

ASSESSING THE CAPACITY FOR
COLLABORATIVE ECOSYSTEM STEWARDSHIP
ON PRIVATE FORESTLAND IN THE MISSOURI OZARKS

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Doctor of Philosophy

by
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SUSTAINING PRIVATE FORESTS IN THE CENTRAL HARDWOOD REGION:
ASSESSING THE CAPACITY FOR
COLLABORATIVE ECOSYSTEM STEWARDSHIP
ON PRIVATE FORESTLAND IN THE MISSOURI OZARKS

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“We end, I think, at what might be called the standard paradox of the twentieth century: our tools are better than we are...They suffice to crack the atom, to command the tides.

But they do not suffice for the oldest task in human history:

to live on a piece of land without spoiling it.”

~ Aldo Leopold (Flader and Callicott 1991)

“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.”

~ Aldo Leopold (1949)

“Never doubt that a small group of thoughtful committed citizens can change the world; indeed, it’s the only thing that ever has.”

~ Margaret Mead (1964)

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ABSTRACT

Missouri's forestland totals nearly 15 million acres and a vast majority of this area, roughly 82 percent, is controlled by more than 300 thousand nonindustrial private forest (NIPF) owners. Consequently, meaningful long-term stewardship of forestland and its associated benefits are largely in the hands of NIPF owners. Complicating the task of sustaining natural resources, especially on a landscape scale, is the ever-changing forest ownership demographic resulting in forestland ownership objectives being in a constant state of flux. What is more, in addressing this complex issue, natural resource professionals often work with limited knowledge and understanding of NIPF owners. Past research aimed at understanding this population has focused on ascertaining management objectives based on prioritizing commodity values placed on commercial and non-commercial forest products. Furthermore, there are reams of studies quantifying conservation motives or management, and in particular the motives and objectives of NIPF owners, but only recently have studies begun to examine non-commodity values and beliefs, such as collaborative ecosystem stewardship, in landscapes dominated by private ownership. Consequently, this exploratory case study sought to contribute to the growing body of collaboration and private land conservation literature by utilizing qualitative research, (1) to examine southeastern Missouri Ozarks NIPF owners' relationship with their land, their neighbors, and their community, as well as their attitudes and beliefs regarding ecosystem stewardship in a landscape dominated by privately owned forestland, and (2) to document the process and potential consequences when forming a local landowner resource group that may engage in collaborative decision-making activities with the ultimate goal to sustain forested resources and their

associated ecological benefits. However, an unexplored assumption inherent in prior collaborative natural resource management plans involving the publics' participation is that stakeholders have the capacity to engage effectively and efficiently in decision-making processes. Therefore, this research also assesses institutional, community, and individual capacity for collaborative ecosystem stewardship on private forestland in the Missouri Ozarks. The methodological framework applied to this case study is divided in three parts: (1) qualitative research methods such as semi-structured phenomenological interviews, a reflective journal, and field notes, (2) collaboration and capacity building activities such as landowner forums, field days, demonstration workshops, and focus groups, and (3) collaboration and capacity building through technological intervention via testing a forest management decision education tool and using GIS generated maps to discuss land use in the study area. Results show the stewardship of private forestland not only requires a scientific and technical course of action, but must also include the social processes in which the natural system is embedded. Indeed, social fragmentation is occurring across the Missouri Ozarks as more forestland is bought by absentee landowners, which in turn complicates and exacerbates landscape scale fragmentation of forestland and the associated ecological benefits. Thus, the values, needs, beliefs, and goals of NIPF landowners must be central to the understanding of those working in natural resource management if the creation of effective landscape scale opportunities and strategies for private forestland conservation are to be cultivated and successfully implemented.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
TABLE OF CONTENTS	v
LIST OF FIGURES	ix
LIST OF TABLES	x
CHAPTER 1. INTRODUCTION	1
BACKGROUND.....	1
Forest resource and ownership patterns	1
Forest fragmentation	2
Ecosystem management and sustainability.....	3
Why collaboration?	6
Project context	9
Research purpose	10
Objectives	11
CHAPTER 2. LITERATURE REVIEW	12
MOTIVES AND OBJECTIVES OF PRIVATE LANDOWNERS	12
PUBLIC AND NIPF ATTITUDES TOWARD ECOSYSTEM MANAGEMENT	14
PROPERTY BOUNDARIES, VISUALIZATION, AND GIS MAPS	16
DISCOURSE AND COLLABORATIVE LEARNING	18
SOCIAL SCIENCE CONCEPTS.....	19
Community	19
Capacity	20
Social capital.....	22
People-place connections.....	23
RESEARCH APPROACHES	25
Qualitative research	26
Case study research.....	27
Action research	28
Phenomenological research	30
QUALITATIVE DATA ANALYSIS	31
CHAPTER 3. METHODOLOGY	34
CONCEPTUAL FRAMEWORK	34
STUDY DESIGN	37
Watershed selection	37
Selection of study cells and landowners	38
Methodological framework.....	43
Part I: Qualitative research methods	44
Part II: Collaboration incentives and mechanisms.....	46

Part III: Technological intervention.....	47
DATA COLLECTION	49
Phase I: Semi-structured phenomenological interviews	49
Key informant interviews	49
Landowner interviews.....	52
Phase II: Collaboration incentives and mechanisms.....	53
Landowner forums and informal dinners.....	56
Collaborative ecosystem stewardship focus group	57
Field days and a demonstration workshop.....	58
Phase III Technological interventions	60
Forest management decision education tool	60
Geographic Information System (GIS) maps – a tool for land use planning.....	60
DATA ANALYSIS	62
Phase I: Semi-structured phenomenological interviews	62
Phase II: Collaboration incentives and mechanisms.....	63
Phase III Technological intervention	63
Forest management decision education tool survey	63
Focus group using GIS generated maps.....	63
CHAPTER 4. RESULTS	64
PHASE I: SEMI-STRUCTURED PHENOMENOLOGICAL INTERVIEWS	64
Key informant interviews	64
Ecological context.....	65
Resource Characteristics.....	65
Historic forestland use	65
Levels of natural resource stocks and current forestland use	66
Local forest issues.....	66
Social context.....	68
Community Environmental Perceptions and Values	68
Resource management incentives	68
Networks and trust	70
Factors affecting collaboration	71
Landowner interviews.....	72
Ecological context.....	74
Individual Land Use Perceptions and Values	74
Current land use	74
Future land use.....	76
Local forest issues.....	77
Social context.....	79
Individual Environmental Perceptions and Values.....	79
Place attachment	79
Networks and trust	80
Factors affecting collaboration	81
SUMMARY OF INTERVIEWS	82
PHASE II: COLLABORATION INCENTIVES AND MECHANISMS	84
Landowner forums and informal dinners.....	84
Field days and a demonstration workshop.....	87

Collaborative ecosystem stewardship focus group	88
PHASE III: TECHNOLOGY INTERVENTION.....	91
Forest management decision education tool	92
Geographic Information System (GIS) maps – a tool for land use planning.....	92
CHAPTER 5. DISCUSSION.....	95
Capacity to collaborate	96
Institutional capacity.....	96
Community and individual capacity	97
People-place connections.....	99
Collaboration in the Missouri Ozarks	100
CHAPTER 6. CONCLUSIONS AND LESSONS LEARNED.....	101
CONCLUSIONS	101
Private forestland stewardship policy	101
Forest fragmentation	104
LESSONS LEARNED	105
Living in the community where you work.....	105
Interdisciplinary and multi-institutional research	105
21 st century natural resource management.....	106
LITERATURE CITED	108
APPENDIX A. PHASE I: SEMI-STRUCTURED PHENOMENOLOGICAL INTERVIEWS	120
KEY INFORMANT.....	120
Human Subjects Consent Form	120
Madison County Key Informant Interview Guide	121
LANDOWNER.....	123
Introductory Letter	123
Sustaining Private Forests Fact Sheet	124
Human Subjects Consent Form	126
Madison County Landowner Interview Guide	128
Landowner Demographic Questionnaire	132
APPENDIX B. PHASE II: COLLABORATION INCENTIVES AND MECHANISMS	133
INVITATIONAL LETTER	133
RSVP CARD	134
REMINDER POST-CARD	134
FIELD DAYS AND DEMONSTRATION WORKSHOP FLYER EXAMPLES	135
APPENDIX C: PHASE III: TECHNOLOGICAL INTERVENTIONS.....	137
FOREST MANAGEMENT DECISION EDUCATION TOOL SURVEY PROTOCOL	137
FOREST DECISION EDUCATION TOOL (FDET) SURVEY	139
FDET SURVEY RESULTS.....	142
COLLABORATIVE ECOSYSTEM STEWARDSHIP FOCUS GROUP LETTER	145

FOCUS GROUP PROTOCOL.....	146
APPENDIX D. TABLES.....	147
VITA.....	148

LIST OF FIGURES

Figure 1. The Central Hardwood region of the United States. (US Forest Service).....	9
Figure 2. Interventions enable the development of institutional, community, and individual capacities which contribute to the general ability to participate in effective and efficient collaborative decision-making. (adapted from Raik et al. 2003)	22
Figure 3. Schematic of place as the intersection of three spheres [based on Canter 1977, Relph 1976, and Sack 1992]. (Cheng and Daniels 2003a)	25
Figure 4: Conceptual framework of this project depicting components that may affect the propensity of private forestland owners to collaborate on ecosystem stewardship.....	36
Figure 5: The Upper St. Francis and the Upper Black River watersheds in the eastern Ozarks in southern Missouri (adapted from Nigh and Schroeder 2002).	38
Figure 6. Location of the 15 randomly selected study cells with Cells 214 and 215 identified for landowner collaboration effort. White areas indicate privately owned land.....	41
Figure 7. Cell 215 digitized land ownership/parcel boundaries.	42
Figure 8. Cell 215 digitized land ownership/parcel boundaries.	43

LIST OF TABLES

Table 1. Common themes among the definitions of ecosystem management.....	5
Table 2. Summary of past research on attitudes toward ecosystem management (EM) in the United States (adapted from Bengston et al. 2001).	15
Table 3. Qualitative and quantitative method approaches (adapted from Creswell 2003).	27
Table 4: Criteria for identifying key informants for Madison County, Missouri.	50
Table 5. Employed incentives and mechanisms (capacity building techniques) to encourage collaborative decision-making.....	55
Table 6. Land use descriptors for study area map.	61
Table 7. Summarized details for landowner interviews.....	73
Table 8. Stewardship interests and education needs of area landowners	87
Table 9. Summary of focus group responses regarding preferred collaboration and incentive mechanisms employed during this project.....	89
Table 10. Summary of focus group responses regarding perceived impediments to forming a collaborative ecosystem stewardship group in the study area.....	89
Table 11. Summary of focus group responses regarding suggestions to encourage landowner support of a collaborative ecosystem stewardship group in the future... .	89
Table 12. Ranking of preferred reasons to steward privately owned forestland.	91
Table 13. Descriptive demographic data for landowner interviews.	147

CHAPTER 1. INTRODUCTION

Background

Forest resource and ownership patterns

Private forests and watersheds in particular are special places both for those who own them, those who live in them, and those who do not. Society values forested systems for numerous reasons, ranging from aesthetics to spirituality, to the wildlife communities they support, to the products we all use from them. Thus, the forests in the United States are essential to the societal welfare of the nation. However, the ever-changing nature of private forest types and private ownership patterns, are many and varied, forming a complex web of interlocking environmental, economic, and social factors (Best and Wayburn 2001).

It is estimated that forests cover roughly 747 million acres of land in the United States, or about a third, down from about 1 billion acres at the time of European settlement (The H. John Heinz III Center 2002). Of this national forestland, 430 million acres or approximately 58 percent is privately owned (The Global Institute of Sustainable Forestry 2003). This is a significant proportion, indeed. In 1996 approximately one-half of America's forests were held by some 9.3 million nonindustrial private forest (NIPF) owners, controlling approximately 393 million acres of forestland. This is a dramatic increase from the 1978 estimate of 7.8 million NIPF ownerships with 333 million acres of forested land (Birch 1996a). Across the nation, this ownership trend affecting privately owned forests is occurring for two primary reasons: (1) many parcels are located at the edge of growing urban areas, and (2) many parcels are located in prime recreation areas popular for second-home development. A recent U.S. Forest Service

(USDA 2005) noted that over 44 million acres of privately owned forests are projected to experience substantial increases in housing development in the next three decades.

In Missouri, almost one-third of the state is covered by forested land, and two-thirds of the Eastern Ozarks region is primarily forested (Hahn and Spencer 1991). Before large numbers of Euro-Americans settled the region, forests occupied an estimated 30 million acres or about 70 percent of the total land area of Missouri (King et al. 1949). Presently, Missouri's forest land totals nearly 15 million acres and a vast majority of this area, roughly 82 percent (12.3 million acres), is owned by more than 300 thousand NIPF owners (Leatherberry and Treiman 2002). Furthermore, similar to the national trend, Missouri, and especially the Eastern Ozarks, is experiencing an increasing trend toward privately owned forests for a variety of reasons. For example, the number of NIPF owners in Missouri jumped dramatically in the previous decade from about 81,000 in 1978 to 307,000 in 1994 (Birch 1996b). Consequently, how Missouri's NIPF owners perceive, value, and utilize their forest holdings will obviously be a dominant factor in the ecological, social, and economic sustainability of Missouri's forests (Governor's Advisory Committee on Chip Mills 2000). Concomitantly, meaningful forest management that mitigates landscape fragmentation and results in sustainable resources in the Missouri Ozarks is largely in the hands of NIPF owners.

Forest fragmentation

Forest fragmentation occurs on two basic levels: (1) the division or parcelization of larger, single-ownership forests tracts into smaller parcels with diverse ownership, and (2) the reductions in forest patch size within the smaller parcels (Best and Wayburn

2001). A complex and interconnected web of area-specific social, economic, and historic land use factors drive the trend to divide forested land into smaller parcels. Moreover, the differences in land use among private forestland owners results in ever-changing arrangements of habitat patches, often differing from those that would occur naturally in the landscape (Sampson and DeCoster 2000). The resulting ecological patchwork affects the spatial configuration of private forested lands and ultimately ecosystems, thus having enormous consequences regarding the sustainability of healthy, productive natural resources.

A continuation of this land fragmentation trend renders private forests, as well as other natural resources and waterways, increasingly vulnerable to environmental degradation. Indeed, forest researchers (Riitters et al. 2002), recently indicated that although U.S. forests are still connected over large regions, fragmentation is pervasive enough to potentially affect the ecological processes across these lands. Accordingly, in recent years the natural resource management paradigm focus has begun to shift from one centered primarily on managing publicly owned lands, to one which also recognizes the importance of implementing sustainable stewardship practices on privately owned lands.

