiveness of traditional conservation tools.

In summary, findings from previous research indicate PFLs are not disinterested in their resource base, but their interests are diverse and complex. However, approaches to studying these interests have been rather uniform relying primarily on quantitative survey techniques consisting of pre-determined questions and answer categories, and have begun to yield repetitive findings and diminishing returns. Results indicate little overall PFL involvement with the opportunities, programs and activities traditionally and consistently offered by NRPs. Furthermore, there is reason to question the continued relevance to PFLs of traditional NRP offerings, such as written management plans. For example, Kittredge (2004) notes that while landowners with plans are more likely to make informed decisions about their land, the need for such plans obviously does not resonate with the vast majority of private forestland owners.

Limitations of and within the traditional methods employed and questions asked in attempts to understand PFLs may provide some explanation for the findings described above (Kingsley, Brock, and DeBald 1988; Bliss and Martin 1989; Elmendorf and Luloff 2001). For example, Bliss and Martin (1989) note although more and more sophisticated data analysis methods are being used with survey data, questionnaires have remained largely unchanged over the last 20 years; a period during which some 200 such studies were conducted. A review of surveys conducted since then reveals although questionnaires may be analyzed for new areas of interest with new techniques, they tend to focus on the same basic sets of information as previously examined.

Survey methodology can also limit what is learned by requiring that both questions and answers are known a priori. Determinations regarding what questions and answers may be appropriate are generally based on previous studies and intuition thus limiting the ability for new insights (Bliss and Martin 1989). Certainly, repetitive findings over time can add greatly to a body of knowledge, however, information garnered in new ways regarding previously unexplored avenues is also necessary for moving understanding forward.

Natural Resource Professional Practice

Traditional forms of interaction between NRPs and PFLs are service orientated (Hull, Robertson, and Buhyoff 2004) consisting of expert-client style relationships in which NRPs convey information they deem relevant to PFLs concerning natural resource use and management. This approach stems from, and is influenced by, the profession's roots in 19th century utilitarian philosophy (Knight and Bates 1995) and has traditionally included an often unstated assumption that with education will come action. In other words, traditional approaches emphasize the role of the professional as expert advisor and "owner" of knowledge (Dukes 1996) and are based on a philosophy that educating PFLs and increasing their awareness concerning sound forest management practices will result in their greater engagement with such practices.

Two major models of information conveyance within this form can be identified. The predominant one, based on Rogers (1995) *Diffusion of Innovations* model, is knowledge dissemination through agencies and

Cooperative Extension specialists. The second is a combination of volunteerism, peer based systems, forest landowner associations and other similar ventures (Best and Wayburn 2001; Finley and Jacobson 2001). The two are often employed in concert with agency and Cooperative Extension staff partnering with private volunteers and citizen forestry associations to promote sound forest stewardship on private lands (Snyder and Broderick 1992; Egan and Jones 1993; Best and Wayburn 2001). The typical information dissemination modes used by these types of institutions are person to person, person to group, printed literature, meetings, and experiential learning through field and demonstration days. Currently, in an attempt to reach greater numbers and broader segments of the PFL population, many state, regional, and national efforts are underway to incorporate new information technologies into landowner education including satellite transmitted short courses as well as web-based resources (Extension Committee on Organization and Policy 2002; Jackson, Hopper, and Clatterbuck 2003).

Despite significant resources expended on outreach and education efforts, research results indicate a possible disconnect between PFLs and NRPs in terms of what type of information is most relevant and the best ways to make that information available and useful (Argow 1996; Bliss and Martin 1989; English et al. 1997; Kuhns, Brunson, and Roberts 1998). These types of disconnects were among the major findings of a pilot study conducted in the study area in the summer of 2001 (Muth et al. 2001). PFLs involved in a variety of land

management activities and/or who had a relationship with a natural resource professional(s), and natural resource professionals with responsibilities in the area, were interviewed about their experiences with forestland. These interviews revealed frequent mismatches between land management plans drafted, and/or recommendations made, by NRPs, and landowners' real objectives. These mismatches resulted in abandoned management plans and recommendations in favor of objectives not articulated to the natural resource professional at the time their assistance was sought (Muth et al. 2001). According to many natural resource professionals one cause is landowners' lack of clarity regarding their objectives. Some natural resource professionals indicated many landowners simply do not know what they want, or have not thought about their resources and objectives. However, landowners' interviews indicate strong ties to the land, strong feelings regarding view-sheds, forest health, forest protection, forest recreation, family connection, economics, and other issues (Muth et al. 2001). Focus group results involving the same individuals, as well as further literature, support these findings as well (Campbell and Kittredge 1996; Cordell et al. 1998; Pavey et al. 2007). These findings suggest mis-matched and/or abandoned management plans and recommendations result from communication problems between NRPs and PFLs rather than PFLs lack of interest in, or thought about, their land. In other words, NRPs are either not able to extract or interpret from landowners the meaningful aspects of their land in ways they can understand

and act on, and/or PFLs are not able to articulate these meaningful aspects of their experience to NRPs in ways NRPs can understand and usefully interpret.

Several possible reasons for these disconnects and other difficulties in further engaging PFLs in forest management have been identified in the literature including those regarding the impact of the way in which the field of forestry developed, those regarding the need to build bridges between the concepts of forest management and landowner interests, and those regarding how NRPs can address the diversity within the PFL population. Knight and Bates (1995) suggest such issues stem from the development of professional forestry during an era “which assumed needs and conditions different from those that exist today.” Cortner and Moote (1999) note the legacy of such development is viewing private forestry as a problem to be solved through expert description, research and prescribed solutions. The result is the promotion of linear cause and effect thinking as a rationale for action rather than relational or dialogic styles of thinking and solution generation which have far greater potential for more equitably including and respecting PFLs’ views, experiences and interests (Isaacs 1999; McNamee and Gergen 1999). Kittredge (2004) proposes that for many PFLs, forestry, as thought of by NRPs, is not on the forefront of their minds, while privacy, recreation and enjoyment of nature are. With private forest land “running in the background” so to speak, the challenge to NRPs is where to focus their efforts and desires to connect more PFLs with forest management. Some authors suggest it is precisely these strong ties or connections to land,

family, and lifestyle which natural resource professionals must leverage in order to get their messages concerning sound forest management across. Hull, Robertson and Buhyoff (2004) note that effective messages are those that are able to convince PFLs forestry can be practiced in ways that “enhance the amenity and ecological qualities” in which they are primarily interested. After finding that “receiving government compensation for retaining one’s woodlots” was the least likely to motivate landowners in Michigan to retain and/or protect their forestland, while aesthetic appreciation and environmental protection were the most likely to motivate retention and/or protection of forestland, Erickson, Ryan, and DeYoung (2002) comment “we have only begun to understand the implications of these connections in terms of planning and management.” They go on to suggest “program planners need to be aware of what landowners really value in their woodlands” and programs need to be linked to opportunities for “creative management” such that these connections between management and aspects of value are made explicit to the landowner (Erickson, Ryan, and DeYoung 2002). Similarly, Bliss and Martin (1988; 1989; 1992) suggest programs and policies reflecting internal motivating factors for forest management such as those relating to manager identity and the ethical use of forest resources may prove more effective in motivating PFL involvement in forestland management than programs and policies relying on external motivators such as financial incentives alone (Bliss and Martin 1988). Lastly, some authors suggest we develop approaches that recognize the diversity

among PFLs and tailor programs to meet the needs and desires of specific population segments rather than trying to appeal to the needs of the “average” forest landowner (Kittredge 2004; Finley and Kittredge Jr. 2006). Such approaches may help “refine our understanding” of PFLs and develop the “more enlightened opinions and effective policies” noted as necessary by Butler and Leatherberry (2004) if we are to reach and engage greater numbers of PFLs in sound forest management (Butler and Leatherberry 2004).

In summary, traditional forms of natural resource professional practice and landowner outreach have been effective in many ways. However, in the face of an increasing and increasingly diverse PFL population, current research indicates this effectiveness may be waning and new approaches are warranted. It is suggested that new approaches utilize dialogic forms of interaction, emphasize creativity in making connections between what landowners value and the management practices that may achieve these objectives, recognize the diversity within the PFL population and target the specific needs and desires of distinct groups, and reflect landowners internal motivations for management (Bliss and Martin 1988; Isaacs 1999; McNamee and Gergen 1999; Erickson, Ryan, and DeYoung 2002; Kittredge 2004; Finley and Kittredge Jr. 2006).

The purpose of this investigation is to demonstrate how NRPs’ understanding of PFLs can be increased and the effectiveness of their outreach efforts improved by using a phenomenological approach to describe how PFLs experience their forestland and the meaning of these experiences to landowners.

The phenomenological approach is used to elucidate the meaningful aspects of PFLs' experiences with their forestland such that NRPs can tap into these most salient aspects of the PFL experience and better connect them with the services they have to offer. A brief presentation of the phenomenological tradition follows, as well as a description of the study's research methods. Findings from interviews with 15 PFLs representing two groups, both those actively involved with forest management and those not involved, are presented and interpreted with respect to understanding PFLs and informing NRP practice.

Research Approach

Although new to private forestland research, phenomenology has been employed across diverse disciplines including sociology, psychology, education, health sciences, and nursing (Polkinghorne 1989; Valle, King, and Halling 1989; Creswell 1994; Pollio, Henley, and Thompson 1997; Thomas and Pollio 2002). Similar approaches have been applied in natural resources research via attempts to understand how individuals experience wilderness (for example Patterson et al. 1998; Pohl, Borrie, and Patterson 2000; Johnson and Hall 2002). The methodological components, as well as the underlying philosophical tenets of phenomenology, make it a particularly good fit for increasing understanding of PFLs in new ways, and for informing the practice of NRPs working with these landowners.

Phenomenology can be varyingly defined and understood depending upon how one traces its development through the thoughts of philosophers such as

Kierkegaard, Husserl, Kant, Merleau-Ponty and others, how one emphasizes the relative contributions of these individuals, or which particular version of phenomenology one subscribes to, and one's aim. All agree however, that phenomenology has components of both philosophy and experimental science (Ihde 1986; Valle, King, and Halling 1989; Creswell 1994; Pollio, Henley, and Thompson 1997; Thomas and Pollio 2002). The particular form of phenomenology followed here, often labeled "existential phenomenology", most closely resembles that put forth by Pollio, Henley, and Thompson (1997) and Thomas and Pollio (2002). The latter define this form of phenomenology as a blend of the philosophy of existentialism and the methods of phenomenological psychology, or the phenomenology of perception, resulting in "rigorous and richly nuanced descriptions of human life" (Thomas and Pollio 2002).

Simply put, phenomenology is the study of experience. Attending to experience, rather than behavior alone, signifies viewing a person not as an object, but as a subject that is constantly aware, or conscious, and interacting with the world (Bugental 1989). For example, Pollio, Henley, and Thompson (1997) explain phenomenology "does not view experience, (or consciousness in more technical terms) as a consequence of some internal set of events as mind or brain but as a relationship between people and their world" As such, phenomenology expands the types and range of PFL issues which can be addressed.

Methodologically, phenomenology involves the collection and analysis of rigorous and richly nuanced first person descriptions of participants' experiences to develop patterns and relationships of meaning regarding the phenomenon of interest, in this case the experience of one's own forestland. In favoring first person descriptions of lived experience over theoretical analyses and cognitive explanations of human existence and behavior, phenomenologists attempt to minimize the distance between representations of the world presented by researchers through their analysis, and the world itself as experienced by individuals. This follows from the phenomenological assumption, "what I am aware of reveals what is meaningful to me" (Thomas and Pollio 2002). In other words, phenomenologists attempt to capture the aspects of individuals' experiences that are most meaningful to them by collecting rich and thick first person descriptions of significant experiences because what is significant, or what stands out, to an individual about an experience reveals what is meaningful to them about it. As such, the goals of phenomenology are to determine what these significant experiences mean for the persons who have had them, and reduce those experiences to a central meaning, or the "essence" of the experience. The central meaning, or "essence" of the experience of the phenomena in question, can then be used by individuals in their professional practice, or work, pertaining to those phenomena with individuals and others experiencing the same phenomena.

Phenomenological interviews have a descriptive and facilitative purpose rather than one of assessing a pre-existing opinion, attitude, or level of knowledge (Pollio, Henley and Thompson 1997). The interview is unstructured and conversational with a single initial question to prompt description of the experience. “What” questions are used to facilitate description rather than analysis (“why” questions), such as “What stands out to you about x phenomenon?”, or “What was it like for you when . . . ?” (Pollio, Henley, and Thompson 1997). Further questions follow on the comments of the participant in order to draw out full descriptions of the experience and clarify what has been understood by the researcher to be figural, or to stand out, to the participant about the experience (Polkinghorne 1989; Pollio, Henley, and Thompson 1997; Thomas and Pollio 2002. See Findings, Introduction for further explanation of the use of the term "figural"). Interviewing continues until additional participants’ experiences support those already collected without adding significant new aspects to the description of the experience as a whole. Appropriate sample size is considered six to twelve individuals. However, sample size is not predetermined, but adjusted as the study proceeds based on the study’s needs (Thomas and Pollio 2002). For example, “if redundancy is evident after hearing the narratives of six participants, the researcher may decide that it will not be necessary to interview an additional four or six” (Thomas and Pollio 2002).

The specific analysis methods followed here reflect those developed by the Center for Applied Phenomenological Research (CAPR) at the University of

Tennessee (Pollio, Henley, and Thompson 1997; Thomas and Pollio 2002). Analysis takes place within a phenomenological research group composed of researchers representing diverse disciplines. Representative study transcripts are read aloud, specific sections that stand out as significant to the experience are noted and their meaning assessed. All interpretations must be supported by the participant's words, individually and collectively, and are continuously challenged until group agreement on the interpretation's support within the text is achieved. Significant effort is made to set aside overly theoretical interpretations, even if they seem plausible and achieve group agreement, until they can be supported or refined by thematic meanings more closely tied to descriptions of experience taken directly from the text(s).

Eventually, commonalities in experiential significance are identified across transcripts resulting in themes representative of the experience for the participants as a whole. Theme names are derived from words taken directly from interview transcripts in an attempt to present them in an "experience-near" vein as possible. Text supporting these themes is gathered from the transcripts to validate and verify the thematic analysis. This thematic analysis is then presented to the phenomenological research group who assist the researcher in finalizing and validating the study themes helping to ensure they accurately describe the meaning of the phenomenon as expressed by the study participants. At this point, a thematic structure, or figure, showing the relationship of themes to one another, may be constructed in an effort to fully

capture and express the meaning of the experience as a whole. Lastly, study participants themselves review themes and findings, a process known as “member checking.” If the themes are valid and accurate, participants should be able to locate their experience within them, and say “Yes! Yes, that’s exactly what it’s like!” (Thomas and Pollio 2002).

Research Methods

Study Area

The Emory-Obed watershed in eastern Tennessee covers approximately 878 square miles between the eastern edge of the Cumberland Plateau and the western edge of the Cumberland Mountains. While portions of seven counties are included within the watershed boundaries, the area primarily consists of Morgan County (approximately 80% included) and Cumberland County (approximately 75% included). Twelve rivers and streams, totaling 1340.3 total river miles, comprise the watershed’s river system. Two major creeks in the western portion of the watershed, Daddy’s Creek and Clear Creek, flow generally north and east draining into the Obed River in Cumberland County. The Obed River continues flowing eastward connecting with the Emory River in Morgan County. The Emory River drains east and south over the edge of the plateau and into the Clinch River which eventually joins the Tennessee River (US EPA US Environmental Protection Agency 2002). Figures 1 and 2 depict the watershed’s location within the state and geographic details (all tables and figures appear in the appendices).

Forestland in the Emory-Obed is primarily an upland mixed hardwood (oak-hickory) forest with some mixed pine-hardwood stands. Pine, mountain laurel, maple, hemlock, rhododendron, and azalea are also commonly found (National Park Service and Tennessee Wildlife Resources Agency 2001). Although the rugged terrain and poor soil made the plateau unappealing to large numbers of settlers, and thus indirectly served to protect it from significant development until relatively recently, those that did settle and farm the land had a significant impact on the landscape. Low lying and relatively flat land adjacent to rivers and streams was converted to crop land. The upland forests were repeatedly high-graded and allowed to naturally regenerate. This process has left the forests in a relatively degraded condition, especially in terms of their timber value to owners. However, as the area was never densely populated, and as subsistence farming waned throughout the last century, the watershed remains a predominantly forested landscape. Wildlife in these forests is abundant including over 100 bird species, bobcat, beaver, raccoon, mink, whitetail deer, rattlesnakes, and copperheads (National Park Service and Tennessee Wildlife Resources Agency 2001) including several US Fish and Wildlife Service Threatened and Endangered plants and animals (American Rivers 2002).

The watershed exemplifies many of the current issues facing private forestland and private forest landowners. While historically the area included industrial ownerships in the form of pine plantations and other commercially

harvestable lands, very little, if any, industrial forestland remains. The majority of the remaining land is in non-industrial private ownership. In addition to the large proportion of privately owned forestland in the watershed, several public landholdings are present including a Wild and Scenic River administered by the National Park Service, a state park, two state forests, a state-managed Wildlife Management Area, and two correctional facilities. Lingering negative feelings and distrust of government amongst residents in the area date back to government take of private land and the perceived under valued sales of private lands to the government when these public land areas were created. Subsequently, residents are resistant to further public land designations in the area. In Morgan County, lack of property taxes contributed by this land to communities, and the very concept of “public” land which community members have historically had free access to and now must use following public rules, have also been sources of contention. These issues among others have contributed to a history of distrust of outsiders, “experts”, and especially the government (Pavey 2003; Pavey et al. 2007).

Much of the historically non-industrial private forestland in the watershed is relatively degraded in terms of timber value to PFLs due to past high-grading practices and the results of a Southern Pine Beetle outbreak during the last decade. In addition, much of the area remains economically depressed as it struggles to transition from a traditionally resource extraction based economy focused on timber and mining. The revenue and subsequent quality of life

generated from these industries has yet to be replaced, however due to the low cost of living, lack of a state income tax, and the many natural amenities of the area, the watershed, and the communities within it, increasingly attract attention as locations for wildland recreation and retirement and other home and land development projects. As a result, some local politicians, business people and residents would like to see industry return to the area and actively try to recruit companies to settle there, while others fear these efforts threaten community integrity, scenic beauty and environmental health (Pavey 2003; Pavey et al. 2007).

Data Collection

Study Participants

Study participants were identified via a telephone screening survey consisting of nine questions regarding respondents' level of engagement with forest management activities on their forestland (labeled "activity" attributes) and level of participation in landowner educational opportunities, assistance programs, and groups (labeled "participation" attributes). Activity attributes were defined as having 1) planted trees, 2) used chemicals pesticides or fertilizers on forestland, 3) planted vegetation or food plots to encourage wildlife, 4) had a timber sale, and 5) plans to sell timber in the future. Participation attributes included 1) participating in a PFL educational event, 2) participating in a PFL organization, 3) having sought advice or assistance in managing or using forestland, and 4) having a written forest or wildlife management plan.

Calls were placed to all PFLs in a 36 square mile block owning greater than 10 acres of “woodland” according to property tax records. Two-hundred fourteen PFLs with identifiable phone numbers were contacted. Ninety-one PFLs completed the telephone survey for a response rate of 43%. “Non-participant” PFLs were defined as those who indicated they had not engaged in any of the nine activity or participation attributes listed above. In contrast, actively managing PFLs were defined as those landowners who responded positively to three or more of the “activity” attributes or three or more of the “participation” attributes. Table 1 summarizes these attributes and their distribution among study participants.

A total of 18 non-participant PFLs willing to be contacted again for further aspects of the study were identified. Eight of these individuals were recruited to participate in interviews. Three other individuals were recruited via the snowball method through a community gatekeeper identified during a community visit. All these individuals were screened in person via a paper equivalent of the telephone survey to verify their categorization as non-participant PFLs. Of these 11 individuals, seven became study participants. Two of the recruits identified via the snowball method did not qualify as non-participant PFLs when screened. The interviews of two additional recruits were unable to be transcribed for analysis.

Five of the non-participant PFL interviewees are male, and two are female. Five (4 male; 1 female) were resident landowners, and two (1 male; 1

female) were absentee landowners. For the purposes of this study, a resident landowner is a landowner who lives within one hour's drive from their forest land property. Although phone survey demographic background questions were limited to gender, age, and ethnicity, information related to employment status and life history was generally revealed during the interviews. Based on this information, all of the men had grown up either on the land they owned in the study area (one), in the study area or very nearby (three), or in the East Tennessee region. The resident female landowner had grown up in the study area, and the absentee female landowner had grown up in East Tennessee while her husband had grown up on the property she owned in the study area. Two of the resident male landowners' careers had taken them away from the area, but in retirement they had made a conscious choice to return. They remained active either keeping up their homes and property, or with small local jobs that kept them busy and kept money coming in, or both. Three (two resident, one absentee) of the men were still working fulltime. Two worked on the Cumberland Plateau within 20 – 30 minutes of their current residences and forestland, while the third, the absentee landowner, lived and worked approximately one and half hours away in the region's largest metropolitan center. Both women are widows, one a retired school teacher, and the other's employment history is unknown although she did not now work outside her home at the time the interview was conducted.

Seventeen active PFLs willing to be contacted again for further aspects of the study were identified. Seven of these individuals were recruited to participate in interviews. An eighth participant was identified via the snowball method by natural resource professionals working in the area.

Seven of the active PFLs interviewed are male and one is female. Five (all male) were resident landowners, and three (two men, one woman) were absentee landowners living approximately an hour and a half away in the region's largest metropolitan area. All of the active landowners, except one resident male landowner, had grown up in the East Tennessee region (two), or the study area or adjacent Cumberland Plateau counties (five). The one resident but non-locally raised landowner had lived and worked in the north and chosen to retire and own forestland property in Tennessee where he could pursue his interests in privacy, outdoor recreation and wildlife viewing and hunting. Six of the men were retired from their original careers, one was on disability. All except the one non-locally raised resident landowner had also spent their working lives in the region, study area or adjacent counties as well. The absentee female landowner's work history is not known. All of the male active landowners were involved in various civic and church activities, forest and wildlife management activities and/or organizations. One was building a home on his property which he intended to also be a Bed and Breakfast facility. The female absentee active landowner was a frail elderly woman who had suffered a stroke within a few years of the interview. She lived with her son in the region's largest metropolitan

center. Her connection to her forestland was that it was the site of her childhood summer home, and the intended location for her and her husband's retirement life, however, her husband passed away before their retirement dream came true. Both her husband, and then her son helped her manage the forestland and had been involved in various forest management practices.

Interview Methods

Interviews were scheduled during follow up phone calls with those survey respondents indicating a willingness to be contacted again for further work. To begin the interview, study participants were asked to "Think of two or three experiences that stand out to you of a time when you were on your forestland, and describe the one that stands out the most." Interviews proceeded from this initial prompt based on respondents' narratives as per the previous description of phenomenological interview methods. Interviews were tape recorded and transcribed verbatim and lasted from 30 – 120 minutes. They were then analyzed for themes describing the meaning of landowners' experiences of their forestland in two separate batches; non-participant PFLs and actively managing PFLs in order to discern possible differences in the meaning of land to PFLs based upon their level of participation in forest management practices. Analysis procedures followed those previously described for the phenomenological approach.

Findings

Introduction

Results of the thematic analysis for each group of landowners interviewed are presented separately below. Six major themes describe the ways in which non-participant PFLs experience their land: 1) Connection, 2) Continuity, 3) Power and Awe, 4) Peacefulness and Frustration, 5) Value, 6) Freedom and Control/Constraint. Five major themes describe the ways in which the active PFLs experience their land: 1) Natural/Un-natural, 2) Being With / Part of It, 3) Continuity, 4) Pleasure, 5) Freedom to Choose and to Be.

Themes are briefly described below including examples of supporting text, as direct quotes, from participant interviews. Participants' slang, grammar, pronunciation, colloquial terms and speech patterns such as repeating words or the use of spacers such as "uh" and "ahm" have been preserved so as to more accurately depict their experiences. Ellipses (. . .) are used in place of text not critical to the illustrative elements of the included sections of participant interviews. Brackets are used in places where descriptive comments from the interviewer concerning the setting, the emotions expressed, interruptions, etc. are necessary for fully conveying the meaning of the text. Shorter quotes are included within the thematic descriptions. Longer excerpts are set off from the descriptions by the use of indents.

Throughout this description, the term "figural" is used to denote those aspects of participants' experiences that most stand out to them, or are most

significant in their experience of land, and therefore most closely describe the meaning of it to them. The use of this term derives from the phenomenological tenet that personal existence is experienced as a type of “standing out” against a background (Thomas and Pollio 2002). Recall, “what I am aware of reveals what is meaningful to me” (Thomas and Pollio 2002). The terms “figure” and “ground” are used to describe the way in which what is significant in our experience stands out as “nearer, having a definite pattern, and easier to name and describe.” This is the “figure” or the “figural” aspect of the experience. What is experienced as “further away, somewhat indefinite, and relatively more difficult to describe except perhaps” in contrast to what is figural, is referred to as the “ground” (Thomas and Pollio 2002). According to Merleau-Ponty, “the perceived ‘thing’ . . . is always perceived as having a certain *figure* or form against a background” (Thomas and Pollio 2002 citing Moran 2000).

Although the reader may notice more than one theme is often embedded within participants’ statements, one theme is generally more figural than another within any description of an experience. As such, supporting text is arranged based on the theme most figural within it. It should be noted that although themes are necessarily described individually below, it is the relationship amongst themes that most fully describes and summarizes how each of these landowner groups experience their land and the meanings these experiences have for them. Figure 3 provides a graphic representation of these thematic relationships in an attempt to assist the reader in appreciating them.

Non-participant PFLs

Connection. Connection is the central theme in non-participant private forest landowner respondents' experience of their land, forming the core and starting point of their experiences. For these NP PFLs, private forestland facilitates connections. Their land is a physical embodiment of psychological ties, much as a memento, or a special object, embodies a person, place, or time. In this case, land has the ability to bring people, memories, times, activities, shared moments, etc. to the fore. Land provides a psychological nexus through which these connections become figural to the landowner. In turn, the land itself becomes figural to the landowner via these connections.

Within Connection, several sub-themes emerge including Connection to Family/Others, Connection to Place, and Connection to Nature/Communion. Connection to Family/Others is summarized well by one landowner's statements, ". . . we go back there and share that together." and ". . . we all participated in it." These NP PFLs are connected to others through the land, and connected to the land through others. The land is a vehicle or tool that facilitates these relationships.

Connection also means to experience an intimacy with nature leading, at times to a sense of communion. NP PFL respondents tended to find this intimacy or communion positive and rewarding. The following two quotes provide examples.

". . . I think being close to the river makes it special. . . ."

. . . there was a coon down there at the pond, and I could go down and sit down on the dam and ah it just come right up to the, you know right in front of me, . . . I just sit, sit real still and watch it until they go on. But I like, I like that kind of stuff. . . . I mean it would be fine with me if I could get close enough to pet 'em you know. The closer I get the better, the better I like it.

Connection to Place is strong as well. The land itself becomes a nexus for these landowners' memories and serves as a physical representation of ties to ancestors and future generations. In this way, the land becomes a place of self genesis and return. Being in this place, enables NP PFL respondents to be with people, and experience times, that are gone. For example,

I was raised on this property. . . . it was uh handed down through like three generation so uh the family members all kept comin' back there.

I was raised in Tennessee . . . on a small farm. . . And then when I was 18 years old, I left and went to uh, Baltimore. . . I stayed, I worked for them for 30 years. I retired and I stayed up there for six more years. . . . I always wanted to come back you know to farm somewhere. . . I just love to, love it out here you know it's; I'm more satisfied here than any place I've ever been. . . . best thing to bein' in heaven, bein' in heaven.

Continuity. Non-participant PFL respondents find continuity in their land in two ways; personal and natural. Continuity in Nature captures the way these PFLs experience their land as an entity that lives, dies and is reborn again. For example, “. . . it had pretty much healed itself by the time we went back up there.” They also recognize that life and death are not just cyclical, but integrated, sometimes existing simultaneously as “there's always something living in those dirt piles.”

Personal Continuity primarily means to extend one's own life time by passing on land to children and/or grandchildren. However, passing on land is far more than a physical real estate transaction. The land is a conduit through which the owner passes on their own experience of it. In the following quote, the landowner passes on not only her literal experience of digging up plants, but also her love of the activity.

I have dug up ferns and, and brought to the house to set out and now I have a granddaughter that does the same thing. She, she doesn't live here . . . she goes out and does pretty much what, what I've done. And loves it.

Power and Awe. For these non-participant private forest landowners their land possesses the power of nature. Landowners are both humbled and awed by this power revealed to them through their land. They describe their experience as follows:

“. . . it was a sad feeling and yet it was, it was uhm, an awesome feeling to see those big trees fall. . . “

And the next thing I guess was the winter of '93. Came a big snowstorm, I don't think there was a road in the county that wasn't blocked off. Electricity was off for a week; 6 days really. . . . I had asthma at that time real bad, and I couldn't hardly do anything. I couldn't get out and start up the driveway and I guess there was a dozen or more trees across the driveway. Got one out and that was as far as I could go the snow was that deep anyway. The fire hall finally had to come in after about three or four days they finally came in and cut the driveway out for me.

The woods'll make you feel small. You just think how long the trees and everythin's been round, and how long you been round. How much space you take up, how much space they take up, hey, most individuals will never make a mark in this world . . . never make a mark on it.

Peacefulness and Frustration. For non-participant PFL respondents, the experience of land has both peaceful and frustrating aspects. These are opposite ends of the same spectrum in terms of relating to the land, hence both aspects can be captured in one theme.

Experiencing the land brings great peace, comfort, and pleasure. To be on the land is to experience relaxation, and a “sense of stillness” as one landowner described it. The land itself is depicted as a peaceful place, or as being able to bring peace to the landowner. The following quotes further illustrate the peaceful aspect of this theme.

“. . . it, it brings just, it just brings uh uh a peacefulness, a joy. It’s relaxin.”

“. . . oh when you have a bad day, you can walk those those woods and, you know, those fields and whatever and it just seems to clear your mind of a lot of things. . . . “

“. . . but it’s peaceful, peaceful and quiet.”

“. . . It’s just very quiet, peaceful, trees, grass, birds, squirrels. It’s very nice . . . Just simple pleasure.”

While experiencing the land can bring great peace, being a landowner means having to deal with “headaches” stemming from responsibility, negotiation with others, and decision making. In addition to serving as a conduit for positive connections to others, ownership of land can also create friction. For example, one landowner experienced a great deal of frustration with the federal government during a boundary dispute. At other times, land can throw annoying obstacles in your way, and bring down your hard work and fences. The land can

also lay waste to well made plans. Participants describe the Frustration aspect of this theme below.

“Well, sometimes I think it wouldn’t be any of these headaches. [Laughs]. . . . if someone wants to buy it it gets real involved.”

There was some good stands of timber and stuff on it, but the pine beetles, there’s nothin’ left now. [Laughs]. . . . Well, I, I was planin’ on usin’ part of it for my retirement [laughs], but it just didn’t work. [Laughs]. . . . We lost the other, we probably lost, probably \$100,000 worth. . . . Well I hate to see, I hate that’s the way it is. . . . I mean you saw dead trees, I mean [laughs] it’s just a big log pile, log pile, I mean everythin’ just fell down crossways. I had about two mile of fence and all of it’s down.

“. . . dead trees all over the place. Can’t hardly get through the woods anymore.”

Value. To be a non-participant landowner in this study means to experience your land as of value; to get something out of it. That something is diverse, but the value laden and intense nature of it is common. Value came from ways in which landowners use the land, including for its monetary value, to statements that their sense of enjoyment of the land was worth far more than any amount of monetary value it may hold. NP PFL participants described using and valuing their land for farming, for retirement income, for investment purposes, for recreating, for gathering with friends and family, for the enjoyment of puttering around outside and keeping busy, for the pleasure of being on the land, for relaxation, for refreshment, for wildlife viewing, etc. This theme is supported as follows.

I’ve been cuttin’ timber off of it off and on, swag cuttin’ I guess you would call it. . . . well, it’s just ah, it’s just another income, . . .

another income. It's somethin' to do. And I like to be outside, like to be doin' things.