Ecosystem management and sustainability

The concept of managing natural resources at the landscape level is not a revolutionary idea. According to some ecologists, the need to protect whole ecosystems as well as individual species first emerged during the 1930s (Jacobson 2002a, Shelford 1933). Others believe that the basic principles of ecosystem stewardship have been a part of natural resource management and conservation efforts since Aldo Leopold (1949)

articulated a land ethic, insisting that “People should take care of the land as a whole organism and try to keep all the cogs and wheels in good working order” and that “A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.”

Despite the lack of consensus regarding the genesis ecosystem management, several principles generally accepted by natural resource professionals are: (1) the scale of ecosystem management takes place over the long term, with greater geographical expanse than do traditional management activities, (2) management is centered around the relationships between the biotic and abiotic factors of an ecosystem, rather than on managing specific populations of organisms, and (3) ecosystem management transcends the boundaries of geography, administration, and ownership. To supplement these principles, Table 1 lists common themes among the various descriptions of ecosystem management found in the literature (Agee and Johnson 1988, Beattie 1996, Boyce and Haney 2001, Bureau of Land Management 1994, Grumbine 1994, Jacobson and Long 2001, Thomas 1996). However, none of these six interrelated characteristics alone defines ecosystem management, and all of them need not be present in a given project. In this study, rather than propose a single, static definition, we recognize the diverse and evolving conceptions of ecosystem management held by various groups and individuals.

Table 1. Common themes among the definitions of ecosystem management.

Ecosystem Management Themes
Focuses on long term resource sustainability
Process that maintains and enhances biodiversity
Requires thinking in broad spatial and temporal scales
Integrates economics sociology, and ecological systems in resource management planning
Incorporates adaptive management tenets regarding monitoring and new scientific information
Recognizes the inherently complex, dynamic, interconnected, and uncertainty of ecosystem processes
Recognizes that humans are an important part of, and inseparable from, ecosystems

While there is no doubt that difference of opinions on specific definition and interpretation of appropriate actions concerning ecosystem management exists, most participants in the literature dialogue would agree that, fundamentally, ecosystem management is managing natural systems so as to assure their long-term viability. Accepting this as a general principle of ecosystem management, the issue then becomes one of defining sustainability. Boyce and Haney (1997), define sustainability as a practice through which the physical and biological elements of productivity are maintained by (1) “preventing the degradation of the productivity capacity of our lands and waters – no net loss of productivity”; and (2) by “preventing accelerated loss of genetic diversity (including species), recognizing that evolutionary processes will result in changes – no accelerated loss of genetic potential.” Others have used the term ‘sustainable forest’ as “...sustainable in the sense that the forest will continue to maintain its ecological processes and functions” (Best and Wayburn 2001). Together, these authors support the

notion that sustainability is the underlying premise or goal of ecosystem management; and thus, the social, physical, and biological elements of productivity must be maintained over time.

Sustaining healthy forests and related natural resources can be achieved several ways.

One means is through the voluntary application of ecosystem management principles referred to in the literature as “stewardship.” Ultimately, ecosystem management is about maintaining both natural and anthropogenic communities. Thus, collaborative ecosystem stewardship (CES), then, refers to voluntary collective actions by individual landowners in an effort to manage natural resources, and the communities which depend on them, on a sustainable basis acknowledging both a landscape and a temporal scale.

Why collaboration?

Why is collaborative decision-making critical for sustaining natural resources on NIPF owned lands? Collaborative efforts are proliferating for many reasons. Some attempts are a direct response to problems caused by past public policies and land management practices. Others contend collaborative approaches in complex and sometimes contentious environmental management scenarios have gained support since the early 1990s as an appropriate way to achieve ecological as well as societal desires (Daniels and Walker 2001, Weber 2000, Weber 2003, Wondolleck and Yaffee 2000).

An extensive academic literature on cooperation and inter-organizational collaboration provides a starting point for defining collaboration. Gray (1985) describes the boundaries of collaboration as the pooling of appreciations and/or tangible resources by two or more stakeholders to solve a set of problems, which neither can individually. This suggests

that the act of collaboration involves individuals or groups moving in concert in a situation in which no single party has the power to command the behavior of others. Further, cooperation is built upon relational linkages or network structures between individual members of the group. Network structures may include, but reach beyond, linkages, coordination, or task-force actions. Unlike networks where people are only loosely linked together, in a collaborative network structure, people must actively work together to accomplish that which is recognized as a problem or issue of mutual concern (Mandell 2001).

Taking advantage of the networked relational linkages has led to a new technique for land management called collaborative resource management. It is based on the following three premises: first, it recognizes the need to ground decision making and management in good science but understands that technical factors are only one of many important considerations; second, it helps to build a sense of shared ownership and responsibility for natural resources by moderating the typical top-down style of government which tends to disempower landowners and local interest groups; and third, it recognizes that government resource agencies as partners that can provide unique resources, incentives, and opportunities important to successful collective efforts (Yaffee 1998).

It has been shown that some collaborative efforts were a direct response to problems created by past public policies and land management practices. For instance, fiscal efforts to reduce state and federal budgets have generally focused on the place where funds are considered discretionary, which usually includes domestic programs such as education, including extension and outreach programs, environmental protection, and natural

resource management. Budgetary constraints notwithstanding, there has been an evolving realization that dependence on only one sector of society is unlikely to produce satisfactory outcomes. According to Wondolleck and Yaffee (2000),

“Reliance on big business led to overexploitation of resources and humans. Reliance on big government resulted in top-down, bureaucratic programs that were often insensitive to public concerns. Reliance on private landowners exercising absolute property rights neglects important transboundary concerns, including the protection of biological diversity. Progress will come only from taking advantage of the unique capabilities of each of these elements of society through the creative interplay of a network of groups and agencies.”

Collaboration is also necessary as a means of making effective management decisions concerning the sustainability of natural resources. In contrast to a top-down or agency-based decision-making approach to natural resource management, collaborative efforts build common understanding, and therefore, may create widespread support for stewardship actions. This occurs because people need the opportunity to engage in the decision-making process as partners, so they can take ownership of the results. Through fostering a shared vision of common land use objectives or issues and by helping to resolve disputes through an equitable negotiation process, collaborative decision-making can yield NIPF stewardship plans which benefit not only the landowner, but are ecologically, communally, and economically sustainable as well.

Project context

This research effort was one part of a regional interdisciplinary project comprised of three land grant universities in Indiana, Missouri, and Tennessee; thus, forming a consortium to pursue a common mission in the Central Hardwood Region (Figure 1) that would lead NIPF owners to initiate stewardship practices that satisfy their personal goals, are acceptable to society, and are consistent with sustainable forest management. Moreover, the consortium's purpose was to: (1) develop and establish collaborative processes with private landowners and land management agency personnel to sustain ecosystems across the region, and (2) provide private landowners with science-based information.



Figure 1. The Central Hardwood region of the United States. (US Forest Service)

Research purpose

Privately owned forests are faced with increasing conversion pressure in both urban and rural areas of the United States. A continuation of this trend, combined with increasing numbers of landowners with decreasing parcel sizes, renders private forests, as well as other natural resources and waterways, increasingly vulnerable to environmental degradation. However, the threats to private forests resemble an interlocking web of economic, environmental, and social relationships of daunting complexity. The first step toward unraveling the complex web is rooted in having a much better understanding of who owns private forestland and why. Further, the values, beliefs, characteristics, and objectives of NIPF landowners are central to our understanding and creation of conservation strategies for private lands. However, only recently have studies begun to examine landowner values and beliefs regarding collaboration and stewardship in landscapes dominated by private ownership (Belin et al. 2005; Jacobson and Long 2002; Muth 2004; Rickenbach et al. 1998; Thompson et al. 2005). Consequently, this four-year case study seeks to contribute to the growing body of collaboration and private land conservation literature by utilizing qualitative research, (1) to examine southeastern Missouri Ozarks NIPF owners' relationship with their land, their neighbors, and their geographic community, as well as their attitudes and beliefs regarding ecosystem stewardship in a landscape dominated by privately owned forestland, and (2) to assess the process and potential consequences when forming a local landowner resource group that may engage in collaborative decision-making activities with the ultimate goal to sustain forested resources and their associated ecological benefits in the Missouri Ozarks.

Objectives

This research project explored the potential for collaborative natural resource management among private landowners, and was driven by the major research question: How can collaborative natural resources management on private lands be initiated, sustained, and evaluated? Therefore, this project focused on one aspect of the overarching question, the capacity of private forestland owners to collaborate on ecosystem stewardship.

Objective 1 – Investigate how landowners relate to their land, their neighbors, geographic place and the meanings they attach to place, as well as current attitudes, beliefs, and knowledge of ecosystem stewardship.

Objective 2 – Identify and test incentives and mechanisms that foster capacity development, thereby encouraging private forestland owners to form collaborative ecosystem stewardship group.

Objective 3 – Explore the process and outcomes of this effort to form a collaborative ecosystem stewardship group.

CHAPTER 2. LITERATURE REVIEW

This chapter presents an overview of the literature relevant to the study of NIPF landowners in Missouri. It begins with a brief look at the previous work aimed at understanding the motives and objectives of private landowners, as well as their perception of ecosystem management and collaboration. This is followed by a succinct review of the literature pertaining to visualization, GIS maps, and discourse and collaborative learning. Next, the chapter presents a discussion of relevant social science concepts, including social capital, capacity, and people-place connections. It concludes with a review of research approaches, including qualitative techniques such as case studies, action research, and phenomenological research. The literature review provided herein is by no means the result of an exhaustive search of all studies related to NIPF owners that have been conducted. Rather it focuses on specific topics outlined above.

Motives and Objectives of Private Landowners

In recent years privately owned forestland has become an increasingly important source of our nation's timber supply, as well as serving to mitigate soil erosion and provide a carbon source. Consequently, growing emphasis is being placed on the need to manage forests and other natural resources at a broader, more comprehensive scale. This type of management faces many obstacles in landscapes with multiple ownerships. However, across the United States, prior research has focused primarily on collecting descriptive statistics concerning landowners and ownership patterns (Birch 1996a, Larsen and Gansner 1972, Marlin 1978), ascertaining management objectives based on income versus non-income choices and length of residence (Ryan 1998), and prioritizing the values placed on various commercial and non-commercial forest commodities via mail

and telephone surveys (Cassingham et al. 2003, Egan 1998, Rickenbach et al. 1998, Brunson et al. 1996, Hodge and Southard 1992). In Missouri, a limited number of studies have attempted to describe NIPF landowners of the Eastern Ozarks. Lewis (1979) and Kurtz and Lewis (1981) developed attitudinal taxonomies to describe their management propensity. Trokey (1981) also identified landowner types and their timber management characteristics. Although, very recent research (Richter 2005) has updated and expanded the Missouri NIPF landowners typology, as well as contributing new insight into their decision-making influences and processes.

It is worth noting that almost all of the previous studies of NIPF landowners are oriented to understanding why they do or do not cut timber, regardless of the study approach. This is particularly perplexing because more than three decades ago Marler and Graves (1974) noted that timber production was not the primary land management goal of NIPF landowners. Nevertheless, the rich, layered data concerning the motives and objectives of NIPF landowners, as derived from qualitative techniques, is noticeably absent from previous studies. Indeed, only recently have investigations been motivated by sociological interests, the values and beliefs of the private landowner, or the non-commodity and ecological values of their forests (Egan and Jones 1993, Horner 2004, Muth 2004, Pavey 2005). Furthermore, only in the last decade, coinciding with interest in new approaches to managing forests, have studies begun to examine NIPF owner objectives toward non-timber related benefits and the related topic of ecosystem planning or management (Jacobson et al. 2000, Brunson et al. 1996, Jones et al. 1995).

Public and NIPF Attitudes Toward Ecosystem Management

For a variety of inter-related and compounding reasons ranging from increased interest from the forest products industry to increased societal value placed on non-commodity forest resources, the role of private forest land and NIPF landowners in sustaining forest resources is now more important than ever. This is the case because, according to leading scholars, the noted economic, social, ecological, and spiritual benefits provided by forests depend on healthy ecosystems at broad spatial and temporal scales (Belin et al. 2005, Costanza et al. 1992). Furthermore, as privately owned lands become increasingly fragmented (DeCoster 2000), an ecosystem-based approach to the sustainability and management of natural resources on NIPF lands becomes more relevant.

Table 2 summarizes a few studies that have examined public attitudes toward ecosystem management, plus, three studies that looked at attitudes of NIPF owners specifically. Only three studies were noted because the literature is thin regarding ecosystem management solely in relation to private lands, with most of the traditional cross boundary management projects occurring on, adjacent to, or in combination with public lands. Concomitantly, previous research efforts have focused primarily on incentives and mechanisms for encouraging public involvement in forest planning exercises, as opposed to understanding the individual participant. The resulting lack of general understanding of landowners has heretofore hindered the extension of the ecosystem management perspective to non-industrial private forestlands (Creighton et al. 2002).

Table 2. Summary of past research on attitudes toward ecosystem management (EM) in the United States (adapted from Bengston et al. 2001).

Study	Method	Dimensions of EM Considered	Attitudes Toward EM
Reading et al. (1994)	Phone and in-person surveys	Systems perspective, biodiversity	A majority recognized the need for EM, but were concerned about the loss of local control
Jacobson and Marynowski (1997)	Mail survey	Systems perspective, biodiversity	Neutral to slightly positive attitudes overall; greater support among neighboring citizens than recreationists
Tarrant et al. (1997)	Phone survey	Ecosystem health, biodiversity, human dimensions, negative beliefs ¹	Positive attitudes toward EM, but a low level of knowledge about it
Solecki (1998)	Mail survey	Unclear – appears to include ecosystem health and biodiversity	75% were supportive of EM, and 35% were neutral or had no opinion
Shindler et al. (1996)	Mail survey	Adaptive management	50 to 77% were supportive of EM
Steel et al. (1998)	Mail and phone surveys	Ecosystem health, a systems perspective, biodiversity, negative beliefs ¹	Neutral to positive attitudes toward specific dimensions or beliefs; slightly positive overall orientation to EM
Brunson et al. (1996) ²	Mail survey	Ecosystem health, sustainability, a systems perspective, human dimensions, adaptive management, collaboration	90% rated EM as appropriate on public lands, and 65 to 79% rated EM as appropriate on private lands
Raedike et al. (2001a) ²	Structured in-person interview surveys	Ecosystem health, personal impacts on ecosystem, human dimensions, cost share incentives, trust	Concerned about future land use regulations, younger and more educated tend to be more supportive of EM
Rickenbach et al. (1998) ²	Mail survey	Systems perspective, sustainability, “small-scale sensitivity”	Positive attitudes toward each of the three dimensions

¹ Negative response about EM was included in two surveys. These beliefs were that EM will (1) reduce the number of timber-related jobs, and (2) increase the cost of timber (Tarrant et al. 1997), and is (1) being used as an excuse for additional timber harvests, (2) a misguided and unscientific attempt to reduce public complaints, and (3) an attempt to take away property rights (Steel et al. 1998). ² Study that examined attitudes of NIPF owners specifically.

Property Boundaries, Visualization, and GIS Maps

Boundaries can take many forms. For instance, they may follow the natural contours of the land, like a state boundary along a river, they may be derived solely from artificial systems of organization such as the township-and-range grid established over most of the western half of the United States, or they may develop over a period of use like the continued use of family cemeteries and traditional hunting grounds. However, regardless of how boundaries are realized, they are social constructs, indicating human-perceived identity of place differences across a landscape, and exist because they achieve societal ends. Even ecosystem boundaries are social constructs in that they reflect the spatial extent of natural conditions that characterize a human-defined categorization within the continuous range of actual and potential conditions (Brunson 1998). In this discussion, the term ‘boundary’ refers to demarcations, including not only the mapped boundaries of the study area and private landholdings, but also the nonetheless real boundaries that individuals may establish to define as their “turf.”

The literature is replete with scholars discussing why cross-boundary stewardship is necessary (Wondolleck and Yaffee 2000, Yaffee 1998), why administrative boundaries create circumstances harmful to ecosystems (Landres et al. 1998, Wall 1998), and how political structures and management strategies might be devised to effectively promote holistic management across property boundaries (Knight and Clark 1998). However, the ability of resource professionals to effectively communicate and implement resource management proscriptions has been hindered by the inability to visualize large spatial and long temporal scales. The need to develop innovative ways to visualize resource management concepts was anticipated, and throughout the 1990s several forest

visualization systems were designed to achieve this, including the Stand Visualization Systems of the USDA Forest Service (McGaughey 1998) and the Landscape Management System (McCarter 1999). However, the strength of each of these simulators lies in the simulation of stand growth and development, not in the realism of visualizations. This is an important distinction and cannot be underscored enough.

The ability to visualize landscape-scale concepts realistically has many applications. Indeed, the process of garnering landowner cooperation itself may be facilitated by linking spatial information such as important ecological or geographical features with the attitudes and preferences of landowner interest (Jacobson 2002b). Furthermore, establishing enduring collaborative ecosystem stewardship in the study areas requires not only the spatial connection of land parcels, but also the identification of individual parcel boundaries and land management goals. One of the questions often encountered by natural resource professionals when discussing with a landowner the decision to implement a management prescription is, “what is it going to look like?” Therefore the need for visual representation of management consequences is critical; especially when considering long-term concepts like ecosystem stewardship and sustainability.

Another reason to create realistic ecosystem maps for visualization is the enhanced ability to communicate spatial concepts such as map scale, land connectivity, and temporal concepts such as sustainability to viewers. Barham (1993) suggests that establishing a common conception among participants regarding how the ecosystem attributes are configured at the landscape-scale may contribute to boundary coherence between the choices participants make concerning their own actions and the needs of the ecosystem.

Specifically, it is the gradual shift in visualization scale perspective from personal property to watershed and to ecosystem-level thinking that represents a larger social reflection by the participant upon the limits of natural systems.

Discourse and Collaborative Learning

Discourse, or dialogue, is the process by which “a communal ‘space of resources’ between all those involved” is created (Katz and Shotter 1996). It can also be described as an open conversation, making space for others, being a member of a group, not hierarchical but equal, and it is a meeting of individuals in hopes of creating something new. In a dialogical relationship, one person is spontaneously responsive to another and understanding does not equate to imagining the same picture in each other’s minds (Muth 2004). It is responding through words or actions that understanding comes. Moreover, sharing through dialogue enables not only the creation of new understandings, but also a better understanding of existence, outreach, and relationships (Pyrch and Castillo 2001). In short, dialogue is a form of open, learning-oriented discussion that is essential to collaborative learning.

In the collaborative learning process, dialogue is valued along with deliberation because the former provides a foundation for the latter. Whereas dialogue emphasizes learning and understanding, deliberation builds upon that learning and understanding as individuals debate possible actions. According to Daniels and Walker (2001), as collaborative learning progresses through “situation understanding” and “situation improvement” stages, the participants’ dialogue becomes increasingly decision oriented. The authors contend that as participants refine their improvements, collaborative learning

occurs as they deliberate about the feasibility of proposed actions or changes.

Collaborative learning is both important to developing a common understanding of the issue and of the concerns of all those impacted (Daniels and Walker 1996), and therefore, is a prerequisite to collaborative decision-making and planning.

Social Science Concepts **Community**

Like many social science concepts, the definition of community does not fit into a nice, neat package because it is a sociological construct comprised of a set of interactions, human behaviors that have meaning, and associated expectations between its members.

Scholars have proposed a number of competing definitions of community. Some focused on community as a geographical area; some on a group of people living in a particular place; and others which looked to community as an area of common life. On one hand, a community can be described as a social group of any size whose members reside in a specific locality, share government, and often have a common cultural and historical heritage. On the other hand, a community can also be described as a changing set of relationships, including the attitudes and behavior of its members. To further complicate the delineation, a specific community may be nested within larger communities, including districts, regions, ethnic groups, nations, interests, and other such boundaries. For instance, according to Flora and Flora (1995), communities of interest, a facet of civil society, are embedded within a larger geographic community and develop as a result of common concerns, interests, goals or attitudes about an issue or resource relative to that place. Pavey (2005) cautions that conflict may result when the goals of a community of interest do not fully reflect those of residents of the geographic community; however, the

potential nonetheless exists to unite the resources and energy of the two levels of community to collaboratively plan for the future.

The inherent difficulty associated with defining community notwithstanding, this project views the term community as a group of individuals who share a common sense of identity and form relationships over time by interacting regularly around shared experiences, which are of interest to all of them for varying reasons. Here an individual refers to a private forestland owner within the study area, as well as institutional actors such as state and county resource agencies and/or non-governmental organizations. A group is defined as two or more people interacting with one another to address a common issue or purpose which neither can fully attend to as individuals. It is also recognized that this community of individuals is nested within a larger geographic community which may have some affect on the relationships and interactions; however, due to the scope of this project, the focus is on community as previously defined.

Capacity

The concept of capacity in a social science context emerged from both theoretical and applied research. It is relevant to this project because an unexplored assumption inherent in prior collaborative natural resource management plans involving the publics' participation is that stakeholders have the capacity to engage effectively and efficiently in decision-making processes. Capacity can be divided into three broadly defined categories: institutional, community and individual (Raik et al. 2003). For the purpose of this research, institutional capacity includes organizations such as state and federal natural resource management agencies and their available resources such as personnel,

leadership skills, funding, technical materials, and expertise. Community capacity includes relationship linkages among those individuals sharing a common sense of identity, as well as the level of commitment, fiscal and technical resources, and leadership or organizational skills found among those persons. Individual capacity includes participants' sense of belonging to or identification with the previously defined community, including a sense of common purpose, shared values, and history.

Increased skills related to capacity contribute to institutional, community, and individual empowerment, thus creating sustained and meaningful action (Rappaport 1981).

According to Wondolleck and Yaffee (2000), empowerment is critical to motivating and sustaining actions related to conservation. However, the process of empowerment does not occur in a vacuum. An interventionist is necessary to catalyze change and attempts to develop local capacity (Rogers 1990) by employing strategies that enable the development of institutional, community, and individual capacity; thus contributing to effective and efficient collaborative decision-making in communities (Raik et al 2003).

Intervention strategies or actions include strategies such as engaging in formal and informal education opportunities, providing leadership training, engaging stakeholders in collaborative learning, and facilitating deliberations that create the conditions in which capacity is more likely to develop. The capacity development and empowerment process is depicted below in Figure 2. This research project and the principal investigator act as intervention catalysts for the growth of institutional, community, and individual capacity.

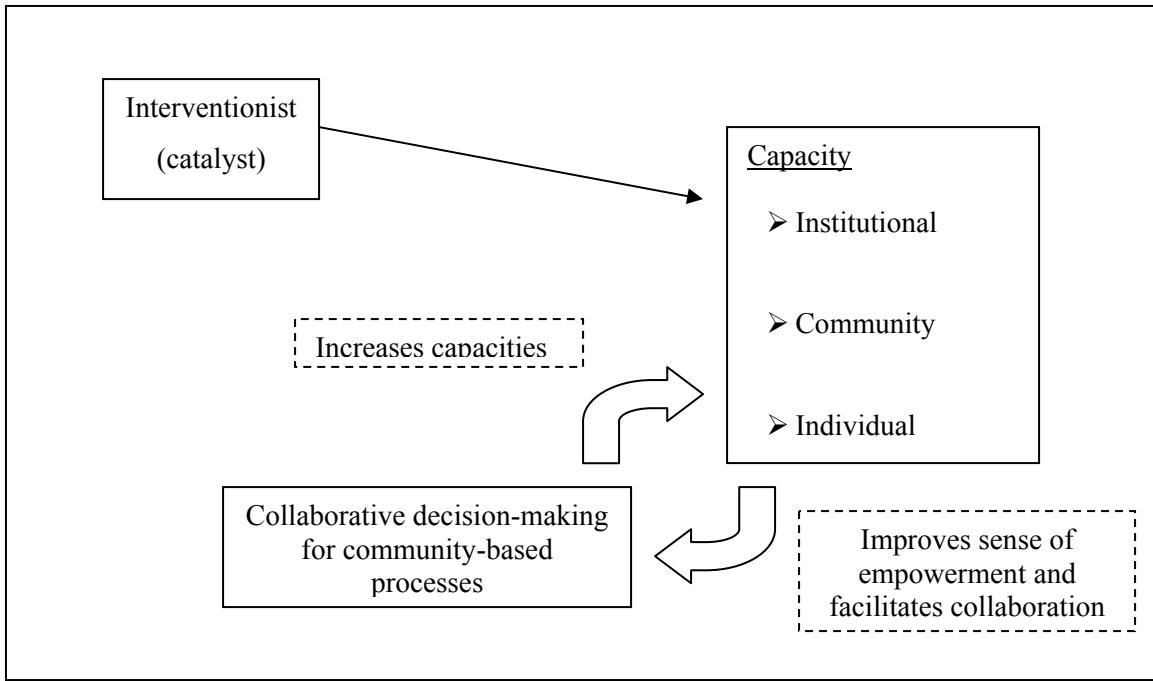


Figure 2. Interventionists enable the development of institutional, community, and individual capacities which contribute to the general ability of individuals to participate in effective and efficient collaborative decision-making. (Adapted from Raik et al. 2003)

Social capital

Social capital is a multidimensional concept, and therefore, cannot be adequately described with one specific definition. Coleman is credited with bringing social capital back into the sociological lexicon and in the late 1980s broadly defined social capital as “some aspect of social structure” that facilitates “actions within that structure” (Liu et al. 2003). Putnam (1995) defined social capital as, “...features of social organizations such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit.” Inherent to Putnam’s conceptualization of social capital is the abstraction that social networks and trust coexist with norms of reciprocity and individualized expectations concerning the appropriate level of community involvement. For the purpose of this research, social capital will be considered one of many pertinent characteristics of capacity, and therefore, is embedded in the concept.

People-place connections

Building on the concept of capacity, is the notion of people-place connections. According to Grieder and Garkovich (1994), the physical landscape reflects the self-definition of people within a particular cultural context. Place is defined as a physical space imbued with meaning, encompassing utilitarian values as well as intangible values, such as belonging, attachment, beauty, spirituality, and expectations of what activities and people belong to that place (Cheng et al. 2003b, Low and Altman 1992). The meanings assigned to these values are socially constructed, and therefore, not readily categorized due to their individualized conception. In the words of geographer Robert Stack (1992), places are, “...fundamental means by which we make sense of the world and through which we act.”

The seemingly benign term ‘home’ can have a variety of meanings depending on the context of place. Consequently, when someone mentions the concept of ‘home,’ he or she may not be referring to a geographic or a physical location, but to a notion, that conveys certain images and sentiments. The term ‘home’ can also refer to a physical structure that provides protection from the weather. On the other hand, home also can be a cultural symbol that expresses stability and safety, as well as cherished memories or relationships. Hence, place is not simply an inert container for biophysical attributes and processes.

Place is constructed, and continuously reconstructed, through social and political processes, as well as through social and cultural meanings. In fact, Cheng et al. (2003b), note that social processes and cultural meanings are emergent properties of a particular place; that is, people and place meanings transpire through the interaction between biophysical attributes and social and political processes (Figure 3). Furthermore,

meanings assigned to a place are unique to that place and do not readily transfer to other places, even if the biophysical attributes or the social and political processes are identical.

As natural resource planning and management increasingly occurs at the landscape scale, the relevance of “place” becomes readily apparent. Therefore, understanding how and why individuals define appropriate behavior for a landscape turns on understanding the landscape as a place. When taking a place perspective, the assumption is made that human connections with natural resources and the landscape in which they occur, are complex, dynamic, and saturated with meanings; thus, utilitarian and intangible values are intertwined and inseparable. Furthermore, the concept of place embeds natural resource attributes back into the system of which they are a part, reminding managers that resources exist in a meaning-filled spatial (and temporal) context. Recognizing and understanding this context is the principle contribution of social science to ecosystem management (Williams and Patterson 1996).

The importance in understanding a landowner’s sense of place lies in its natural ability to promote collaboration (Mandell 2001). For good or bad, natural resource management, which is an inherently place-based activity, tends to bring together a diverse set of people that would not otherwise be linked. Although conflicts are unavoidable, they do not preclude the possibility of discovering common place-based identities among individual group members (Wondolleck and Yaffee 2000).