Well, uh some of this is diversification of investment. Uh I do have uh various other investments in things. I would say that the land honestly probably gives me more pleasure than the others just uh and I'm not sure why. . . I don't know; it's emotional. . . . It's an esoteric thing owning it. . . . that's a gorgeous part of the world and it's a really pretty piece of property. It's very nice in there so uh but really it's more the uh just the value, just knowing that it's there, I don't know . . . really far beyond any kind of monetary worth, I guess.

It was just a, a sweet, um lovin' time.

Freedom and Constraint/Control. As with the Peacefulness and Frustration theme, Freedom and Constraint/Control are two poles along the same spectrum of the meaning of the experience of land for these non-participant landowners. The three concepts, Freedom, Constraint, and Control are also intricately entwined. To be a non-participant private forest landowner in this study means to be free to do, or not do, as you please, and/or to decide, or not decide and let be, as you please. Ironically, to decide freely is to be in control; two seemingly juxtaposed qualities. However, respondents seek out and desire both these aspects of the experience simultaneously. For example, it is only within the constraint of socially prescribed property boundaries or borders that NP PFL respondents can experience such freedom. However, within these borders they describe strong desires to control what happens, including the desire to keep nature from getting out of control. Many of the landowners in this study frequently mentioned fence lines, boundaries, and borders. Maintaining one's line in the sand between freedom (inside your property) and the absence of

freedom (outside your property) occupies much time and thought for the non-participant private forest landowners interviewed. Freedom, Constraint, and Control can be seen in the following descriptions of the experience of land.

“. . . it’s just like a bird loose when you go there, . . . you’re just free to do. . . .”

“I don’t have to do anything one way or the other.”

Where most people have to go to a park to do that, you know . . . we didn’t even have to do that, you know. We was fortunate enough to be able to do it on our own and go where we need to and uh you know, and do things that we really like to do without even, without any interference at all. . .

. . . we still like the surroundings to be as much as it could like it used to be. . . . I would just like to be able to go out there and see that land in the same state it was then. Of course, it won’t always be that way and it’s not always that way but uh as much as it could possibly be.

Active PFLs

Natural vs. Un-natural. A keen awareness of the condition of the land as either “natural” or “un-natural” is the central theme describing how PFL respondents’ involved in forest management activities, groups, or educational opportunities experience their land. Immediately following this awareness, to the point of almost overpowering the ability to recognize their direct experience of the land, was a personal judgment about what naturalness and un-naturalness mean and how these two conditions made these landowners feel.

Naturalness was clearly the preferred state and was associated with harmony, balance, and respect for the land. Examples of these sentiments include “I’d like to see a lot more of it left natural”, “. . . it’ll kindly take care of its

own”, “we had pretty good harmony I guess you would call it”, “I’d want it to grow back natural”, and “he was quite a respectful farmer”. Un-naturalness was condemned and associated with waste, degradation, human disturbance and emptiness. Examples of these sentiments include “the land was forested you know undisturbed relatively” compared to “. . . we saw how the land had been mismanaged”, and “Now, that’s, that’s a waste of land in my opinion. All it is is plant, harvest ever’ what 25 years, somethin’ like that and there’s there’s nothing there for you, . . . there’s nothin’, there’s nothin’ there. Nothin’ there for the wildlife.”

Another example of the way natural and un-natural were experienced is seen in these landowners’ responses to different types of forest disturbances. Although many of these landowners expressed great sorrow and a sense of loss over forest damage from natural disturbances such as storms, they accepted these “natural” processes and respected their role in forest evolution. However, forest damage, such as that wrought by the Southern Pine Beetle, resulting from the perceived poor management practices of humans was experienced with not only a sense of loss but a sense of anger and even betrayal.

This awareness and sense of natural and un-natural conditions on, and processes and/or treatment of, the landscape formed the basis for a land ethic these active forest landowners repeatedly expressed about living on and with the land. This land ethic had a strong moral component to it. One respondent’s expression, “the law of the land,” meaning doing things not only in accordance

with legal policies such as for hunting, but also according to what the resources demand from you in terms of proper treatment, captured a sentiment expressed by all the active PFLs interviewed. In other words, as several landowners expressed you eat what you kill, you put back what you disturb, you plant what you cut.

This ethic establishing the proper way to treat the land and nature (that being the “natural” way) bleeds into how one should interact with other people, or the preferred mode of personal conduct, as well. For example, naturalness, natural processes, and natural, and thus desirable or preferred, ways of working with the land were most often associated with locals and with forest or wildlife management for the benefit of the resources themselves, or personal use and enjoyment, rather than for the use or benefit of outsiders especially that related to the profit making exercises of timber companies. Un-naturalness, un-natural processes, and un-natural, and thus negative, ways of working with the land were most often associated with outsiders, including other/newer landowners with different values and ethics, and with use, abuse, and exploitation of resources usually having to do with profit making exercises and hunting exclusively for trophies irrespective of wildlife management needs. As an example, one landowner recalled the colloquial term “starvation sticks” used by locals for the products outside timber companies paid them to harvest from the land.

Being With / Part of It. This theme is similar to the theme of Connection for non-participant PFL respondents, including the sub-themes connection to place, to others, and to nature, but for active PFLs the meaning of the experience of land goes beyond a connection to an inseparability of self from land. It is this distinctive aspect of the theme that is explored here. For example, note the italicized words in the following illustrative quotes. “It’s something that *gets into* you.” “I’m *real bonded* with the place today.” “I’m *right here with* this.” Active PFLs’ choice of words here reveals a relationship with the land that is stronger than a connection. A connection to land can be broken and/or its maintenance can depend on life circumstances, but a “bond,” a “being with,” or the experience that a thing is now inside of you, and thus part of you, can not be severed or broken despite various changes in life circumstances over time.

Active forest landowner respondents form this bond via their experiences with their land, especially via the work they do tending to their land nurturing nature. The forestland they own and experience is a place of creation for these landowners; not only a place where the wonder of nature’s creation is displayed and experienced, but where active PFLs work together with the land and with nature to create improved and/or new forests, stands, and wildlife habitat, and to coax new and healthy growth in both plants and animals by joining their efforts to the raw materials with which they are presented. In so doing, they create sanctuary for themselves as well. For example, in describing his relationship to and feelings about a stand of pines he had been tending for years one active

PFL respondent stated, “I’m right here with this you know.” When the Southern pine beetle hit the study area, destroying thousands of acres of pine stands, including this particular stand, he described the experience with difficulty:

I just went back to see what was left and you know it looked, it looked devastating, you know. I told my wife there that was about the worst I ever felt about you know anything. You know, it was just completely gone. It’s just like us this is something that I have looked after, kindly nurtured along. I’d went through it, cut the undergrowth out you know. I kept ever’ thang kindly little trimmed, culled out, or uh the better trees I left and cut the worst ones and I had you know it was just you know, it’s all you know no under bush and now it’s just one big briar patch. You know it’s just devastating. . . . To me it was because those, those pines is something that I, excuse me [landowner is becoming emotional and clears throat before continuing], when I bought the place here in the mid-60’s, they were young you know. They were six inches in diameter or so and I you know through time I took care of ‘em all and you know I had 30 inch trees, 32 inch trees you know. You know just that that pine beetle destroyed all of ‘em. . . . it was more personal than I guess it was financial. . . . the few thousand dollars that I lost on it, I you know, I I could bear that but you know somethin’ I’d took care for the last last 30 plus years.

Continuity. Active PFL respondent landowners’ experiences of the land in terms of continuity are quite similar to those of the non-participant PFLs interviewed. However, active PFL respondents are more directly and personally engaged with both personal and natural continuity than are non-participant PFL respondents. Continuity for these PFLs goes beyond an awareness of natural life cycles to actively trying to promote natural continuity on their land. In addition, although active PFLs also feel a connection to past and future generations through the land, again it is more their actions, than their simply being a landowner of an inherited piece or of a piece that resurrects a family

connection, that promotes this sense. Many of these landowners have recreated and lived off the land. They have pro-actively chosen to settle in the woods, and to raise their families there. The land represents the length of their own life spans and continues who they are beyond their lifetime. From birth to death, these landowners are on and with the land.

The first two quotes below show the similarities in Continuity between these PFLs and the more un-involved PFLs, while the third and fourth provide a sense of the additional proactive nature of Continuity for active PFLs.

“This way it’ll grow back up. It’ll reclaim itself.”

“I’ve been in the woods since I was eight year old.”

. . . the chestnut I would really love to see brought back into this country because it was such a powerful tree in the formative years of of of the nation and of the state; very, power powerful trees . . . I got some chestnuts I want to sprout and I’m gonna try to get some of those chestnuts growing up there. I’m going to really try.

I understand that quail and rabbit need different habitats than deer and ever’ thang like that but that’s uh, that’s more or less what I like to see happen, you know, somethin’ for the wildlife, somethin’ for the future. Even uh I probably won’t be ‘round to see it. Wildlife, habitat, you know, a place where people you know get out and see nature. That’s what that’s what I like uh my grandkids to do.

Pleasure. Active PFLs in this study made numerous comments in reference to the enjoyment and pleasure of living on and with the land. Again, although this theme shares similarities with the Peacefulness aspect of the Peacefulness and Frustration theme for non-participant PFL respondents, Pleasure for active PFL respondents stems more from being actively engaged with the land, and from getting it to produce desired products or benefits based

on their efforts, than from the sense of peacefulness, relaxation, solitude, or tranquility, although those aspects are certainly present as well, that are more present in NP PFL respondents' experiences. The range of experiences descriptive of this theme can be seen in the following examples.

"It's a past time, almost like a, well you, I would call it a pleasure."

"I don't even consider it work; just play time."

"I really enjoy getting out and workin', sawin' trees, . . . Well, it's just uh just uh smell of of clear you know recently cut wood you know and uh the uh seein' the land produce somethin'.

"It's all all enjoyable."

"I appreciate the the woods."

"It's just it's just a lot of fun to be out in nature, be out in the woods.
. . ."

"I just get away. . . it's solitude."

Freedom to Be and to Choose. For active PFLs in this study, the land affords the personal and spatial opportunity to be who you are and to live your life the way you want to live it. As with many of the other active PFLs' themes, Freedom is proactive, it is a choice to live in a particular way. The way of life chosen is one tempered by the "law of the land" described above. This is not anarchy, it's freedom, freedom moderated primarily by natural laws rather than man made laws. This Freedom is similar in many ways to the Freedom and Control/Constraint theme describing the meaning of non-participant PFL respondents' experiences, but this Freedom is freedom to or towards a way of being, and the ability to do, in addition to, and overall more than, freedom from

constraint. Freedom for active PFLs in this study is not entwined together with experiences of constraint or control as much as it is for non-participant landowners interviewed. The following quotes from active PFL study participants help show both these similarities and differences, respectively, to the way Freedom is experienced by non-participant PFL respondents.

“. . . I just like to see you know what's there, what's over the next horizon or hill or whatever. You know I, I'm just out.”

“I'd ten times rather see a herd of deer walk through there as one person that's not been invited.”

“. . . the reason you know I've got it is because I want to, you know. I don't have to. I don't need it. But I enjoy it.”

“. . . I could live off the land if I had to.”

“I think it's a real, real, real nice situation when you can make your own personal decisions about whatcha wanna do with this piece of ground or that piece of ground.”

The meaning of Freedom as experienced by active PFLs can also be seen in excerpts describing experience of the absence of freedom. For example,

“I didn't like that at all It felt like we were being invaded or something like that, but with no choice in the matter obviously. We didn't own the land. We didn't have a choice. . .”

“Then one day I was out on this property. There was no wind. It was a beautiful day and I heard a tree fall, . . . and I got to looking and checking and there was more than one tree had fallen, about ready to fall and that was the start of the pine beetle. That completely tore me away from my plan”

Summary

For those PFLs who have been uninvolved in forest management activities and opportunities, here referred to as non-participant PFLs, the focus of

their experience of forestland is the self. By “self focused”, I mean the land is external to the landowner, experienced by the landowner, and the experience produces certain feelings within the landowner that are either sought out if positive, or avoided if negative. This is supported by the primary theme describing the meaning of these experiences - Connection; Connection to Others, Connection to Nature, Connection to Place. These Connections are strong, but it is important to note the difference between the nature of a “connection” and of a “bond” as described by active PFLs. Connections are formed at the intersection of two things, and require some kind of link or conduit by which to form the connection. In this case, the self is connected to three elements of the world, others, place, and nature, through the land. A bond, on the other hand, unites two separate things such that they become inseparable. Once two previously separate entities are bonded, the point at which the bond forms may become undetectable. The two formerly separate pieces may even be considered one. Consider again active PFLs choice of words in describing how they experience their land: “It’s something that *gets into* you.” “I’m *real bonded* with the place today.” “I’m right here *with this*.”

In contrast, for active PFLs the focus of the experience is on the land. The land and its condition are noticed first and most prominently. How it makes the landowner feel personally, the effect on the self, comes after, and is secondary to, this initial awareness of Natural and Un-natural conditions and ways of being. According to the phenomenological assumption that what I am aware of reveals

what is meaningful to me, this awareness indicates the land, its condition, and the concomitant ways people treat it and each other, are most meaningful to these active landowners. For this reason, these landowners might be best described as “land focused”, rather than “active landowners”. The label “active landowners” bases its description on participation in activities on the land rather than on the meaning of experiences with the land. Similarly, the term “self focused” may be a more appropriate label for PFLs previously described here as non-participants.

The two themes each landowner group shares most closely, Continuity and Freedom, also reveal interesting differences in the stance these landowners take towards their experiences of land, and thus the meaning they find in these experiences. For non-participant or “self focused” landowners, Freedom is meaningful as freedom from social constraints and freedom to control. For active forest landowners, or “land focused” PFLs, Freedom is meaningful as freedom to be who one is and to be able to make choices about how one wants to live.

In terms of Continuity, both groups of landowners find personal as well as natural continuity in the land. However, for active PFLs these meanings of Continuity come more from their active engagement with their land, than from their passive enjoyment of it. This is not to say non-participant PFLs are merely passive in terms of their activities on the land. To describe them as inactive would be incorrect. However, their activities, including those which might be considered forest management (see Part II), have more of a recreational sense

than those of active PFLs. In contrast, active PFLs' engagement with their land has a sense of creation about it. They engage together with their land and with nature in the act of creation. Together they create new and improved forest stands, wildlife habitat, and thus personal sanctuary. They continue both themselves and nature through creation. Non-participant PFLs experience the continuity of nature on their land by observing the cycles of life and death, and continue themselves more from a sense of familial legacy than from their direct actions on and with the land. These subtle differences in these two shared themes suggest a more proactive and "engaged with" stance in relation to the experience of the land on the part of active PFLs, and a more reactive and "receive from" stance in relation to the experience of the land on the part of non-participant PFLs.

Discussion

The findings described here concerning how PFLs who both do and do not actively engage in the management of forestland experience their land, and what those experiences, and thus the land itself, mean to these landowners, as well as what these findings mean for NRP practice, both support and add to much of the previous literature concerning the improvement of NRP practice with PFLs. Numerous authors have suggested various ways, means, and reasons for NRPs to "shift their outreach messages" as stated by Mater (2001). For example, Finley and Kittredge (2006) suggest the key to increasing PFL participation in forest management programs is to recognize the heterogeneity of the PFL

population and tailor programs to meet the specific needs and desires of specific PFL population segments. Similarly, Erickson, Ryan and DeYoung (2002) have suggested that NRPs look for opportunities to creatively link what landowners value with management practices that may achieve these objectives. A greater focus on reality as landowners perceive it has also been recommended by Mater (2001) who states foresters need to “understand that perception is as much a fact as a fact itself.”

According to these findings, the PFL population is indeed diverse. This diversity displays itself not just in demographics, and interests, values and reasons for owning forestland as demonstrated by previous research, but also in the meaning of PFLs’ experiences with their forestland. Recognition of such heterogeneity does present opportunities for tailoring outreach to the needs and desires of specific population segments. In addition, findings such as these increase NRPs’ ability to creatively link their services to the interests of PFLs, and to shift their outreach messages towards the language and understandings most familiar to and appropriate for this audience more so than do traditional survey methods. By using a method specifically trained on how PFLs experience their forestland, in other words their perception of its meaningful aspects, as expressed in their own words as they respond to questions with low cognitive load and high relevance, as in this study, opportunities for tailoring forest management programs to PFLs’ interests can be made that much more clear. Such a method allows NRPs to capture participants’ own words as they describe

forests and their forestland experiences and practices, as well as the full range of what is meaningful to them about their forestland. This is of particular importance considering the overall PFL population includes a large proportion of non-participant PFLs who may find it difficult to accurately and adequately articulate their reasons for owning forestland and who therefore may not have been substantially represented in the respondent population of standard surveys.

Furthermore, a focus on experience reveals some of the exact ways in which forestry can be practiced compatibly with the meanings of forestland to PFLs. For example, like some boutique forest owners as described by Hull, Robertson and Buhyoff (2004) and some PFLs identified as Thoreau's by Finley and Kittredge (2006), the active PFLs in this study are not opposed to forest management. However, via phenomenology we now know much more, and in more detail, about what these landowners consider acceptable forest management. According to these results, acceptable forest management is forest management that respects both people and nature, that directly engages the landowner in a creative partnership with the forest, and that allows the landowners to cast work as a pleasurable pastime. Lastly, by emphasizing the meaningful aspects of forestland to PFLs, as opposed to enrollment in assistance programs, or the production of management plans, the kinds of disconnects between NRPs and PFLs in terms of interests discussed and recommendations followed, and the lack of trust in NRPs exhibited in other PFL studies may be decreased.

Implications of the Findings for Professional Practice

By carefully examining how private forest landowners experience their land and the meanings of these experiences to them from the perspective of those who do not manage their land or participate in landowner education and assistance programs, as compared to those who do, several implications for professional practice, especially in terms of outreach, become apparent. For non-participant PFLs, the meaning of the land has to do with its ability to connect them to others, to place, and to nature, and to soothe them and relieve their stresses. Experiencing the land connects them to something larger than themselves that is both awe inspiring and humbling. They find inherent value in the land, whether it is managed or not, whether they are personally engaged in management activities or not, and whether it produces income for them or not. For these reasons, forest management appeals emphasizing utilitarian benefits such as improved timber stands or financial reward are unlikely to connect with the value these landowners find in their land. However, given the meaningful aspects of the experience of land for these landowners revealed by this study, non-participant PFLs may be willing to engage in management activities which they see as ensuring the continuity of these personally meaningful experiences. For example, outreach efforts such as “Keeping The Family in Family Forest” are much more likely to connect with these landowners interests than appeals such as “Forest Estate Planning” or “Timber Stand Improvement Practices.”

Other ideas for capitalizing on connections between landowners' meaningful experiences and forest management practices, include the use of these practices for preserving specific forest conditions, views, species, etc. which serve to create and maintain the experiences these landowners cherish. The job of the NRP in this case expands from proscribing forest management practices which will produce the expressed desired outcomes of a landowner to one of relating the most meaningful aspects of PFLs' forestland experiences to the forest management practices that would help sustain these experiences. For example, some non-participant PFLs are very tied to forestland experiences such as utilizing certain trails or continuing to experience the forest in a certain state that connects them to experiences of others or of times gone by. One landowner in this study expressed the desire to maintain his family's home place as it was in his memory, and a sadness and frustration over the continual progression of forest growth and change in such a way as to block his ability to recreate these meaningful experiences. Forest management for the sake of maintaining such experiences may not seem to NRPs to match their goals of engaging greater numbers of PFLs in sound forest stewardship, however, it provides an excellent opportunity to engage a previously non-participant PFL in forest management activities that she/he will find personally meaningful and rewarding, and thus provides the opportunity to establish a relationship that may grow to include many other types of, and reasons for, forest management. In other words, in order to motivate more PFLs to engage with forest management, NRPs may need to

make more of an effort to connect and integrate forest management information with what landowners' find meaningful about their land, rather than simply disseminating information and hoping it will strike landowners as relevant. This is especially important when working with a population that has historically not made meaningful connections with NRPs or their work.

For active PFLs, the meaning of the land has to do with natural and unnatural conditions, treatments, and processes. This meaning extends from the condition and treatment of the land, to the condition and treatment of the people living with the land. These landowners are bonded with their land in an inseparable way such that what is done to the land is done to them and vice versa. They are deeply interested in the continuation of healthy forests for the sake of their own enjoyment of them, but also, and importantly, for the sake of the forest resources themselves. Active forest landowners are not only not opposed to proactive forest management activities, they find pleasure in the activities of caring for forestland. However, while active forest landowners certainly do not mind making profit from their forestland, especially in cases when resources may be "wasted" if action is not taken due to natural disasters or the natural processes of succession, and many even seek it out, it is important to note that profit making exercises are only acceptable when they go hand in hand with forest management activities that are respectful of natural processes, and that benefit forest resources themselves. For these reasons, active PFLs may be more likely to engage in forest management activities presented as preserving the integrity of

forest resources, than those presented as providing utilitarian benefits. As an extension, they are likely to be more supportive of forest management activities that preserve the integrity of the individuals involved in the activities as well. While engaging greater numbers of these landowners in forest management practices will, as with non-participant PFLs, be a matter of helping them to form connections between the meaningful aspects of their lived experience with their forestland and sound forest stewardship, given their ready acceptance of the utility of forest management, forming such connections with this population should prove easier.

In addition, active PFLs' interests in creation, and their deep personal bond with the land, provide excellent leverage points for NRPs to engage more PFLs more substantially in forest management activities, and in the sharing of forest management messages. As long as forest management is presented as respectful of nature, and especially if opportunities are presented for personal engagement with forestland management, and for some, for the sharing of forest management with others, active PFLs present a population eager to engage in the work NRPs are trying to promote.

Incentive programs are another way through which NRPs may be able to inform their practice relative to these findings. The Freedom owning and experiencing forestland provides to both these PFL groups is an important aspect of its meaning for them. In addition, we know many PFLs are retired or are not using their forestland as their primary source of income. Furthermore, the use of

forestland purely for income is largely irrelevant to the meaning of land for non-participant PFLs, and in many cases distasteful to active PFLs. Taken together, these realities may account for much of the lack of PFL interest in incentive based policies and assistance programs. Such programs require the abandonment of cherished freedom for the reward of unneeded money. Such policies and programs make sense from an economic standpoint alone, and perhaps from the standpoint of attempting to enroll greater amounts of private forestland acreage in sound forest management, but fail to take into consideration the meaning of the land to landowners as revealed here.

Conclusion

As the social and biophysical landscape of U.S. forestland changes, foresters and other natural resource professionals have turned increasing attention to understanding private forest landowners, their interests and motivations in owning forestland, and the nature of their involvement, or lack thereof, in forest management practices. And for good reason. Private forest landowners control significant forest resources nationwide placing them in the position, whether they are aware of it, or proactively engage with it, or not, of being the direct stewards of their own, and much of the public's, timber, recreation, ecologic, and aesthetic resources. For these reasons, and owing to the service oriented nature of their profession, foresters and other natural resource professionals have been keenly interested in engaging these landowners more substantially in sound forest management practices, and in

helping them to make informed decisions about their forestland uses and transactions.

Numerous studies attempting to address these issues have been conducted. The focus of these studies has tended to be on ownership characteristics, management motivations and objectives, and PFLs' reasons for owning forestland. The methods used have primarily been quantitative survey based approaches relying on apriori assumptions from past research, and researcher interests and assumptions concerning variables of interest. Findings from these studies reveal that despite PFLs' significant interest in forest health, protection, recreation and aesthetics most forestland is not in active management, and most PFLs are not aware of the education, information, and assistance programs designed for them. Obviously, for the majority of PFLs, as opposed to foresters and natural resource professionals, there is a missing link between these interests and forest management. The few qualitative studies conducted have added depth and context to understanding the reported findings, but have been limited to structured inquiries of similar topics. Consequently, there have been increasing calls for NRPs to both broaden and deepen their understanding of the PFL population through new approaches and new perspectives in PFL research and outreach. This study using phenomenology to describe how PFLs experience their forestland and the meanings they find in these experiences utilizes both new approaches and new perspectives in an attempt to address these issues, broaden and deepen NRP understanding of

PFLs, and inform their practice relative to working with PFLs based upon this understanding.

As indicated above, phenomenology as a method in private forest landowner research offers several benefits. Landowners, as shown in this study, do not separate themselves as conscious beings from the world in which they live out that consciousness. Philosophically, phenomenology also does not separate thought, or cognition about existence, from the experience of existence as do many other research methodologies which focus respectively on landowners' behavior or thoughts concerning their forestland. Phenomenology also holds that what people are aware of reveals what is meaningful to them. This allows a researcher, or practitioner, to easily capture the most salient aspects of forestland to PFLs, to open to the broadest possibilities of interest, categories, and variables relative to the phenomenon of interest, and to be assured they are capturing something beyond their own pre-conceived notions of what is relevant in a given situation. Methodologically, phenomenology emphasizes natural conversation and the participant's voice. Such a methodology may be more comfortable for some participants. It is also well suited for any situation in which a "professional consultant seeks to discover the wishes and needs of a client" (Pollio, Henley, and Thompson 1997). By not emphasizing any particular aspect of experience over another, but instead focusing on the inter-relationship of aspects of experience, phenomenology allows the gestalt truth of experiences to emerge rather than requiring that experience be parsed into measurable, finite, and

mutually exclusive categories. Such a method is respectful of the complex and often internally conflicting realities of human existence. Lastly, phenomenology is specifically designed to shed light on the meaning of experiences to individuals (Thomas and Pollio 2002).

It is this seeming focus on the nuanced details of individuals' experiences, that often brings the most criticism to phenomenological methods. While it is true that phenomenological studies utilize relatively small purposefully selected samples which can not be statistically generalized to the broad population of interest at large, it is not true that results are not useful beyond the confines of the particular study area or population. Given the focus on the essence of an experience, and the requirement that all participants share that experience, phenomenological results can safely be applied and/or transferred to all those individuals who share the experience in question and are similar in cultural and geo-political background. More importantly, these results can be transferred to similar cases in which practitioners and researchers are looking for increased understandings and explanations of phenomena. Ultimately, it is up to each reader of a phenomenological study to determine its utility to them in their own understanding of the phenomenon in question in their own setting. Based on discussion of these findings with a wide variety of NRPs through correspondence and conference presentations, these findings resonate strongly with NRPs across the country as they struggle to increase their understanding of PFLs and utilize that understanding to inform their practice. As such, this study not only presents

useful and novel findings, but addresses many of the concerns raised by previous efforts.

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Appendix A

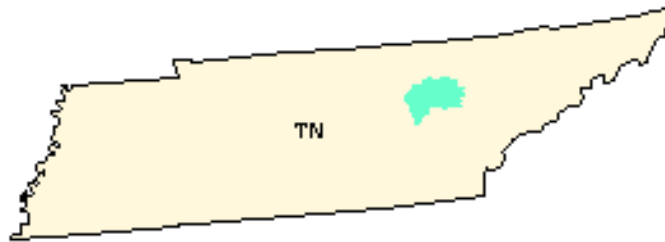


Figure 1: Location of Emory-Obed Watershed in Tennessee

(U.S. Environmental Protection Agency US Environmental Protection Agency 2002)

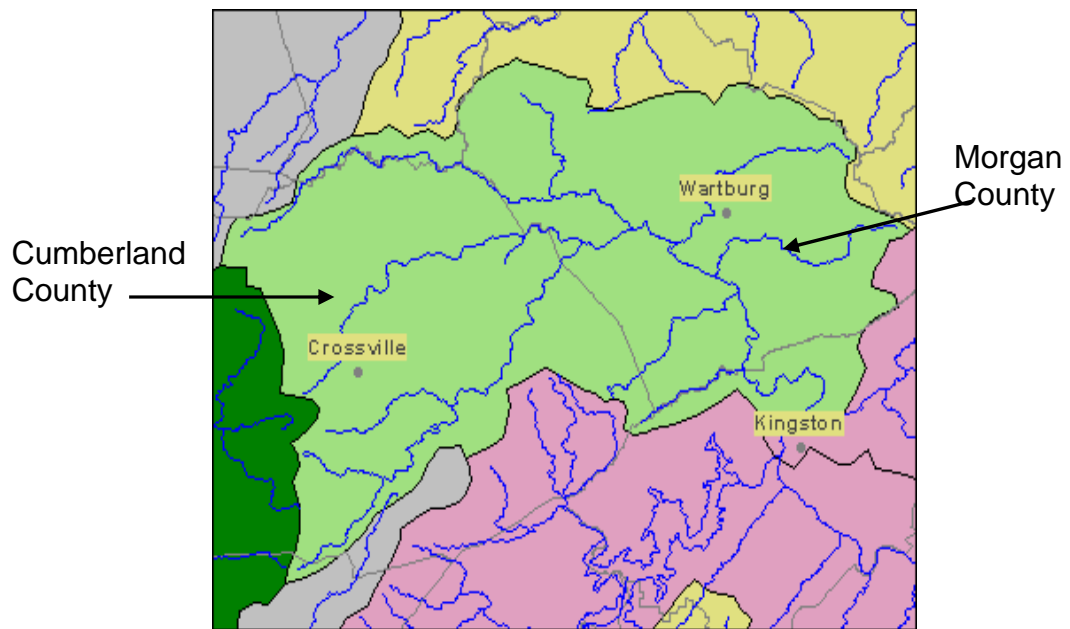


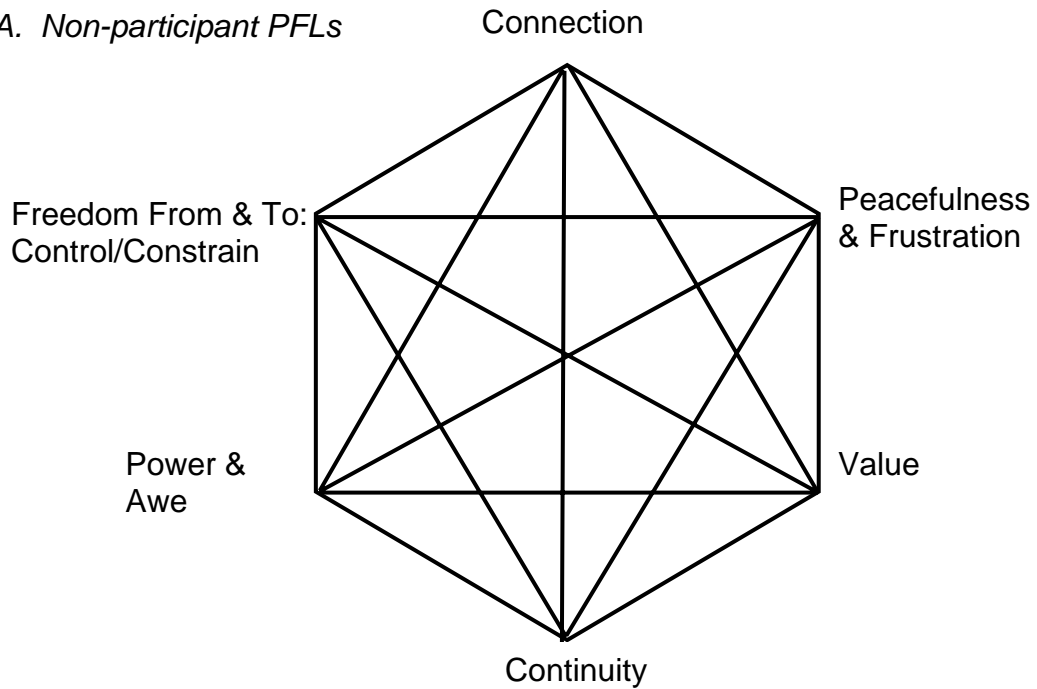
Figure 2: Detailed View of Emory-Obed Watershed

(U.S. Environmental Protection Agency US Environmental Protection Agency 2002)

Table 1: Participant Attributes

		PARTICIPATION ATTRIBUTES				ACTIVITY ATTRIBUTES				
Landowner		PFL ed. event	PFL org.	Sought advice/asst.	Have Mgt. Plan	Planted trees	used chem., pest., fert.	planted food plots or veg.	had timber sale	plan to sell timber
ACTIVE LANDOWNERS	1			X		X	X	X		
	2	X	X	X	X	X	X			X
	3	X		X	X	X		X	X	X
	4	X		X		X	X	X	X	X
	5					X	X	X		
	6					X	X	X	X	
	7					X	X	X		
	8					X		X	X	
NON-PARTICIPANT LANDOWNERS	9									
	10									
	11									
	12									
	13									
	14									
	15									

A. Non-participant PFLs



B. Active PFLs

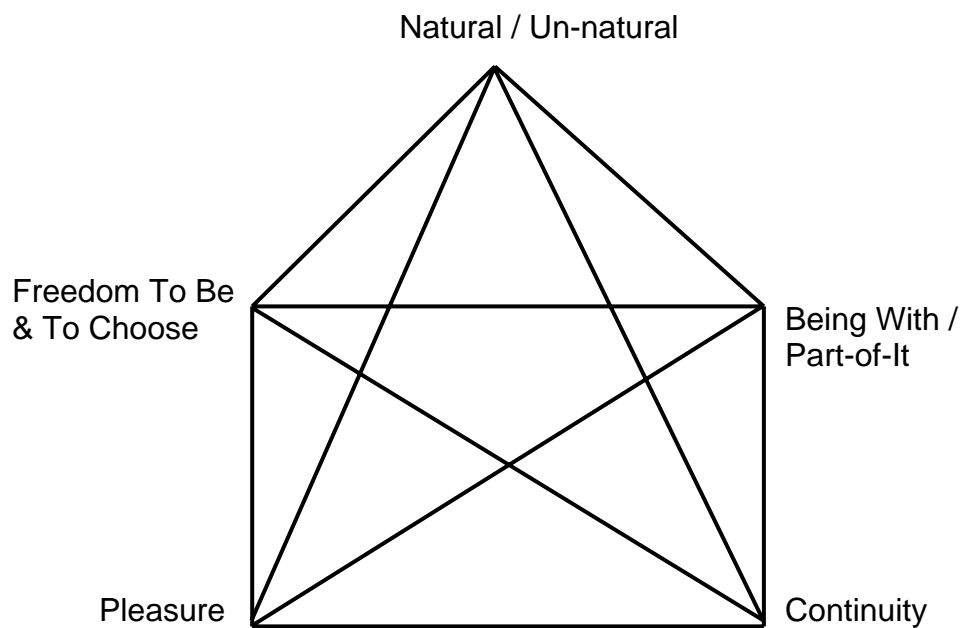


Figure 3: Thematic Structure: The Meaning of Landowners' Experience of Their Land

PART II - CONCEPTUALIZING FOREST MANAGEMENT:
PRIVATE FOREST LANDOWNER PERSPECTIVES AND THEIR
RELATIONSHIP TO THEIR MANAGEMENT BEHAVIOR

Introduction

This chapter summarizes concerns regarding private forestland management and the types, findings and conclusions of previous research addressing them. As a means of further addressing these issues, a survey of PFLs' conceptualization of forest management and its relationship to their management behavior is proposed and its methods, findings and conclusions described. The purpose of this effort is to inform the practice of natural resource professionals working with PFLs in order to increase the effectiveness with which they are able to engage PFLs in forest management.