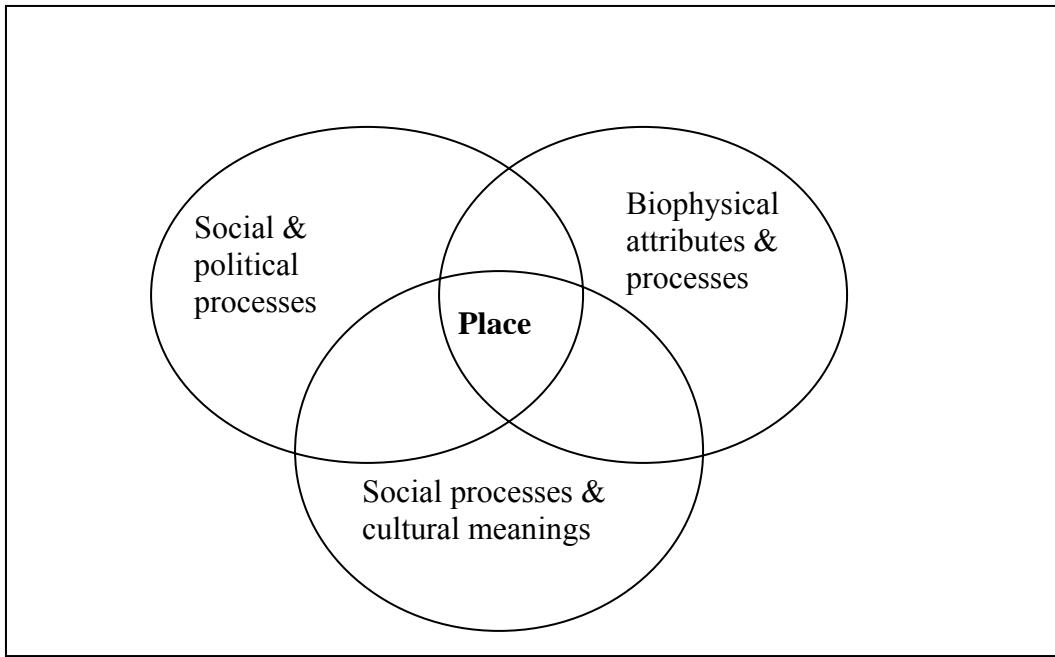


Figure 3. Schematic of place as the intersection of three spheres [based on Canter 1977, Relph 1976, and Sack 1992]. (Cheng and Daniels 2003a)

Research Approaches

The goal to sustain private forests in the Central Hardwood Region is indeed a multifaceted issue complicated by trends such as the ever-changing forest ownership demographic resulting in land ownership objectives being in a constant state of flux. In addressing this complex issue, natural resource professionals often work with limited knowledge and understanding of private forest landowners. Consequently, the task of sustaining natural resources is difficult, both spatially and temporally, especially on privately owned forestland. As previously noted, most of the past work aimed at understanding this population has focused on collecting descriptive statistics concerning landowners and ownership patterns, ascertaining management objectives based on prescriptive choices, and prioritizing the values placed on various commercial and non-commercial forest products via mail and telephone. However, using quantitative surveys

limits the landowner's responses to multiple-choice questions containing pre-determined answers. Moreover, the rich, layered data concerning the motives and objectives of NIPF landowners, as derived from qualitative techniques, is noticeably absent from previous studies.

Qualitative research

There are many different opinions regarding what constitutes qualitative research, including significant disagreement on its characteristics and the nature of its inquiry (Creswell 1998, Creswell 2003, Lincoln and Denzin 2000). However, as indicated in Table 3, a qualitative approach is one in which the researcher makes knowledge claims based on constructivist perspectives (i.e., the multiple meanings of individual experiences, meanings socially and historically constructed, with an intent of developing a theory or pattern), participatory perspectives (i.e., issue-oriented, collaborative, change oriented), or a combination of both perspectives. It is an approach that uses inquiry strategies such as narratives, phenomenologies, ethnographies, action or participatory research, grounded theory studies, or case studies. Furthermore, the researcher collects open-ended, emerging data with the primary intent of developing themes from the data.

Table 3. Qualitative and quantitative method approaches (adapted from Creswell 2003).

Research Tends to...	Qualitative Approaches	Quantitative Approaches
Use these philosophical assumptions	Constructivist or participatory knowledge claims	Post-positivist knowledge claims
Employ these modes of inquiry	Phenomenology, case study, grounded theory, ethnography, narrative, or action research	Surveys (mail and telephone) and experiments
Employ these methods	Open-ended questions (can be semi-structured), emerging approaches, or text and/or image data collection	Closed-ended questions, predetermined approaches, analysis of numerical data
Use these research practices	Collects participant meanings, focuses on a single concept or phenomena, brings personal values into the study, studies the context or setting of the participants, makes interpretations of textual data, or collaborates with the participants	Identified variables to study, relates variables to questions or hypotheses, uses standards of validity and reliability, observes and measures information numerically, uses unbiased approaches, or employs statistical procedures

Case study research

As a research strategy, the case study is used to contribute to our knowledge of individual, group, organizational, social, political, community planning and related phenomena. In all of these situations, the distinctive need for case studies arises out of the desire to understand complex and contextualized social phenomena (Yin 2003).

Case studies are the preferred strategy when “how” or “why” (and sometimes “what”) questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. This is an important clarification because as researchers improve their ability to explain why social phenomena exist, they are then better able to predict future behavior. Furthermore, a case

study is a valuable tool for understanding a bounded system in order to better understand that specific case and perhaps apply that understanding to similar situations or to illustrate other bounded systems (Stake 2000). The data collection for case studies is extensive, drawing on multiple sources of information such as observations, interviews, documents, and audio-visual materials. However, it is only through the various data collected that a detailed description of the case emerges, as do an analysis of themes and an interpretation about the case by the researcher.

In short, the case study method is appropriate for this dissertation based on the following:

(1) it is driven by the major research question: how can collaborative natural resources management on private lands be initiated, sustained, and evaluated? (2) it focuses on the contemporary phenomenon referred to as collaborative ecosystem stewardship, and (3) it focuses on a bounded system within the southeastern Missouri Ozarks.

Action research

There is substantial disagreement over what exactly constitutes action research per se because it is probably the most generically used term which varies across disciplines. One scholar indicates that action research is a process that is as much an act of scientific research as it is an act of engagement with people experiencing the problem (Cunningham 1993). Another suggests it is research that involves working from within a practice or process to improve the practice (Muth 2004). Bradbury and Reason (2001) conclude that “A basic tenet of action research is that any new understanding must be grounded in experience/experiment.” While, Russell and Harshbarger (2003) suggest that action research is all about, “Sharing thoughts, discussing research questions, asking

questions, sparking the imagination and intellect, collaborating, building partnerships, taking action, and getting the desired results.”

This research project is based on two main conceptions. First, in a recent publication, Herr and Anderson (2005) define action research as, “...an inquiry that is done by or with insiders to an organization or community, but never to or on them.” In terms of this research, insiders were the private forest landowners in Madison County, Missouri. Second, action research, “Builds descriptions and theories within the practice context itself, and tests them there through intervention experiments – that is, through experiments that bear the double burden of testing hypotheses and effecting some (putatively) desired change in the situation” (Argyris and Schon 1991). This explanation is significant for two reasons. First, the intervention portion directly relates back to the concept of increasing capacity through a catalyst or interventionist (Figure 2). Second, a key component of this project is employing a variety of intervention experiments (i.e., technological innovations such as a forest management decision education tool and GIS generated maps, as well as organizational and community development techniques such as forums, informal dinners, field days, focus groups, deliberative discourses, etc.) in the hope of effecting change in the population of interest that results in sustainable forest resource systems on privately owned land through the process of collaborative ecosystem stewardship.

Phenomenological research

Philosophically, phenomenology has its roots in existentialism, a tradition focused on the nature of existence and the freedom one faces in shaping their existence. Moreover, the goals of phenomenology are to determine what an experience means for the persons who have lived it, and to reduce those experiences central to a meaning, or the “essence” of the experience that can be used in practice with those experiencing the phenomena (Creswell 1998, Pollio et al. 1997, Thomas and Pollio 2002). Simply put, existential phenomenology is the study of experience and the tradition’s methodological aspect involves the collection and analysis of rigorous and richly nuanced descriptions of participants’ experiences to develop patterns and relationships of meaning.

Another important characteristic of phenomenological research is that participant selection is purposeful. Participants must have experienced the phenomenon of interest, and must be willing to talk about their experience. Furthermore, participants are selected so as to represent a full range of variation in experiences related to the specific topic being explored. Appropriate sample sizes are considered six to twelve individuals, and the reported range is 3-325 individuals (Thomas and Pollio 2002).

As a research method, phenomenology offers several benefits to the study of private forest landowners. First, given its focus on collecting clear and complete descriptions of someone else’s experiences or an aspect of their experience, it is the desired approach for a situation in which a consultant seeks to discover the wishes and needs of a client (Muth 2004, Pollio et al. 1997). Second, it allows the study of attributes of landowners’ experiences, such as the meaning of their forestland to them, which are not captured or measurable through quantitative instruments. Third, as questionnaires only measure what

it specifically asks, they may fail to address those aspects of the experience that are most salient to the landowner. For instance, respondent views on the aesthetic qualities of the land, the family connection it provides, or the desire to pass it on to future generations are significant influences often overlooked (Thomas and Pollio 2002). Lastly, phenomenology also provides a different format for sharing experiences and for a viewpoint that may have been systematically missed by other approaches, or turned off by them. This is indeed a key point.

Together, the above benefits support the position that understanding the meanings behind individual experiences or aspects of their existence is critical to engaging them in sustainable forest stewardship practices and to initiating and/or improving their relationship with natural resource professionals.

Qualitative Data Analysis

There is no one dominant method for analyzing qualitative data gathered with techniques such as interviews, journaling, and observational notes, which result in copious amounts of layered data in a text format. Consequently, software packages such as NUD*IST, Atlas-ti, WinMAX, Textbase Alpha, QSR NVivo, and Qualrus have been created to aid subsequent coding analyses of qualitative data using a grounded theory approach.

To do inductive analysis (also referred to as “grounded theory”), one begins with an open-minded desire to know a social situation or setting; the data and oneself as an agent of induction serve as guides in the task of emergently formulating one or more propositions (Lofland and Lofland 1995; Strauss and Corbin 1990). Grounded theory requires that generation of theory, whether creating new theory or building on previously

established tenets, be founded in empirical data and occur through inductive analysis. However, due to the inductive and emergent process, achieving this order is not simply a mechanical process of assembly-line steps and requires the researcher to remain open to evolving trends in the data.

The coding process involves two stages. The first stage is open coding, involves breaking the data down into categories and sub-categories, that is, “taking apart an observation sentence, a paragraph, and giving each discrete incident, idea, or event, a name, something that stands for or represents a phenomenon” (Strauss and Corbin 1999). This is a process of breaking down, examining, comparing, conceptualizing and categorizing data. The second stage, known as axial coding, is used to find relationships between these sub-categories and categories and, thus, puts the data back together in a new way. Axial coding is done by using a ‘coding paradigm’ which involves thinking about possible causal conditions, contexts, intervening conditions, action/interaction strategies, and the possible consequences of action/interaction not occurring.

Another useful technique during data analysis is called memoing, which occurs throughout the data collection and analysis processes. There are three kinds of memos significant to grounded theory generation (Babbie 2001, Strauss and Corbin 1990). Code notes identify the code labels and their meanings. This is particularly important because, as in all social science research, most of the technical terms used also have meaning in everyday language (Babbie 2001). Consequently, it is essential to write down a clear account of what is meant by the codes used in an analysis. Theoretical notes generally reflect the dimensions and deeper meanings of concepts, relationships among concepts,

and theoretical propositions related to the topic being researched. In qualitative data analysis, it is vital to write down these thoughts; even the ones that will be later discarded (Babbie 2001). Operational notes deal primarily with methodological issues. For instance, some memos may draw attention to certain data collection circumstances that may be relevant to understanding the data later. On the other hand, some operational memos will consist of notes to direct future research efforts.

CHAPTER 3. METHODOLOGY

The methodology chosen for this study was designed to meet the research requirements for the “Sustaining Natural Resources in the Central Hardwood Region” project and to allow for data and outcome comparison across the three states involved in the overarching project. Thus, researchers from each of the universities collectively planned the methodology relevant to the case studies in their respective states. In Missouri, qualitative research techniques were used, (1) to examine southeastern Missouri Ozarks NIPF owners’ relationship with their land, their neighbors, and their geographic community, as well as their attitudes and beliefs regarding ecosystem stewardship in landscapes dominated by private ownership, and (2) to document the process and potential consequences when forming local private landowner resource groups that may engage in collaborative decision-making activities with the ultimate goal to sustain forested resources and their associated ecological benefits. Specifically, this research sought to assess the institutional, community, and individual capacity for collaborative ecosystem stewardship on private forestland in the Missouri Ozarks.

Conceptual Framework

In recent years, collaboration as a tool for natural resources management has emerged as a new mantra among politicians, resource managers, and community activists (Daniels and Walker 2001, Selin et al. 1997, Wondolleck and Yaffee 2001). A number of innovative natural resource management models have been presented by academics, resource agencies, and environmental advocacy groups trying to break protracted conflicts over natural resource issues. Common themes, such as ecosystem management, civic environmentalism, and community-based conservation, support the belief that

natural resource agencies and affected stakeholders need to initiate and sustain more collaborative processes in order to resolve management disputes and advance a more shared vision of the future.

The research literature is replete with studies that have identified a variety of antecedents to successful collaborative ecosystem management projects. Yaffee et al. (1996), asserted the need to involve the participants early, use an open and inclusive process, to secure adequate agency support, and use broad, flexible, science-based management approaches. Selin and Chavez (1995) developed a five-step model that included collaboration characteristics such as crisis, brokering, mandate, leadership, and incentives. In addition to the attributes presented in prior collaborative models, Ostrom's (1999) work on self-organization of individuals addressing resource management issues identified several components of the resource, user community, and institutions, which influence the effectiveness of self-governed management regimes. Findings showed that success in collective common-pool resource management efforts increased when components, including trust which is an attribute of social capital and capacity, shared perceptions and values of the resource, and previous experience in cooperative activities, were addressed.

These components may also be attributes to collaborative ecosystem stewardship on privately owned lands. Therefore, a collaborative ecosystem stewardship framework (Figure 4) was developed *a priori* data collection phases and builds upon previous studies (Ostrom 1999, Raedeke et al. 2001a, Selin and Chavez 1995, Yaffee et al. 1996). For this research project, the framework conceptually represents how current social and

ecological contextual characteristics (i.e. present capacity levels) and interventions (i.e. capacity building activities) may effect the community's sense of empowerment and propensity to participate (i.e. future level of capacity), or not, in a collaborative ecosystem stewardship group. Capacity developing methods such as community forums, informal dinners, field days, demonstration workshops, and focus groups were used to provide opportunities for participants to interact with one another. Concomitantly, the framework incorporated technological innovations such as a forest management education decision tool to examine a variety of management regimes, and the use of GIS generated maps to facilitate a landscape-scale visualization of the study area, as well as to support the communication and exchange of ideas among participants.