Private forestland management has been a focus of concern since Europeans first encountered the vast resources of the New World (Andrews 1999; Leavell and Welch 2001; Freyfogle 2003; Sharpe, Hendee, and Sharpe 2003). The primary reason is the combination of the continued private ownership of vast forest resources, the numerous benefits these resources provide to society, the lack of an "integrated policy toward non-industrial private forests" which might regulate the provision of these resources (Bliss 2001), and the idea that management of forest resources is a critical component in the continued existence and health of these forest resources; in other words, in their ability to continue to provide benefits to society (Bourke and Luloff 1994; Best and Wayburn 1995; McEvoy 2004).

Private forestland accounts for a significant proportion of forested land both regionally and nationally (Egan and Jones 1993; Best and Wayburn 2001;

Butler and Leatherberry 2004). Nationally, privately owned forestland (excluding industrial ownerships) accounts for four of every ten forested acres (Butler and Leatherberry 2004). In Tennessee, the Agricultural Extension Service reports 400,000 private forest landowners (PFLs) owning over 82% of the state's 10.5 million forested acres (The University of Tennessee Institute of Agriculture 2003).

Benefits from this land can be broken into three broad areas: economic, environmental, and social. Economically, private forests are significant for their contribution of approximately half the U.S. timber supply (Best and Wayburn 2001). Environmentally, private forestland provides "invaluable ecosystem services" (Wilcove 2004) and goods such as clean air, fresh water, habitat, migratory corridors, and opportunities for carbon sequestration (Wolff and Hirschhorn 2001). It has also been argued, the ecological contribution of private forestland is distinct from that provided by industrial or public forestland, and the significance of the biodiversity harbored by private forestland may be underestimated (Bliss 2001; Wilcove 2004). Undoubtedly, private forestland provides numerous recreational opportunities, but the importance of private forestland's other social contributions, especially to those other than private forest landowners themselves, is difficult to measure and its importance difficult to judge. Bliss (2001) suggests the social benefits provided by private forests may be simultaneously the most fundamental and the least appreciated. He suggests PFLs infuse the forest landscape with a human dimension not represented by other forest resources, and form a critical link between the

resources society depends on and society's members; most of whom are no longer aware of their dependence on these resources (Bliss 2001).

Unfortunately however, privately owned forests, and the benefits they provide, face numerous and increasing challenges. As the region with the second greatest proportion of forest land to total land in the US, these trends are especially pronounced in the Southeast (Best and Wayburn 2001). Pressures on southern forests in the 1990's came via shifts in the forest products industry's interests away from the Pacific Northwest and towards the South for forest product and market opportunities (Henry and Bliss 1994) and via increasing recognition and concern from the public for non-commodity forest values such as recreation, open space, aesthetics, environmental services, and others (for example Argow 1996; Bliss and Martin 1989; Brunson et al. 1996; Campbell and Kittredge 1996; Cordell et al. 1998; Egan and Jones 1993). More recently, industry restructuring has placed additional strain on privately owned forests as ownership trends move away from corporate entities in favor of family ownerships (Best 2004). Furthermore, in recent years, public policies decreasing the amount of timber that can be harvested on public land (found primarily in the West), and new technologies increasing the size range and types of trees profitable for use, have increased harvest pressures on privately owned forestland (Wear and Gries 2003). Lastly, over the past few decades there has been an increasing nationwide trend in forest parcelization, the concomitant increase in the number of PFLs and decrease in the average size of ownership

parcels (Cordell et al. 1998; Mehmood and Zhang 2001). Parcelization makes management of privately owned forests more difficult as efforts to coordinate across boundaries and at landscape scales are frustrated by increasing numbers of owners and smaller parcel sizes (Best 2004; McEvoy 2004). McEvoy (2004) summarizes the ultimate concern over parcelization stating, as it continues, eventually land “is taken out of production and our ability to sustain forests for traditional values declines, until the tree-covered landscape we now know as “forests” gradually transforms into one big backyard, and the working forest becomes a facade.”

Given these complex issues, numerous studies have been conducted aiming to increase natural resource professionals’ (NRPs’) understanding of PFLs with the goal of increasing PFL engagement in forest management practices. Primarily quantitative methods, in the form of mail and telephone surveys, have been used to characterize private forestland ownership in general, and to assess PFLs’ attitudes, motivations, and objectives in managing forestland in particular. Landowners’ behavior, or the activities they engage in in relation to their use and ownership of forestland, have also been a major focus. In addition, numerous demographic variables have been investigated for their association with PFLs’ tendency to engage in forest management activities including landowner age, employment status, income, and education level as well as how much land they own and how long they have owned it (Bliss and Martin 1988; Esseks and Kraft 1988; Kingsley, Brock, and DeBald 1988; Rosen

and Kaiser 1988; Bliss and Martin 1989; Snyder and Broderick 1992; Kuhns, Brunson, and Roberts 1998; Finley and Jacobson 2001; Mater 2001; Erickson, Ryan, and DeYoung 2002). Little qualitative research has been conducted to identify additional categories and variables of interest, or add context, richness, and detail to quantitative findings. Furthermore, despite recognition from several sources of the utility of combining qualitative and quantitative approaches, qualitative methods have not been readily used to inform survey development in the numerous PFL studies relying on survey methodology. Likewise, survey methods have not been readily used to quantify qualitative results among broad segments of the PFL population (Bliss and Martin 1989; Egan et al. 1995; Elmendorf and Luloff 2001; Creswell 2003).

Regardless of method, findings reveal that despite the numerous outreach and education opportunities provided by NRPs, most PFLs are not engaged in forest management activities as traditionally defined, and/or are unaware of the importance of such activities, assistance for such activities, and how to get information about them if they were interested (Jones, Luloff, and Finley 1995; Argow 1996; English et al. 1997; Finley and Jacobson 2001; Finley et al. 2001; Erickson, Ryan, and DeYoung 2002; Hull, Robertson, and Buhyoff 2004). As an example, the 1990 and 1997 Tennessee State Stewardship Plans state many Tennessee forest landowners are unaware assistance in managing their land exists (USDA Forest Service). The same is true regarding federal programs. One year after the launch of the Conservation Reserve Program, large portions

of potential clientele remained uninformed or misinformed about conditions critical to their decisions on participation (Esseks and Kraft 1988). Looking nationwide, Butler and Leatherberry (2004) report only 13% of PFLs in the 48 conterminous states have sought management advice in the past five years with only 4% having a written management plan. In contrast to the reported lack of interest and engagement in forest management practices as traditionally defined, are near universal reports of landowners' interest in non-commodity forest values such as aesthetics, recreation and forest protection (Jones, Luloff, and Finley 1995; Campbell and Kittredge 1996; Koontz 2001; Hull, Robertson, and Buhyoff 2004).

Studies investigating landowners' attitudes, values, motivations, objectives and reasons for owning and managing forestland reveal extreme diversity (Kurtz and Lewis 1981; Argow 1996; Egan 1997; Kluender and Walkingstick 2000; Butler and Leatherberry 2004; Hull, Robertson, and Buhyoff 2004; Kittredge 2004; Finley and Kittredge Jr. 2006). These results call the utility of attempts to identify the average landowner into question, leading some authors to suggest outreach efforts be specified to particular "market segments" within the PFL population (Finley and Kittredge Jr. 2006). Several authors suggest one reason for the difficulty in identifying generalizations concerning landowners' attitudes towards forest management may be that despite what appears to be a more direct connection to forestland, PFLs' attitudes towards forest management are

no less diverse than those of the general public (Bliss et al. 1994; Bourke and Luloff 1994; Jones, Luloff, and Finley 1995; Bliss 1997).

In addition to examining landowners' attitudes, values, beliefs and motivations for owning forest land, private forest landowner studies also typically examine the relationship between demographic variables such as amount of acreage owned, tenure, PFL income, education level and age, and landowners' management practices and attitudes. Results of these investigations are ambiguous. For example, while Best (2004) generally finds owners of "large tracts are more active forest managers than owners of smaller parcels", and Rosen and Kaiser (1988) find owners of larger tracts are more likely to harvest, others conclude tract size is not useful in predicting management opinions and/or predispositions (Jones, Luloff, and Finley 1995; Bliss 1997). One area of relative agreement concerns the relationship between income and harvesting, with landowners in lower income brackets being more likely to harvest than those with greater income levels (Rosen and Kaiser 1988; Best and Wayburn 2001 citing Alig et al. 1990). However, it is important to note the relative age of some of these studies versus the social changes among the PFL population in the last fifteen years. In addition, variations in study purposes, methods and populations among studies examining these relationships hamper the ability to draw general conclusions linking demographics to management practices and attitudes.

While forestry research indicates an overall lack of assistance seeking on the part of PFLs regarding forest management, the American Nursery and

Landscape Association reports American households spend approximately \$15 billion or more annually for professional help with their gardens and trees. Based on 1997 figures, forested home site owners represent 27% of this market, a market which was expected to increase annually (DeCoster 2000). Furthermore, in their study of the information and assistance needs of West Virginia PFLs, Fraser and Magill (2000) find PFLs are most interested in information relating to the activities they most frequently engage in and correlating with the reasons given for owning their property. The former include activities such as building roads, improving beauty, harvesting timber, cutting vines and plants, thinning trees, etc. The latter include reasons such as place of residence, farm or domestic use, esthetic enjoyment, investment, recreation, etc. Many of these reasons and activities do not typically register in PFL studies as interest or engagement in forest management, yet they clearly indicate PFLs are active on their land, have objectives for their land, an interest in, and willingness to pay for, assistance with their land. Such findings suggest conclusions drawn from the literature regarding the extent to which PFLs are managing their forestland must be tempered by an understanding of how forestland management is measured and responses interpreted.

Regardless of whether PFL management literature has been interpreted correctly or not, overall there is concern that PFLs not getting the message regarding the value of forest management. Some authors suggest this is because many PFLs do not connect the ways they appreciate their land, and the

reasons it is meaningful to them, with the need for forest management (Steiner 2003; Davis and Fly 2004; Kittredge 2004). Others contend natural resource professionals do not adequately understand PFLs and have called for new approaches and new perspectives in research and program development (Bliss and Martin 1989; Parker 1992; Jones, Luloff, and Finley 1995; Best and Wayburn 2001; Best 2004; Butler and Leatherberry 2004; Hull, Robertson, and Buhyoff 2004; Kittredge 2004; Finley and Kittredge Jr. 2006). More than two decades ago, Weiseman (1983) foreshadowed these more recent calls stating, “We must demonstrate the ability of the product (forest management) to meet the needs of the consumer (landowner).” Still others see the potential within these results to connect PFL interests with forest management suggesting “we have only begun to understand the implications” of the connections between PFLs’ values and the type of forest planning and management offered by NRPs (Erickson, Ryan, and DeYoung 2002).

Previous research by the author sought to address these issues by using a novel approach to investigate how non-participant PFLs, those landowners who form the majority of the PFL population and are under-involved and under-represented in forestry and forestry studies, experience their forestland and the meaning of these experiences to them (Steiner 2003; Davis and Fly 2004). Based on the language used by study participants in interviews, and a comparison of interview responses to those from a pre-interview telephone screening survey regarding their forest management activities, findings indicated

a need for greater clarity in terminology and meanings relative to forestland management. For example, one landowner replied, "Well, I do what needs to be done." when asked in an interview whether she felt she managed her forestland.

In addition, although study participants were screened specifically for their lack of engagement with forest management practices, and although they did not consider themselves forest or land managers, in interviews, they all described engaging in activities that might be considered forest or land management, depending on how the concept of management is defined and by whom. These included cutting trees, changing drainage patterns, maintaining roads and trails, and harboring and enhancing wildlife (Steiner 2003, Davis and Fly 2004). Furthermore, these actions were generally described as premeditated, deliberate and undertaken with the intention to achieve a particular end result; qualities associated with traditionally defined forest management (see Literature Review, next section). Some interview participants had to be disqualified from the study as the details of their interviews revealed that they had in fact engaged in traditionally defined forest management activities such as harvesting or selling timber from their land despite their previous survey responses to the contrary. As there were no indications to suggest these participants intended to lie during their screening surveys, it was determined their survey responses were truthful based upon their interpretation of the survey questions at the time. For example, some of these participants simply had forgotten they had had a timber harvest

until they were questioned in more detail. Others did not personally interpret their actions as harvesting.

Overall, these findings suggested professional vocabulary may not resonate clearly with private forest landowners and that landowners' understandings of what constitutes forest management may differ from that of professionals. Given the importance of PFLs' self report concerning their intentions, activities, objectives, interests etc. regarding forest management in private forest land research, lack of clarity concerning their understanding of this concept places accurate interpretation of research results at risk. Also, with the increasing emphasis on targeting specific groups of landowners with specific interests, it becomes increasingly important we understand what it means for a landowner to be interested in or un-interested in management, and what they may mean when they describe themselves as currently involved or un-involved in land management. In addition, given the role of NRPs as communicators, facilitators and educators concerning forest management, an assumption that PFLs and NRPs share a common understanding of forest management threatens to jeopardize the success of these enterprises. Also, as Leuschner (1984) notes in his discussion of the definition of forest management, forestry is a dynamic field. Therefore, he cautions students to be prepared for changes in usage of the term forest management over time. As such, periodic reviews of the usage and understanding of forest management are important in ensuring effective communication and relationships between professionals and landowners. Lastly,

lack of clarity concerning key natural resource management terms such as “forest management” has important and broad reaching philosophical and political ramifications.

This survey study attempts to address these issues by identifying how PFLs conceptualize forest management and the ways in which their conceptualization relates to their engagement with it. Literature concerning language and language use in natural resources, as well as the forestry field’s definition of forest management, is reviewed to provide context and a comparative base from which to interpret the findings. A description of study methods and results follows. Lastly, findings will be discussed in relation to the literature and to the study’s purpose of informing the practice of natural resource professionals working with PFLs.

Literature Review

Introduction

Effective communication requires a shared understanding of terms and concepts. Lund (2002) notes this is “especially important when dealing with emotionally sensitive topics, such as the state and management of forest resources.” Greater consistency and clarity in the use of forestry terms is also believed by some to have the potential for enhancing the science and practice of forestry, its education programs, and the effectiveness of dialogue between forestry and society regarding forest use (Helms 2002a). Nevertheless, while the importance of language and language use has received some attention within

natural resource management, no systematic reviews of the definition of forest management were revealed in the published literature. Furthermore, while private forestland management has received significant research attention, only one gray literature study examining PFLs' perceptions of forestland management was revealed (Weiseman 1983).

Language and Language Use in Natural Resource Management

Examining the language of stakeholders and the public, as well as their understandings of technical terms, has a long history in natural resource management. This is especially true in cases involving public lands and minority groups, including underserved private landowners, who are frequently assumed to differ from natural resource professionals in their language use and ways of seeing things. Examples include an examination of Native Americans' feelings about natural resource management via review of the language used in ethnic journalism sources (Bengston 2004), and citizen stakeholders' perspectives on "nature" and "naturalness" (Hull, Robertson, and Kendra 2001). Reflecting the implications of different usages and understandings of language among professionals and across agencies, some studies have also examined language use among these populations. Examples include foresters' reactions to the "new" forestry language of ecosystem management (Egan et al. 1999), the use of the terms "forest", "forestry", and "forester" by society, agencies, nations and regions (Helms 2002b), and environmental professionals' understandings of "environmental quality" (Hull et al. 2003). Regardless of the purpose in

examining language use, or the specific population studied, all such studies indicate differences in understanding of terms and concepts.

A series of related efforts conducted by Egan and Jones (Egan and Jones 1993; Egan and Jones 1995; Egan et al. 1995) are among the most notable for identifying differences between landowners' and NRPs' interpretation of important natural resource management terms. Egan and Jones (1993; 1995) found survey respondents interpreted "timber harvest" in varying ways. In their initial study, only 86% of PFLs originally claiming to have harvested timber answered affirmatively upon re-survey. Of those who answered negatively upon re-survey, some explained their previous response by saying they had counted having cut firewood for personal use, or having cleared land for a house or yard, as having "harvested timber." Others denied having ever harvested timber at all. Landowners who agreed they had "harvested timber in the last 10 years," but who owned fewer than two acres of forestland, described harvesting "in terms of individual tree removal, or clearing land for a house or lawn." (Egan and Jones 1993). The authors conclude survey respondents may not always understand terms used in surveys and/or may interpret them differently than intended (Egan and Jones 1993). In further work, the authors attribute these findings in part to a common assumption of survey construction, the primary PFL research method appearing in the literature. In constructing surveys, investigators often assume the target audience shares their understanding of key terms and words. Using their own previous work as an example, the authors note errors in this

assumption can make findings difficult to interpret (Egan et al. 1995). In an effort to rectify this difficulty in their follow up study aimed at determining the level of forest stewardship occurring on non-industrial private forest lands, the authors used surveys and focus groups first to identify how landowners understand and speak about forest stewardship (Egan and Jones 1993; Egan et al. 1995). For an additional example of complications in results interpretation based on differences between how PFLs interpret survey terms and how researchers intended them to be interpreted see Bliss and Martin (1989).

In addition to differences in interpretation, natural resource management terms can also fail to resonate with PFLs. Cox (2004) found that only 38% of Indiana PFLs enrolled in the state's Classified Forest Program reported possessing a written management plan, although having one is a requirement of the program. While the primary use of Cox' findings is to reveal the disconnect between possessing a written management plan and engaging in management behavior (an important issue in and of itself), it is also possible that the finding reflects poor resonance of professional vocabulary with landowners. For example, at least some landowners in Cox' study may not have considered the paper work involved in enrolling in Indiana's Classified Forest Program "a written management plan" for their property. At the very least, the term "written management plan" did not jog their memory of possessing one.

Several recent studies provide further evidence for the importance of examining language use in natural resource management, specifically the

importance of professionals using language understandable to, and used by, those they serve or are trying to reach. For example, in their examination of the new practice of “boutique forestry”, Hull, Robertson and Buhyoff (2004) found forestry service providers are changing the way they speak to clients. Several service providers stated they avoid certain words due to their perceived negative connotations in favor of more positively perceived words. For example, these service providers indicate using the terms “removal” instead of “harvest” and ““opening up” the forest to “let sun in”” instead of “clear cut” (Hull, Robertson, and Buhyoff 2004).

Conservation organizations are also working to not only understand the language of their constituents, but translate their own vocabulary into that of their constituents in order to achieve greater resonance with the general public. Fairbank, Maslin, Maullin & Associates, an opinion research and public policy analysis firm, conducted two studies on behalf of The Nature Conservancy and The Trust for Public Land regarding the “language of conservation” and “communicating about state wildlife action plans.” These studies yielded specific results regarding language use such as “DO NOT say *open space*, DO say *natural areas* instead” and “DO NOT use *endangered species* as interchangeable with *wildlife*.” (Weigel, Fairbank, and Metz 2004; Metz and Weigel 2005).

Lastly, the importance of language use and the meaning of terms in natural resource management further emerges when the generally low literacy

level of traditionally underserved landowners in many rural areas is considered. Researchers at the University of North Carolina involved in an effort to make forestry extension and educational publications more appealing and clear to this audience noted traditional offerings frequently included terms such as “pine plantation” and “timberlands” which have precise technical meanings to foresters, but which may have different connotations for traditionally underserved landowners. Accordingly, they created new publications for this audience trading words such as “forest” for “woods”, and paragraph text format for bulleted lists in fact sheet form (Mance, Sills, and Warren 2004).

Beyond the issues of resonance, practice, and interpretation of findings, shared understandings of natural resource management terms, and efforts towards creating definitions agreeable to more than one group of users, have important political (Gramling and Freudenberg 1996; Hull et al. 2003), philosophical (Patterson and Williams 1998; Sorvig 2002), physical and practical ramifications (Sorvig 2002). Several authors note differing interpretations of words opens a Pandora’s box in terms of the use of language for the promotion of one political agenda over another (Gramling and Freudenberg 1996; Hull et al. 2003). For example, in their investigation of professionals’ understandings of the term “environmental quality,” the values they place on it, and their ambiguities regarding those values, Hull et. al. (2003) describe environmental decision making as “a tournament of value wherein stakeholders compete over which definitions of nature and environmental quality are ultimately used to set land-use

goals and policy.” In the politically charged world of natural resource management, the same could be said of the process of defining forestland management and negotiating its application in various settings.

Defining Forest Management

Forest management definitions are numerous and vary by intended audience. However, in a review of forestry and forest management texts, websites, dictionaries, and glossaries, all forest management definitions were found to share two components – an “action” and a “purpose” (Leuschner 1984; Baskerville 1986; Erdle and Sullivan 1998; Helms 1998; Fedkiw and Cayford 1999; Davis et al. 2001; Nyland 2002; McEvoy 2004; North Carolina Forestry Association *Glossary of forestry terms* 2007). In the following examples, *action components are italicized* and purpose components are underlined for emphasis. Helms’ Dictionary of Forestry (1998) defines forest management as the “*practical application* of biological, physical, quantitative, managerial, economic, social and policy principles to the regeneration, management, utilization, and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest – note forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products, and other forest resource values.” A definition developed for forest landowners found on the North Carolina Forestry Association’s website and using less technical language shares these two components, “*Caring for a forest* so it stays healthy and vigorous and provides the products and values the

landowner desires" (*Glossary of forestry terms* 2007). McEvoy (2004) notes both action and purpose components must be present for the phenomenon known as forest management to be considered management. He clarifies this with the example of the "do nothing" approach,

" . . . even woodland owners who decide that their goal is to leave nature to its own devices are – by the act of controlling forests in ways to achieve this benefit – managing lands, provided they do all that is necessary to ensure that their goal is carried into perpetuity. Simply stating a goal is not management."

Table 2 demonstrates the similarities shared by the numerous definitions reviewed.

In the definitions reviewed, the "actions" of forest management range from the more cognitive in nature to the more physical, with cognitive actions appearing most frequently. Verbs and verb forms present in the definitions reviewed include, in order from more cognitive to more physical, "process, designing and implementing, guiding, application (of principles), controlling and regulating." These verbs and verb forms are consistent with the definition of the verb "manage" in the Oxford English Dictionary:

To conduct, to carry on, supervise, or control (a war, undertaking, operation, affair, etc.); To control (a person or animal); to exert one's authority or rule over; To take charge of, control, or direct (a household, institution, business, state, etc.). Formerly: to cultivate, till (land). Later: to maintain and control (the environment, an area, forest, nature reserve, etc.). Also to conserve (natural

resources such as game, fish, timber, wildlife, etc.) (Oxford English Dictionary online *Oxford English Dictionary online* 2007b).

The “purpose” component of the forest management definitions reviewed simply indicates management is conducted for the purpose of fulfilling or providing the needs, values, benefits, conditions, products, etc. desired either by society as a whole or by landowner. The specific forms these purposes take are left open.

When forest management is measured in private forestland studies, the action component of the definition tends to be operationalized as the presence or absence of specific landowner behaviors rather than as the presence or absence of cognitive actions such as the application of principles, the design and implementation of actions, or the guiding of natural evolution. Based on such measures, most PFL literature concludes PFLs do not manage their forestland. However, it is not clear what conclusions about PFL forestland management might be drawn if forestland management was measured based on the action and purpose dichotomy found in forest management definitions. The extent to which PFLs are engaged in the cognitive activities found in forest management definitions vs. the types of specific behaviors traditionally measured is also unknown. In addition, not all studies clearly describe the indicators of forest management used. Within those that do, substantial variation is seen.

Examples of the behaviors operationalized as forest management include possessing a written management plan, seeking management advice, tree

planting, timber harvesting, timber stand improvement, and wildlife habitat improvement (Bliss and Martin 1989; Erickson, Ryan, and DeYoung 2002; Butler and Leatherberry 2004). Often, the way forest management is operationalized in a study is not specifically mentioned, rather a composite factor of management such as “hands-off management” is described (Erickson, Ryan, and DeYoung 2002). In other instances, only some variables are individually reported while others are lumped together into a general category such as, “and other practices implemented to increase the quality and quantity of forest-related products and amenities” (Bliss and Martin 1989). Still others report only the number of management activities landowners engage in without detailing the specific practices considered management activities (Henry and Bliss 1994). The most common situation concerning the definition of forest management in private forestland/owner studies is failing to include the study’s working definition of forest management despite referring to the concept frequently. This issue was identified by Weiseman (1983) more than two decades ago. Based on this review of the more recent literature it has not been significantly improved upon. Lastly, a number of studies referring to forest management actually measure only specifically timber related practices and concepts (Kurtz and Lewis 1981; Greene and Blatner 1986; Young and Reichenbach 1987; Kluender and Walkingstick 2000). This may be a historical hold over from an era when forest management was considered synonymous with timber management (Weiseman 1983; McEvoy 2004).

While the question of what motivates forest landowners to manage their forests has been the subject of some PFL research (Bliss and Martin 1988; Bliss and Martin 1989; Erickson, Ryan, and DeYoung 2002), operationalization of the purpose component of the forest management definition is often unclear and/or missing from PFL studies. For example, Erickson, Ryan and DeYoung (2002) measured the motivation for particular types or styles of management such as “cooperative” and “hands-off,” but not the purpose of the specific management activities they operationalized as forest management. To an extent, the purpose of forest management activities may be captured by such popular survey topics as the importance of timber production, the likelihood of harvesting trees, the reasons for owning forestland, or the types of activities planned for the future of the forestland owned. However, a specific purpose component has not generally been matched to measures of specific forest management activities. Measurements of the purpose of forest management may also be absent from studies due to the traditional synonymizing of forest management with timber management, and the concomitant assumption that the primary goal of such management is timber production.

Only one previous study was uncovered whose purpose was to examine forest management from landowners’ perspectives. In a 1983 MS thesis, Weiseman looked for ways to increase the effectiveness of forestry programs by examining the characteristics influencing landowner participation in forest management, landowners’ perception of the benefits and disadvantages of

practicing forest management, and landowners' perception of their engagement with forest management. While this study did include more latitude for the perspective of forest landowners regarding forest management than any other study reviewed, landowners were not actually asked how they defined forest management, rather forest management definitions were "derived by examining a group of variables which measured respondents' participation in certain forest related activities." (Weiseman 1983). However, landowners were directly asked whether they felt they were practicing forest management.

Based on a factor analysis of responses to 15 variables Weiseman (1983) used to measure participation in forest related activities, two constructs considered forest management definitions were identified: 1) Timber Products Investment (including contact with a professional forester, following a management plan, attending forest-related workshops, being a Tree Farm Member, participating in federal cost sharing programs, harvesting timber), and 2) Personal Investment (including constructing trails, cutting wood for personal use, removing poor quality trees, improving wildlife habitat, camping, skiing, bird watching, hunting and fishing). Landowners participated more in the Personal Investment style of management than the Timber Products Investment style of management. In addition, 23% of respondents considered themselves to be practicing forest management. People who participated in some form of management (based on the 15 activity variables representing forest management practices) were more likely to consider themselves managers than those who did

not participate in management practices. Five variables were found to significantly predict landowners' perception of their management status. Three were associated with the Timber Products Investment view of management: 1) harvesting trees, 2) having a management plan, 3) attending landowner workshops. Two were associated with the Personal Investment view of management: 1) constructing trails, and 2) removing poor quality wood. According to Weiseman (1983), with the exception of constructing trails, all these activities are concerned with the timber resource rather than amenity values. Therefore he concluded that when determining their management status, respondents place more weight on participation in Timber Products Investment than Personal Investment and thus respondents' definitions of forest management lean more toward than away from traditional forestry efforts. It is important to note however that respondents' "definitions" of forest management were based upon their participation in a set of activities considered management activities by the study. It is unclear what landowners who did not participate in these activities, or participated in other activities, considered forest management to be. It is also unclear that participating in an activity means that's how you define it.

Research Summary and Objectives

In summary, private forestland literature and research relies primarily on traditional definitions of forestland management emphasizing landowner behaviors (participation in activities), and proposes PFLs do not manage their

land because they are uneducated about land management, unaware of assistance and education programs, and increasingly interested in non-commodity forest products and values. Literature also links management to the existence of adequate incentives and tends to reveal a focus on timber interests (Weiseman 1983; Egan 1997; Best and Wayburn 2001; McEvoy 2004).

However, our understanding of PFLs and their management of forestland has left the conceptualization of forest management from the PFL perspective largely unexamined. An improved understanding of PFLs' ideas concerning forest management promises to improve our ability to communicate and work with PFLs in meaningful ways, ways that can potentially be perceived by PFLs as more relevant to their experience of their forestland. Such improved communication might also serve to increase PFLs engagement with and interest in forestland management.

Using the Emory-Obed watershed of East Tennessee, an extensively privately owned and forested area, for illustration, the work presented here adds to the PFL research base both in content and method by building upon previous qualitative efforts with quantitative approaches and approaching the issue of private forestland management in ways previously un-addressed. Specifically this work, 1) explores how PFLs conceptualize forest "management" by examining how they define the term in reference to their own forestland, and how they perceive their own level of engagement with forest management as they conceive of it, 2) examines how variations in these conceptualizations and

perceptions are related to PFLs' management of their forestland as measured by their level of engagement with activities traditionally defined as composing private forestland management, and 3) compares PFL definitions of forestland management to those of NRPs via a review of the use and conceptualization of the term forest "management" in the literature.

Methods

Study Site and Population

Characteristics of the Emory-Obed watershed are described in Part I of this document. As stated previously, the watershed boundaries include portions of seven counties with two, Morgan and Cumberland, dominating the land area. Therefore, population characteristics of watershed residents are equated to the known characteristics of Morgan and Cumberland County residents. Population characteristics of each county are described below, however, average amount of land owned per landowner was calculated based on property tax records for landowners in sampled cells of the watershed only (see Data Collection below for details on sampling). That figure is 21.3 acres (Huss 2005).

Of the two counties, Cumberland County is by far the more populous with more than twice as many residents (46,802) as Morgan County (19,757) (U.S. Census Bureau 2000). While both counties remain rural, Cumberland County has experienced greater development in the past 25 years and a greater influx of "outsiders" than has Morgan County. This is due in part to its active seeking of retirees, golfers and businesses to relocate to the area and the fact that the

county lies along a major interstate (Crossville - Cumberland County Chamber of Commerce 2006).

As of 2000, the total population in Cumberland County was 46,802 with approximately 57% of those individuals falling between 18 and 64 years of age and approximately 23% 65 years of age or older. County residents are overwhelming white representing 98.3% of the population. The median household income as of 2004 was \$34,061 with approximately 15% below the poverty level. Females represent 51.5% of the population (U.S. Census Bureau 2000). Morgan County, in contrast, is less populous (19,757, has a lower median household income (\$30,387), a greater percentage of individuals living below poverty (18.7%), and a lower percentage of persons over the age of 65 (13.3%). Approximately ninety-seven percent (96.8%) of the population is white and 46.4% is female (U.S. Census Bureau 2000).

Data Collection

Identifying landowners appropriate for survey and ensuring random sampling was conducted via the procedures detailed in Huss (2005). In summary, counties in the watershed were parsed into 3mi² cells subsequently categorized as belonging to one of three major landscape types representing a continuum from more to less heavily urban/forested. Twelve cells were randomly selected for survey administration, four from each of the three landscape types.

A sampling frame for these 12 cells was drawn from property tax records. Business ownerships, partnerships, and public holdings were dropped from the

sampling frame. The final sampling frame consisted of private forest landowners owning one or more acre of “woodland” (property tax terminology) within the 12 selected cells (see Huss 2005 for further details).

A total of 1,010 surveys were mailed to identified PFLs in the study area and 563 responses were received (Huss 2005). Upon closer examination of the data, 59 cases were identified with self reports of less than one acre of woodland or zero percent wooded acres. These cases were dropped from the sample as they did not meet the population criteria leaving a final sample of 504 usable surveys for analysis and a response rate of 53%.

Checks for representativeness between survey respondents and individuals living in the Emory-Obed watershed were conducted by comparing socio-demographic variables from the survey to those reported in the U.S. Census for residents in Morgan and Cumberland counties. Differences between survey respondents and county residents include a larger percentage of males in the survey respondent pool than in the two counties and a greater percentage of survey respondents in higher income brackets than county residents in higher income brackets. The greater percentage of male respondents than males in the counties’ general populations is likely a result of men being more likely to fill out the survey than women. It is also likely that higher income levels are positively correlated to landownership given the costs involved in purchasing and maintaining property, therefore the income level difference between survey respondents and county residents are as expected. In addition, response rate

was checked against expected response rate and found to be within tolerable limits (Huss 2005).

Survey

A mail survey was administered to PFLs in selected cells of the Emory-Obed watershed owning one or more acres of woodland as defined by property tax records. Survey methodology followed the standard Dillman (2000) Tailored Design Method including a pre-test of representative potential respondents and subsequent survey design revision. Survey development was a collaborative effort between researchers at Purdue University, University of Missouri, and The University of Tennessee. Survey items were developed through several iterations informed by the literature, qualitative research conducted by each participating university, and the goals of the Sustaining Private Forests project ongoing at each of the three universities (Kurtz, Fly., and Swihart 2006).

The survey instrument consisted of a 12 page questionnaire including 55 questions structured in the following six sections: 1) General Characteristics of Your Land, 2) Importance of Your Woodland, 3) Woodland Management and Woodland Uses, 4) Your Community and Your Land, 5) Taxes, 6) Background. In addition, a substantial open comment area for any additional comments about the survey or the respondents' land was included (see Appendix B). The survey was simultaneously administered in two watersheds each in Tennessee, Missouri and Indiana. The term "woodland" as opposed to "forestland" was used throughout the survey due to Indiana's large areas of less densely wooded land

cover. "Woodland" was defined as "a minimum of ten (10) trees per acre on at least one (1) acre of land" and was perceived by the survey design team as a more generally applicable term than "forestland" or "forest" which might connote more densely wooded areas than are present in much of the survey's study area. Nevertheless, for Tennessee data it is appropriate to discuss issues of "forestland" and "forest" management as the typical wooded land in the study area is more densely wooded than the "woodland" defined in the survey. In other words, "woodland" in east Tennessee is "forestland." In addition, interviews conducted with PFLs in the study area indicated they do not make the types of distinctions typically made by forest researchers and practitioners between these terms. For example, one landowner stated, "You call it forest, I call it woods."

PFLs' conceptualization of the term forest "management" was measured with a 5-point 15 item Likert scale with potential responses ranging from Strongly Disagree to Strongly Agree and including an Undecided option as the midpoint. The survey question read as follows, "When people talk about managing their woodland, they sometimes mean several different things. We are interested in what **you think** of when you hear or read the term "management" in reference to your woodland. Please indicate the extent to which you agree or disagree with each item by placing an X in the box closest to your opinion on what management includes." Response items included a mix of relatively traditional definitions of forest management based on the literature, and possible meanings identified from the language of non-participant PFLs via qualitative research.

Items based on traditional definitions included choices such as, “In my opinion, woodland management includes removing low value trees to improve the growth of high value trees.” Items based on the language of non-participant PFLs included choices such as, “In my opinion, woodland management includes cutting down trees around the property to make it look the way I like” (Steiner 2003; Davis and Fly 2004; see also Part I of this document). Self perception of engagement with forest management was measured with a yes/no question as follows, “When thinking about what you consider to be “management” do you feel you manage your land?” (see Q13 Appendix B). PFLs’ level of engagement with forestland management activities as traditionally defined based on literature and past surveys, and their perception of their own level of engagement with forest management as they conceive it, were measured via a series of eight yes/no and multiple choice questions such as, “Have you ever harvested or cut trees from this woodland?” and “When thinking about what you consider to be “management” do you feel you manage your land?” (see Q13, Q14, Q15, Q16, Q17, Q18, Q19, and Q21 Appendix B).

Data Analyses

Analyses were conducted using the Statistical Package for Social Sciences for PC, Version 14.0. Exploratory factor analysis, a data reduction technique used to uncover the underlying structure of a set of variables, was used to determine significant constructs concerning how PFLs conceptualize forest management based on PFLs’ responses to the survey’s management

definitions scale. The data reduction aspect of factor analysis refers to the method's ability to analyze patterns of relationships within the correlations between a set of variables and condense these correlations to a smaller set of underlying variables, or factors, which represent these relationships. Factors themselves are not observed or measurable entities but are said to "explain" the variance of the observed variables (Kim and Mueller 1978; Kachigan 1982; Green, Salkind, and Akey 2000; Garson 2006). Principal Components Analysis with varimax rotation and Kaiser normalization, a form of orthogonal rotation, was used to generate the rotated component matrix.

Initially, four factors were identified based on the "Eigenvalue-greater-than-one criterion" (Green, Salkind, and Akey 2000). However, the fourth factor identified under this interpretation scheme was both statistically and theoretically weak with one item loading onto both it and another factor, and one item loading onto it negatively. Therefore, the negatively loading item (Letting the forest grow and change naturally) was recoded to the positive direction (*Not* letting the forest grow and change naturally) and the selection of factors was limited to three in order to improve interpretability of the analysis. Selection of factors based on these criteria yielded three distinct and highly interpretable factors with Eigen values greater than one and all component loadings greater than .5.

Several additional statistical techniques were employed to examine the other areas of interest in this research. To examine PFLs' level of engagement with forest management activities, a new variable (ActSum3) consisting of 18

different activities traditionally associated with forest management was created. Respondents' self report concerning their involvement with each of these 18 activities was summed creating a range of respondent activity level from zero to 15 activities. Table 3 lists the activities included in the ActSum3 variable. Figure 4 summarizes the frequency (as percent) with which respondents engaged in each level of traditionally defined management activity.

The relationship between PFLs' level of engagement with management activities, and the ways in which they conceptualize forest management was examined using both bivariate correlation and Multivariate Analysis of Variation (MANOVA). Due to the non-normal distribution of level of engagement in management activities across the respondent population, Spearman's bivariate correlation was used to measure the strength and direction of the relationship between PFLs' level of engagement in management activities and their conceptualization of forest management. MANOVA was used to compare differences in how PFLs conceptualized forest management based on their involvement in selected individual management activities. MANOVA was also used to compare differences in PFLs' conceptualization of forest management based on PFLs' self perception of their engagement with forest management. Lastly, a series of statistical tests including a two independent samples Mann-Whitney U test for non-normally distributed data, cross tabulations with chi-square statistics, MANOVA and t-test, depending on the types of variables involved, were conducted to examine the relationship between PFLs'

engagement with forest management activities and their self perception as forest managers or non-managers.

Results

Survey Sample

A total of 504 usable surveys were received. The average amount of acreage owned by respondents is 68.2 acres. The maximum number of acres owned by survey respondents is 2212, the median is 77 and the mode is 5. These measures of central tendency may provide some explanation for the fact that the average number of acres owned by survey respondents is greater than the average number of acres owned by landowners in the sampled cells (21.3 acres). In addition, landowners with larger acreages may have tended to answer the survey more than smaller landowners. It seems plausible that smaller landowners may have seen less relevance in responding to the survey than larger landowners considering the survey title of “A Survey of Private Woodland Owners in the Emory-Obed Watershed of Tennessee.”

Table 4 summarizes selected demographic characteristics of the survey sample. The majority of respondents are older males earning moderate incomes and who have graduated from high school and received some further higher education. The majority of respondents are also resident landowners. For the purposes of this study, residents are defined as landowners who live in the study area themselves or who live within 49 miles of their forestland in the study area.

Respondents whose live 49 or fewer miles from their forestland are considered to be within a one hour's drive of their forestland.

Meaning of Management

Exploratory factor analysis of the Defining Woodland Management scale produced three distinct factors named based on similarities in the items loading onto each factor and interpretive insights concerning these items gained from the aforementioned qualitative work (see Table 5): 1) Management as “property maintenance” (planting trees around the property to make it look the way I like, removing dead trees and unwanted plants, cutting down trees to keep the property looking the way I want, putting up or maintaining fences around my property, planting fruit trees or plants for food, using pesticides to keep insects from harming plants or trees), 2) Management as “making money” (cutting down trees for a timber sale, planting trees to make money, removing low value trees to improve the growth of high value trees, leasing the land to another person, *Not* letting the forest grow and change naturally), 3) Management as “creating and enhancing forest habitat” (establishing food plots for wildlife, consulting with foresters on how to plan for the future of my property, building and maintaining trails for recreating through the woods, planting trees for the future). These three factors explain 49% of the variance in the data matrix. The overall reliability of the Defining Woodland Management scale was .76 (Cronbach's alpha). The reliability (Cronbach's alpha) and amount of variation explained by each subscale is as follows, 1) property maintenance (.74) explaining 17.5% of the variance, 2)

making money (.71) explaining 17.2% of the variance, 3) creating habitat (.63) explaining 14.6% of the variance.

Respondents' scores for each factor were calculated as the mean of their summed Likert scale responses for the items composing each factor.

Subsequent analyses involving respondents' conceptualizations of forest management were conducted using these values as the factor scores. Means were compared to the original Likert scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, and 5 = Strongly Agree. All means are reported as "x=___." Overall, respondents tend to agree that creating and enhancing forest habitat is forest management (x = 3.6), somewhat agree that property maintenance is forest management (x = 3.4) and are relatively undecided as to whether conducting activities to make money is forest management (x = 2.9).

Engagement in Management Activities

The majority (61%, n = 307) of landowners sampled in the Emory-Obed watershed are involved in two or more traditionally defined forest management activities (see Figure 4). Nearly 40% (n = 188) engage in three or more of these activities. Approximately one fifth of those sampled (22%, n = 110) report engagement in four or more management activities with involvement levels tapering steadily from approximately 10% (n = 48) at the level of four activities to a low of between .2% and .6% (n = 1 – 3 individuals) at eight or more activities. Overall, more respondents engage in at least one management activity (84%, n =

425) than none of the 17 possible management activities measured (16%, n = 79).

Although, only 4% (n = 19) of respondents have a written management plan, 58% (n = 268) claim to make a multi-year land use decision plan as opposed to planning only for the current year. Use of professional foresters is limited. For example, although 49% (n = 243) of landowners report having ever harvested or cut trees from their land, and 69% (n = 365) agree creating and enhancing forest habitat is management, a definition which includes “Consulting with foresters on how to plan for the future of my property”, only 10% (n = 24) of respondents used a professional forester to plan, mark or contract the most recent harvest. In addition, planting trees on the advice of a forester or county extension agent is not among the top five reasons respondents give for choosing to plant trees.

Figure 5 summarizes the five most popular activities engaged in by landowners in each of the following four activity levels: 1 Activity, 2 Activities, 3 Activities, and 4 or more activities. Three activities are among the top five most popular activities across all four engagement level groups: having ever planted trees, having ever harvested or cut trees, and having built or maintained roads and/or trails. Having built or maintained ponds and/or ditches is among the top five most popular activities for all management activity engagement levels except 3 Activities. Differences across engagement levels include the proportionately high level of enrollment in the Green Belt program among the least active

landowners, and the popularity of preparing land to plant trees and applying pesticides and/or herbicides to forest land among landowners engaged in 3 Activities. These particular activities do not appear among the most popular activities for any of the other engagement level groups. Lastly, at the highest management activity engagement level, 4 or more Activities, two new activities appear as most frequently engaged in including Timber Stand Improvement (TSI) and managing for wildlife populations. Thus as management activity engagement level increases, so does the diversity of activities engaged in.

Relationship Between Engagement in Management Activities and How Forest Management is Conceptualized

Spearman's bivariate correlation for non-normally distributed data was used to measure the strength and direction of the relationship between PFLs' level of engagement in management activities and how they conceptualize forest management. It is a weak positive correlation ($p < .001$). In other words, as engagement in forest management activities increases, so does strength of agreement with the items related to creating and enhancing forest habitat, property maintenance, and making money define forest management. The opposite is true as well; correlation does not imply causality. The relationship between engagement with forest management activities and conceptualizing forest management as creating and enhancing forest habitat is strongest ($\rho = .213$), followed by conceptualizing forest management as property maintenance ($\rho = .153$) and as making money ($\rho = .147$).

In addition to examining the strength and direction of the relationship between level of engagement in forest management activities and conceptualization of forest management, the relationship between engagement in eleven individual forest management activities and how forest management is conceptualized was also examined. Table 6 lists the eleven activities examined and summarizes the significance of the relationship between engagement in these activities and the conceptualization of forest management. Detailed results for each of the three significant relationships examined (having a multi-year land use decision plan vs. planning only for the current year, having ever harvested trees, and having ever planted trees) including how engagement in each activity relates to conceptualization of forest management are described below and summarized in Table 7.

Having a multi-year land use decision plan vs. planning only for the current year was significant [$F(3, 448) = 15.970, p < .001$]. Respondents who report making a multi-year land use decision plan are significantly different from those who plan only for the current year with regards to conceptualizing forest management as making money ($p < .001$) and as creating and enhancing forest habitat ($p < .001$). Specifically, landowners who make multi-year land use decision plans are more likely to agree that making money ($x = 2.97$) and creating and enhancing forest habitat ($x = 3.78$) define forest management than are those who plan only for the current year ($x = 2.71$ and $x = 3.41$ respectively).

Multi-year land use planning vs. planning only for the current year did not differ significantly with regard to management as property maintenance ($p = .123$).

In addition to the statistical significance of these differences in mean level of agreement with the various forest management conceptualizations based upon engagement with individual management activities, these differences can be practically interpreted by comparing the mean agreement level for each forest management conceptualization to the original forest management definitions scale measures. For example, the original Likert scale measures include Strongly Disagree scored as 1, Disagree scored as 2, Neutral or Undecided scored as 3, Agree scored as 4 and Strongly Agree scored as 5. Therefore, in the case of landowners who make multi-year land use decision plans agreeing that making money defines forest management more than those who plan only for the current year, we can note that while this difference is statistically significant, agreement that making money defines forest management is approximately neutral. In contrast, landowners who make multi-year land use decision plans are not only statistically significantly more likely to agree ($x = 3.78$) creating and enhancing forest habitat is forest management than those who plan only for the current year ($x = 3.41$), but when compared to the original Likert scale values, they indicate practical agreement as well.

Having ever harvested or cut trees was also found to significantly impact respondents' conceptualization of forest management [$F(3, 474) = 5.337, p = .001$]. Having ever harvested or cut trees had a significant impact on PFLs'

conceptualization of forest management as making money ($p = .001$), but not on PFLs' conceptualization of forest management as creating and enhancing forest habitat ($p = .295$) or as property maintenance ($p = .095$). Specifically, landowners who have ever harvested or cut trees are more likely to agree ($x = 2.97$) that making money defines forest management than are those who have not harvested or cut trees ($x = 2.77$). Note that while a significant difference in mean level of agreement exists for conceptualizing forest management as making money based upon having ever harvested or cut trees, the agreement level in both cases is close to neutral indicating that while PFLs who have harvested or cut trees may be more likely to view forest management as making money, agreement that forest management can be conceptualized as making money is relatively neutral regardless of whether PFLs have harvested trees or not.

In addition, having ever planted trees on their forestland also significantly impacted respondents' conceptualization of forest management [$F(3, 466) = 13.880, p < .001$]. Having ever planted trees on their forestland had a significant impact on PFLs' conceptualization of forest management as property maintenance ($p < .001$) and as creating and enhancing forest habitat ($p < .001$), but not on PFLs' conceptualization of forest management as making money ($p = .826$). Specifically, landowners who have ever planted trees are more likely to agree ($x = 3.48$) that property maintenance defines forest management than are those who have not ever planted trees ($x = 3.24$). They are also more likely to

agree ($x = 3.73$) that creating habitat and enhancing forest habitat is forest management than are those who have not planted trees ($x = 3.43$).

Self Perception of Engagement with Forestland Management

When PFLs were asked, “when thinking about what **you** consider to be management do you feel you **manage** your land?”, the overwhelming majority of respondents (77%, $n = 382$) responded positively. Only 23% ($n = 113$) of respondents do not believe they manage their land based upon their personal conceptualization of forest management. A MANOVA run to test whether differences exist between respondents who believe they manage their land and those who do not believe they manage their land in terms of their conceptualizations of forest management was significant [$F(3, 473) = 12.243, p < .001$]. Specifically, belief that one manages one’s land has a significant effect on how likely respondents are to conceptualize forest management as property maintenance ($p < .001$), with respondents who believe they manage their land significantly more likely to conceptualize forest management this way ($x = 3.480$) than those who do not believe they manage their land ($x = 3.135$). Individual Analysis of Variance (ANOVA) tests determined that conceptualizing forest management as making money ($p = .934$) and as creating and enhancing forest habitat ($p = .701$) did not differ significantly relative to self perception of engagement in forest management.

In addition to examining the relationship between how PFLs’ conceptualize forest management and their self perception of whether they

manage their forestland or not, the relationship between PFLs' perception of themselves as forest managers or non-managers and their engagement in forest management activities was examined in several ways. A two independent samples Mann-Whitney U test for non-normally distributed non-parametric data indicated a significant relationship ($p < .001$) exists between PFLs' reported levels of engagement with forest management and their self perception of their engagement with forest management. For those landowners who believe they manage their forestland, the mean number of management activities engaged in is 2.6, as compared to 1.5 for PFLs who do not believe they manage their land, the median number of activities engaged in is 2.0, as compared to 1.0 for PFLs who do not believe they manage their land, and the maximum number of activities engaged in is 15, as compared to six for PFLs who do not believe they manage their land.

Chi-square tests were run for nine individual management activities and five related items to determine whether significant differences exist between those who believe they manage their land and those who do not in terms of which specific individual management activities they most frequently engage in. Results of the 14 chi-square tests are summarized in Table 8. Significant differences in the management activity engagement level of respondents believing they manage their forestland and those who do not believe they manage their forestland were found for eight different management activities. For each of these eight activities, chi-square results, including the percentage of

respondents believing they manage their forestland and not believing they manage their forestland, for each activity, are described below.

First, a significant difference was found for making multi-year land use decision plans when making land use decision plans vs. planning only for the current year ($\chi^2 = 13.065$, $df = 1$, $p < .001$). While sixty-two percent (62%) ($n = 228$) of those who believe they manage their forestland make multi-year land use decision plans, only 42% ($n = 40$) of those believing they do not manage their forestland plan beyond the current year when making land use decision plans. Second, a significant difference was found for having prepared land for tree planting in the last five years ($\chi^2 = 8.385$, $df = 1$, $p < .01$). Seventeen percent ($n = 61$) of those who see themselves as managers of their forestland have ever prepared their land for tree planting, vs. only 6% ($n = 6$ individuals) of those who do not see themselves as managing their forestland. Third, having applied pesticides or herbicides to their forestland in the last five years revealed a significant difference in terms of self perception of engagement with forestland management ($\chi^2 = 5.280$, $df = 1$, $p < .05$). Of those who believe they manage their forestland, 15% ($n = 55$) have applied pesticides or herbicides to their forestland in the last five years as compared to only 7%, or seven individuals, who do not believe they manage their forestland. Fourth, a significant difference was found for having managed for wildlife populations in the last five years ($\chi^2 = 8.743$, $df = 1$, $p < .01$). Eighteen percent ($n = 67$) of those who believe they manage their forestland report having managed for wildlife populations in the last

five years as compared to 7% (n = 7) of those who do not believe they manage their land. Fifth, having built or maintained ponds or ditches in the last five years revealed a significant difference in terms of self perception of engagement with forestland management ($\chi^2 = 8.061$, df = 1, p < .01). Of those who perceive themselves as managing their forestland, 23% (n = 83) have built or maintained ponds or ditches on their forestland in the last five years compared to 10% (n = 11) of those who do not see themselves as managing their forestland. Sixth, conducting TSI is a forestland management activity significantly related to self perception of engagement with forestland management ($\chi^2 = 8.981$, df = 1, p < .01). Of those who believe they manage their forestland, 18% (n = 66) have ever conducted TSI, while only 6% (n = 7) of those who do not believe they manage their forest land have ever conducted TSI. Seventh, a significant difference was found for ever having planted trees ($\chi^2 = 22.493$, df = 1, p < .001). 68% (n = 252) of those who believe they manage their forestland have ever planted trees. Forty-three percent (n = 48) of those who do not believe they manage their forestland have ever planted trees. Lastly, ever having harvested or cut trees revealed a significant difference in terms of self perception of engagement in forestland management ($\chi^2 = 9.623$, df = 1, p < .01). Of those who believe they manage their forestland, 53% (n = 200) have ever harvested or cut trees, while only 36% (n = 41) of those who do believe they manage their forestland have ever harvested or cut trees.

A comparative view of the percentage of respondents believing and not believing they manage their forestland engaged in each of these eight previously discussed management activities is presented in Figure 6. Note, while significant differences in self perception of engagement with forestland management were found for all eight of these forestland management activities, only three of these activities represent activities engaged in by more than half of all respondents: making a multi-year land use decision plan, planting trees, and harvesting or cutting trees. The other five activities indicating significant differences relative to self perception of engagement with forestland management are only engaged in by a maximum of 23% of respondents.

Two additional items related to ever having harvested or cut trees were tested separately for their relationship to self perception of engagement in forestland management. First, a t-test was used to examine the importance of the income received from having ever harvested or cut trees relative to self perception of engagement in forestland management ($t = 2.301$, $df = 70.805$, $p = .024$, equal variances not assumed). Income was significantly more important for those who believe they manage their land ($x = 2.38$), than it was for those who do not believe they manage their land ($x = 1.87$). However, while differences in importance of income between belief groups are significant, a mean agreement level of 2.38 does not indicate significant importance of income as a reason for harvesting overall.

Second, a MANOVA run to test the importance of reasons for having ever harvested or cut trees relative to self perception of engagement in forestland management was significant [$F(14,181) = 2.596, p < .05$]. Individual ANOVAs determined that of 14 possible reasons for choosing to harvest or cut trees, four specific reasons were significant including "to remove trees damaged from a natural catastrophe" ($p = .034$), "to improve wildlife habitat" ($p = .021$), "to clear land for conversion to another use" ($p = .002$), "as part of my management plan" ($p = .000$). In terms of removing damaged trees due to a natural catastrophe, those who believe they manage their land are more likely to view this as an important reason for harvesting trees ($x = 3.23$) than those who do not believe they manage their forestland ($x = 2.62$). In terms of improving wildlife habitat, those who believe they manage their land are more likely to view this as an important reason for harvesting or cutting trees ($x = 2.52$), than are those who do not believe they manage their land ($x = 1.95$). Those who believe they manage their land, are more likely to view clearing land for conversion to another use as an important reason for harvesting or cutting trees ($x = 2.49$) than are those who do not believe they manage their land ($x = 1.65$). Lastly, those who believe they manage their land, are more likely to harvest or cut trees "as part of my management plan" ($x = 2.5$) than are those who do not believe they manage their forestland ($x = 1.43$). These results are summarized graphically in Figure 7.

Discussion

Introduction

Management of private forestland has been a concern since New World colonization due to the economic, environmental and social benefits these lands provide both landowners and society. However, despite significant effort to understand PFLs and motivate their greater participation in forest management practices, consistent reports describe vast amounts of unmanaged private forestland and large numbers of PFLs unaware of the benefits of managing their land and the assistance available for doing so. Such discrepancies yield calls for new approaches and perspectives in research, outreach and program development. This study addresses these calls via a mail survey of private forest landowners in the Emory-Obed watershed of East Tennessee by relating PFLs' conceptualization of forest management to the degree and nature of their engagement in forest management practices. In addition, professional forest management definitions and research operationalizations were reviewed via the literature and compared to the findings concerning PFLs' forest management conceptualizations.

Three forest management concepts were identified from survey responses. Forest management as property maintenance, forest management as creating and enhancing forest habitat, and forest management as making money. The strength of PFLs' agreement that each of these concepts describes forest management, and their self perception of their engagement with forest

management, was found to relate to their engagement with forest management activities. More-active landowners were more likely to agree the activities related to each of the three forest management definitions identified are forest management. In addition, engagement with specific forest management activities is related to agreement with the forest management definitions. Management definitions are also related to a landowner's belief as to whether or not they manage their land. In turn, believing you manage forest land is related to level of engagement with forest management activities. Lastly, forest management definitions from the literature, and their operationalizations, were analyzed. Forest management definitions were found to include both an action and a purpose component. The action component ranged from more cognitive forms of action such as "designing" to more physical forms of action such as "implementing". The purpose component referred to the fulfillment or provision of needs, values, benefits etc. of society or a landowner. Research study operationalization of these definitions was found to be wholly lacking or ill-matched to the literature definitions. When present, forest management operationalizations in the literature were limited to only the physical aspect of the action component, while the purpose component was often synonymized to the goals of timber management alone.

Results of this effort are discussed below including implications for professional practice and some suggestions for future research. Little previous literature concerning PFLs' conceptualization of forest management is available

for comparison or context, however where available, an attempt to tie in related literature is made.

Defining Forest Management

A factor analysis of respondents' level of agreement with a series of choices completing the statement, "In my opinion, woodland management includes . . . ", reveals three distinct forest management concepts. Forest management as property maintenance includes activities such as planting, cutting down, and removing trees for the purpose of maintaining or enhancing one's property. Forest management as making money includes these activities plus "leasing land to another person" and "letting the forest grow and change naturally" for the purpose of making money. "Letting the forest grow and change naturally" loaded negatively onto this factor, meaning it groups with the other items in the making money construct as "*Not* letting the forest grow and change naturally." In other words, those people who tend to see activities related to making money as forest management are less likely than others to allow the forest to grow and change at its own pace. The third forest management concept identified is forest management as creating and enhancing forest habitat. This includes activities such as establishing food plots for wildlife, planting trees for the future, and consulting with foresters on forest planning for the purpose of creating and enhancing forest habitat.

This study reveals landowners and natural resource professionals understand the term "forest management" in both similar and different ways.

Respondents are most likely to agree activities related to creating and enhancing forest habitat are forest management ($x = 3.6$), followed by activities related to property maintenance ($x = 3.4$), and making money ($x = 2.9$). The items making up these constructs were either modeled after those included in traditional PFL surveys as indications of forest management, or were identified through qualitative research in the study area as the types of activities many landowners traditionally viewed as non-managers engage in. Taken together, these three ways of conceptualizing forest management cover a broader range of activities and purposes than those traditionally seen in PFL research. By associating multiple purposes such as “for food”, “to make money”, “for the future”, and “to make it (my property) look the way I want” with the same traditionally operationalized forest management activity, for example, “planting trees”, rather than assuming and/or limiting the purpose of planting trees to traditional forest management concepts such as income generation and/or forest regeneration, a PFL definition of forest management not previously identified was uncovered: forest management as property maintenance. Nevertheless, the forest management conceptualization landowners most agree with is “creating and enhancing forest habitat”; the only definition to include consulting with foresters, and one modeled closely after some traditional views and operationalizations of forest management. In addition, respondents also recognize one way of conceptualizing forest management is “making money”, another construct composed of mostly traditionally defined forest management activities, even if

they are undecided as to whether they agree forest management includes these activities. Therefore, we can conclude while respondents' conceptualization of forest management may be broader than that typically associated with the field of forestry, they do understand and, to a degree, agree with more traditional definitions of forest management. Such findings support those reported in the literature regarding the different ways landowners and professionals can interpret the same natural resource management term (Egan and Jones 1993; Egan and Jones 1995; Egan et al. 1995; Cox 2004; Hull, Robertson, and Buhyoff 2004; Mance, Sills, and Warren 2004). No other studies examining how PFLs conceptualize "forest management" are available for comparison.

Forest Management Activities

The lack of a standard operationalization for measuring the presence of forest management makes interpreting the degree to which these results reflect PFL engagement in forest management difficult. These results indicate more respondents engage in any management activity at all than no management activity, the majority (61%) engage in at least two management activities, and substantial numbers (37% and 22% respectively) engage in three and four or more management activities. Such findings suggest the majority of these landowners are more engaged in forest management than they are un-engaged. This conclusion runs counter to those reported in the literature concerning general levels of PFL engagement in forest management activities.

In terms of engagement in specific activities, the three most popular activities across all engagement levels are having ever planted trees, having ever harvested or cut trees, and having built or maintained roads or trails. However, the wording of these forest management operationalizations, modeled after that used in previous surveys, makes interpreting the practical significance of these results difficult. For example, having ever harvested, cut, or planted trees potentially spans a range from one tree to entire stands. Given the known interpretation differences between PFLs and NRPs concerning the same terms (Egan and Jones 1995), and the amounts of personal landscaping activity reported by the American Nursery Association (DeCoster 2000), based on these measures it is difficult, if not impossible to distinguish between engagement in landscaping, or property maintenance, and engagement in traditionally defined forest management. Similarly, counting a positive response to “Having built or maintained roads or trails” as forest management is potentially problematic. In this case, it is the operationalization of forest management as an activity without a defined purpose which causes difficulty. Despite the prevalence of operationalizing forest management in surveys as including road and trail maintenance or building activities, no studies describe how such an activity relates to forest management. Given the synonymization of timber management and forest management identified in the literature, items concerning the building of roads or trails were likely included in early PFL surveys as a measure of

logging activity. However, without further information, participation in this activity reveals only limited information regarding PFLs' management of their forestland.