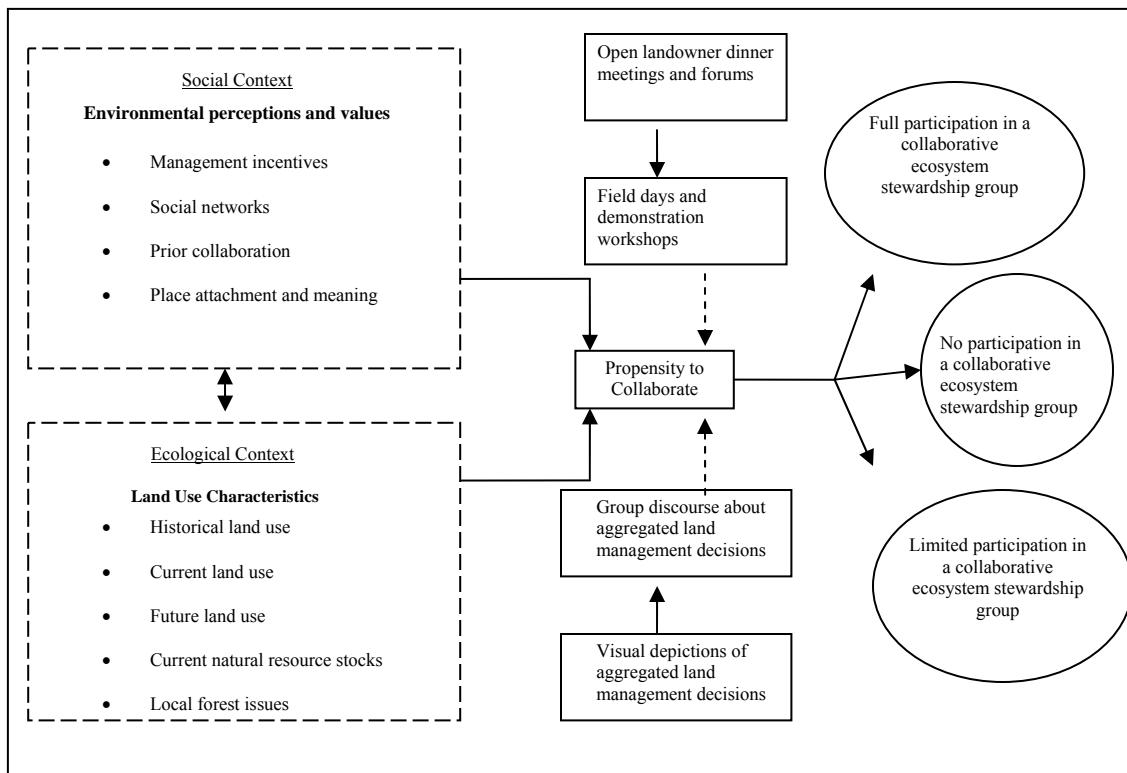


Figure 4: Conceptual framework of this project depicting components that may affect the propensity of private forestland owners to collaborate on ecosystem stewardship.

Study Design

Watershed selection

Due to the geographically and ecologically diverse nature of the Central Hardwood Region (Figure 1), watersheds were selected by the tri-state consortium according to the degree of land fragmentation within their respective boundaries, both in terms of property ownership and contiguous forest cover. A secondary criterion was a desire to minimize the level of public ownership, thus focusing on privately owned forest land.

In Missouri, the Upper St. Francis and the Upper Black River Watersheds (USGS Cataloging Units 11010007 and 08020202, respectively; Seaber et al. 1987), located in the eastern Ozarks of southeastern Missouri (Figure 5), were chosen because they represent a low degree of forest fragmentation and minimal urban development. Both watersheds encompass approximately 1.75 million acres and primarily include all or parts of St. Francois, Madison, Iron, Reynolds, Wayne, Carter, Ripley, and Butler counties. Recent research by Nigh and Schroeder (2002) indicates that over 90 percent of these watersheds are forested. This is not only part of the largest block of contiguous forest in the Ozarks; it is also one of the largest in the Midwest. This characteristic is important in terms of the overarching tri-state project since Missouri's watersheds were chosen because they could be described as contiguously forested. Whereas, Tennessee's watersheds represented a mix of forest cover and agricultural use, and the selected watersheds in Indiana contained land in agricultural use with pockets of woodlands and fragmented riparian forests.

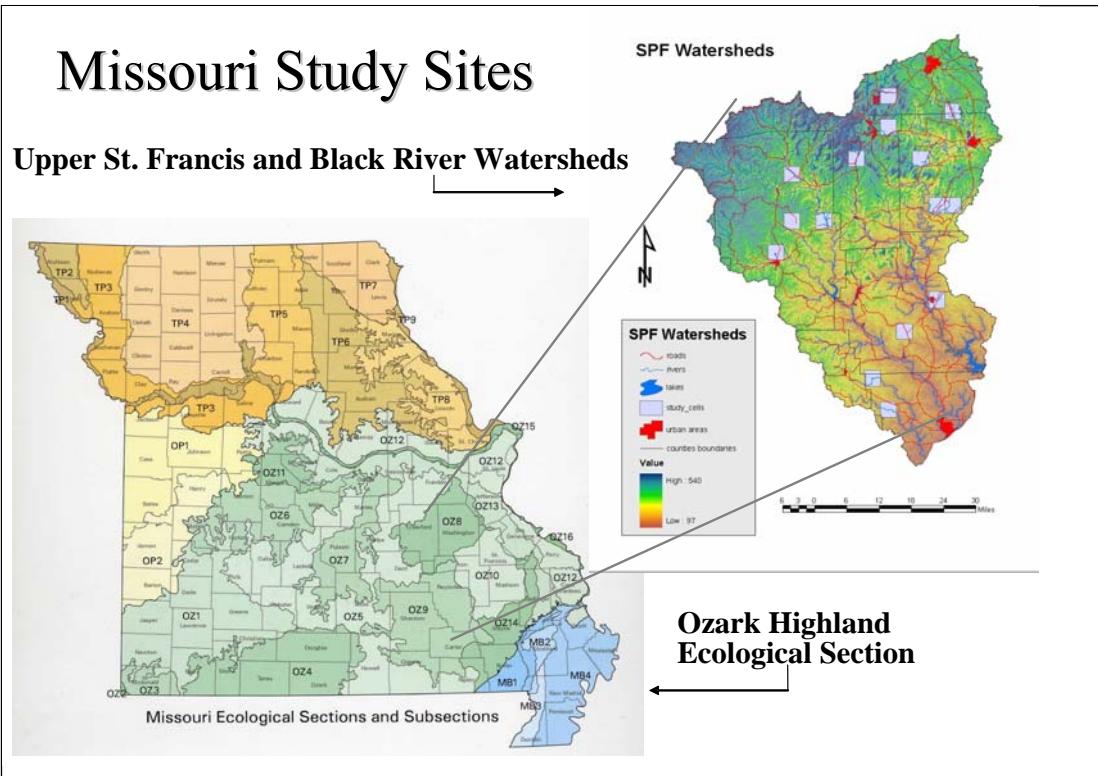


Figure 5: The Upper St. Francis and the Upper Black River watersheds in the eastern Ozarks in southern Missouri (adapted from Nigh and Schroeder 2002).

Selection of study cells and landowners

Within each watershed complex, a 9 square-mile block (or cell) served as the elementary sampling unit, and 15 cells were randomly selected from a pool of 372 cells via random sampling with rejection. This means that once selected, the cell must meet all requirements or it was rejected. Of the 372 cells which intersected the adjoining watersheds, 119 were dropped because they were partially clipped by the watershed boundary. An additional 95 cells were dropped because they did not meet the sampling criteria: >70% forested, >50% privately owned, and <25% urban. This sampling design ensured that the sample selected was representative of both watersheds, while each study

cell also met the primary criteria to select privately owned forestland will little urban influence.

Study cells 214 and 215 (Figure 6, Figure 7, and Figure 8) were purposively chosen for a collaborative ecosystem stewardship effort because: (1) cells were in close proximity to one another and fell within a focal watershed; (2) each cell contained a fairly contiguous landscape of privately owned land; and (3) each cell had a mixture of both local and absentee landowners. Both cells were in Madison County, partially covered by the St. Francis watershed, where the rural economy is based largely on a mix of hay cropping and livestock husbandry, forest industry-related activities, in addition to an expanding recreation and second home or retirement sector. Geographically, the cells were approximately 90 miles south of St. Louis, Missouri, and 15 miles from the nearest urban center, Fredericktown with an estimated population of 4,000.

Using plat maps and parcel boundaries digitized in GIS (Figure 7 and Figure 8), landowners falling within the boundaries of each of the purposively selected study cells were identified through the County Assessor's office using property record cards and their contact information was entered into an Access database. In addition to falling within the sample area, each parcel of land met the following: (1) it had to be privately owned nonindustrial forestland, and (2) it had to include at least 20 acres (8 hectares) of land classified as forestland (land capability class 6 or 7). Those landowners living within a 30 mile radius of the center of either study area were designated as local landowners; and those landowners living greater than a 30-mile radius from the center of either study cell, but within the Missouri state border, were designated as absentee landowners.

The methodological design advanced by the tri-state consortium ensured that the selected samples were representative of the entire watershed, while each cell also met the desired criteria. However, this method has two notable drawbacks with respect to ensuring that every landowner within the study area had an equal probability of being selected. First, parcels near or crossing the outer study cell boundaries, were not selected. Second, the probability of a landowner being included in the sample is proportional to the amount of land he or she owns. Therefore, landowners with tracts of land less than 20 acres (8 ha) were not selected. Furthermore, the labeling of local and absentee landowners based on a 30-mile radius was an arbitrary characterization.

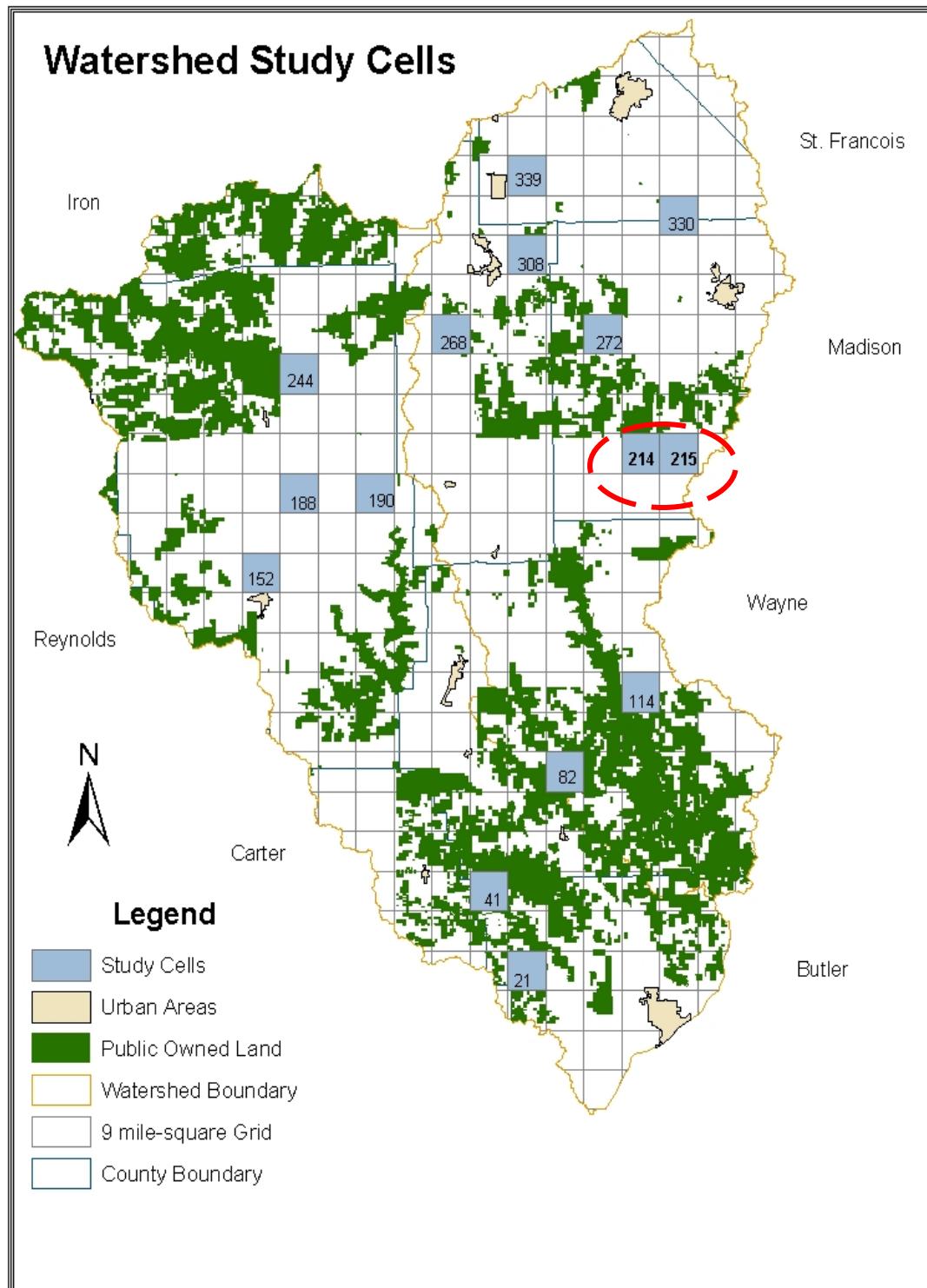


Figure 6. Location of the 15 randomly selected study cells with Cells 214 and 215 identified for landowner collaboration effort. White areas indicate privately owned land.

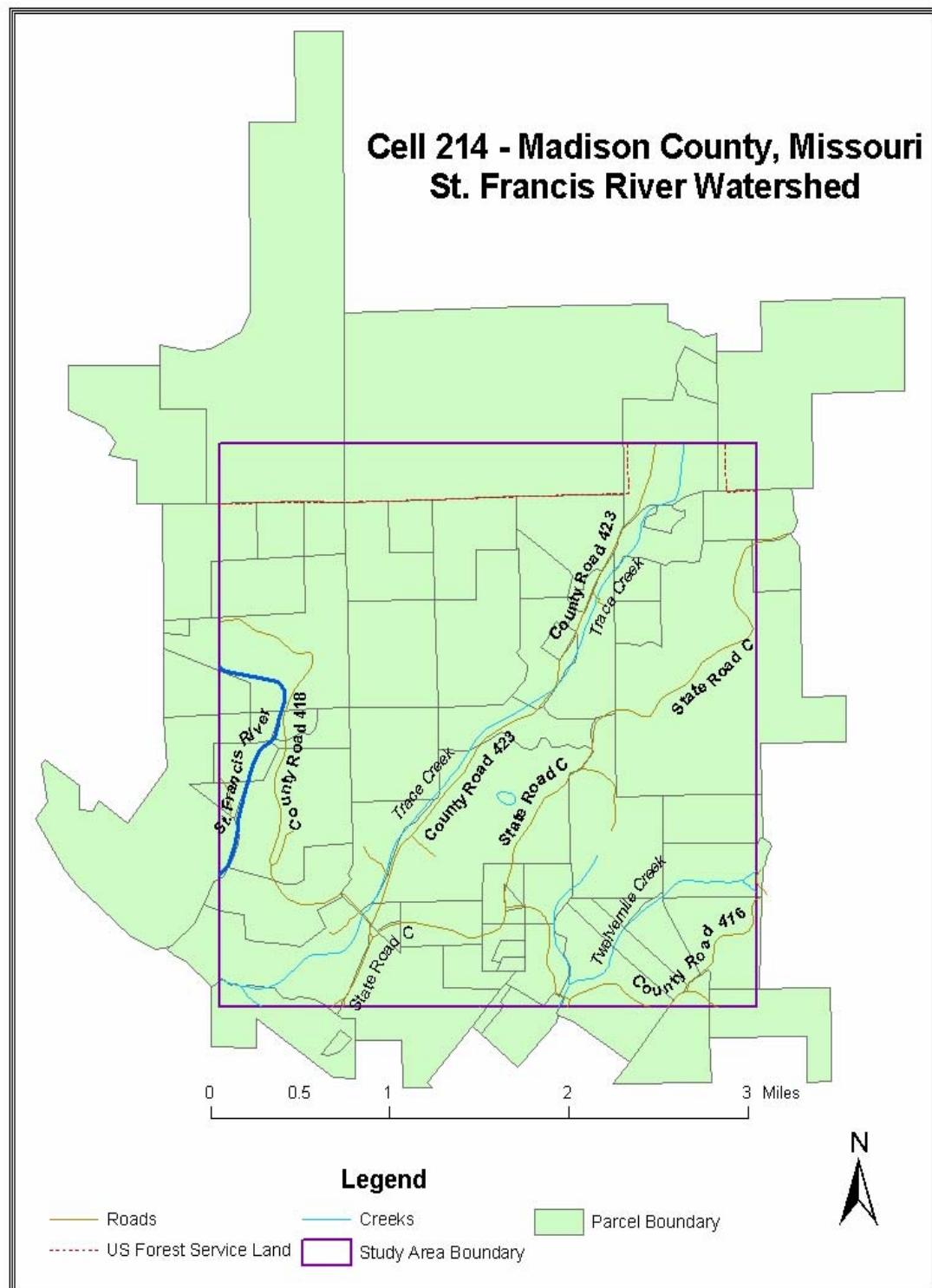


Figure 7. Cell 215 digitized land ownership/parcel boundaries.