Another example of the difficulty operationalizing forest management creates in terms of interpreting results, is the discrepancy between the number of PFLs possessing a written management plan (4%) and the number claiming to make a multi-year land use decision plan (58%). A major component of the literature's definition of forest management is cognitive action such as "applying principals" and "guiding evolution." However, given these aspects of forest management have no observable trait, unlike possessing a written management plan, conclusions regarding PFL forestland management based on the possession of a written management plan and not including the possession of an unwritten multi-year land use plan, or other measure of cognitive forest management activity, may be inaccurate and/or misleading.

Relationship Between Engagement in Management Activities and How Forest Management is Conceptualized

A weak positive correlation was found between level of engagement in management activities and agreement with the three constructs identified as defining forest management. In other words, the more engaged a PFL is with forest management activities, the more likely they are to agree that the items related to creating and enhancing forest habitat, property maintenance, and making money define forest management. In addition, several tests of the relationship between engagement in individual forest management activities and

how forest management is conceptualized were conducted. Of these, three individual management activities were significantly related to the conceptualization of forest management: making a multi-year land use decision plan, having ever harvested/cut trees, having ever planted trees.

Landowners who make a multi-year land use decision plan are more likely to agree making money ($x = 2.97$) and creating and enhancing forest habitat ($x = 3.78$) define forest management than are those who plan only for the current year ($x = 2.71$ and $x = 3.41$ respectively). This makes sense given the activities making up each of these constructs tend to require planning and investment. It is interesting to note that making a multi-year land use decision plan is significantly related to how respondents conceptualize forest management but having a written management plan is not. Note, however, only 19 respondents out of 504 reported having a written management plan. Thus the sample size may have been too small to detect a significant difference with respect to possessing a written management plan. Also note, regardless of the degree of planning a landowner engages in, agreement that making money defines forest management hovers at or below neutral whereas agreement that creating and enhancing forest habitat is forest management is much stronger.

Landowners who have ever harvested or cut trees are more likely to agree ($x = 2.97$) making money defines forest management than are those who have not harvested or cut trees ($x = 2.77$). This is interesting because harvesting trees is one of the primary ways a landowner interested in making money from their

land would do so. However, while landowners who have ever harvested or cut trees are more likely to agree making money defines forest management than are those who have not ever harvested trees, based on the original Likert scale scores, both groups are undecided that activities related to making money define forest management. Lastly, landowners who have ever planted trees are more likely to agree property maintenance ($x = 3.48$) and creating and enhancing forest habitat ($x = 3.73$) defines forest management than are those who have not ever planted trees ($x = 3.24$ and $x = 3.43$ respectively). This result may indicate planting trees for the purpose of keeping up or enhancing your property and the surrounding woodland is a more popular reason, than planting trees for future profitability.

Self Perception of Engagement with Forestland Management

The majority of respondents (77%) believe they manage their forestland. This number is much higher than the number of landowners generally considered to manage their forestland reported in the literature. It is difficult to know to what exactly to attribute this discrepancy. One obvious possibility is to consider what those landowners believing they manage their forestland consider forest management to be, and what sorts of activities they engage in on their forestland. The results of this study indicate landowners who believe they manage their forestland differ significantly from those who do not believe they manage their forestland both in terms of their level of participation in forest management activities and in terms of how they conceptualize forest

management. Landowners who believe they manage their forestland are more engaged in forest management activities than those who do not believe they manage their forestland. Believing you manage your forestland is also significantly related to agreement that activities related to property maintenance define forest management.

These findings share both similarities and differences with the only other study uncovered examining landowners' perceptions of forest management (Weiseman 1983). Both studies examined the relationship between engagement in individual forest management activities and self perception of forest management. However, as with all PFL forest management studies, the activities included as indicating the presence of forest management differed. Nevertheless, both studies found engagement in certain individual forest management activities was significantly related to perception of forest management. Of these, one can be considered common to both studies, harvesting trees, and one can be considered similar, having a written management plan (Weiseman's study) or making a multi-year land use plan (this study).

A major difference between the two studies is in the percentage of landowners who feel they manage their forestland. While 77% of the landowners in this study feel they manage their forestland, only 23% of those in Weiseman's study felt they were practicing forest management. This difference may be due in part to changes in landowner conceptualization of forest management over

time. Twenty-five years ago, the public's challenges to traditional natural resource management and newer models of participatory and collaborative natural resource management were in their infancy making it more likely that landowners' conceptualizations of forest management would agree with those of the forestry profession. Differences in the studies' populations, locations, and changes in the general PFL population over time may also explain these differences. In comparison, Weiseman's (1983) study was located in the northeast as opposed to the southeast, had a sample size approximately one half as large as this study, and included a greater percentage of PFLs owning between 25 and 100 acres than the present study.

The results of this study may offer some explanation for some of the findings in the PFL literature. Numerous studies indicate while most PFLs aren't managing their forestland, nor are they significantly aware of the benefits of doing so, and the opportunities to become involved, most PFLs are interested in forest protection, forest health, recreation, aesthetics, and other non-commodity forest values. It is no wonder forestry extension programs promoting a conceptualization of forest management more in line with that understood by most NRPs, and attempting to motivate PFLs to manage their forestland based on economic, utilitarian, or scientific forest health related bases, are poorly attended and failing to recruit significant numbers of PFLs into forest management when these interests are combined with the following findings from this study and others: 1) most PFLs believe they are managing their forestland,

2) those with this belief are more likely to define forest management as property maintenance than those who do not believe, 3) the field has allowed only a narrow set of purposes for any individual activity to count as forest management, 4) Americans readily seek help with landscaping.

Implications for Practice

The findings presented here add to the understanding of private forest landowners' forestland management in several ways. As such, several implications for theory, research and practice relative to PFLs' forestland management are evident. These include, 1) implications of the inter-relationship of PFLs' management activities, conceptualizations, and beliefs regarding their engagement in forestland management, 2) of the identification of a property maintenance definition of forest management, and 3) of the way the term forest management is understood, used and interpreted by both PFLs and NRPs. For clarity, implications related to each of these will be discussed separately, however, just as the study's findings are inter-related, their implications are also inter-related. As such, while suggestions for informing and re-forming professional practice resulting from these implications will be discussed individually, implementation would be improved by applying them in concert.

1) Inter-relationship of PFLs' Management Activities, Conceptualizations and Beliefs Regarding Their Engagement in Forestland Management

Previous efforts to increase professionals' understanding of private forest landowners' interest and engagement in forest management have primarily relied on traditional forest management conceptualizations in terms of both the activities and purposes attributed to, and measured as, forest management. Results of these efforts have been used primarily in attempts to alter landowner behavior by increasing engagement in forest management activities such as enrollment in education and assistance programs, possession of a written management plan, planting, cutting, harvesting and removing trees, etc. However, given this study's findings that landowner engagement in forest management is related to how they conceptualize forest management and whether they consider themselves to be managers or not, efforts to increase the engagement of landowners in forest management activities would benefit from incorporating, and acting on and from, landowners' conceptualizations of forest management and their perceptions of their own engagement with it. For example, the historically low attendance levels at landowner educational events, low enrollment levels in assistance programs, and low levels of engagement in forest management activities as measured by previous PFL surveys may be related to the fact that the majority of PFLs in the sample population believe they are already managing their forestland. Appeals to engage in a set of activities one believes oneself to already be engaged in are unlikely to result in significant

recruitment. Similarly, appeals to engage in a set of activities one assumes oneself to be uninterested in based on one's understanding of those activities are also unlikely to increase recruitment. However, outreach and assistance efforts which incorporate and/or reflect landowners' perceptions of themselves relative to their forestland, conceptualization of forest management, and forest management interests might have a greater appeal than outreach and assistance programs presented more purely from a traditional forest management view focusing on timber production, assuming landowners are uninvolved in and uneducated about forest management, and relying on the terminology of the forestry profession. For example, program titles such as "Working With the Forest to Enjoy the Woods" or "Landscaping for Wildlife" may have greater appeal than traditional titles. At the same time, changing behavior, even among those who intend to behave in a certain way, value such behavior, and see such behavior as desirable is notoriously difficult, so attempting to convince landowners to adopt behavior for which they see no need may be unrealistic. Therefore, one implication of the link between forest management conceptualizations, perceptions and behaviors may be for the forestry profession to have more realistic ideas about who they are reaching, and what and how they can achieve their goals.

2) Identification of a "Property Maintenance" Definition of Forest Management

Several calls for NRPs to improve their outreach and their understanding of PFLs can be found in the literature (Bliss and Martin 1989; Parker 1992;

Jones, Luloff, and Finley 1995; Best and Wayburn 2001; Best 2004; Butler and Leatherberry 2004; Hull, Robertson, and Buhyoff 2004; Kittredge 2004; Finley and Kittredge Jr. 2006). Recent PFL literature suggests parsing the PFL population into specific market segments representing homogenous interests as one way of linking forestry messages to the values of particular types of landowners (Finley and Kittredge Jr. 2006). This study supports suggestions to improve outreach efforts by tailoring professional messages, and offers a potentially new PFL sub-population for such targeted outreach; those landowners who view forest management as property maintenance and whose forest management activities, while categorized as traditionally defined forest management by PFL surveys, may in fact more accurately reflect activities at the scale of property maintenance or landscaping. Based on this study's findings, the majority of these landowners, especially those who make a multi-year land use decision plan, have ever planted trees, and have ever harvested or cut trees, probably also consider themselves to be managing their forestland. In addition, although PFL research, including the present study, consistently reports PFLs do not avail themselves of available forestry assistance, the American Nursery and Landscape Association reports American households spend \$15 billion or more annually for professional help with their gardens and trees (DeCoster 2000). Taken together, these findings suggest the potential existence of a new PFL sub-population and that focusing forestry outreach on the potentially large number of PFLs viewing forest management as property maintenance, believing they are

engaged in forest management, and engaged in activities which may tend more towards property maintenance than traditional forest management may result in a more specific and thus more successful match between outreach messages and landowner interests.

3) Understanding, Use and Interpretation of the Term “Forest Management” By Both PFLs and NRPs

A review of forest management definitions in the literature, as well as the results of this study, reveal both similarities and differences in how the term and concept “forest management” is understood, used, and interpreted by NRPs and PFLs which have important implications for both the praxis of NRPs working with PFLs and for forestry research in general. Although a review of the literature indicates variation within forest management definitions, all definitions reviewed were found to share two components: an action and a purpose. The actions referenced tend to be more cognitive than physical, such as “a process of exerting control,” and the purpose of forest management is quite broadly defined as one designed to meet the “desired objectives.” However, when PFL studies attempting to measure the presence of forest management operationalize this concept, the actions of forest management become almost entirely physical and individual (landowner behavior) and the purposes of forest management are generally either not defined or limited to a narrow set such as timber production, recreation and/or wildlife. By providing PFLs with multiple choices for the purpose of activities typically categorized as forest management, such as

removing and/or planting trees, “to keep my property looking the way I like” and “to make money,” PFL definitions for forest management which are broader than those traditionally seen in PFL research emerge. In their study of public understandings of nature and naturalness, Hull, Robertson and Buhyoff (2001) discuss the idea of a “range of meanings” in the public’s understandings of nature and naturalness. Such a concept may also be useful when considering the meaning of “forest management” to multiple user groups such as PFLs, professionals, and the public. For example, rather than attempting to identify one agreed upon definition of forest management, it may be more useful to consider the “range of meanings” of forest management for PFLs, professionals, and the public.

The landowners in this study appear to be fairly active in terms of cutting and removing trees, planting trees, and building and maintaining trails, roads, ponds and ditches. However, results are similar to those of other PFL studies in that very few PFLs report engagement in two additional activities traditionally measured as accounting for forest management: possessing a written management plan and consulting with professional foresters when harvesting or cutting trees. However, 58% of the landowners in this study indicate they make multi-year land use decision plans. Apparently the vast majority of these plans are made independently and in mind only. In his discussion of management planning and management plans, McEvoy (2004) notes that the difference between cutting trees and silviculture is good planning. If this is true, then

perhaps there are both active and non-active forest landowners managing their land. In other words, again, conclusions reached and interpretations of results concerning PFLs' management of their forestland depends upon how forest management is defined and measured. If the conclusion of much of the PFL literature that most PFLs are not managing their forestland means most PFLs are not engaged in forest management practices, this fact in and of itself may not be as problematic as it might seem in that engaging in practices alone without thoughtful consideration of those practices (forest management) may not be entirely beneficial for the resource. However, if the fact that most private forest landowners are not managing means most are not carefully considering decisions made concerning their forestland, regardless of their level of physical activity, then the management results reported in the literature are potentially more deleterious for the state of private forestland on the whole. Differences between engagement in activities and engagement in planning, as well as what constitutes planning, are an important area for future work discussed further below.

Differences in how PFLs and professionals use, understand, and interpret the term forest management may also be related to the language used to ascertain the presence of forest management in PFL studies. Such a broad scale of activity is covered when asking PFLs whether they "have ever harvested or cut trees" that conclusions drawn concerning the prevalence of PFL management based upon these measures may potentially be misleading. Egan

and Jones (1993, 1995) found some landowners responding affirmatively to “have you harvested timber in the last 10 years” had removed only single trees, while some landowners respond affirmatively regarding timber harvest due to removing firewood for personal use at one point, and negatively at another. Thus, it is both unclear whether the presence of forest management has been measured as accurately as possible, and unclear whether PFLs responding to forest management studies are interpreting study questions in the ways they were intended. Therefore, improving NRPs’ understanding of PFLs, their ability to reach out to PFLs, and their ability to engage greater numbers of them more substantially in forest management may be as much a matter of clarifying language use, conceptualization, and research methodology as modifying practice.

Future Research

Several avenues for future research and next steps in both research methods and methodology are evident. As it appears PFLs and NRPs can view several key forestry and resource management terms and concepts somewhat differently, and as PFL interpretation of terminology and survey questions is key to the results achieved by self report research methods such as interview, survey and focus group, one important avenue for future research is to use pre and post test methods and to combine qualitative and quantitative methods. For example, preceding PFL survey research with qualitative efforts designed to flesh out PFL understanding of key forestry terms such as “forest management” can be used in

survey development such that survey questions can more accurately and precisely measure their intended constructs. Qualitative methods, as well as secondary surveys, could also be used to clarify survey results. Similar suggestions have been made by other authors (Bliss and Martin 1989) and have been most notably and usefully applied by Egan et. al. (1995) in their attempts to assess the condition of recently harvested private forestland and interpret PFL expressions of forest stewardship. As noted by Egan et. al. (1995), traditional single method approaches yield much quality information useful in answering many of the questions of concern to the field of forestry, however, integration of multiple methods, especially of traditional quantitative approaches with methodologies based in the social sciences, can “provide insights generally not available when a single-methodology strategy is employed.”

More accurately assessing PFLs’ conceptualization of forest management and interpreting survey responses to a range of forest management related questions could also be improved by repeated use of the management definitions scale developed for this study. The scale itself could be improved by incorporating the results of qualitative research efforts specifically aimed at capturing PFLs’ expressions of the forest management concept, and by adding items to strengthen measurement of each of the three management definition constructs identified here. Additionally, clearer information about PFLs’ management understandings could be garnered by matching items used for defining the forest management concept with items used to measure the

presence of forest management for an individual landowner. In other words, while it is useful to know what landowners consider forest management to be, it would also be useful to know whether they actually engage in those specific activities. Such knowledge would assist in parsing out the difference between participation and perception. For example, landowners may have a clear understanding of forest management matching that of the forestry profession, but choose not to engage in such forest management, or they may not engage in traditionally defined forest management, but engage in other activities which they consider to be forest management, or they may consider other or additional activities to be forest management which they also do not engage in. In the present study, measurements of PFL conceptualization of forest management, and PFL participation in forest management differ. A better match between these measurements would increase the utility of future studies.

Question wording could also be improved to deal with the scale issues evident around the terms “harvesting” and “cutting”. Participation in harvesting or cutting timber is typically considered participation in forest management, yet PFLs can consider a range of activities from removal of an individual tree to clearing an entire stand to be harvesting, as well as a range of purposes from selling timber for money, to clearing timber for aesthetic reasons. Survey question wording could be improved so as to break down these scale issues and yield a clearer understanding of landowner activities relative to forest management.

Although only 4% of respondents report possessing a written management plan, 77% believe they manage their land and 58% report making a multi-year land use decision plan when they make land use decisions. Such results indicate a fruitful avenue for future work would be to investigate the degree and nature of the thinking and planning landowners engage in that does not appear in written management plans. Without such information, interpreting the meaning of these results is limited, especially in the face of much anecdotal evidence provided by practicing professionals who report writing management plans can be more a matter of satisfying bureaucratic needs than truly assisting landowners or improving forest stewardship.

The ability to interpret the practical meaning of landowner engagement in management activities based upon survey response may be improved by including a broader range of purposes for activities such as planting trees, harvesting/cutting trees, using pesticides and herbicides, building trails or roads, etc. Engagement in these activities may signify traditionally defined forest management, but it may also signify home landscaping activities. Understanding what landowners hope to achieve by engaging in these activities, rather than measuring engagement alone, may provide useful information concerning the true nature of their forest management.

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Appendix A

Table 2: Forest Management Definitions from the Literature

<u>Action Component</u>	<u>Purpose Component</u>	<u>Reference</u>
By definition, management is a process of exerting control	for the purposes of allocating benefits. . . . when preceded by the word <i>forest</i> , it encompasses all the potential benefits forests are capable of providing.	McEvoy 2004
The practical application of biological, physical, quantitative, managerial, economic, social, and policy principles to the regeneration, management, utilization, and conservation of forests	to meet specified goals and objectives while maintaining the productivity of the forest – <i>note</i> forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products, and other forest resource values.	Helms 1998
Forest management is the control or regulation of the pattern of stages of stand development , across the area of the forest, and across time. . . .	Good management is anticipation and correction of emerging structural problems in a specific forest so that the desired quantity and quality of benefits are available continuously. Goodness of management can only be judged in specific cases by comparing what is done on-the-ground against what is needed in a particular forest to achieve the desired goals.	Baskerville 1986
Forest management is the fitting of uses into ecosystems according to their capability to support them – compatibly with other uses on the same or adjacent lands -	in ways that assure the permanence of the uses, benefits, and resources for future generations.	Fedkiw and Cayford 1999

Table 2: Continued

The framework is founded on defining forest management as the process of designing and implementing a set of actions which	Is deemed likely to result in a set of forest conditions which is deemed likely to provide the desired values in the desired amount over time.	Erdle and Sullivan 1998
Caring for a forest	so it stays health and vigorous and provides the products and values the landowner desires.	North Carolina Forestry Association 2007
The study and application of analytical techniques	to aid in choosing those management alternatives that contribute most to organizational *objectives. (*Objectives – use of this term implies there is a desired point that the forest organization wishes to reach. This is almost always forest products. . . . it is this desired end point, . . . that makes the forest worth managing. The forest would be unmanaged if its products were useless to society.)	Leuschner 1984
The practical application of scientific, economic, and social principles	to the administration and working of a forest for specific objectives.	Nyland 2002
Forest management involves the use of forests	to meet the objectives of landowners and society.	Davis et. al. 2001

Table 3: Activities Included in ActSum3 variable measuring respondents' engagement with forest management as traditionally defined

	<u>Activity</u>	<u>Survey Question</u>
1	Having a written management plan	Q15
2	Having ever harvested or cut trees	Q16
3	Having prepared land for tree planting in the last five years	Q17.1
4	Having applied pesticides or herbicides in the last five years	Q17.2
5	Having managed for wildlife populations in the last five years	Q17.3
6	Having built or maintained roads or trails in the last five years	Q17.4
7	Having built or maintained ponds or drainage ditches in the last five years	Q17.5
8	Having conducted a Timber Stand Improvement operation	Q18
9	Having ever planted trees	Q19
10	Being enrolled in the Greenbelt Forest Program	Q21.1
11	Being enrolled in the Wildlife Habitat Program	Q21.2
12	Being enrolled in the Conservation Reserve Program	Q21.3
13	Being enrolled in the Forestry Incentives Program	Q21.4
14	Being enrolled in the Stewardship Incentives Program	Q21.5
15	Being enrolled in the Wetland Reserve Program	Q21.6
16	Being enrolled in the Forestland Enhancement Program	Q21.7
17	Being enrolled in the Wildlife Habitat Incentives Program	Q21.8
18	Being enrolled in Forest Certification (e.g. FSC, SFI, American Tree Farm System)	Q21.9

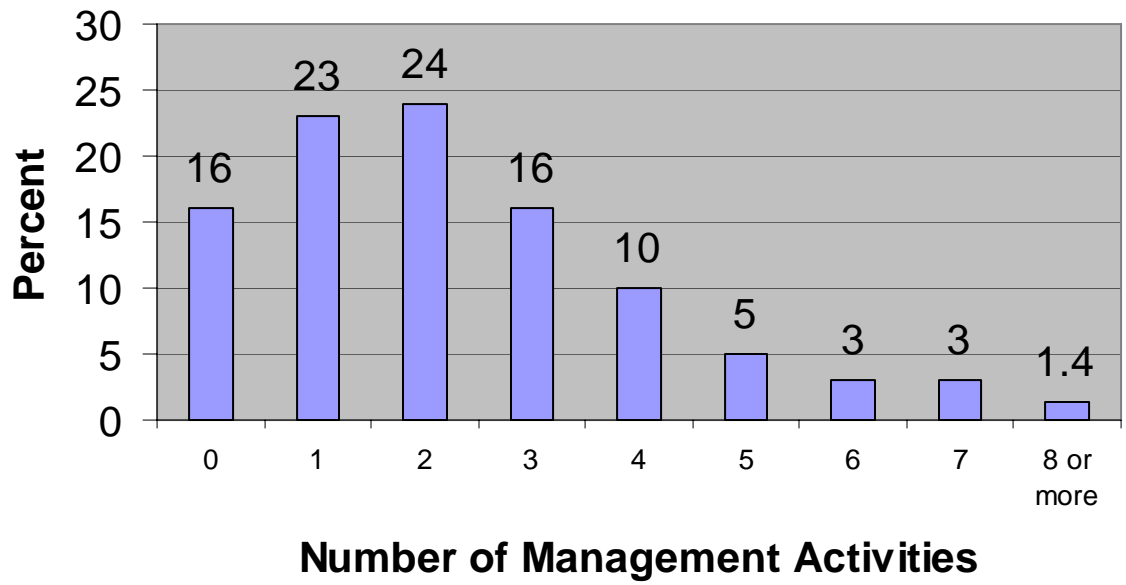


Figure 4: Percent of Engagement in Various Numbers of Traditionally Defined Management Activities

Table 4: Selected Demographic Characteristics of Survey Population

	n	%
Age (years old)		
18 - 34	6	1.3
35 - 49	82	17.4
50 - 69	266	56.6
70 or older	116	24.7
Income (in last 12 months)		
less than \$10,000	22	5
\$10,000 - \$29,999	116	26.5
\$30,000 - \$49,999	105	24
\$50,000 - \$74,999	101	23.1
\$75,000 - \$99,000	56	12.8
\$100,000 or higher	37	8.5
Education (highest level completed)		
Less than 12th grade	47	9.6
Highschool or GED	129	26.4
Some College Credit	81	16.6
Vocational / Technical / Associate's Degree	106	21.7
Bachelor's Degree	74	15.1
Graduate or Professional Degree	52	10.6
Gender		
Male	322	66
Female	166	34
Resident status		
Resident*	395	80.4
Absentee**	96	19.6
Acres owned		
4.9 or fewer	100	19.8
5 - 9.9	77	15.3
10 - 24.9	115	22.8
25 - 49.9	76	15.1
50 - 99.9	53	10.5
100 - 499.9	73	14.5
500 or more	10	2

* Resident landowners are defined as those landowners whose primary residence is within the study area OR who live within 49 miles of their forestland in the study area.

** Absentee landowners are defined as those landowners who live greater than 49 miles from their forestland in the study area.

Table 5: Management Definition Scale Factors and Item Loadings

	Factor		
	Property Maintenance	Making Money	Creating and Enhancing Forest Habitat
Planting trees around the property to make it look the way I like	.739		
Removing dead trees and unwanted plants	.635		
Cutting down trees to keep the property looking the way I want	.624		
Putting up or maintaining fences around my property	.617		
Planting fruit trees or plants for food	.589		
Using pesticides to keep insects from harming plants or trees	.524		
Cutting down trees for a timber sale		.824	
Planting trees to make money		.745	
Removing low value trees to improve the growth of high value trees		.588	
Leasing the land to another person		.537	
(Not) Letting the forest grow and change naturally*		.512	
Establishing food plots for wildlife			.765
Consulting with foresters on how to plan for the future of my property			.717
Building and maintaining trails for recreating through the woods			.640
Planting trees for the future			.551

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

* Included in Management Definition Scale as a positivist statement, "Letting the forest grow and change naturally", but loaded negatively onto Making Money factor, so recoded to the negative here.

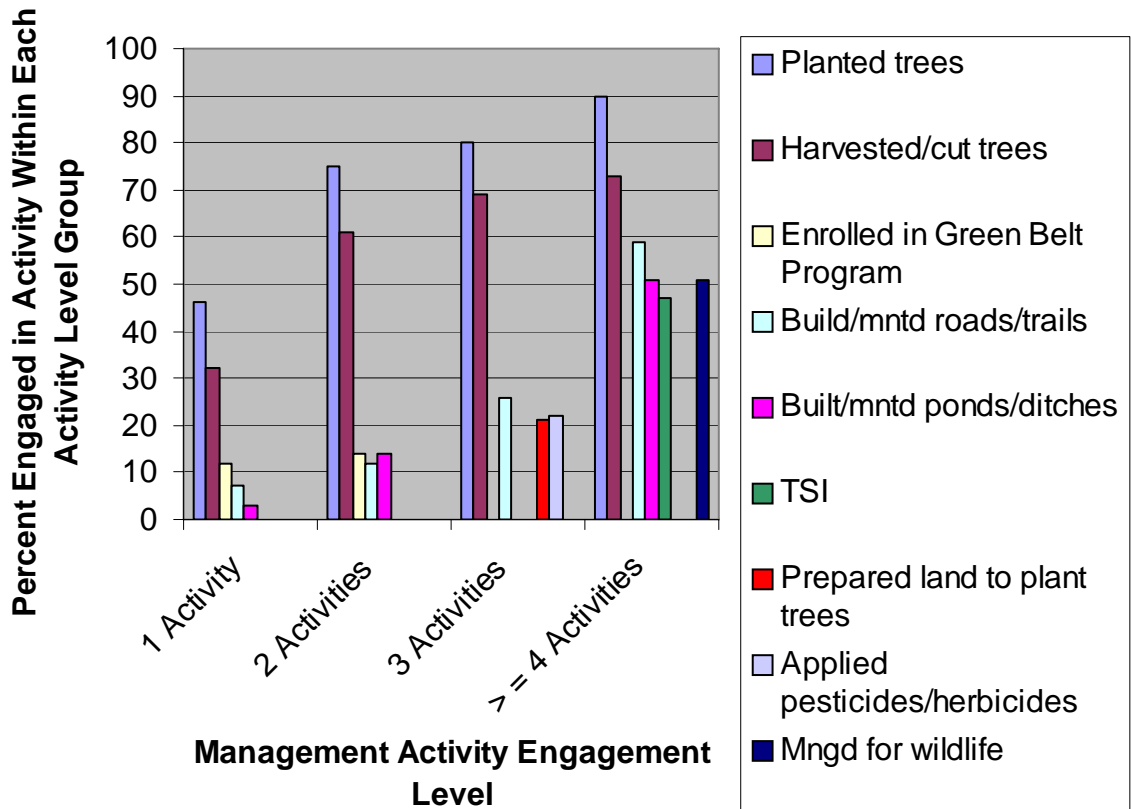


Figure 5: Top Five Most Popular Management Activities (as %) within each Management Activity Engagement Level

Table 6: Results of MANOVAs for Conceptualization of Forest Management and Each Forest Management Action

	Forest Management Action	F	df	P
1.	Making a multi-year land use decision plan (vs. planning only for the current year)	15.970	3, 448	.000*
2.	Having ever harvested or cut trees	5.337	3, 474	.001**
3.	Having ever planted trees	13.880	3, 466	.000*
4.	Having a written forest management plan	2.686	3, 471	.046
5.	Having a professional forester plan, mark or contract the most recent harvest/cut	1.292	3, 229	.278
6.	Prepared land for tree planting in the past 5 years	1.660	3, 407	.175
7.	Applied pesticides or herbicides in the past 5 years	.785	3, 407	.503
8.	Managed for wildlife populations in the past 5 years	.632	3, 407	.595
9.	Built or maintained roads or trails in the past 5 years	2.553	3, 407	.055
10.	Built or maintained ponds or drainage ditches in the past 5 years	1.640	3, 407	.179
11.	Ever conducted Timber Stand Improvement	1.786	3, 407	.149

*p < .05

**p < .01

Table 7: Detailed Results of Statistically Significant MANOVAs Measuring the Relationship Between Forest Management Actions and Forest Management Conceptualization

Management Activity	Forest Management Conceptualization	Mean Agreement		Significance
		Yes	No	
Make multi-year land use plan	Making money	2.97	2.71	.000
	Creating and enhancing forest habitat	3.78	3.41	.000
	Property maintenance	3.45	3.35	.123
Ever harvested or cut trees	Making money	2.97	2.77	.001
	Creating and enhancing forest habitat	3.58	3.64	.295
	Property maintenance	3.45	3.35	.095
Planted trees	Making money	2.86	2.87	.826
	Creating and enhancing forest habitat	3.73	3.43	.000
	Property maintenance	3.48	3.24	.000

Table 8: Chi-square Results for Self Perception of Engagement with Forest Management and Participation in Forest Management Activities

Activities and Related Items	χ^2	df	p
1. Making a multi-year land use decision plan	13.065	1	.000**
2. Having a written management plan	1.733	1	.188
3. Having ever harvested or cut trees	9.623	1	.002**
4. Harvesting/cutting trees for pulpwood for sale	.568	1	.451
5. Harvesting/cutting trees for sawlogs for sale	.227	1	.634
6. Harvesting/cutting firewood for personal use	.354	1	.552
7. Harvesting/cutting sawlogs for personal use	.776	1	.378
8. Having ever prepared land for tree planting	8.385	1	.004**
9. Having ever applied pesticides or herbicides	5.280	1	.022*
10. Having ever managed for wildlife populations	8.743	1	.003**
11. Having built or maintained roads or trails in the last 5 years	1.765	1	.184
12. Having built or maintained ponds or ditches in the last 5 years	8.061	1	.005**
13. Having ever conducted TSI	8.981	1	.003**
14. Having ever planted trees	22.493	1	.000**

*p < .05

**p < .01

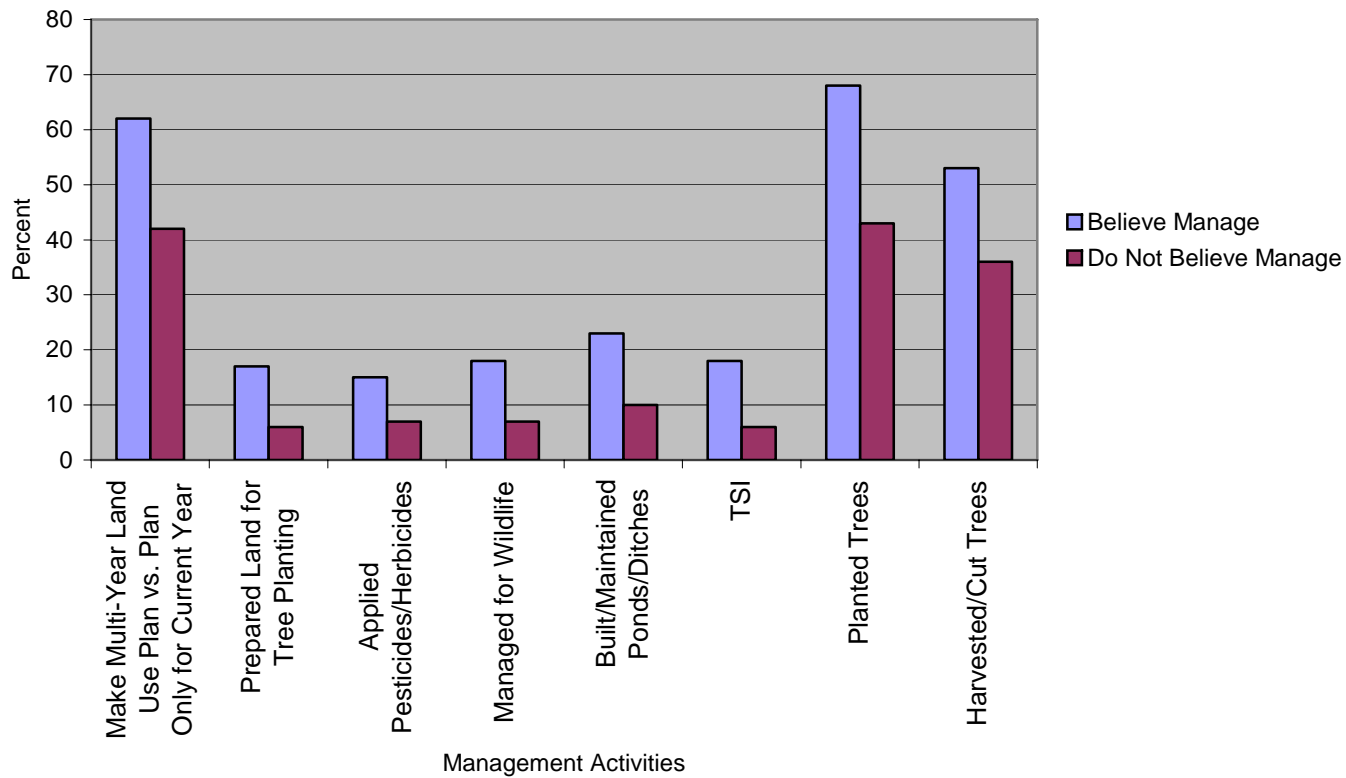


Figure 6: Percentage of Landowners Believing and Not Believing They Manage Their Land Involved in Individual Management Activities

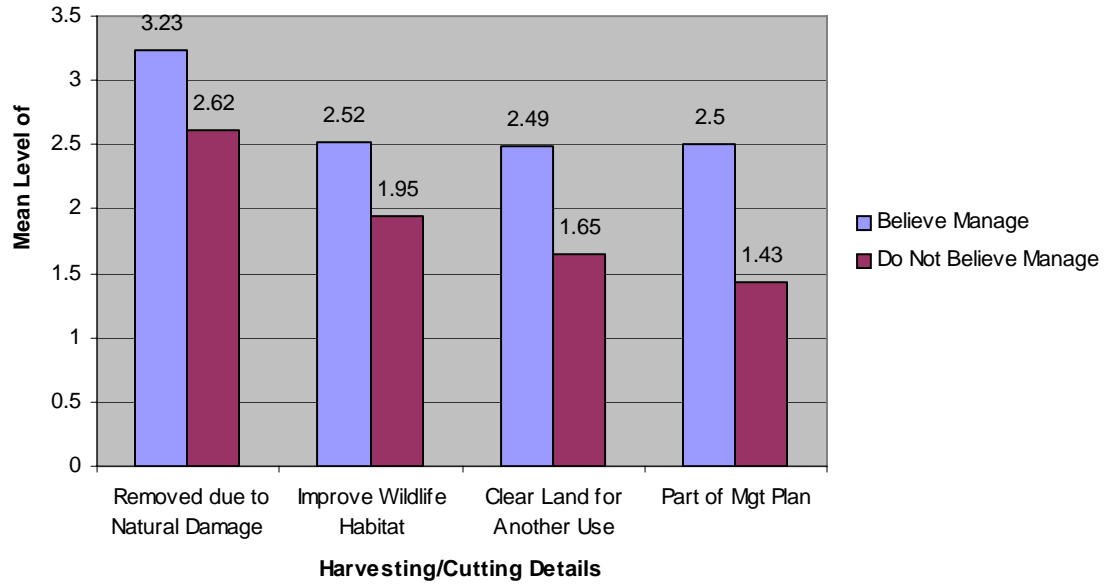
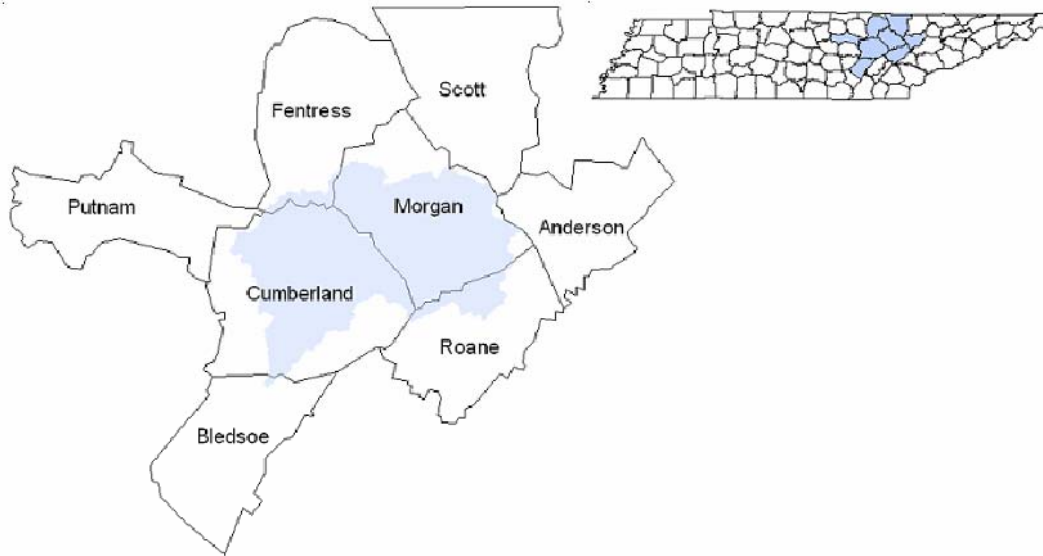


Figure 7: Mean Level of Agreement Among Landowners Believing and Not Believing They Manage Their Land Concerning Details of Harvesting/Cutting

Appendix B

A Survey of Private Woodland Owners in the Emory-Obed Watershed of Tennessee

We are interested in learning about you and the woodland you own in our study area, the Emory-Obed watershed in Tennessee (shaded in blue on the map below). Woodland is defined as a minimum of ten (10) trees per acre on at least one (1) acre of land. For each question, please either mark your responses with an "X" in the boxes provided or write in your answers where appropriate. Remember, all of your answers will remain strictly confidential.



Section 1: General Characteristics of Your Land

1. How many **acres** of land do you own in the study area (see map)?
2. Approximately what **percentage (%)** of this land is wooded?
3. How many **tracts** of land do you own in the study area?
4. In what **year** did you acquire the majority of this land?
5. How many **acres** of land in the study area have you sold in the past?
6. How did you **acquire** the majority of this land?
 - Purchase
 - Inheritance
 - Gift
 - Other (please specify)
7. How is the majority of this land currently **owned**?
 - Individual
 - Family
 - Trust
 - Partnership
 - Corporate
 - Club or association
 - Other (please specify)

8. How many **acres** of land in the study area do you lease for each of the following? # acres

- Hunting or Fishing
- Agriculture
- Other (please specify)
- I don't lease land (**Skip to Q9**)

8a. Compared to your total family income, how **important** is the **income** you receive from leasing this land?

- Not important
- Of little importance
- Somewhat important
- Important
- Very important

9. Is your **primary residence** in the study area?

- Yes (**Skip to Q10**)
- No

9a. Roughly how many miles is it from your **primary residence** to your property in the study area?

- Less than 20 Miles
- 20 - 49 Miles
- 50 - 99 Miles
- 100 - 200 Miles
- More than 200 Miles

10. Does a **stream** flow through or within **75 feet** of any of the land you own in the study area?

- Yes
- No (**Skip to Q11**)
- I do not know (**Skip to Q11**)

10a. On a scale from 1 to 5, with 1 being very poor and 5 being very good, how would you rate the overall **health** of this stream?

10b. Which do you consider to be **most important** when rating the **health** of this stream? (**Choose one**)

- Water quality
- Bank stability
- Beauty of stream and surroundings
- Variety of fish
- Abundance of fish
- Variety of small animals on the stream bottom

10c. Which of the following has the **biggest impact** on the health of this stream? (**Choose one**)

- Livestock waste
- Soil erosion
- Run-off from agriculture
- Run-off from residential lawn care
- Drainage practices (e.g. tile)
- Industrial waste water
- Bank development

Section 2: Importance of Your Woodland

11. People own woodland for many reasons. Please indicate how important each of the following reasons is to you when thinking about your woodland by placing an in the box closest to your opinion.

	Not Important	Of little importance	Somewhat important	Important	Very important	Not Applicable
To pass on to my children or other heirs.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As part of my family heritage.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To enjoy scenery.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As a long-term financial investment.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To collect firewood.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To pick nuts, berries, mushrooms, etc.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To supply food and habitat for wildlife.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For privacy.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For timber production.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have trees surrounding my primary or vacation home.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For hunting and fishing.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For recreation other than hunting and fishing.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because the land can't be farmed.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To learn from nature.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To protect the watershed/provide clean water.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 3: Woodland Management and Woodland Uses

12. When people talk about managing their woodland, they sometimes mean several different things. We are interested in what **you think** of when you hear or read the term “**management**” in reference to your woodland. Please indicate the extent to which you agree or disagree with each item by placing an in the box closest to your opinion on what management includes.

In my opinion, woodland management includes...	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
letting the forest grow and change naturally.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
planting trees to make money.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
leasing the land to another person.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
planting trees around the property to make it look the way I like.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
using pesticides to keep insects from harming plants or trees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cutting down trees to keep the property looking the way I want	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cutting down trees for a timber sale.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
removing dead trees and unwanted plants.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
putting up or maintaining fences around my property.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
planting fruit trees or plants for food.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
building and maintaining trails for recreating through the woods.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
removing low value trees to improve the growth of high value trees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
consulting with foresters on how to plan for the future of my property.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
establishing food plots for wildlife.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
planting trees for the future.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. When thinking about what **you** consider to be “management” do you feel you **manage** your land?

- Yes
 No

14. When you make land-use decisions about this woodland, do you make a **multi-year plan** or do you focus only on the **current year**?

- Multi-year plan
 Current year

15. Do you have a **written** management plan for this woodland?

- Yes
 No

16. Have you ever **harvested** or **cut** trees from this woodland?

- Yes
 No (**Skip to Page 4, Q17**)

16a. In what **year** was the most recent harvest or cut?

16b. For the most recent harvest or cut, did a **professional forester** plan, mark, or contract the harvest?

- Yes
 No

16c. What was **harvested** or **cut**? (**Check all that apply**)

- Pulpwood for sale
 Sawlogs for sale
 Firewood for personal use
 Sawlogs for personal use
 Other (please specify)

16d. How **important** was the **income** obtained from the harvest relative to your total income?

- I had no income from the harvest
 Not important
 Of little importance
 Somewhat important
 Important
 Very important

16e. For the **most recent harvest**, how important were the following reasons for why you chose to harvest or cut the trees? Please the response closest to your opinion on the importance of each reason for harvesting listed below.

	Not important	Of little importance	Somewhat important	Important	Very important
A forester recommended it.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A logger or timber buyer approached me.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To clear land for conversion to another use.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trees were mature.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Needed the money.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Needed wood for my own personal use.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The price for the timber was right.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To improve hunting opportunities.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To improve the scenery.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To remove trees damaged from a natural catastrophe.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To improve the quality of remaining trees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To improve wildlife habitat.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because neighbors logged adjacent tracts.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As part of my management plan.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. In the **past five (5) years**, have any of the following **occurred** on the land you own in the study area?

- Prepared land for tree planting
- Applied pesticides or herbicides
- Managed for wildlife populations
- Built or maintained roads or trails
- Built or maintained ponds or drainage ditches
- None of these activities

18. Have you ever conducted any **Timber Stand Improvement (TSI)** operations on this woodland (e.g., removed a few trees to improve the woodland)?

- Yes
- No (**Skip to Q19**)

18a. In what **year** was the most recent TSI?

18b. Was a **professional forester** involved in the TSI operation?

- Yes
- No

18c. Do you think the TSI improved the health of your woodland?

- Yes
- No

19. Have you ever **planted trees** on any of the land you own in the study area?

- Yes
- No (**Skip to Page 5, Q20**)

19a. In what **year** did you most recently plant trees?

19b. On which **type of land** did you plant trees? (**Choose all that apply**)

- Yard/Around House
- Pasture
- Crop fields
- Harvested woodland
- Existing woodland
- Wetland
- Prairie
- Stream banks

19c. For the **most recent tree planting**, how **important** were the following **reasons** for why you chose to plant trees? Please the response closest to your opinion on the importance of each reason for planting listed below.

	Not important	Of little importance	Somewhat important	Important	Very important
I had revenue from a timber sale to finance the planting operation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost-share programs were readily available.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low-cost seedlings from the state were readily available.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forester or county extension educators advised me to do so.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tax benefits were readily available.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt the land should be used to produce timber.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To enhance the scenic beauty of my property.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To conserve the natural environment.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To provide forestland for future generations.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To supply food and habitat for wildlife.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To improve water quality.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To provide a windbreak.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For privacy.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To improve the quality of the forest.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. There are many different ways to learn about your woodland. Please the appropriate box to indicate **whether or not you have used** each information source. For each source you have used, please the appropriate box to indicate **how useful** it was.

	Have you used this information source?			...how useful was the information source?		
	No	Yes		Not at all useful	Somewhat useful	Very useful
Tennessee Department of Environment and Conservation.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USDA Forest Service.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natural Resources Conservation Service (NRCS).....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Farm Bureau.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soil and Water Conservation District (SWCD).....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forester	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Logging contractor.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
County extension educator.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet websites.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Books or magazines.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV, radio, or newspaper.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friends, relatives, or neighbors.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental groups (e.g., Audubon Society).....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Farm suppliers or tree nurseries.....	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landowner associations(e.g., county landowner org.)	<input type="checkbox"/>	<input type="checkbox"/>	IF YES ⇔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. There are many different programs available to assist you with technical and financial aspects of woodland management. We are interested in knowing whether or not you are **familiar** with these programs and if you are **enrolled** in any of them. Please the response that fits with your familiarity/enrollment for each item listed.

	I am not familiar with this program	I am familiar with this program but not enrolled	I am enrolled in this program
Greenbelt Forest Program.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife Habitat Program.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conservation Reserve Program (CRP).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forestry Incentives Program (FIP).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stewardship Incentives Program (SIP).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wetland Reserve Program (WRP).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest Land Enhancement Program (FLEP).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife Habitat Incentives Program (WHIP).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest certification (e.g., FSC, SFI, American Tree Farm System)....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conservation Easement.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land Trust.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. For those programs in which you are enrolled, please each box that corresponds to a reason why you chose to enroll. (Choose all that apply)

- For technical assistance
- For financial assistance
- To improve the productivity of the land
- For environmental benefits
- To improve wildlife habitat
- To prevent development of the land
- None of these reasons
- I am not enrolled in any of the programs above

23. For those programs in which you are not enrolled, please each box that corresponds to a reason why you are not enrolled. (Choose all that apply)

- Not eligible.
- Program requirements were too rigid.
- Don't want to commit to anything right now.
- Don't want government involvement.
- Don't need/want financial assistance.
- Don't need/want technical assistance.
- Not aware of these programs
- None of these reasons

24. This section will help us learn about the types of activities you do on your land. Please indicate how often you or members of your household have engaged in the following activities on the woodland you own in the study area in the past twelve (12) months.

	Never	Once	Seasonally	Monthly	Weekly	Daily
Hunting or Trapping.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hiking or Walking.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mountain biking.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Horseback riding.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife viewing.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collecting firewood.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Picking nuts, mushrooms, berries, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using off-road vehicles (e.g., 4-wheelers and dirtbikes).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. How likely are you to do each of the following with the woodland you own in the study area over the next five (5) years? Please the response closest to how likely you are to do each of the following.

	Very unlikely	Somewhat unlikely	Somewhat likely	Very likely	Not Applicable
Timber Stand Improvement (TSI).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collect firewood.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pick nuts, mushrooms, berries, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cut sawlogs.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cut pulpwood.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Talk with other landowners about land-use decisions.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allow others access for recreation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graze livestock.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Donate all or part of the woodland to a land trust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Build a pond or drainage ditch.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Build a home or other structure (e.g., barn or shed).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enroll all or part of the woodland in a conservation easement.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lease all or part of the woodland.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sell all or part of the woodland.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transfer all or part of it to my children or other heirs.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Divide all or part of the woodland into lots for development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buy more woodland.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Convert all or part of the woodland to other uses (e.g., pasture)....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participate in a cost-share program (e.g., CRP).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manage according to my management plan.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plant trees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Let the land take care of itself.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 4: Your Community and Your Land

26. Please place an in the box that indicates the level of influence each of the following may or may not have on the decisions you make regarding the woodland you own in the study area.

	No influence	Little influence	Moderate influence	A great deal of influence	Not Applicable
Spouse.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Children.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parents.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other relatives.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neighbors.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friends.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business partner.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Farm manager.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forester.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Logging contractor.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tenants on your land.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other landowners.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27. Please indicate the extent to which you agree or disagree with each of the following statements on **information sharing, regulations, and land management** by placing an in the box closest to how you feel.

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
Landowners should work together to improve the land in the study area.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What other landowners do on their land does not affect me.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not have time to talk with other landowners about plans for my land.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often disagree with other landowners with regard to land management.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landowners in the study area should not be expected to provide for the future.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Too much of the land in the study area is publicly owned.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landowners should have the freedom to manage their land as they see fit.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private land in the study area is better managed with the aid of regulations than through voluntary programs alone.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am not interested in talking with other landowners about plans for my land.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I talk with other landowners about my land, I often get helpful information and ideas I had not considered.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often talk with other landowners about plans for my land.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What I do on my land now will not matter in the long term.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Talking with other landowners about plans for my land helps them to accept the decisions I make.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not ask district foresters about what to do with my land because they represent the views of government.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

28. Please indicate the extent to which you agree or disagree with each of the following statements about what your **land** (woodland and other types of land) in the study area **means to you** by placing an in the box closest to how you feel.

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
It would not matter to my family if I sold my land.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am sometimes in awe of the beauty of my land.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My land gives me the opportunity to enjoy the outdoors.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think of my land primarily as a financial investment.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like knowing that I can sell trees if I need the money.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I enjoy relaxing on my property and taking in the natural surroundings.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Owning land means I can do with it what I please.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For me, taking care of my land is an important part of who I am.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My land has taught me a great deal about how nature works.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like to think of my land as a legacy that I will pass on to my children.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My land reminds me of nature's power.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My land is an important part of my family's heritage.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sometimes I think that owning land is more trouble than it is worth.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My land has an emotional value for me that is worth more than money.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My land connects me to something larger than myself.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29. We also would like to know how you **feel** about the community **where you now live**. Please indicate the extent to which you agree or disagree with the following statements on communities by placing an in a box for each item.

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
When a new person moves into the community, people try to make them feel at home.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neighbors in my community try to work together to get things done.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People are expected to participate in community activities.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People often attend meetings on various issues in my community.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People support one another in hard times.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People tend to visit and spend time with one another.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People generally don't feel comfortable asking their neighbors for favors.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People tend to mind their own business.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most people in my community can be trusted.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall, my community is a desirable place to live.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 5: Taxes

This section will help us to learn about your opinions of the taxes you pay and how they may affect what you do with your land.

30. Do you feel the amount of **property tax** you pay on the land you own in the study area is:

- High
 Moderate
 Low
 Minimal

31. Do you do your own taxes?

- Yes
 No

32. Do you **itemize** or use **standard deduction** when filing your income tax form?

- Itemize deduction
 Standard deduction

33. There are a variety of tax benefits made available to landowners. We are interested in how aware you are of these benefits and whether or not you use any of them. Please the box closest to your level of awareness and use for each item in the table below.

34. If you inherited the woodland you own in the study area did the estate pay a Federal Estate Tax?

- Yes, estate paid tax
 No, estate did not pay tax
 I did not inherit this woodland (**Skip to Q35**)

34a. Did payment of the Estate Tax influence what the executor did with the land?

- Yes, the executor had to sell land
 Yes, the executor had to sell timber
 No

34b. Did the estate pay a State or County Inheritance Tax?

- Yes
 No

35. Do you think Federal Income Taxes have affected what you do with your land?

- Yes
 No

	I am not aware	I am aware but have not taken advantage	I have taken advantage
Itemized deduction of annual management expenses.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Itemized deduction of property tax.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reforestation Tax Credit for planting trees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 6: Background

This final section will help us to learn about your background and experience. All responses to the following questions are confidential and for statistical purposes only. No question you answer on this survey will be linked to you personally in any analysis or report.

36. Do you own any **land outside** the study area ?

- Yes
 No

37. Are you:

- Male
 Female

38. How would you best **describe** where you **live**?

- Urban
 Suburban
 Rural

39. How would you describe the area where you have lived most of your life?

- Urban
 Suburban
 Rural

40. On approximately how many **acres** is your residence?

41. How many **years** have you resided at your current address?

42. What is your zip code?

43. Please the item that best describes your present employment status:

- Fully retired
- Semi-retired
- Not currently working
- Working part-time
- Working full-time

44. Are you a farmer?

- Yes
- No (**Skip to Q45**)

44a. What percentage of your income comes from farming?

- None (**Skip to Q45**)
- Less than 25%
- 25-49%
- 50-75%
- More than 75%

44b. How important is farm income relative to other sources?

- Not important
- Of little importance
- Somewhat important
- Important
- Very important

45. How important is it to you to make money from your woodland?

- Not important
- Of little importance
- Somewhat important
- Important
- Very important

46. Have you ever worked in: (**Choose all that apply.**)

- Agriculture
- Forestry
- Fisheries
- Mining
- Outdoor recreation or nature-based tourism
- I have not worked in any field listed above.

47. How would you characterize yourself politically?

- Very Liberal
- Liberal
- Moderate
- Conservative
- Very Conservative

48. What is the highest level of education you have completed?

- Less than 12th grade
- High school or GED
- Some college credit
- Vocational/technical school
- Associate's degree
- Bachelor's degree
- Graduate degree
- Professional degree (e.g., MD, DDS, DVM, JD)

49. Would you describe yourself as:

- White (non-Hispanic)
- Black or African American
- Hispanic or Latin American
- Asian or Asian American
- Bi-racial (please specify)
- Other (please specify)

50. In what year were you born?

51. What is your marital status?

- Married
- Widowed
- Divorced
- Separated
- Single (never married)

52. How many children do you have under the age of 18 years?

53. How many children still live at home?

54. What is your best estimate of your total household income over the past 12 months?

- Less than \$10,000
- \$10,000 to \$29,999
- \$30,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 or more

55. Approximately how often do you attend religious services?

- At least once a week
- Two to three times a month
- Several times a year
- Once a year
- Don't attend religious services

Thank you so much for taking the time to answer these questions. We appreciate your time and value your opinions. If you have any comments about this survey or the woodland you own, please share them with us by using the space below.

Please return this questionnaire using the stamped, self-addressed envelope provided.
Human Dimensions Research Lab, Department of Forestry, Wildlife and Fisheries-1075, 5723
Middlebrook Pike, TN 37921-9920.

PART III - EXPERIENCE OF LAND AND ITS RELATIONSHIP TO
MANAGEMENT BEHAVIOR: IMPLICATIONS FOR PRACTICE AND
EVIDENCE OF SENSE OF PLACE AND PLACE ATTACHMENT

Introduction

The reasons for interest in private forestland, private forest landowners, and private forestland management, as well as the methods employed for studying these topics and a summary of the findings in the literature, have been addressed in Parts I and II. As with the conceptualization and definition of forest management and how these relate to PFLs' management of their forestland (Part II), how PFLs experience their forestland has not been widely addressed in previous studies (see Part I for an exception), nor have variations in the meaning PFLs ascribe to these experiences been investigated for their potential relationship to PFLs' level of engagement with forest management practices. As previously mentioned, despite numerous studies, outreach and education opportunities, and financial incentive programs, the percentage of PFLs managing their forest land is consistently reported as no higher than 15%. For these reasons, numerous calls for NRPs' increased understanding of PFLs in general, their management of their forestland specifically, and for new approaches and perspectives in outreach, research and program development have been made. This research attempts to address these concerns by relating the meaning of PFLs' experience of their forestland to their management of their forestland. Specific objectives include, 1) to identify a set of quantifiable components characterizing how PFLs experience their forestland and the meaning of their experience to them, and 2) to examine how variations in these

components are related to a) PFLs' management of their forestland, and b) their self perception of their forestland management.

Literature Review

Introduction

There are numerous overlapping and interacting views regarding the human experience of nature/land/the environment (referred to interchangeably in this literature review) and its relationship to human behavior. These stem from differences in philosophical perspective and therefore reflect different content areas and methodologies. At the very least, it can be said that addressing the human experience of nature/land/the environment is an interdisciplinary venture (Altman and Wohlwill 1983; Cassidy 1997; Bechtel and Churchman 2002) with contributions coming from human geography (e.g. Tuan 1977), existential phenomenological psychology (e.g. Peacher 1995; Seamon and Mugerauer 1995; Seamon 2000), architecture and design (e.g. Peponis and Wineman 2002), psychology (Williams and Patterson 1996; Bell et al. 2001; Bechtel and Churchman 2002; Stedman 2002), and other fields such as anthropology, sociology, and recreation and leisure studies (Bechtel and Churchman 2002). In addition, various authors take various positions on the distinctiveness of the different fields and sub-fields addressing these issues. Nevertheless, a general distinction between two major approaches to the topic can be made. The two approaches are: the social constructionist approach and the positivist approach. Both Lalli (1992) and Stedman (2003) make similar distinctions in reviewing the

sense of place literature (see further descriptions below) by dividing it into phenomenological (based in a social constructionist epistemology) and positivistic approaches.

The social constructionist approach to the human experience of nature views person and world as co-constituting each other and in constant dialogue. This is the approach taken by existential phenomenological psychology, relevant areas of human geography, and the realm of traditional environmental psychology referred to as, or generating from, the gestalt approach (Cassidy 1997; Bell et al. 2001). The positivist approach, in contrast, focuses on environment and behavior as two separate and distinct but interrelated variables (Bell et al. 2001). This is the primary approach of a body research often referred to as "environment-behavior" research. A few of the more well defined fields involved in this research include environmental psychology, environmental sociology, and eco-psychology (Bechtel and Churchman 2002). Whether environment-behavior research is the organizing umbrella for these fields or is but one aspect of each is itself a matter of debate (Bechtel and Churchman 2002). Regardless of the philosophical and methodological ambiguities that can exist, both approaches describe various ways in which people experience their environment, and provide evidence for a relationship between the experience of nature and human behavior.

Social Constructionist Approach

Major Concepts and Related Research

The major contribution of the social constructionist approach to the question of how humans experience land and how these experiences relate to their behavior is the concept of “place.” In defining this concept, it is useful to also discuss the concept of “space.” Space refers to the undifferentiated geographic world, from the global to the personal scale, that is devoid of personal attachment and historical familiarity from the perspective of any one, or group of, perceivers (Tuan 1977). Space is unknown and unfamiliar to the perceiver. Place, on the other hand, is space that has “become the location of cultural meaning” (List and Brown 1996). Places are “distinctive, memorable, affect generating, and psychologically owned” (Greene 1996). The transformation of space to place happens as people form meaning attachments to space through experiences, memories and feelings located there (Tuan 1977; Greene 1996; Roberts 1996). Although undifferentiated, and without personal attachment, history, or memory, space is not devoid of meaning. A tremendous reciprocity exists between the concepts of space and place. It is precisely the undifferentiated “freedom” of space that allows such a thing as “place” to develop. Tuan (1977) perhaps relates the two best, submitting, “Place is security, space is freedom: we are attached to one, and long for the other.” As such, it is experiences of place that allow us to both internally and externally orient ourselves within our environments, to make sense out of the world of

space, and to find order and meaning in the world (Roberts 1996; Cheng, Kruger, and Daniels 2003). External orientations to place tell one where one is, internal orientations tell one how it is to be there. Given such orienting experiences, these concepts extend from the fundamentally physical to the level of psychic well-being and cultural symbology. Knowing how one is, and where one is, are critical to the identification and development of personal identity and character (Roberts 1996).

“Sense of place” and “place attachment” are concepts closely related to “place.” “Sense of place” typically refers “to an individual’s ability to develop feelings of attachment to particular settings based on combinations of use, attentiveness, and emotion” (Stokowski 2002). “Place attachment” is the result of strong “place-related experiences” which build up within the memory, residing there and taking on special meaning over time (Greene 1996). The role of memory as the locus of the connection between place and meaning is key.

Place attachment has been further broken down by some researchers into emotional and functional divisions, which in turn have been linked to behavior (Williams, Patterson, and Roggenbuck 1992; Mitchell et al. 1993; Vaske and Kobrin 2001). Functional attachments, also referred to as place dependent attachments, link the importance or value of a place with the importance or value of the activities pursued or supported there (Mitchell et al. 1993; Vaske and Kobrin 2001). In describing place dependent attachments, Williams, Patterson and Roggenbuck (1992) emphasize the overall necessity of a specific place for

enjoying a leisure pursuit rather than the types of attributes a place possesses. Emotional attachments are those in which the place itself becomes as important as the activities conducted there. These attachments are formed via long term psychological investments in places which then develop meanings related to personal identity and purpose (Relph 1976; Williams, Patterson, and Roggenbuck 1992; Williams and Patterson 1999; Vaske and Kobrin 2001).

Two particular studies employing these concepts bear elaboration as their goals of describing how humans experience their environment, and their findings, relate to those of the present study. First, is Rosemary Peacher's 1995 doctoral dissertation "The Experience of Place" which used phenomenological methods to describe the lived experience of special places (Peacher 1995). Five themes descriptive of one's experience of place were identified including Identity, Connection, Security, Possibilities, and Beauty/Awe. Places were found to connect people to others and to times experienced in them. These places also connected participants with something larger than themselves whether that was a group, a family, a team, a city, or the entire planet/world. Special places also allowed participants to feel safe, secure, and free from constraints. Types of Security experienced in special places included permanence and tradition, familiarity and safety, relaxation and tranquility, solitude, and escape (Peacher 1995). The theme of Possibilities arises out of the experience of special places as places that do not impede one's desires. Within these places one is allowed the freedom to think, dream, aspire, experiment, explore, discover, etc. These

aspects of the theme of Possibilities speak to the stimulation, learning, and challenge found in a special place. The Beauty/Awe theme “addresses the ability of a place to communicate a divine or supernatural influence, to inspire one to transcend his or her own boundaries in identifying with a oneness of the universe, and to recognize the natural beauty and majesty of a place” (Peacher 1995).

Second, is the Radford University Cultural Heritage Research Team’s ethnographic study of residents’ of two rural Virginia communities cultural attachment to land (Wagner 2002). In this study, land and culture were found to be inseparable. Residents referred to their land as their heritage and legacy. Nine generations were traced to particular properties in some parts of one county. Residents frequently and consistently commented on how long their land, including indicating the boundaries of that specific piece of land, had belonged to their family and the importance of that historical presence to them. Researchers concluded residents’ land attachments are based on the cultural continuity provided by their knowledge of the past, life in the present, and vision of the future on the land, and by “the link between their culture and the nature that surrounds and penetrates that culture” (Wagner 2002). Researchers also found these residents to have a complex middle ground relationship with the land between land as a utilitarian commodity to be developed and used, and land as a defining aspect of personal identity, material culture, and economic life. Neither aspect of the meaning of land dominated the other; both existed in a complex

and delicate balance shaped by years of using land to meet one's needs, and years of giving meaning to the land based on the human and social activities that had occurred there. Residents' relationship to nature was also complex and intense. "Nature is used, nurtured, admired, feared, and kept at bay" (Wagner 2002). Residents simultaneously sought to control nature, especially and particularly around their home places, and revered it.

Behavioral Implications

While the social and political implications of sense of place and place attachment for natural resource management and politics have been noted by several researchers (e.g. Stokowski 2002; Cheng, Kruger, and Daniels 2003; Schaaf 2005), few studies have explicitly linked sense of place and/or place attachment with individual behavioral implications. Stedman (2002) believes this results from little systematic theory, lack of agreement on core concepts, and the absence of hypothesis testing in place studies. Accordingly, he outlines ways to translate place terms such as place attachment, satisfaction, and symbolic meaning(s) into social psychology concepts such as identity, attitude and cognitions respectively in order to take advantage of well established measures, theories, and hypothesis testing. Furthermore, he suggests that measurements on these attributes be compared between those who participate in behaviors of interest and those who do not (Stedman 2002, 2003).