Cell 215 - Madison County, Missouri St. Francis River Watershed

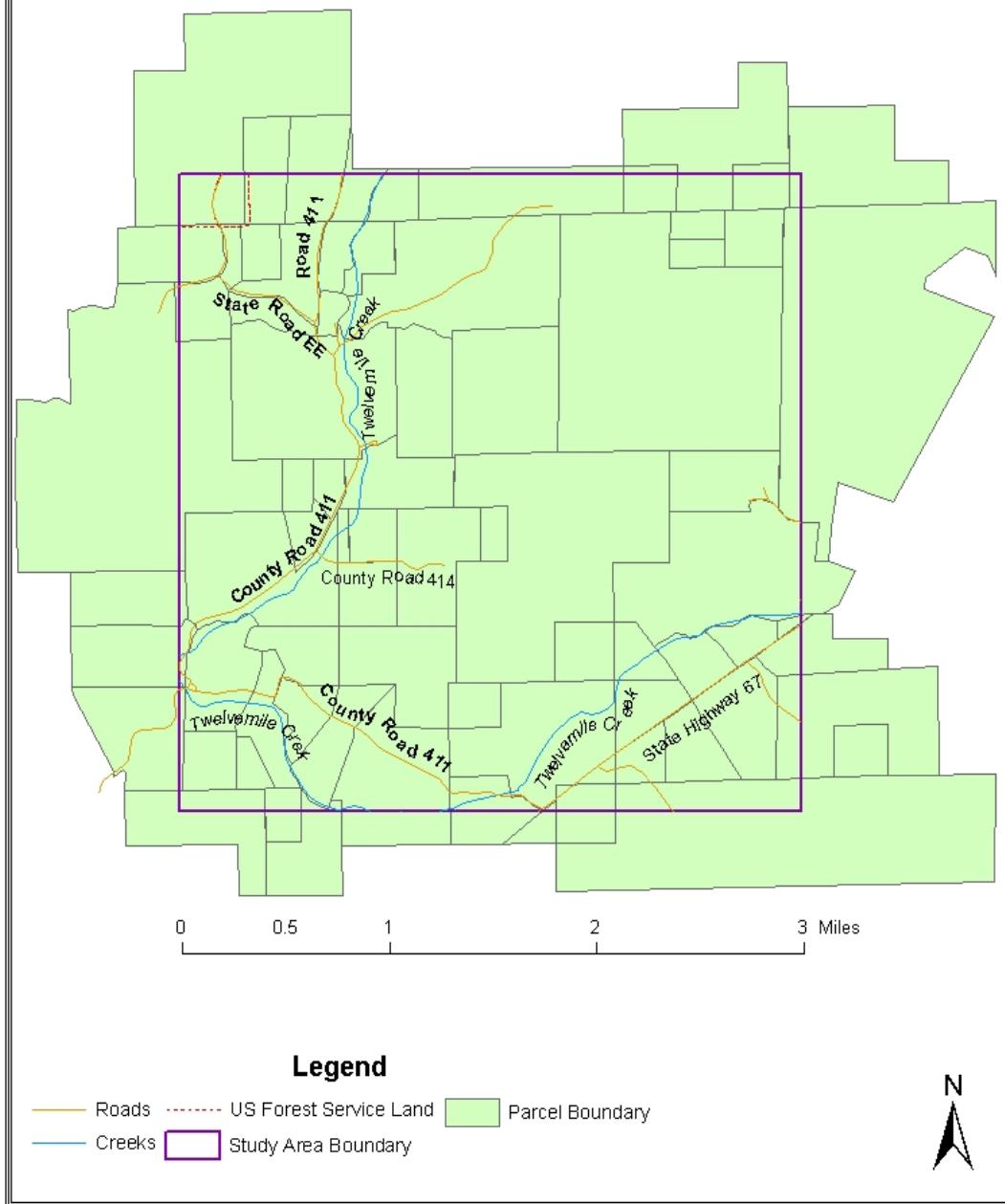


Figure 8. Cell 215 digitized land ownership/parcel boundaries.

Methodological framework

The methodological framework applied to this case study was divided in three parts: (1) qualitative research methods such as semi-structured phenomenological interviews, a reflective journal, and field notes, (2) collaboration incentive and mechanism testing via capacity building activities such as landowner forums, field days, demonstration workshops, and focus groups, and (3) assess capacity through technological intervention via testing a forest management decision education tool and using GIS generated maps to discuss land use in the study area.

Part I: Qualitative research methods - A well-established principle of qualitative research is that of triangulation, which aims to increase trustworthiness of data. Triangulation, in which the researcher incorporates multiple methodologies, increases the likelihood of more sustained and legitimate conclusions derived from the data. This research focused on methodological triangulation, which was realized using qualitative research methods such as semi-structured phenomenological interviews, a reflective journal, and field notes from landowner forums, informal meetings, field days, a demonstration workshop, and a focus group using GIS generated maps representing the study area.

Phenomenological Interviews

The initial data collection goal for this case study was to identify stakeholder values, beliefs, and interests regarding sustainable resource management through a qualitative instrument that would avoid research preconceptions. Accordingly, a phenomenological interview technique was appropriate because it allows respondents to describe their experience using their own words while the process itself requires them to clarify their meaning, or realize it for the first time (Pollio et al. 1997). Consequently, interviews

were conducted via semi-structured, face-to-face interviews with both key informants and study area landowners. This semi-standardized approach was utilized to ensure that the same information was gathered from all participants. To uphold data quality, both the key informant and landowner interviews were conducted by the same researcher following identical protocols. The researcher maintained a respectful stance towards participants throughout the interview process, presuming no expertise regarding the phenomenon under inquiry and positioned herself as a learner. In an effort to establish an informal, trusting atmosphere, all of the interviews were digitally recorded because the equipment used was quite small, and therefore, considered unobtrusive. Interviews were transcribed verbatim, along with accompanying observations and comments. Identifying characteristics (names, geographic places, names of work places, etc.) were removed. The transcripts were then coded using a grounded theory approach.

Reflective Journal

Another data gathering technique often used by qualitative researchers is keeping a reflective journal in which the interviewer reflects on their own and interviewee actions, noted events as well as self and participant perceptions. This technique allowed for the gathering of thoughts and ideas; in addition to recording an individual's or a group's progress. The rationale behind using this type of technique was twofold. First, the additional text data captures minute details that may prove useful during analysis but would have been lost if not recorded and reflected upon. Moreover, these key details could not be adequately obtained through traditional quantitative survey methods. Second, as previously noted, incorporating multiple research methodologies, increases the likelihood of more legitimate conclusions derived from the data (Patton 1990). To

control data quality and validity, journal entries were recorded as soon as possible after the conclusion of each interview, meeting, or other noted event, paying particular attention to my role and feelings as researcher and facilitator, in addition to noting areas in which the researcher saw herself needing improvement. The journal entries were later incorporated into the qualitative text analyses served to anecdotally supplement and clarify the research findings.

Field Notes

This qualitative data gathering method was used for the purposes of identification, and generally keeping track of interviews, and therefore, the researcher maintained a series of field notes to log gross factual data. For instance, items such as time of day of the interview, a description of the setting and the interview participant, and any particular difficulties or positive encounters, both methodological and personal, may be recorded. The jotted notes became a portion of the data log, and were later incorporated into the interview write-up (Lofland and Lofland 1995).

Part II: Collaboration incentives and mechanisms - Working together in a cooperative manner is a requisite condition for collaborative ecosystem stewardship. Thus, research techniques such as landowner forums and informal dinners, field days and a demonstration workshop, an invited forest management planning exercise, and invited focus groups serve two purposes: (1) to entice participation by landowners that have chosen not to attend the landowner forums by providing an alternative meeting format (i.e., incentive), and (2) to facilitate the development of a collaborative group by providing opportunities for individuals to meet, share ideas, negotiate solutions, and most

importantly, to develop trust, networks, and relationships with other area landowners, as well as with local agency resource managers (i.e. mechanism).

The focus group approach was chosen to assess the process, as well as incentives and mechanisms associated with forming a collaborative ecosystem stewardship group because the conversation that ensues centers on a primary topic of interest to the researcher and participants. Furthermore, it offers a unique perspective salient to a target population (Edmunds 1999, Elmendorf and Luloff 2001). Focus groups create an atmosphere that enables participants to bring out insights and understandings that may not be captured with questionnaires or even with one-on-one interviews (Garson 2003). While a focus group does not take the place of a formally structured dialogue, “it can afford opportunities for learning not possible when individuals remain isolated from each other (physically or verbally)” (Horner 2004). Therefore, the focus group approach served to supplement and verify data collected through interviews, observations, and field notes. Concomitantly, it provided an opportunity to further define and clarify issues and sentiments as they were expressed by the population of interest.

Part III: Technological intervention – Facilitating the development of collaborative ecosystem stewardship in the study areas requires the identification of individual land management goals, as well as the spatial connection of land parcels. Thus, following the previously noted tenets of action research, a forest management decision education tool and GIS generated maps depicting current land uses were two types technological intervention tested during this study.

Forest Management Decision Education Tool

In an effort to make available technologies that accurately address forest management concerns of private landowners, previously interviewed key informants and landowners were invited via mailed letters and telephone calls to participate in a group planning exercise where a variety land management options were elucidated using a computer-based forest management decision education support tool (Larson 2004). The tool is based on type, size, and density of forest stands and depending on which ecological characteristics and management options were selected the program produces a 20 year “virtual growth” using stock photographs representing the forest type. Furthermore, the tool is intended for those landowners with little to no forestry management knowledge or experience and was created to provide anecdotal and descriptive information regarding the economic, aesthetic, and environmental impacts of various management regimes.

Collaborative Stewardship Planning Using GIS Generated Maps

Interviewed landowners indicating a will to participate in or learn more about collaborative ecosystem stewardship were invited to participate in a focus group where area landowners could collectively compare and contrast various management scenarios and their potential long-term landscape consequences, both positive and negative. The substantive focus of this meeting was to foster collective decision-making on private lands using combined data from the interviews and the decision support tool. This information was placed in a GIS framework to display aggregated land uses in the study area. Discussing potential collaborative stewardship activities visualized through GIS generated maps has several potential applications, including landowner education, outreach and extension opportunities, and as an aid in forest management planning.

Data Collection

Following the methodological framework, data collection for the study comprised of three broad phases that overlapped in some instances. Moreover, specific technique details applied, such as topics covered during open forums and field days, were emergent and process details unfolded through the course of the project. During the first phase, semi-structured phenomenological interviews were conducted with key informants working in Madison County and landowners with parcels in the aforementioned purposively selected study cells. The second phase investigated various incentives and mechanisms that may encourage landowners to participate in a collaborative group by hosting and facilitating a series of open informal dinners and community forums, field days and a demonstration workshop, an invited forest management planning exercise, and ending with two focus groups. In the third phase of data collection, technological interventions were assessed when participants tested a forest management decision education tool and discussed collaborative stewardship scenarios using current land use preference maps generated using GIS.

Phase I: Semi-structured phenomenological interviews

Key informant interviews - For the purposes of this inquiry, key informants were individuals that could provide particular insight or knowledge regarding landowners in the study area. Interviewees included non-governmental organization members, community development specialists, local business owners, and county extension agents, as well as several natural resource agency representatives at both the state and federal levels. To select the key informant to interview first, an internet search was conducted to ascertain names and contact information for at least one person representing each of the

levels of landowner access (Table 4). The selected individuals were then contacted via telephone and/or email to introduce the project and to solicit their participation. Additional key informant contacts were identified to augment the sample using a non-probability technique called snowball sampling (Babbie 2001). Using this approach, data was collected with initial key informants and those individuals provided the information needed to locate other members of that population whom they happen to know and believed could contribute to the project. Indeed, according to Elmendorf and Luloff (2001), key informant responses to interview questions should show a reasonable and diverse understanding of the social reality of the community of interest.

Table 4: Criteria for identifying key informants for Madison County, Missouri.

Level of access to Study Area Landowners	Example	Relationship with Study Area Landowners
Federal level natural resource agency representatives	Employees of US Forest Service and Natural Resource Conservation Service	Manage publicly owned land adjacent to the study area, provide technical and educational assistance
State level natural resource agency representatives	Employees of Missouri Department of Conservation (forestry, wildlife, and private land divisions)	Provide technical and educational assistance and enrollment in government sponsored programs
County level agencies	Community development, extension specialists, and soil and water district employees	Provide economic, educational, and technical assistance
Non-governmental organizations	Eastern Ozarks Forestry Council, Nature Conservancy	None with population of interest but have members living in the county

The taped and transcribed key informant interviews played an important role in aiding study site selection, development of the final landowner survey instrument used during the main data-gathering phase (Phase I), and provided landowner contacts. Such recommendations were typically individuals already enrolled in government land assistance programs and/or active in area conservation issues. Referred landowners were sought for the following three reasons: (1) to potentially augment the landowner interview sample in Phase I, (2) to create a list of individuals who may be interested in Phase II of the project by attending the community forums, fields days, demonstration workshops, and focus groups, and (3) to garner contacts for individuals that may participate in Phase III of the project by testing the forest management decision education tool and by contributing to the discourse on GIS generated maps.

During the summer and fall of 2003 and through the spring of 2004, key informant interviews, ranging from 20 minutes to 1.75 hours, were conducted with seventeen (n=17) natural resource managers, community development professionals, and non-governmental organization members. Interviews were conducted during working hours at the respondents' office. Prior to interview commencement, the research project was explained in detail and interviewees were asked if the session could be digitally recorded. Participants were then asked to sign an informed consent form (Appendix A) acknowledging that the project had been explained and that they were aware the session was being digitally recorded.

The key informant semi-structured interview questions (Appendix A) were composed to elicit community and ecological contextual characteristics in which the population of

interest was situated. Community characteristics included their impression of landowner environmental perceptions and value patterns, and social networks, in addition to available resource management incentive and factors that may encourage collaborative stewardship. The interviews also attempted to ascertain ecological characteristics, which include historical and current land uses, as well as levels of natural resource stocks, traits which may affect a landowner's propensity to collaborate, or not. Furthermore, through key informant interviews, this project sought to better understand issues related to forestry and land use in the study area, as well as how landowners relate to these issues and each other.

Landowner interviews - Introductory letters, accompanied by a two-page color fact sheet (Appendix A), were sent to all local and in-state absentee landowners with at least 20 acres (8 ha) in the purposively selected cells. The letters explained the project and the private landowner's role as well as inform them that a graduate student will be contacting them to request a face-to-face interview. For the first mailing, official University of Missouri, Forestry Department letterhead, typed business envelopes, and a metered mail service was used. However, this resulted in numerous letters being marked 'returned to sender.' In an effort to coax recipients to at least accept correspondence, subsequent mailings used plain white paper and envelopes, which were hand addressed and mailed using a regular postal stamp. Two weeks after the first mailing, using the phone number found on the county property record cards, landowners were contacted by telephone to solicit their participation. Appointments were made to visit with landowners consenting to be interviewed. After one month of repeated telephone contact attempts, non-respondents were mailed a second letter describing the attempts to reach them, explaining

the research project, and requesting their valued contribution. The final attempt to contact non-respondents was via telephone approximately two weeks after the second mailing.

From early 2004 through the summer of 2005, fifteen (n=15) landowner interviews ranging from 45 minutes to 3 plus hours, were digitally recorded and transcribed. The semi-structured open-ended questions (Appendix A) were developed based on thematic categories relevant to the overarching research objectives and had a descriptive and facilitative purpose. In particular, questions were designed to elicit individual characteristics and beliefs regarding environmental perception and value patterns, social networks (including trust), place attachment, and prior experience with resource management incentive programs and collaborative situations.

Prior to interview commencement, the research project was explained in detail and interviewees were asked if the session could be digitally recorded. Participants were then asked to sign an informed consent form (Appendix A) acknowledging that the project had been explained and that they were aware the session was being digitally recorded.

Immediately following the interview session, participants were asked to answer seven anonymous demographic questions given to them on a separate sheet of paper (Appendix A). Most of the interviews took place in the landowner's home, while the remainder occurred at their places of employment.

Phase II: Collaboration incentives and mechanisms

The landowner interview process was an ongoing effort; meanwhile, the second phase of data collection was initiated. This phase investigated various incentives and mechanisms that may encourage landowners to participate in a collaborative group by hosting and

facilitating a series of open informal dinners and community forums, field day, a forestry demonstration, an invited planning exercise and an invited focus group (summarized in Table 5).

To control the quality of experience for participating landowners, great care was taken in designing each experience. All events were advertised approximately three weeks in advance through mailed letters, flyers, reminder post-cards, and word-of-mouth (Appendix B). They were also scheduled purposively to not conflict with community events like evening church, school sports, and hunting activities.

To encourage participation, forums were held in the community room at the Black River Electric Co-op in Fredericktown, a comfortable and neutral public venue that was easily accessible to both local and absentee residents, and a local restaurant provided informal dinners at each forum and box lunches at the field days and demonstration workshops. Furthermore, each event was designed to have a pre-determined activity, like using a facilitator led focused conversation method to engage the participants and encourage interaction among them. To maintain the validity for each landowner forum/informal dinner, the same person facilitated each meeting while another person wrote meeting minutes and observational notes. Field notes were recorded immediately after each meeting to capture more descriptive data.

Table 5. Employed incentives and mechanisms (capacity intervention techniques) to encourage collaborative decision-making.

Date	Type of Mechanism	Event Purpose	Number of Participants
2004:			
May	Open community forum and informal dinner	Meet other landowners; Identify tracts of land on study area map	6 landowners
June	Open community forum and informal dinner	Meet other landowners; Consensus workshop with participants to identify issues	7 landowners 1 resource agency rep.
July	Open community forum and informal dinner	Discuss: (1) ways to encourage other landowners to participate; (2) education and information needs	7 landowners
September	Field day	View recent land management/wildlife habitat enhancement activities on private land	10 landowners 3 resource agency personnel 2 university personnel 1 nonprofit group member
October	Demonstration workshop	Watch mechanized logging and forest thinning demonstration	150+ participants; only 2 landowners from study area attended
2005:			
March	Invited planning exercise and informal dinner	Participate in an exercise to evaluate a computer-based forest decision and education tool	6 landowners 2 resource agency personnel
June	Field day	View forestry and wildlife habitat enhancement activities on public land	3 landowners 2 resource agency personnel
August	Invited focus group and informal dinner	Conduct two focus groups: (1) view maps and have a discourse on management scenarios; (2) assess collaboration processes	5 landowners

Landowner forums and informal dinners – Six (n=6) area landowners attended the first open forum and informal dinner held May 2004. Three specific activities were covered with the attending landowners. After dinner, participants first viewed a GIS digitized map of the study cells, and then as a group discussed where their respective parcels of land were located and who they thought their neighbors were.

June 2004, seven (n=7) landowners and one MDC resource agent took part in the second community forum and informal dinner. After dinner landowners participated in a group facilitation technique called the Consensus Workshop (ICA 2000). The purpose of the technique is to facilitate group consensus around a particular topic. Thus, this approach was used to determine if there were common natural resource issues or concerns among participants.

July 2004, seven (n=7) landowners participated in the third landowner forum and informal dinner. At this meeting participants openly discussed ways to encourage other landowners to participate in future community forums, as well as the resource education and information needs of area landowners.

March 2005, landowners and resource managers were invited to participate in an exercise to evaluate a newly created computer-based forest management decision education tool. Following the exercise, participants were asked to respond to a short written survey. Seven (n=7) landowners and two (n=2) resource professionals attended. This meeting also included an informal dinner.

A core set of five (n=5) landowners participated in each community forum.

Collaborative ecosystem stewardship focus group - The final landowner meeting

consisted of an informal dinner and two focus groups held June 2005, in the meeting room of a local restaurant. This event was designed to meet two criteria. First, to hold a focus group whereby landowners in the study area could view study area maps with color coded parcels digitized in GIS to collectively compare and contrast various management scenarios and have a discourse regarding potential long-term landscape consequences. Second, to conduct another focus group to assess the processes associated with forming a landowner-driven collaborative ecosystem stewardship group. Therefore, invitation letters and reminder post-cards were mailed only to landowners that had participated in at least two community forums and one field day or workshop. A focus group protocol (Appendix C) was closely followed, allowing flexibility to pursue some topics more when necessary. Five landowners ($n=5$) participated in a focus group and everyone sat at the same table, allowing all participants to be visible to one another and the moderator. The session lasted about 1 hour and another graduate student took detailed notes.

Two focus group activities were created to assess the processes for encouraging the formation of a collaborative ecosystem stewardship group. First, participants were prompted to discuss the following questions: (1) What did you like best about the collaboration and incentive mechanisms employed during this project? (2) What were some impediments to forming a collaborative ecosystem stewardship group in general? (3) Can you provide some suggestions that may encourage landowners to support the future formation of a collaborative ecosystem stewardship group? Second, focus group participants were given three different colored stickers (blue = first choice, red = second

choice, silver = third choice) and asked to rank given reasons for managing their land by placing each sticker next to their preference.

Field days and a demonstration workshop - To potentially augment the number of participants and to address educational suggestions made during early landowner forums, field days and a demonstration workshop were developed. Invitational letters and reminder post cards (Appendix B) were mailed to all landowners in the study area welcoming them to attend and to bring a friend. In September 2004, fourteen participants ($n=14$) attended the first field day, hosted by a participating landowner, and served three over arching purposes: (1) to introduce interested landowners to various wildlife habitat improvement techniques and to show them on-the-ground results, (2) to promote working relationships between private landowners and area resource agency personnel, and (3) to establish collaborative networks among neighboring landowners. To encourage participation, the event was held on a Saturday morning and was scheduled to end at noon. A soil and water conservation specialist from Natural Resource Conservation Service and a private land biologist from Missouri Department of Conservation attended to provide needed technical and resource assistance. A representative from the Eastern Ozarks Forestry Council, a regional landowner-driven organization, attended to promote their membership, and over lunch discussed the organization's mission to support area forestland owners in managing their timber resources. A local caterer provided box lunches and drinks. Participants were asked to bring their lawn chairs, picnic tables, and bug spray.

In October 2004, at the “Coldwater Conservation Area,” a state-managed forest in neighboring Wayne County, the Missouri Department of Conservation and the Eastern Ozarks Forestry Council jointly sponsored a mechanized logging and forest thinning demonstration workshop. Landowners and managers, foresters, loggers, and mill operators were invited via flyers, radio and newspaper advertisements, letters, and word-of-mouth to attend a free demonstration of conventional and novel forest logging technologies. Although this event was not created expressly for the purposes of this research project; nonetheless, landowners from the study area were expressly invited via mailed letters that included an information flyer one month prior to the event. The letters were followed by reminder post-cards two weeks later. This event was exceptionally well attended by over 150 landowners, forest-workers like loggers, mill owners, and resource agency professionals. However, only two (n=2) of the landowners from the study area attended this event.

Due to oncoming seasonal weather and various hunting seasons, field days and demonstration workshops were discontinued until the following year. In June 2005, landowners were invited using the established protocol to attend the final field day/demonstration and lunch held at “Amidon Memorial Conservation Area,” which is owned and managed by Missouri Department of Conservation. An agency forester and a private land biologist led the participants on a short walk around the property. Along the way, landowners saw and discussed various ongoing wildlife habitat management activities. The landowners also viewed several forest stands, each with different management regimes. A local caterer provided box lunches and drinks. Due to

unforeseen community conflicts, such as a community picnic and parade for soldiers coming home from war, only three landowners attended the demonstration.

Phase III Technological interventions

A key component of this case study is to employ action research techniques using “intervention experiments” in the form of technological innovations such as testing a forest management decision education tool and the use of GIS generated maps to facilitate a focus group on collaborative ecosystem stewardship.

Forest management decision education tool - Natural resource managers and landowners were invited to a meeting to assess a computer-based forest management decision education tool (Larson 2004). The tool was designed to educate landowners with little or no knowledge of forest management and elucidate silviculture options for their individual forest stands. First the tool was demonstrated to the entire group using hypothetical forest stand data and various management scenarios. Then participants were permitted to “test” the usability of the program for themselves using laptop computers at individual stations. Following both the group demonstration and the individual assessments, participants were asked to respond to a complete a short survey (Appendix C) to evaluate the tool.

Geographic Information System (GIS) maps – a tool for land use planning - Descriptive data collected from the interviews and the forest management decision education tool survey aided the production of a landowner derived land use preference map through a GIS framework. This process used a minimal number of base data layers and customized ArcView applications in conjunction with the Spatial Analyst extension.

The original research protocol called for digitally displaying the land use map and having an interactive, real-time discussion. However, the computational power to achieve this was not available, and thus, a paper map was used. Individual parcels were marked using different colors and patterns to represent seven general land use descriptions (Table 6). The purpose of the map was to facilitate a focus group whereby neighboring landowners could collectively compare and contrast various management scenarios and their potential long-term landscape consequences, both positive and negative. A focus group protocol (Appendix D) was closely followed, allowing flexibility to pursue some topics more when necessary. Five landowners ($n=5$) participated in the focus group and everyone sat at the same table, allowing all participants to be visible to one another and the moderator. The session lasted about 1 hour and another graduate student took detailed notes.

Table 6. Land use descriptors for study area map.

Symbol	Land use category
	No management goals
	Unknown (non-participant or trust)
	Managed for timber production (written plan)
	Managed as a woodland (no written plan)
	Managed for wildlife habitat (written plan)
	Managed for wildlife habitat (no written plan)
	Mixed use agriculture (livestock, crops, woodland)

Data Analysis

Phase I: Semi-structured phenomenological interviews

Qualitative data analysis proceeds through the methodology of reduction, the analysis of specific statements and themes, and a search for all possible meanings. The researcher must also set aside all prejudgments, thus bracketing his or her experiences and relying on intuition, imagination, and research protocol to obtain a picture of the experience. All interviews were digitally recorded and transcribed verbatim, along with accompanying observations and comments. Identifying characteristics (names, geographic places, names of work places, etc.) were removed. Following transcription, the text documents were uploaded to a computer-assisted qualitative data analysis software program, Qualrus, Version 2.1.0.3 (Idea Works, Inc. 2002), that uses an array of computational strategies to assist with coding and qualitative data analysis. The transcripts were then coded using a grounded theory approach. It requires that the generation of theory, whether novel or building upon previous theory, be grounded in empirical data and that it occur through an inductive analysis. This approach employs three coding strategies: (1) open – denoting and labeling major categories and themes, (2) axial – examining those categories in greater detail and creating rich descriptions, and (3) selective – synthesizing major coding structures to find underlying relationships that may lead to theory (Strauss and Corbin 1998). It is important to note that though an inductive approach was employed, coding and subsequent analyses were informed by the conceptual framework (Figure 4) guiding the research.

Phase II: Collaboration incentives and mechanisms

Additional qualitative data collected throughout the duration of the project via field notes and reflective journal entries were later incorporated into the qualitative text analyses, serving to anecdotally supplement and clarify the research findings. Focus group analysis began almost immediately afterward when the moderator and the other team member informally shared their thoughts about the session. Primary analysis was conducted based on the notes taken during and after the session. Responses to each question were summarized and categorized, with participant comments provided for clarification and support.

Phase III Technological intervention

Forest management decision education tool survey - Seven attributes of the forest management decision education tool (FDET) were evaluated by asking participants to respond to a set list of questions with a corresponding ordinal or Likert scale of 1 (totally disagree) to 5 (totally agree) (Appendix C)). Statistical analyses were performed using the SPSS 13.0 version.

Focus group using GIS generated maps – Focus group analysis began almost immediately afterward when the moderator and the other team member informally shared their thoughts about the session. Primary analysis was conducted based on the notes taken during and after the session. Responses to each question were summarized and categorized, with participant comments provided for clarification and support.

CHAPTER 4. RESULTS

This chapter presents and discusses the results of this effort to examine southeastern Missouri Ozarks NIPF owners' relationship with their land, their neighbors, and their community, as well as their attitudes and beliefs regarding ecosystem stewardship in landscapes dominated by privately owned forestland. Concurrently, this investigation sought to assess the process and potential consequences when forming a local private landowner resource group that may engage in collaborative decision-making activities with the ultimate goal to sustain forested resources and their associated ecological benefits on NIPF in Madison County. Using semi-structured phenomenological interviews this project sought qualitative data focused on the ecological and social contexts as they presently exist in the Missouri Ozarks. To ensure anonymity, identifying characteristics were omitted and number combinations were randomly assigned to the transcribed interviews. For example, data associated with key informant and landowner interview numbers are prefaced by 'KI' and 'LI' respectively.