While identifying the behavioral implications of sense of place and place attachment has not been a widely addressed research goal, two studies which do

address this link were identified and are discussed below. Vaske and Kobrin (2001) examined the relationship between place attachment and the environmentally responsible behavior of youth employed in natural resource based community work programs by surveying participating youth upon completion of a five to seven week long work program. Place attachment indicators included the place dependence and place identity concepts described above. Environmentally responsible behavior indicators ranged from general discussions with others about environmental issues to actions such as recycling and conserving water. Place dependence and place identity were found to form independently with place dependence (the functional relationship) preceding and influencing the formation of place identity (the emotional relationship). Place identity in turn was found to influence environmentally responsible behavior and thus was said to “mediate” the relationship between place dependence and environmentally responsible behavior (Vaske and Kobrin 2001). The authors are careful to note their study does not support the conclusion that participation in the natural resource based youth program is responsible for the environmentally responsible behaviors. They also can not conclude specific place attachment causes generalized environmentally responsible behavior. Nevertheless, their findings do demonstrate linkages between place attachment to local natural resource settings and environmentally responsible behavior both in the specific setting and in more generalized manners. In addition, a significant implication of this work is that while it has been repeatedly demonstrated that stimulating

environmentally responsible behavior via increased awareness of environmental issues reflects faulty assumptions about the link between education and action, stimulating environmentally responsible behavior in localized and generalized settings via facilitating place attachment to local natural resource areas may prove more effective (Vaske and Kobrin 2001).

A second effort to address the “behavioral implications of sense of place” is Stedman’s (2002) use of social psychological concepts to test the hypothesis that “higher place attachment and lower place satisfaction are each associated with increased willingness to engage in place-protective behavior” among landowners in a tourism and recreational landscape in Wisconsin (Stedman 2002). Stedman (2002) conducted a mail survey of lake area residents concerning their experience with a special lake of their designation, social network participation, beliefs and meanings about the lake, place attachment, place satisfaction, and willingness to involve themselves in behaviors proposed to protect the lake against hypothetical threats. It is important to note references to “place—protective behavior” refer to measures of the likelihood of engaging in hypothetical behaviors relative to hypothetical situations rather than measures of landowners’ current engagement in actual behaviors. Measuring place-protective behavior this way confirmed the hypothesis; the higher the level of place attachment and the lower the level of place satisfaction, the greater the intention to engage in place protective behavior. In other words, respondents were willing to fight for places central to their identity and which they perceived

as being in “less than optimal” condition (Stedman 2002). These results suggest the importance of place to those interested in understanding linkages between people and environment; specifically implications for behavior relative to natural resource management.

Positivist Approach

As stated above, numerous fields address the human experience of nature using a positivist approach in which environment and behavior, the two main aspects of inquiry, are seen as separate but related variables. Given that each field approaches the topic slightly differently, summarizing the major environment-behavior research concepts requires paying more attention to similarities than to detailed differences, and is aided by choosing one of the more historically predominant fields, environmental psychology, as an overall guide. With these comments in mind, and drawing predominantly on the Bell et al. (2001) *Environmental Psychology*, and the Bechtel and Churchman (2002) *Handbook of Environmental Psychology* texts, the following major concepts from the positivist approach to the human experience of nature are provided.

Major Concepts and Related Research

The positivist approach focuses on how the environment influences behavior and vice versa. Much of this literature is beyond the scope of this research covering such areas as the effects of environmental conditions and stimuli such as temperature, sound, and stress on behavior, how the brain understands spatial information presented by the environment (environmental

cognition and perception), and how values, attitudes and beliefs about the environment influence behavior (Bechtel 1997; Bell et al. 2001). Nevertheless, two topics from the positivist approach relate to the present work in terms of what they say about how humans relate to the environment and how those relationships influence their behavior. First, a significant body of work has been amassed regarding the effects of nature on physical, emotional and mental well being (Bell et al. 2001). Second, a smaller and more disparate body of work examines how direct experience of nature relates to behavior.

While research on the restorative effects of nature does not address the relationship between experiencing nature and behavior per se, it says much about how people experience nature and its effect on them. Several studies have examined the effects of direct and indirect experience of nature on the mental and physical health of recovering surgical patients (Ulrich 1984), patients living in hospital rooms for weeks to months at a time (Verderber 1986), and prison inmates (Moore 1981). Ulrich (1984) demonstrated that window views of nature, as opposed to buildings, contributed to fewer post surgical complications and faster rates of recovery for post surgical patients. He has also demonstrated the stress reduction effect of viewing nature scenes for college students (Ulrich 1979) and a similar effect, reduction of stress and anxiety, in pre-surgical patients (1986). Moore (1981) found a strong correlation between use of health care facilities by inmates and content of the view from their cell. Those with views of

other cells and inmates sought health care more frequently than those with views of nature.

While these restorative effects have been well documented and recognized for decades, the responsible mechanisms are not agreed upon. Bell et al. (2001) summarize two of the main explanations: the stress reduction hypothesis supported by studies such as those described above and the Attention Restoration Hypothesis (Kaplan and Kaplan 1989; Kaplan 1995). The stress reduction hypothesis simply explains the positive health outcomes of spending time viewing nature, or directly in contact with it, by way of claiming that such time reduces the physical, mental and emotional stress of everyday living in a variety of settings. Some of the most direct support for this hypothesis comes from another one of Ulrich's studies. In 1991, Ulrich and others asked participants to watch a stressful video, followed by either a videotape of natural scenes or urban scenes. Measures of stress arousal such as blood pressure and muscle tension decreased more in participants who viewed nature scenes after exposure to stressful stimuli than in those who viewed urban scenes. These measures also converged with participants self ratings of how they felt after exposure to the natural scenes (Ulrich et al. 1991).

Attention Restoration Theory is an alternate explanation for the restorative effects of nature based upon differences in the mental energy required by attending to natural and non-natural settings. The Kaplans (1989) propose nature is full of fascinating objects which require little to no effort to attend to,

such as clouds, sunsets, and wildlife. Spending time in effortless attention provides a rest from the fatigue brought on by directed attention and allows one to re-charge (Kaplan and Kaplan 1989; Bell et al. 2001).

Behavioral Implications

While significant research exists to document the restorative affects of the environment, it is difficult to identify research from the positivist tradition which documents the behavioral implications of direct personal experience with nature. This may be due to the fact that from this perspective, behavior is one of the variables of interest, meaning it is one of the constructs measured and operationalized within studies, rather than being the construct to which study results are applied. In addition, there appears to be a historical bias in the positivist approach towards viewing the environment as a collection of physical stimuli to which human physiology and psychology respond rather than viewing the environment as a contextual setting within which people live and to which they react as a combined unit of physical and mental effort. Regardless of the reason, a review of the literature produced very few positivistic studies which document the behavioral effects of direct personal experience of nature. Those that were uncovered consistently and positively link childhood experience of nature to adult pro-environmental behavior. No studies were uncovered which link adult experience of nature to adult pro-environmental, or any other kind of, behavior. It is possible this results from the fact that few adults exhibiting environmentally related behavior had little to no contact with nature as children,

especially when the fact that “contact with nature” can be defined as broadly as walking down a suburban street, to playing in a city park, to wilderness experiences. Regardless, studies examining the basis of adult environmentally related behavior have tended to focus on childhood experiences (Tanner 1980; Chawla 1998; Louv 2005; Armstrong et al. 2007).

According to Chawla (1998) who reviewed studies on “environmental sensitivity, an important variable in environmental awareness and in the predisposition to take responsible environmental action”, the genesis of the genre is Tanner’s work on the significant life experiences of environmentally focused “informed citizen activists” (Tanner 1980; Chawla 1998). Looking for the kinds of learning experiences likely to produce an active and informed citizenry, Tanner (1980) invited members of the professional staff of organizations such as The Nature Conservancy, National Audubon Society, and the Sierra Club to provide autobiographical statements identifying formative influences relative to their current work. Tanner hypothesized four formative influences: 1) “Outdoors – interaction with natural, rural, or other relatively pristine habitats”, 2) “Habitat – frequent, perhaps daily, contact with natural, or pristine habitats, either year-round or during summer vacation”, 3) “Habitat alteration – witnessing the commercial development of one’s habitat”, 4) “Solitude – frequent contact with relatively pristine habitats, either alone or with just one or two friends.” In addition to confirming the four hypothesized constructs, five additional constructs were reported as formative: “1) Parents, 2) Teachers, 3) Other Adults, 4) Books,

5) Miscellaneous – overseas experiences, a reawakening during adult life of latent childhood interests, other.” Tanner (1980) notes the study is “modest in methods” using descriptive analysis only with no inter-coder reliability check and including a sample size of 45 “and therefore reserved in its conclusions.” However, it remains the case that all four hypothesized aspects of childhood nature experience were found to relate to adult environmentalist behavior, with “outdoors” and “habitat” most frequently cited.

As mentioned above, according to Chawla (1998), Tanner’s (1980) study spawned a line of research into the “autobiographical antecedents” of the concept now recognized as “environmental sensitivity”. Subsequent research broadened the populations studied and methodologies employed, but has shown consistency among the main responses concerning the sources of environmental activism, career choice, concern and/or interest. These include positive experiences in natural areas, adult role models, experience with environmental organizations, education, negative experiences of environmental degradation, books and other media and on the job experience (Chawla 1998). However, Chawla (1998) points out an important limitation of this research stream. None of the studies has compared the experiences of those engaged in these environmental pursuits to those who are not engaged. Therefore, it is unclear whether those who are environmentally indifferent or even antagonistic towards environmental causes would report different significant life experiences. Nevertheless, this line of research does serve to demonstrate that time spent in

nature, at least in childhood and/or formative years, does relate positively to positive environmental behaviors in adulthood.

Methods

Data Collection

The research site for this study, described further in Part I of this document, is the Emory-Obed watershed of East Tennessee. Data were gathered via a mail survey following the procedures described in Part II. Two 15 item five point Likert scale survey questions were used to identify quantifiable components characterizing PFLs' experience of their forestland and the meanings they ascribe to these experiences. Items in both questions were informed by the results of Part I for non-participant PFLs. Results for actively managing PFLs were not available at the time of survey development.

Survey question 11 (see Part II Appendix B), "Importance of Owning Woodland", comprised the first set of items characterizing PFLs' experience of their forestland and the meaning of these experiences to them. The question read as follows, "People own woodland for many reasons. Please indicate how important each of the following reasons is to you when thinking about your woodland by placing an X in the box closest to your opinion" (see Part II Study Site and Survey for a discussion of the use of the term "woodland" in the survey versus "forestland" in this document). Response items were a combination of items derived from the non-participant PFL results of Part I, literature review, and review of existing survey instruments. "Importance" of owning woodland relates

to how landowners experience woodland and the meaning of these experiences to them via the phenomenological assumption “what I am aware of reveals what is meaningful to me.” In other words, response items were created by translating thematic elements into important reasons for owning forestland under the assumption that what is meaningful is what is important and vice versa.

Response items derived from the phenomenological results include for example, “To pass on to my children or other heirs” and “To learn from nature.” Items derived from literature review and review of existing survey instruments include items such as “To collect firewood” and “Because the land can’t be farmed.” Response choices ranged from Not Important (1), to Very Important (5) with Somewhat Important (3) representing the midpoint. A choice of Not Applicable was provided as well.

Survey question 28 (see Part II Appendix B), “Meaning of Land”, comprised the second set of items used to characterize PFLs’ experience of their forestland and the meaning of these experiences to them. The question read as follows, “Please indicate the extent to which you agree or disagree with each of the following statements about what your **land** (woodland and other types of land) in the study area **means to you** by placing an X in the box closest to how you feel.” All response items were derived from the non-participant PFL results of Part I. Response choices ranged from Strongly Disagree (1), to Strongly Agree (5), with Undecided (3) representing the midpoint. Note that although this study focuses on forestland issues, landowners were asked to consider all of

their land in answering this question as opposed to just their forestland because phenomenological interviews revealed that when thinking about their experiences landowners do not distinguish between types of land they own. Furthermore, due to the significant percentage of wooded land in the study area, most PFL ownerships are either completely wooded, or wooded except for a home site.

Data Analyses

Analyses were conducted using the Statistical Package for Social Sciences for PC, Version 15.0. Exploratory factor analysis, a data reduction technique used to uncover the underlying structure of a set of variables, was used to identify a suite of components characterizing how PFLs experience their forestland based on their responses to the two questions described above. The data reduction aspect of factor analysis refers to the method's ability to analyze patterns of relationships within the correlations between a set of variables and condense these correlations to a smaller set of underlying variables, or factors, which represent these relationships. Factors themselves are not observed or measurable entities but are said to "explain" the variance of the observed variables (Kim and Mueller 1978; Kachigan 1982; Green, Salkind, and Akey 2000; Garson 2006). Principal Components Analysis with varimax rotation and Kaiser normalization, a form of orthogonal rotation, was used to generate the rotated component matrix.

The relationship between PFLs' engagement in forest management activities and the components comprising the meaning of the experience of

forestland was examined using both bivariate correlation and Multivariate Analysis of Variation (MANOVA). Engagement in forest management activities was operationalized as the sum of respondents' self report concerning their engagement in a set of 18 activities traditionally associated with forest management. Table 3 Part II lists these activities. Figure 4 in Part II summarizes the frequency with which respondents engaged in these activities. Due to the non-normal distribution of engagement in management activities across the respondent population, Spearman's bivariate correlation was used to measure the strength and direction of the relationship between PFLs' level of engagement in forest management activities and the strength of their agreement with each of the five identified components describing the meaning of respondents' experiences with their forestland. MANOVA was used to compare differences in how respondents experience their forestland based on their self perception of themselves as forest managers and based on their involvement in a series of selected individual forest management activities. Self perception of engagement with forest management was measured with a yes/no question as follows, "When thinking about what you consider to be "management" do you feel you manage your land?" (see Q13 Appendix B Part II). Although, the purpose of this investigation is to relate the meaning of PFLs' experience of their forestland to their management of their forestland, thus viewing meaning of experience as the independent variable and engagement in forestland management behavior as the dependent variable, statistical tests were conducted and results are

presented with the variable assignments reversed. These variable assignments (meaning of experience = dependent variable, engagement in forestland management behavior = independent variable) reduce the potential for Type I errors. As no direct cause and effect or predictive relationships between variables can be sought or proven with this research, variable assignments were made so as to achieve the greatest statistical accuracy possible.

Results

Meaning of the Experience of Forestland

Together these five factors explain 60% of the variance in survey responses regarding the meaning and importance of forestland to private forest landowners. The reliability of the overall scale is .881 (Cronbach's alpha). The reliability (Cronbach's alpha) and amount of variation explained by each subscale is as follows, 1) emotional connection (.874) explaining 28.9% of the variance, 2) family connection (.844) explaining 10.9% of the variance, 3) connection to nature (.844) explaining 8.9% of the variance, 4) personal and financial gain (.744) explaining 6.1% of the variance, 5) investment (.516) explaining 5.1% of the variance.

Respondents' scores for each factor were calculated as the mean of the Likert scale responses for the items composing each factor. Subsequent analyses involving PFLs' experience of forestland were conducted using these values as the factor scores. Means were compared to a Likert scale measuring the agreement of meaningfulness/importance where 1 = Strongly Disagree that a

particular factor is a meaningful/important aspect of the experience of land, 2 = Disagree, 3 = Undecided, 4 = Agree, and 5 = Strongly Agree. All means are reported as “x = ____.” Overall, respondents tended to agree with the experience of their land as providing an emotional connection (x = 4.1), a family connection (x = 3.6), and a connection to nature (x = 3.8). Respondents tended to disagree or be undecided as to whether personal and financial gain are meaningful and important aspects of the experience of land (x = 2.4) and are undecided as to whether land is important or meaningful as an investment (x = 3.0).

Multiple factor analysis solutions were examined for their statistical and theoretical validity. The initial solution including all possible “Meaning of Land” and “Importance of Owning Woodland” items yielded seven factors based on the “Eigen value-greater-than-one criterion” (Green, Salkind, and Akey 2000). However, two of these factors appeared both statistically and theoretically weak. By limiting the factor analysis to a five factor solution and removing three items (see Part II Appendix B: Question 28, “Meaning of Land”, items 5, 7 and 13) which did not load significantly onto any factor, loaded weakly and/or reduced the reliability of either the overall solution or the individual sub-scales, five factors with strong scale and sub-scale reliability as well as conceptual integrity characterizing the meaning of respondents’ experience of their forestland emerged. Factors were named based on similarities in the items loading onto each factor and interpretive insights concerning the items gained from Part I (see Table 8). (1) Experiencing an “emotional connection” with/to land. The focus of

the experience is on the self. The important and therefore meaningful aspect of how PFLs experience their land is “how the experience makes me feel.” (2) Experiencing a “connection to family” via the land. In this case, the land provides a means for connecting to, and staying connected to, family and vice versa. For these PFLs, the important and therefore meaningful thing about their experience of land is the connection to family. (3) Experiencing a “connection to nature” via the land. In this case, being a landowner means being able to live in and with nature, appreciating nature for its own sake, not for what it can do for you, and giving back to nature. The focus of the experience is on the land. (4) Experiencing the land means reaping the “personal and financial gain” of what it produces. The land is meaningful and important to the landowner because of what it provides. The benefits could be experiential or material or both. (5) The meaning of the land is in its worth as an “investment”. It is an investment which may or may not produce benefits at the present time, but it is meaningful in the present due to what it holds for the future.

Relationship Between Engagement in Management Activities and How Landowners Experience Their Land

Spearman’s bivariate correlation for non-normally distributed data was used to measure the strength and direction of the relationship between PFLs’ engagement in management activities and how they experience their land. The relationship is strongest between engagement with forest management activities and personal and financial gain ($\rho = .298, p < .001$), followed by emotional

connection ($\rho = .260$, $p < .001$), connection to nature ($\rho = .198$, $p < .001$), family connection ($\rho = .155$, $p < .001$), and investment ($\rho = .131$, $p < .01$). These are weak positive correlations. In other words, as activity increases, so does the strength of agreement with the items related to personal and financial gain, emotional connection, connection to nature, connection to family, and investment. The opposite is true as well.

Having a multi-year land use decision plan vs. planning only for the current year was significant with regards to how landowners experience their land [$F(5,430) = 7.237$, $p < .001$]. Respondents who report making a multi-year land use decision plan are significantly more likely than those who plan only for the current year to have an emotional connection to their land ($x_{\text{yes}} = 4.182$ vs. $x_{\text{no}} = 3.942$, $p < .001$), connect to nature through their land ($x_{\text{yes}} = 3.918$ vs. $x_{\text{no}} = 3.570$, $p < .001$) and find the personal and financial gains they receive from their land meaningful ($x_{\text{yes}} = 2.550$ vs. $x_{\text{no}} = 2.177$, $p < .001$). Note that while in addition to examining how PFLs' engagement in management activities correlates to the meanings they ascribe to their experience of their forestland, the relationship between their engagement in 11 individual forest management activities and how they experience their forestland was also investigated. Too few respondents ($n = 19$) reported having a written management plan to accurately evaluate a relationship between engagement in this activity and the meanings PFLs ascribe to their experience of their forestland. Table 9 lists the remaining ten activities examined, and summarizes the significance of the

relationship between engagement in these activities and the meaning of PFLs' experience of their forestland. Detailed results, including the difference in mean level of agreement between those who engage in each activity and those who do not, for each of the components comprising the meaning of PFLs' experience of their forestland, are explained below and summarized in Table 10. In addition, as it can be difficult to understand the overall picture revealed when comparing each management activity to each experience component, Table 11 indicates which of the tests relating management activity to experience component are significant.

Landowners who make multi-year land use decision plans are statistically more likely to find their land meaningful for personal and financial gain than those who plan only for the current year, their level of agreement with the personal and financial gain component is close to neutral on the level of agreement scale. Multi-year land use planning vs. planning only for the current year did not differ significantly with regard to connecting to family through forestland ($p = .768$) or finding forestland meaningful for its investment potential ($p = .093$).

Having ever harvested or cut trees was also found to relate significantly to the meanings PFLs ascribe to their experience of their forestland [$F(5,456) = 8.803, p < .001$]. Respondents who have ever harvested or cut trees are significantly more likely than those who have not to find their land meaningful for its ability to connect them to family ($x_{yes} = 3.791$ vs. $x_{no} = 3.451, p < .001$), provide personal and financial gain ($x_{yes} = 2.537$ vs. $x_{no} = 2.227, p < .001$), and

for its investment potential ($x_{yes} = 3.111$ vs. $x_{no} = 2.899$, $p < .05$). Note that while PFLs who have ever harvested or cut trees are statistically more likely to find their land meaningful for its ability to provide personal and financial gain and for its investment potential than those who have not ever harvested or cut trees, the mean level of agreement with these components of the meaning of their experience of land is close to or below neutral in both cases. Having ever harvested or cut trees did not relate significantly to having an emotional connection to land ($p = .138$) and connecting to nature through land ($p = .183$).

For those PFLs who have harvested or cut trees, using a professional forester for the most recent cut is significantly related to the meanings they ascribe to their experience of their land [$F(5,223) = 4.625$, $p < .001$]. Landowners who used a professional forester for their most recent cut are significantly more likely than those who did not to find the investment potential of their land meaningful ($x_{yes} = 3.870$ vs. $x_{no} = 3.027$, $p < .001$). Using a professional forester for the most recent cut did not relate significantly to forming an emotional connection with the land ($p = .117$), connecting to nature through the land ($p = .432$), connecting to family through the land ($p = .147$) or finding personal and financial gain in the land ($p = .408$).

Having ever prepared land for tree planting was also significantly related to the meanings PFLs ascribe to their experience of their forestland [$F(5,448) = 5.105$, $p < .001$]. Landowners who have prepared land for tree planting are significantly more likely to experience an emotional connection to their land (x_{yes}

= 4.302 vs. $x_{no} = 4.037$, $p < .01$) and to develop a connection to nature via their experience of their land ($x_{yes} = 4.174$ vs. $x_{no} = 3.695$, $p < .001$) than are those who have not prepared land for tree planting. Having ever prepared land for tree planting did not relate significantly to connecting to family via the land ($p = .221$), finding personal and financial gain in experiences of the land ($p = .763$) or finding the land meaningful for its investment potential ($p = .890$).

Applying pesticides or herbicides to the land was significant with regards to how landowners experience their land [$F(5,448) = 2.482$, $p < .05$]. Landowners who have applied pesticides or herbicides to their land exhibited a marginally significant difference compared to those who have not in terms of experiencing an emotional connection with their land ($x_{yes} = 4.209$ vs. $x_{no} = 4.053$, $p = .048$). In terms of the land providing a means to connect to family ($p = .073$), connecting landowners to nature ($p = .195$), providing personal and financial gain ($p = .463$) and/or having meaning as an investment ($p = .620$) PFLs who apply pesticides and herbicides are not significantly different from those who do not.

Having ever managed for wildlife was also found to relate significantly to the meanings PFLs ascribe to their experience of their forestland [$F(5,448) = 4.871$, $p < .001$]. Respondents who have ever managed for wildlife are significantly more likely than those who have not to be emotionally connected to their land ($x_{yes} = 4.325$ vs. $x_{no} = 4.027$, $p < .001$), connect to nature through their land ($x_{yes} = 4.161$ vs. $x_{no} = 3.682$, $p < .001$) and characterize the personal and financial gain they experience in their land as meaningful ($x_{yes} = 2.686$ vs. $x_{no} =$

2.328, $p < .01$). Note however, although a significant difference exists between those who have managed for wildlife and those who have not in terms of feeling their land provides meaningful personal and financial gain, PFLs who have managed for wildlife are mostly undecided as to whether their land is meaningful to them for the personal and financial rewards they receive from it. Managing for wildlife populations does not relate significantly to connecting to family through the land ($p = .081$) or characterizing the investment potential of the land as meaningful ($p = .552$).

PFLs who have built and/or maintained roads and/or trails were found to have a statistically significant relationship to the meanings they ascribe to their experience of their land [$F(5,456) = 8.803, p < .001$]. Specifically, respondents who have built or maintained roads and/or trails were more likely to find their land emotionally meaningful ($x_{yes} = 4.242$ vs. $x_{no} = 4.024, p < .01$), and meaningful for its ability to connect them to nature ($x_{yes} = 4.032$ vs. $x_{no} = 3.676, p < .001$), yield personal and financial benefits ($x_{yes} = 2.624$ vs. $x_{no} = 2.313, p < .01$) and investment potential ($x_{yes} = 3.200$ vs. $x_{no} = 2.958, p < .05$) than those who have not built or maintained roads and/or trails. These relationships are strongest for the emotional and natural connections found in the land, moderate for the personal and financial benefits found in the land, and relatively weak for the investment benefits found in the land. Furthermore, although statistically significant relationships were found between building and/or maintaining roads and/or trails and personal and financial gain and investment, landowners tended

to be neutral as to whether these components of the meaning of their experience of their land were important to them.

Having built and/or maintained ponds and/or ditches was also significant in terms of the meanings PFLs ascribe to their experience of their land [$F(5,448) = 5.196, p < .001$]. Landowners who have built and/or maintained ponds and/or ditches are significantly more likely than those who have not to experience an emotional connection to their land ($x_{yes} = 4.249$ vs. $x_{no} = 4.029, p < .01$), a family connection to their land ($x_{yes} = 3.888$ vs. $x_{no} = 3.555, p < .01$), to experience their land as providing personal and financial gain ($x_{yes} = 2.708$ vs. $x_{no} = 2.301, p < .001$) and to find their land meaningful as an investment ($x_{yes} = 3.247$ vs. $x_{no} = 2.954, p < .05$). A moderately statistically significant difference between those who have built and/or maintained ponds and/or ditches and those who have not was found for experiencing the land as providing a connection to nature ($x_{yes} = 3.928$ vs. $x_{no} = 3.714, p < .05$). Note that those who have built and/or maintained ponds and/or ditches and those who have not express neutrality relative to agreeing that personal and financial gain is meaningful and important.

Having ever planted trees on any of the land you own in the study area was also found to relate significantly to the ways in which respondents experience their forestland and the meanings they ascribe to their experiences [$F(5,451) = 7.909, p < .001$]. Landowners who have ever planted trees are significantly more likely than those who have not ever planted trees to be emotionally connected to their land ($x_{yes} = 4.165$ vs. $x_{no} = 3.912, p < .001$), to

connect to nature via their land ($x_{\text{yes}} = 3.940$ vs. $x_{\text{no}} = 3.437$, $p < .001$), and to find the personal and financial gains they receive from their land meaningful ($x_{\text{yes}} = 2.471$ vs. $x_{\text{no}} = 2.271$, $p < .01$). Despite yielding a statistically significant difference relative to finding personal and financial gains from the land meaningful, respondents who have ever planted trees and those who have not express neutrality to disagreement regarding whether this aspect of the experience of land is meaningful. Having ever planted trees was not statistically significantly related to finding land meaningful for its ability to connect one with family ($p = .327$) or as an investment ($p = .890$).

As previously described, following the pattern of analysis determined to be most statistically sound, the above results are presented with the meaning of the experience of land as the dependent variable and management activity as the independent variable. Nevertheless, the results of the Spearman's correlation indicate an overall positive, although not strong, statistically significant correlation with the strength of agreement with the components characterizing the experience of land increasing with increasing engagement in forest management activity and vice versa. Therefore, given the original interest in understanding the impact of the way respondents experience their forestland on their engagement in forest management activities, Table 12 is presented as a summary of the significant relationships between each component characterizing how respondents experience their forestland and respondents' engagement in forest management activities by component rather than by management activity.

Relationship Between Self Perception of Forestland Management and How PFLs Experience Their Land

A MANOVA was used to test whether a significant relationship exists between PFLs' self perception of themselves as forestland managers and how they experience their land. The relationship was significant [$F(5,454) = 7.081, p < .001$]. Those who believe they manage their forestland are significantly different from those who do not believe they manage their forestland in terms of being emotionally connected to the land ($p < .001$), experiencing the land as a conduit that connects them to family ($p < .01$), experiencing nature through the land ($p < .05$), and finding meaning in the personal and financial rewards they receive from the land ($p < .01$). Self perception of forestland management did not differ significantly with regard to experiencing the investment land represents as meaningful ($p = .103$). Specifically, those who believe they manage their forestland are more likely to experience an emotional connection to the land ($x = 4.156$), to experience the land as a conduit connects them to family ($x = 3.689$), to experience nature through the land ($x = 3.820$), and to find meaning in the personal and financial rewards they receive from the land ($x = 2.448$) than are those who do not believe they manage their forestland ($x = 3.817, x = 3.409, x = 3.564, x = 2.165$ respectively). Note that while a strong significant result is found for the relationship between believing one manages one's forestland and finding the personal and financial gains from that forestland meaningful, respondents

tend to disagree that personal and financial gain is an important and/or meaningful way of experiencing forestland.

Having ever conducted TSI (Timber Stand Improvement) was significantly related to the meanings PFLs ascribe to their experience of their land [F (5,449) = 4.682, $p < .001$]. Specifically, PFLs who report having ever engaged in TSI are significantly more likely than those who report never having engaged in TSI to find their land emotionally meaningful ($x_{yes} = 4.259$ vs. $x_{no} = 4.035$, $p < .001$), to connect to nature via their experience of their land ($x_{yes} = 4.025$ vs. $x_{no} = 3.704$, $p < .001$), to find the personal and financial benefits they receive from their land meaningful ($x_{yes} = 2.774$ vs. $x_{no} = 2.308$, $p < .001$), and to find the investment their land represents meaningful ($x_{yes} = 3.314$ vs. $x_{no} = 2.949$, $p < .01$). Note that despite exhibiting statistically significant differences, respondents who have ever conducted TSI, as well as those who have not, are relatively undecided as to whether the personal and financial benefits of land and the investment land represents are meaningful and important. Having ever conducted TSI was not significantly related to experiencing the land as a conduit for connecting to family ($p = .053$). When interpreting these results it should be noted that TSI was defined in the survey as having “removed a few trees to improve the woodland.”

Discussion

Introduction and Summary of Results

Substantial interest in private forest landowners and their management of their forestland exists. Despite numerous efforts to identify factors useful in

understanding these landowners, and motivating their greater participation in forest management practices, PFL management participation rates are consistently reported as at or below approximately 15%. In response, calls have been made for the use of new approaches and perspectives in research, outreach, education and program development. This study addresses these calls via a mail survey of private forest landowners in the Emory-Obed watershed of East Tennessee by quantifying components characteristic of how PFLs experience their forestland, and the meaning of these experiences to them, and relating these to PFLs' management behavior.

Five quantifiable components characterizing how PFLs experience their forestland and the meaning of these experiences to them were identified via a factor analysis of respondents' level of agreement with a series of choices describing important reasons they hold for owning their forestland as well as the meaning of their forestland to them. These components are, 1) an "emotional connection" to nature, to something larger than themselves, and to important parts of who they are, 2) a "connection to family" heritage, legacy, and future generations, 3) a "connection to nature" facilitated by the privacy and scenery their land provides, and their actions to protect watersheds and provide habitat and food for wildlife, 4) the "personal and financial gain" their land affords them via activities such as hunting, fishing, and timber production, and 5) the financial "investment" their land represents. Overall, respondents tended to agree the emotional connections and connections to family and nature provided by their

forestland are meaningful and important, they neither agree nor disagree their land is meaningful or important as an investment, and they tend to disagree their land is meaningful and important for the personal and financial gain it provides them.

In addition, a statistically significant positive relationship was identified between PFLs' level of engagement in forestland management activities and their agreement with the components characterizing how PFLs experience their forestland. Engagement in each of ten individual forest management activities was also significantly related to how PFLs experience their forestland. Lastly, PFLs' self perception of their forestland management was found to significantly relate to how they experience their forestland with those who believe they manage significantly more likely to find the emotional connections, family connections and personal and financial gain aspects of the experience of their land meaningful and important than those who do not believe they manage their forestland. These findings both support and add to those found in the literature. Further discussion of these results, their relationship to those found in the literature, limitations of the present study, implications for professional practice, and some suggestions for future research follows.

Meaning of the Experience of Forestland

One mechanism for understanding how humans imbue their world with meaning is the experiential model of place in which meanings and attachments are formed through experiences with the landscape (Stedman 2002). These

findings provide substantial evidence for viewing the meaning of private forestland for the PFLs that own it as place rather than space. For PFLs, their land becomes “distinctive, memorable, affect generating, and psychologically owned” (Greene 1996) via their experiences on it and with it. The important reasons for owning their land, and the meaningful aspects of it to them, are those things that connect them to their sense of self (their identity), to the natural world, to their heritage and to their legacy. The feelings of attachment based on the combination of how they use their land, the reasons for its importance to them, the meaningful aspects of it to them, and the things about it which capture their attention contained within these findings mirror the concepts “sense of place” and “place attachment” as described in the literature. In addition, these findings support the emotional (in which the place itself becomes as important as the activities conducted there) and functional (in which the importance of a place is linked to the importance of the activities pursued there) place attachment divisions described in the place attachment literature by identifying separate components characterizing the emotional and personal and financial gain aspects of PFLs’ experience.

Evidence is also found for private forestland as not just place, but as special place. Several aspects of the themes identified by Peacher (1995) from her participants’ descriptions of special places appear as aspects of the components describing how PFLs experience their land. Aspects of the connection to family component identified here can be seen in Peacher’s theme

of Connection in which special places were found to connect people to others and to times experienced in them. Special places as relaxing (Peacher's Security theme), awe inspiring (Peacher's Beauty/Awe theme), able to connect one to something larger than oneself (Peacher's Connection theme) and inspiring the ability to recognize the natural beauty and majesty of a place (Peacher's Beauty/Awe theme), are meaningful to participants in this study for their ability to provide an emotional connection to a place (I enjoy relaxing on my property and taking in the natural surroundings; I am sometimes in awe of the beauty of my land; my land reminds me of nature's power). Given these similarities, it is not surprising that the most frequently mentioned special places in Peacher's (1995) study were first, "a natural setting", and second a "home or residence."

Taken together, the components characterizing the meaning of PFLs' experience of their forestland also resemble the entwinement of land and culture identified by residents' of two rural Virginia communities (Wagner 2002). In both cases, land has "become the location of cultural meaning" (List and Brown 1996). Residents in these rural communities referred to their land as their heritage and legacy, and formed land attachments based on the cultural continuity provided by their knowledge of the past, life in the present, and vision of the future on the land; all aspects captured by this study's "family connection" meaning of the experience of land. The complicated relationship with nature these Virginians share, all of whom either owned land or came from land owning families, in which land is simultaneously experienced as a utilitarian commodity to be used and a

defining aspect of personal identity, character, material culture and economic life finds meaning here as the investment, personal and financial gain, connection to nature, and emotional connection aspects of how PFLs experience their forestland.

The findings concerning how PFLs experience their forestland and the meaning of these experiences to them have less in common with literature on the restorative effects of nature from the positivist tradition. Convergence is seen in that several aspects of the emotional connection to forestland which PFLs find meaningful and important do reflect the types of experiences the positivist literature focuses on such as relaxation and enjoyment of the outdoors, a sense of awe and power found in nature, and the emotional value of nature.

The experience of land as meaningful due to the investment it represents to its owners was not identified in any of the literature on how humans experience nature and the environment reviewed. Viewing investment as strictly a personal financial investment as stated by this survey, the absence of this component from the literature is likely due to the fact that the only land that can be viewed as an investment by someone experiencing it is land which is personally owned by that individual. As no other studies have been identified which examine how PFLs experience their land, beyond place, it is not surprising this component has not surfaced previously.

Relationship Between Engagement in Management Activities and How Landowners Experience Their Land

This work addresses a noted limitation in the human experience of nature literature concerning how meanings such as sense of place and place attachment, formed via experiences with the landscape, relate to the behavior of those who hold them. Furthermore, this study specifically addresses Stedman's (2002, 2003) suggestion to compare the meanings formed by those who participate in a behavior of interest and those who do not. While he suggests social psychological methods for this comparison, given the overall lack of work relating the meaning of the experience of nature to behavior, these findings make a worthwhile contribution. Furthermore, in finding PFL engagement in management behavior positively correlated with strength of agreement with components characterizing how PFLs experience their land, as well as engagement in ten individual forest management activities significantly related to these components, the results reported here support the limited research establishing a connection between place attachment and behavior.

While the present study sought to characterize PFLs' broad experience of their forestland and its relationship to their management behavior, Vaske and Kobrin (2001) specifically looked for evidence of the formation of place attachment, defined as the combination of place dependence and place identity, and its relationship to behavioral indicators in the form of environmentally responsible behavior among youth who participated in natural resource based

community work programs. They found place dependence formed prior to place identity which in turn influenced environmentally responsible behavior. Thus place identity was said to “mediate” the relationship between place dependence and environmentally responsible behavior. The emotional, family, and nature connection components of PFLs experience of their forestland identified here most closely resemble the concept of place identity, while the personal and financial gain component most closely resembles the place dependence concept. Also, PFLs tended to agree emotional connections, family connections and connections to nature were important and meaningful aspects of their experience, more than they agreed personal and financial gain aspects were meaningful and important. Considering Vaske and Kobrin’s (2001) findings, it is possible the components of PFLs’ experience of their forestland most closely resembling place identity more strongly influence management behavior than do those resembling place dependence, and mediate the relationship between place dependence and management behavior. Investigations with PFLs which specially address these divisions of place attachment and their relationship to management behavior are the only way to substantiate this possibility. Nevertheless, Vaske and Kobrin’s (2001) results are not only supported, and support, these findings regarding the relationship between experience of nature and behavior, but also may offer some explanation for PFLs difference in agreement level concerning the emotional, family and nature components of their experience versus the personal and financial gain component.

Stedman (2002) established a link between behavior and experience of nature by relating the strength of place attachment and place satisfaction to willingness to engage in place-protective behavior. High place attachment was found to relate positively to place-protective behaviors, while high place satisfaction related negatively to place-protective behavior. In other words, “we are willing to fight for places that are more central to our identities and that we perceive as being in less-than-optimal condition” (Stedman 2002). Given the evidence here for private forestland as place for PFLs, and the correlation between strength of agreement with the components characterizing the experience of land and engagement in management behaviors, these results suggest place attachment may be related to willingness to engage in behaviors other than place protective behaviors.

Another way to view the relationship between this study and Stedman’s (2002; 2003) work, is to consider whether forest management behavior might be viewed as place protective behavior especially when it concerns one’s own property. Stedman (2002) defined place protective behavior as respondents’ willingness to protect their special place against hypothetical future change via activities such as voting for laws that might prevent changes perceived as negative or joining/forming a group to work against such changes. Given the generally held belief that unmanaged forestland is more susceptible to conversion to other uses (see Part II for a further discussion of forest management conceptualization), and the relationships between forest

management and forest health, sustainability, and enjoyment of aesthetic qualities such as scenery and recreation, it seems plausible that a reasonable argument could be made for forest management of one's own property to be seen as place protective behavior. Furthermore, although place satisfaction was not addressed here, substantial evidence exists to support the notion PFLs are often highly satisfied with their forestland, especially given the evidence presented here for PFL forestland as place (see thematic results from Part I for further evidence of place satisfaction with forestland). If this is true, then high place satisfaction may be at least partially responsible for the large numbers of PFLs who do not engage in forest management behavior. In summary, and considering results from Part II of this document concerning the substantial numbers of PFLs who believe they manage their forestland versus the reported numbers the forestry community believes manage their forestland, the relationship between place attachment and place protective behavior may help to at least partially explain the correlation between the components characterizing how PFLs experience their forestland and engagement in forest management , while the relationship between place satisfaction and place protective behavior may help explain the discrepancy between PFLs and NRPs views concerning the degree to which PFLs management their forestland.

This research is difficult to match to positivistic studies on the human experience of nature and its relationship to behavior. This is primarily due to differences in intent and the literature's focus relating childhood experience of

nature to adult environmentally related behavior. Nevertheless, aspects of these PFLs' emotional connections to their land, connection to nature, and interest in the personal and financial gain they receive from their land do match much of the literature concerning the restorative benefits of experience of nature such as enhanced mental, emotional and physical well being. In addition, the positive correlation between different ways PFLs' experience forestland and their management behavior adds to the environmental sensitivity literature relating significant life experiences to environmental action. For example, while the environmental sensitivity literature operationalizes experience of nature as childhood experience and environmental behavior as mostly politically based adult behavior, these findings relate adult experience of nature to current behavior in the form of direct contact with the environment.

Relationship Between Self Perception of Forestland Management and How PFLs Experience Their Land

This research adds to the literature by examining not only the relationship between PFLs' reported behavior and how they experience their forestland, but the relationship between PFLs' self perception of their forestland management behavior and their experience of their forestland. Examining individuals' beliefs about their own behavior is well established in social psychology. Ajzen's Theory of Planned Behavior holds that behavioral beliefs concerning the probability of achieving a desired outcome link one's behavior to expected outcomes (Ajzen 1985, 1987, 1991, 2008). However as Stedman (2002) noted, experience of

nature/land research has made little use of social psychological concepts. Given that these results find a positive correlation between both how PFLs' experience their forestland and their engagement in forestland management activities and PFLs' self perception of their engagement in forestland management activities and how they experience their land, this research supports Stedman's (2002) suggestion concerning the greater use of social psychological concepts in experience of nature research.

Implications for Practice

Efforts to increase the prevalence of PFL forest management tend to focus on changing PFL behavior. The positive correlation between strength of agreement with the constructs characterizing PFLs' experience of their forestland and PFLs' engagement in management practices implies that addressing PFL forest management may also involve placing greater value on how PFLs experience their forestland, as well as facilitating and even enhancing those experiences. The five components identified as characterizing PFLs' experience of their forestland can be used as guides concerning the specific types of land based experiences PFLs find meaningful and important. In addition, when combined with the results of Part II indicating self perception of management behavior is significantly related to engagement in forest management activities, these results plus the positive correlation identified here between PFLs' self perception of their engagement in forestland management and several of the components characterizing how PFLs experience their forestland, this research

suggests improving understanding of PFLs' self perception of their management behavior may be as important as improving understanding of their reported and/or observed behavior.

In recent years, NRPs have been increasingly called on to fill numerous roles in addition to technical expert (Cortner and Moote 1999; Bliss 2001). This is certainly a challenge, and the extent to which NRPs should stretch beyond their traditional roles of educators and technical advisors is, and should be, debated within the field. Nevertheless, this study, and related research, suggest that meanings formed through experience with the landscape are positively related to behavior. Therefore, while I am not suggesting NRPs go so far as to help PFLs throw family reunions on their property in order to enhance the meaningfulness of the connection to family aspect of their experience, I am suggesting that where we can not, or can not effectively, encourage greater participation in forest management, as it has been traditionally viewed using traditional methods, that we focus on encouraging greater participation in simply experiencing one's forestland. This may be of particular importance in areas experiencing a greater than average influx of owners less familiar with personally and directly experiencing nature. Landowners, who in other words, may view nature, and their own land, as something out there and separate from themselves, best viewed through a glass window, such as an aquarium or a zoo, and best left alone. While there is nothing wrong with a "leave it alone" management philosophy per se, leaving nature alone by virtue of being totally

unfamiliar with how it functions, what it produces, and how it feels to be in it, is not only different from leaving it alone by virtue of careful choice, but deleterious to sound environmental management. At least one author hypothesizes that we can not care about, let alone engage ourselves with, that of which we know nothing (Louv 2005). Facilitating landowners' greater familiarity with their forestland in particular as well as with forests in general in terms of how they function and what benefits they provide may also be a useful and important tactic when trying to reach forest landowners not residing on their forestland property or visiting it frequently. Forest landowner educational opportunities and events such as "Getting to Know Your Woods", "The Woods in Your Backyard: What's There And Why You Might Care", and "Having Your Cake and Eating It Too: Enjoying *and* Profiting From Your Forestland" might encourage specifically those landowners less familiar with their resource and less comfortable with viewing it as a commodity to become more familiar with it and more comfortable with a range of ways to appreciate it, than more traditional educational opportunities such as field days, seminars on particular styles of management such as selective cutting, or traditional financially based incentive programs.

Improving NRPs' familiarity with the concepts of sense of place and place attachment, how these manifests for PFLs, how they can impact PFL decisions and actions, and helping NRPs incorporate these concepts into their work with PFLs is an additional implication of these findings. As summarized in Mitchell et al. (1993) and applied to public forest management planning, urban and rural

planners have long recognized the importance of incorporating place and emotional attachment into their work. The same must now also be true for work with private forest landowners. For those PFLs already at the stage of seeking NRP assistance with their forestland, management recommendations made by NRPs must address the needs of PFLs to maintain emotional, family, natural, personal, financial and investment connections with their land in addition to addressing the needs of the resource itself. For those PFLs for whom seeking assistance with their forestland is either “not on their radar” or connotes negative feelings, capitalizing on the presence of these connections and PFLs desires to maintain them may be one way of breaking through unfamiliarity, discomfort, and outright negativity concerning forest management.

Future Research

Several avenues for future research are evident. These fall into two categories: those relating to improvements in quantifiably measuring how PFLs experience their land and the meaning of their experiences to them and those relating to repeating and expanding efforts to investigate the relationship between the meaning of PFLs experience of their forestland and its relationship to their forest management behavior.

In terms of improving quantified measurement of PFL experience of land, an apriori assumption was made when constructing the survey instrument that “importance of owning woodland” and “meaning of land” represented two separate constructs which should and could be measured and analyzed

separately. However, analysis reveals they are highly correlated both statistically and conceptually. Theoretical support comes from the phenomenological assumption that what one is aware of reveals what is meaningful, and the common logic that those things that are more meaningful to an individual than others are also those things that are more important to an individual than others. Therefore, future efforts to quantitatively assess PFLs' experience of their forestland would benefit from combining these two scales into one question. This would also enable the application of a standardized Likert scale for response categories.

In addition, the wording of several scale items and the overall balance of items relating to different aspects of the experience of owning forestland could be improved. For example, using the current scale terminology the importance of short term financial gain, from timber sales or land development plans for example, can not be separated from the importance of long term financial investments. In addition, although, personal and financial gain aspects of the experience of forestland are highly correlated, the lack of specific items to measure the importance of money from timber sales, the inclusion of investment language referring only to long term investments, and the overall limited number of financially related items diminishes the study's ability to comment on how those who's primary interest is in forestland for short term financial purposes are connected to their land. Including such changes in future research might be particularly timely as it was recently noted PFLs are increasingly interested in

forestland for investment purposes rather than timber production (Butler and Leatherberry 2004). Modifications to the current measurement scale may be one way to not only improve future research with goals similar to those of this study, but to also further explore this reported change in the PFL population.

Due to unavoidable timing of survey development the items designed to characterize how PFLs experience their forestland, to which the entire sample responded, were derived from only non-participant PFL interviews. For the present study, this limitation is considered minimally problematic for several reasons. First, it was previously established that those PFLs interviewed as “non-participant” were actually engaged in several of the activities operationalized in this survey as forest management (see Steiner 2003 and Part I of this document). Furthermore, the fact that PFLs representing a range of management activity from very little to substantial responded to these survey items in ways that allowed for statistically significant and conceptually strong factor and bivariate correlation analysis is further evidence that meanings concerning the experience of forestland derived from one set of PFLs, defined by their forest management activity level, can apply to another. In other words, while the results of this study do indicate that the meaning of the experience of forestland to PFLs and their engagement in forest management activities are significantly related, they are not correlated one to one such that survey items characterizing the meaning of the experience developed from one group could not be applied to another. Nevertheless, understanding of how PFLs experience

their forestland and how these experiences relate to their management behavior would be improved by including items characterizing the experience of forestland derived from active PFLs in future studies. Lastly, the greatest improvement in quantifying PFLs' experience of their forestland and its relationship to their forest management behavior lies in further qualitative explorations into how PFLs experience their forestland. Such explorations provide insights unavailable through quantitative efforts, but which can then be quantitatively linked to reported PFL behavior.

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Appendix A

Table 9: Meaning of PFLs' Experience of Land Scale Factors and Item Loading

Survey Item	Factor				
	Emotional Connection	Connection to Family	Connection to Nature	Personal and Financial Gain	Investment
I enjoy relaxing on my property and taking in the natural surroundings	.797				
My land reminds me of nature's power	.769				
My land gives me the opportunity to enjoy the outdoors	.766				
My land connects me to something larger than myself	.719				
I am sometimes in awe of the beauty of my land	.680				
My land has taught me a great deal about how nature works	.667				
For me, taking care of my land is an important part of who I am	.661				
My land has an emotional value for me that is worth more than money	.626	.458			
As part of my family heritage		.828			
My land is an important part of my family's heritage		.813			
To pass on to my children or other heirs		.807			
I like to think of my land as a legacy that I will pass on to my children		.806			
It WOULD matter to my family if I sold my land (RC)		.642			

Table 8: Continued

Survey Item	Factor				
	Emotional Connection	Connection to Family	Connection to Nature	Personal and Financial Gain	Investment
To have trees surrounding my primary or vacation home			.732		
To learn from nature			.720		
For privacy			.703		
To enjoy scenery			.693		
To supply food and habitat for wildlife			.654		
To protect the watershed/provide clean water			.572		
To collect firewood				.702	
For hunting and fishing				.676	
For timber production				.636	
For recreation other than hunting and fishing				.636	
To pick nuts, berries, mushrooms, etc				.574	
Because the land can't be farmed				.478	
I think of my land primarily as a financial investment					.780
As a long-term financial investment					.756

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a Rotation converged in 7 iterations.

Table 10: Results of MANOVAs for Meaning of the Experience of Forestland and Each Forest Management Action

	Forest Management Action	F	df	P
1.	Making a multi-year land use decision plan (vs. planning only for the current year) ^{***}	7.237	5, 430	.000
2.	Having ever harvested or cut trees^{***}	8.803	5, 456	.000
3.	Having ever planted trees^{***}	7.909	5, 451	.000
4.	Having a professional forester plan, mark or contract the most recent harvest/cut ^{***}	4.625	5, 223	.000
5.	Prepared land for tree planting in the past 5 years ^{***}	5.105	5, 448	.000
6.	Applied pesticides or herbicides in the past 5 years [*]	2.482	5, 448	.031
7.	Managed for wildlife populations in the past 5 years ^{***}	4.871	5, 448	.000
8.	Built or maintained roads or trails in the past 5 years ^{***}	8.803	5, 456	.000
9.	Built or maintained ponds or drainage ditches in the past 5 years ^{***}	5.196	5, 448	.000
10.	Ever conducted Timber Stand Improvement ^{***}	4.682	5, 449	.000

^{***} $p < .001$, ^{**} $p < .01$, ^{*} $p < .05$

Table 11: Detailed Results of MANOVAs for Meaning of the Experience of Forestland and Each Forest Management Action

Management Activity	Factor	Mean Agreement		Significance
		Yes	No	
Make multi-year land use plan	Emotional***	4.182	3.942	.000
	Nature***	3.918	3.570	.000
	Personal & Financial Gain***	2.550	2.177	.000
	Family	3.638	3.610	.768
	Investment	3.115	2.943	.093
Ever harvested or cut trees	Family***	3.791	3.451	.000
	Personal & Financial Gain***	2.537	2.227	.000
	Investment*	3.111	2.899	.033
	Emotional	4.111	4.032	.138
	Nature	3.695	3.807	.183
Professional forester for most recent harvest	Investment***	3.870	3.027	.000
	Emotional	4.277	4.093	.117
	Family	4.041	3.762	.147
	Nature	3.570	3.717	.432
	Personal and Financial Gain	2.700	2.527	.408
Prepared land for tree planting	Emotional**	4.302	4.037	.001
	Nature***	4.147	3.695	.000
	Family	3.483	3.645	.221
	Personal and Financial Gain	2.418	2.379	.763
	Investment	3.032	3.012	.890
Applied pesticides/herbicides	Emotional*	4.209	4.053	.048
	Family	3.414	3.655	.073
	Nature	3.897	3.736	.195
	Personal and Financial Gain	2.467	2.372	.463
	Investment	2.951	3.024	.620
Managed for wildlife	Emotional***	4.325	4.027	.000
	Nature***	4.161	3.682	.000
	Personal & Financial Gain**	2.686	2.328	.003
	Family	3.807	3.588	.081
	Investment	3.083	3.001	.552

Table 10 cont'd: Detailed Results of MANOVAs for Meaning of the Experience of Forestland and Each Forest Management Action

Management Activity	Factor	Mean Agreement		Significance
		Yes	No	
Built/maint. trails & roads	Emotional**	4.242	4.024	.001
	Nature***	4.032	3.676	.000
	Personal & Financial Gain**	2.624	2.313	.003
	Investment*	3.200	2.958	.043
	Family	3.619	3.624	.960
Built/maint. ponds & ditches	Emotional**	4.249	4.029	.001
	Family**	3.888	3.555	.003
	Nature*	3.928	3.714	.041
	Personal & Financial Gain***	2.708	2.301	.000
	Investment*	3.247	2.954	.019
TSI	Emotional**	4.259	4.035	.003
	Nature**	4.025	3.704	.006
	Personal & Financial Gain***	2.774	2.308	.000
	Investment**	3.314	2.949	.008
	Family	3.816	3.572	.053
Planted trees	Emotional***	4.165	3.912	.000
	Nature***	3.940	3.437	.000
	Personal and Financial Gain**	2.471	2.217	.005
	Family	3.654	3.562	.327
	Investment	3.058	2.936	.238

*** $p < .001$, ** $p < .01$, * $p < .05$

Table 12: Summary of Significant Relationships Between Engagement in Individual Management Activities and Components Characterizing How PFLs Experience Their Forestland

Management Activity	Component Characterizing How PFLs Experience Their Land				
	Emotional Connection	Connection to Nature	Personal and Financial Gain	Connection to Family	Investment
Multi-year land use planning	X	X	X		
Prepared land for tree planting	X	X	X		
Built or maintained roads or trails	X	X	X		X
Timber Stand Improvement	X	X	X		X
Built or maintained ponds or ditches	X	X	X	X	
Applied pesticides or herbicides	X				
Management for wildlife	X	X			
Planted trees	X	X			
Harvested or cut trees			X	X	X
Used a professional forester for most recent harvest/cut					X

Table 13: Statistically Significant Relationships Between Components Characterizing Meaning Respondents Ascribe to Their Experience of Their Forestland and Engagement in Forest Management Activities

Component Characterizing Meaning Respondents Ascribe to Their Experience of Their Forestland	Management Activity	Mean Agreement = Yes	Mean Agreement = No
Emotional	Make multi-year land use plan	4.182	3.942
	Managed for wildlife	4.325	4.027
	Planted trees	4.165	3.912
	Prepared land for tree planting	4.302	4.037
	Built/maint. Trails/roads	4.242	4.024
	Built/maint. Ponds/ditches	4.249	4.029
	TSI	4.259	4.035
	Applied pesticides and herbicides	4.209	4.053
Family	Make multi-year land use plan	4.182	3.942
	Ever harvested/cut	3.791	3.451
	Built/maint. Ponds/ditches	3.888	3.555
Nature	Make multi-year land use plan	3.918	3.570
	Managed for wildlife	4.161	3.682
	Prepared land for tree planting	4.147	3.695
	Planted trees	3.940	3.437
	Built/maint. Trails/roads	4.032	3.676
	TSI	4.025	3.704
	Built/maint. Ponds/ditches	3.928	3.714
Personal and Financial Gain	Make multi-year land use plan	2.550	2.177
	TSI	2.774	2.308
	Built/maint. Ponds/ditches	2.708	2.301
	Ever harvested/cut	2.227	2.537
	Managed for wildlife	2.686	2.328
	Built/maint. Trails/roads	2.624	2.313
	Planted trees	2.471	2.217
Investment	Professional forester mark/cut	3.870	3.027
	TSI	2.949	3.314
	Built/maint. Ponds/ditches	3.247	2.954
	Ever harvested/cut	3.111	2.899
	Built/maint. Trails/roads	3.200	2.958

CONCLUSION

Findings from this research both support and add to literature on private forest landowners and the management of their land. As suggested by the literature, private forest landowners are indeed a diverse group. Nevertheless, sub-groups within this population with different interests and behaviors are identifiable. Two new variables by which PFLs, and their proclivity to manage their forestland, can be categorized are identified: the meaning of their experience of their land and their conceptualization of forest management. Both these variables are positively correlated to PFL management behavior highlighting the importance of addressing these areas of the PFL experience when attempting to 1) understand and change PFL behavior, and 2) improve communication and dialogue between NRPs and PFLs.

Based on these findings, PFLs form strong personal attachments to their forestland. Both the strength and the nature of these attachments varies relative to the degree to which PFLs actively engage in forest management practices. The more actively engaged in forest management practices PFLs are, the more strongly they agree they experience an emotional connection to forestland, a family connection to forestland, and a connection to nature through forestland. Greater engagement in forest management also produces stronger feelings of personal and financial gain relative to experiencing their forestland and a stronger sense of the investment represented by their forestland.

The nature of the meaning of PFLs' experience of their forestland also varies relative to their degree of engagement with forest management practices.

Active PFLs have a greater degree of familiarity with their forestland due to the nature and level of their interactions with it, and are more comfortable with viewing it as a resource to be used for a variety of benefits. The focus of their experience of their forestland is on the land itself. Less active PFLs are less likely to interact with their forestland in ways beyond property maintenance type puttering and hobby work aimed at maintaining valued amenities. The focus of their experience of their forestland is themselves and how experiencing their forestland makes them feel. Their forestland serves their own emotional needs whereas active forest landowners are more likely to see themselves as servants of, or to, their land and to focus on what owning forestland requires of them rather than on what owning forestland can do for them. What has been said, that we romanticize or fear that which we do not know, seems to be true among private forest landowners. Active PFLs are comfortable working with nature to provide benefits for themselves and others they feel connected to, while non-participant PFLs put nature on a pedestal to be admired, revered, and protected.

Landowners also differ in their understanding of forest management as a concept. Forest management is viewed as property maintenance, as creating and enhancing habitat and as making money. For most PFLs, their conceptualization of forest management includes parts of all three of these definitions, however, the more actively they engage in the management of their forestland the more strongly they agree with each of these definitions of forest management.

Contrary to reports of PFL forest management engagement in the literature, PFLs participating in this study also tend to feel they are managing their forestland. Based on the most popular activities these PFLs engage in, and their descriptions of their experience of their forestland, most PFLs enjoy and are engaged in the type of putting on, and with, their forestland commonly referred to as landscaping and/or property maintenance. The popularity of this form of recreation among the broader population is evidenced by the amount of money homeowners spend each year for assistance with their yards, shrubs, and greenery (DeCoster 2000). However, given the difficulties noted in operationalizing forest management consistently across studies, and in ways well matched to its definition in the literature, it is difficult to know where property maintenance ends and forest management begins. In recent years, an entire movement or field known as “woodscaping”, “backyard habitat”, or “backyard forestry” has taken up residence within this conceptual space. These terms refer to blending the concepts and activities of traditional forest management with the amenities traditionally sought and activities traditionally engaged in by landowners in their yards and around their homes such as the maintenance of views, the attraction of wildlife, and the cultivation of plants and trees.

These findings offer a number of suggestions for improving the practice of NRPs working with, and attempting to engage greater numbers of, PFLs in forest management practices. Prioritizing outreach to PFLs is a noted problem in the literature as there are, and will continue to be, simply more private forest

landowners than natural resource professionals. The following suggestions, presented in bullet form, are intended to not only demonstrate the implications of this work for professional practice with PFLs, but to address ways in which NRPs might reach greater numbers of PFLs as well. Ultimately, it will take adding all these suggestions together with many others not addressed here to successfully manage private forests, ensure their sustainability, and their place within the broader social and biological forest landscape.

- Increase familiarity with, and palatability of, forest management to those who see nature not as a resource to be managed for sustainable use but as an entity quite separate and removed from themselves which is to be revered, admired, and respected.
 - Do this by translating traditional concepts of forest management into tools and concepts which can facilitate those aspects of forestland these PFLs currently find enjoyable and wish to preserve.
- Increase familiarity with, and palatability of, forest management as well as use of forest management assistance to those un-opposed to forest management and resource use, and possessing a desire to “do right by” the forest, by:
 - engaging them in, or with them in, forest management activities which capitalize on their enjoyment of being on and with the land

- recognizing and capitalizing on the recreational aspects of engaging in the act of creation and re-creation of forest habitat in assistance, outreach and education offerings.
 - and ensuring the message of “respect for the land” is included in the “need for forest management” message.
- Piggyback onto/into the backyard forestry movement. “Gradually, engagement can evolve into active stewardship” (Best and Wayburn 2001).
- Collaborate with and engage urban foresters, nurseries, arborists, landscape planners, and backyard forestry/woodscaping programs in developing a set of goals indicative of good forest management which landowners can reach and learn about via engagement with any one of these sources of forest and/or landscape management and assistance.
 - Given the similarity in many landowners interests and among the activities they do engage in and enjoy, consult with the above related professions/professionals on how to break up the PFL population, especially in more local/regional settings, in order to more efficiently reach greater numbers of landowners with a similar message. Such a targeted and dispersed approach may also be useful in trying to reach absentee landowners.

- Given that many landowners are highly satisfied with their current forestland experience and believe themselves to be managing their forestland, when sharing the message of forest management consider one valuable purpose of forest management to be managing for what is rather than managing for future goals. This validates landowners current experience, and decreases the likelihood of defensiveness on their parts concerning “not having done something right” and/or of expressing goals for the sake of having goals. Discussing current valued aspects of their forestland experience opens avenues of communication concerning potential threats to the valued status quo such as natural forest changes which forest management might address.
- Critically evaluate language used in education, outreach and assistance programs for its appropriateness for the intended audience.
- Understand that private forestland is place for many PFLs. Consider the implications of forest management on sense of place and place attachment, especially when addressing issues of landowner succession, or forest management activities which might alter place.

In addition to these comments concerning professional practice, this research suggests the utility of the forestry field’s increased embrace of qualitative methods just as it has embraced the increased incorporation of social science over the years. As forests are social spaces, in addition to ecological

communities, and forestry a social endeavor, in addition to a technical exercise, and given the stated need for new approaches and perspectives, not only do issues traditionally the purvey of social science such as attitudes, values, and beliefs need to be incorporated into forestry research, but the broad array of methods designed to address social issues need to be incorporated as well. This means greater incorporation of interview, focus group, and case study research for informing surveys capable of producing the statistics and generalizations necessary for policy planning and implementation. It also means, the greater incorporation of less frequently used research methodologies such as phenomenology, discourse analysis, ethnography, collaborative learning, social learning and network theory and others, as well as less frequently used philosophical perspectives such as social constructionism, post modernism and critical theory. These approaches and perspectives have the ability to broaden and deepen our understanding of forestry from multiple perspectives, and grow the field in terms of how it is defined and applied. Combining these findings' implications for practice and research addresses several of the major issues of concern within private forestry today which are themselves critical to the sustainable management of both the social and biological forest landscape in the United States.

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VITA

Miriam Davis is fortunate to have spent many years of her life in several of the country's most beautiful regions. Living successively in rural, urban fringe, and urban settings, her childhood experiences primed her curiosity about the natural world while her later experiences and education primed her interest in society's management of its natural resources. She grew up first in the Hudson River Valley region of New York and later in the Mississippi River Valley of Wisconsin. College years were spent in Los Angeles, California at Occidental College where she studied biology and environmental conservation graduating *summa cum laude* in 1993. Prior to entering graduate school at the University of Tennessee in 2001, Miriam worked in Boston, Massachusetts at the Harvard Museum of Comparative Zoology and for The Nature Conservancy and NatureServe. Miriam graduated from the University of Tennessee in the fall of 2003 with a Masters in Forestry and simultaneously enrolled in the PhD in Natural Resources program. During her PhD studies Miriam married and started a family. She expects to complete her doctorate in the spring of 2008. After graduation Miriam looks forward to starting an academic career and continuing her research in the Human Dimensions of Natural Resource Management.