Phase I: Semi-structured Phenomenological Interviews

Key informant interviews

During the summer and fall of 2003 and through the spring of 2004, seventeen (n=17) key informant interviews were conducted with natural resource managers, community development professionals, and non-governmental organization members. The interviews attempted to ascertain resource characteristics which include historical forestland use, levels of natural resource stocks and current forestland use, and local forest issues. In addition, the interviews wanted descriptions of community environmental perceptions

and values, resource management incentives, social networks and trust, and factors which may affect a landowner's propensity to collaborate, or not.

Ecological context

Resource Characteristics

Historic forestland use

The forested, glade, and cliff communities found in this area of the Ozarks are unique and found no where else in Missouri. Prior to Euro-American settlement, igneous glades and open-oak woodlands occupied the exposed slopes, while shortleaf pine-oak forests and woodlands occupied the hills and ridges. From the late 1800s to the 1920s the forests of the Missouri Ozarks were heavily harvested and natural processes were seriously altered. The forested areas adjacent to the rivers were cut first using steamboats to transport the timber; later railroad trams were constructed to access the interior of the Ozarks. The over-harvesting changed the historical spatial configuration of dominant tree species which resulted in landscape scale conversions from predominately shortleaf pine and white oak stands; thus, allowing black and scarlet oaks to move in. The over harvesting activity, along with fire suppression which permitted subsequent red cedar encroachment, not only hastened declining forest health in the Ozarks, but are also a contributing factors in present-day woodland glade complex loss. However, recent efforts by the Missouri Department of Conservation are underway to restore some of these degraded areas through the use of prescribed fire and long-term stewardship plans across both public and privately owned lands.

Levels of natural resource stocks and current forestland use

Today, forest management and land use across Madison County are as varied as the resources themselves. While there is a mix of public and private land, the county was described as,

“...the majority of the northern part of the county is more pastureland with here and there woodlands. The southern part of the county is primarily forested with continuous private forests in between the Mark Twain National forest.” (KI-103)

Adding to the historical account of unique resources found no where else in the state a respondent noted,

“I’d call it pretty rich and diverse as far as natural resources are concerned...we’ve got a little bit of what the whole state has to offer right here – a little bit of agriculture, a little bit of this and a lot of that. There’s nothing you can’t get here, the hunting and fishing can’t be beat.” (KI-106)

KI-102 agreed with this assessment saying, “I view this area as the most important in the state...it’s also my favorite part of the state and that’s why I’m working here.”

Local forest issues

Key informants indicated a number of issues, ranging from economic drivers to ecological change to social change, which challenge the implementation of sustainable forest management at broad spatial scales. It was suggested that today’s stewardship efforts must first take into account the past land uses and the results of it. One respondent described a view of resource changes in the Ozarks and the present difficulty in managing forestland associated with these changes.

“...what we’ve lost since the turn of the century are these woodland-glade types...every landowner can recognize a glade, but there are associated layers around there where there is usually poor timber, rocky and it’s not really glade and it’s not really forest. Well, that’s due to different styles of timber management over the last 100 years and aggressive fire control, etc. As a result, a lot of those woodlands that were very rich as far as plant and wildlife habitats, have kind of grown up with some of these black and scarlet oak stands, which we wouldn’t normally consider to be good growing timber sites...now we’re trying to grow black and red oak on them because they have economic value, which makes it harder to manage those areas for the habitat it wants to be and was historically, which is a woodland.” (KI-105)

Other key informants noted concerns such as oak borer, oak decline, and deteriorating forest health in general, as increasingly important forest issues across the Ozarks. Adding to the degradation of forest resources is the concept of parcelization. KI-109 indicated that, “...some of the larger tracts of land that have been owned by big timber companies and other large landowners are currently being sold off in to smaller acreages and that has had a real big effect here.”

In addition to ecological change, one person alluded to recent social changes as being just as taxing, if not more so, on the skill set of resource managers then is addressing the physical stewardship of forests themselves.

“Right now there is a kind of a clash of cultures going on here. The county is beginning to get a lot of St. Louis residents who are buying land for hunting or recreation or something else. So we’re seeing a clash in land uses between the local landowners and those not from here. For example, city or urban people are calling and complaining about timbering activities – saying that their neighbors can’t cut their timber ‘cause it’s next to their timber.” (KI-103)

Another agreed and added that the general lack of forest resource knowledge is compounding the stewardship challenge. An illustrated example,

“I’ve gotten a couple of complaints that have gone to the central office, from landowners saying, ‘Oh, well, they are wrecking this and they are driving through creeks...’. When I go out to check a site that someone has called about, all the BMP practices are fine, it seems that the neighboring landowner just simply didn’t want the other landowner to log their forest. There seems to be a real lack of understanding concerning timber practices.” (KI-105)

Across all interviews, it was unanimous that educating landowners is paramount to encouraging stewardship on private lands. On the other hand, one interviewee went as far to say,

“I really think that maybe rather than focusing on current landowners, we probably need to be focusing more on our schools, you know talking to kids and talking to the people teaching kids – because I know outreach and education...I would like to see more programs oriented toward educating local kids regarding their forests and natural resources and stuff like that.” (KI-101)

Indeed, enlightening the next generation and how to engage them in stewardship practices is a vexing issue confronting all professions associated with natural resource management.

Social context

Community Environmental Perceptions and Values

Resource management incentives

The range of programs that encourage sustainable resource management on privately owned forestland is quite limited and increasing fiscal constraints at all institutional levels is a compounding factor in developing and implementing resource incentives.

“Other than the creation of MDC’s Private Lands Conservation Division, I can’t think of any efforts directed just at private landowners.” Continuing, “Well, the recent Farm Bill’s cost share programs have actually set aside some money for forestry and natural resource issues.” (KI-103)

Obtaining financial sources or reimbursement through cost share programs is neither guaranteed nor equitable. Many landowners in the Ozarks are land rich but cash poor and are not able to front the money for conservation projects and hope the funds are legislatively appropriated. In addition, according to one resource manager, a mix of local and absentee landowners, mostly with parcels in the 100 – 400 acres range or higher, primarily use cost share programs; however a majority of landowners across the Ozarks hold forested parcels of less than 100 acres. Thus, only a very small segment of the overall population of private forestland owners is accessing available programs and funding sources.

Further complicating the involvement of area landowners in resource management incentives is the lack of communication and coordination among the land management agencies at all institutional levels.

“There have always been efforts, both at the state level...and at the federal level...trying to provide some forestry support...” but the confusion occurs because, “...programs are delivered different ways on the county level.” (KI-106)

“...individually there has been some effort to promote healthier forest stewardship but we’ve never had a consistent large-scale program that was universal across counties.” (KI-116)

In an effort to overcome fiscal and institutional constraints, forest stewardship has been encouraged through educational opportunities and face-to-face interactions. For instance, a local landowner-driven group organized ‘woods walks,’ and before passing away, a

prominent and well respected landowner often invited other landowners to his property to see forestry stewardship in action. These programs are popular because they don't require a lot of funding, but on the other hand, they do require a person willing to dedicate their time to developing such events. It is important to note that to date neither of these approaches has been used in Madison County even though,

"...the landowners here have always gone somewhere else for it...it hasn't been held here even though the attendance from Madison County is fairly high." (KI-105)

This point underscores the need for creating similar informal forest stewardship education opportunities in Madison County.

Networks and trust

Key informants described area landowners as independent, self-reliant, very private people and, "...typically not wanting any outside influence, whether that comes from the government or from neighbors or who ever." (KI-104) In concurrence, "As far as cultural differences here, they are typical 'leave me alone' landowners." (KI-109)

These views were supported by responses which indicated that many landowners in this part of the Ozarks have serious and deep-seeded trust issues with anyone associated with state or federal government. The distrust has roots in years of poor relations between area landowners and professional natural resource managers. For instance, locals remember when the national and state forests were formed from private lands; they are still angry. Furthermore, the expressions used by many resource managers automatically cause some landowners to be resistant to advice.

“...the guys in green are not popular around here. And a lot of it has to do with vocabulary. For example, when they come out to talk, they say, ‘my land’ or ‘our land’ and everybody here thinks, ‘No, it’s my land.’” (KI-105)

A different aspect contributing to the misgivings of area landowners is the inability of land management agencies to adequately communicate their role and what they can offer.

“The biggest problem is that most people seem to be confused as to what the different agencies do which results in frustration on their part. They lump all the agency folk together, people are not sure what the difference is between the Forest Service versus MDC versus the city versus DNR. There is also the really big issue of environmental control. There is a lot of distrust where regulations are concerned, which is normally the job of DNR, but I don’t think people generally make that distinction.” (KI-103)

Another interrelated factor complicating the trust issue is the perception of outside environmental organizations and their attempts to influence land management policy in the Ozarks.

“This area does suffer from its share of radical environmental groups. The [blank] club, eco-something, they are fairly radical group, and so people have become really guarded because it’s the idea that some who never use the land in the county, is not a resident of the county...will attempt to force policy in this area...we definitely have some environmental extremists trying to force policy in the area using lawsuits and people here are very touchy about it.” (KI-106)

Factors affecting collaboration

One noted impediment to collaboration and sustainable NIPF management is the concept of sustainability itself. When describing the perceived sustainability view of area landowners, several respondents believe that local Ozark landowners have an extremely short-term view regarding the future of natural resources in their watershed. Despite its resource extraction history, this area of Missouri has not experienced readily evident

changes on privately owned forestland during the past 50 years. Consequently, the concept of forest sustainability and the need to collaborate in order to protect the resource is difficult to grasp for most people living in the Ozarks. However, some resource managers are, "...seeing this perspective gradually change as more forestland is being bought by absentee and/or non-resident landowners." (KI-107) This may be due to the increased economic and education levels often associated with persons able to purchase land for non-commodity reasons such as recreation, aesthetics, and retirement homes.

When describing area landowner willingness to collaborate on ecosystem stewardship, agency personnel were very skeptical regarding the development of a formal group due to trust and private property rights issues. Compounding these issues is the inherent difference between individuals and the competitiveness among some area landowners.

"There is not one single attitude that is going to typify what you are going to find here. Sometimes neighbors will go in together to get their land cut or marked for sale and sometimes they'll work with another landowner that they respect or with an MDC professional...but just like taking livestock to an auction, they will never tell another landowner what they got paid for their timber" (KI-105)

If it is possible to form a cooperative stewardship alliance, the collective view of key informants was that it would first occur among neighboring landowners that know each other well. But, the overriding challenge will be actually getting them to participate.

Landowner interviews

Landowner interviews were employed to shed light on current and future individual land use values, as well as their perception of issues impacting local forestland. Furthermore, the interviews explored concepts such as place attachment, networks and trust, and factors which may affect a landowner's propensity to collaborate, or not.

Making a personal contact with and getting private landowners in the study area to participate in the interview phase of this research project was difficult indeed. Despite the many challenges, reasons ranging from family deaths to an individual's ill health to property boundary disputes, as well as a number of parcels held in a variety of legal instruments and the overriding lack of personal trust, fifteen (n=15) interviews were conducted from 2003 to 2005. Details are summarized in Table 7 and described in more detail below.

Table 7. Summarized details for landowner interviews.

	Local Landowner	Absentee Landowner	Total
	33	16	49 (100%)
Interviewed	10	5	15 (30%)
Declined	8	9	17 (35%)
Unreachable	15	2	17 (35%)

Combining both study cells, there are approximately 33 local and 16 absentee land owners, for a total of 49 landowners. This represents approximately a 2:1 local landowner to absentee landowner ratio. This sample size was estimated because parcel ownership was in a constant state of flux as tracts were bought and sold, and as properties were merged and divided during the course of this project. In addition, a number of parcels were held in a variety legal instruments, such as trusts and limited liability corporations (LLC), which meant the owner with controlling interest was difficult to ascertain and contact regarding participation in the study.

Though fifteen (n=15) landowners were interviewed, 17 landowners (approx. 35%) declined to be interviewed and/or to participate in the project. The remaining 17 landowners (approx. 35%) were not reached despite numerous attempts. However, close to 60% of both local and absentee designations were contacted, leaving 40% of landowners (primarily local landowners) in the study were deemed unreachable. Following the interview, respondents were asked to answer a short anonymous demographic survey; however, due to the very small sample size, missing data, and overall survey non-response (n=6) statistical analyses could not adequately be preformed; thus, only descriptive data was summarized in Table 13 (Appendix D).

Ecological context

Individual Land Use Perceptions and Values

Current land use

Responses to questions regarding current and future land uses were as varied as the natural communities found in the Ozarks, ranging from mixed agriculture to timber production to providing wildlife habitat and hunting use to recreation and scenic or nature viewing. Regardless of preference, both local and absentee landowners alluded to the self-determination they feel in using the land as they see fit.

“I like having options, uh, to do what you want to do...I used to live in a place where I rented...I was always restricted...I didn’t have the freedom to put in perennials or breed a mare or plant a tree if I wanted to...um, here it is just a lot different.” (LI-2a)

In terms of deriving an income from their land, only three landowners had a written forest management plan and harvested timber with a financial intent. One of these landowners

held approximately 750 acres, another held approximately 3,000 acres, and the third held a 145 acre residential parcel but managed over 8,000 acres. These landowners cannot be considered representative of a typical forestland owner in Madison County because four interviewed landowners held acreage in the 145 – 280 range, while the remaining eight landowners held less than 100 acres each. Moreover, a majority (n=12) of the interviewed landowners indicated that they did not want or need to derive income from their land; it wasn't their primary reason for ownership. Consequently, in order to achieve meaningful resource sustainability on NIPF stewardship options must be presented to landowners as a means to achieving non-commodity land use goals such as increasing wildlife habitat for hunting and viewing or improving stream habitat and water quality. One important point elucidated through the interviews was that natural resources managers ought to learn to respect and accept a landowner's choice to not manage their land in the modern sense. Those forestland owners without a written management plan did not understand the need for one. For instance, a respondent described their land use as simply, "...just a place to be. Nothing more than that." (LI-10)

Illustrating another view,

"...I've been on this land all my life, why do I need someone else to tell me what I should and should not do? ...I know how to take care of my land, keeping cows out of the stream, taking out sick trees and whatnot...just 'cause I don't have it written down doesn't mean I don't have a plan in my head...I find it insulting...at least I'm not selling my land to the highest bidder like some folks 'round here." (LI-13)

Echoing this sentiment,

"I was born and raised on this property...my father retired from [blank], he spent almost 30 years working in the [blank] marking timber for sale and in the summertime he took care of the recreation areas in the park...so, we've never had a written management plan exactly and dad left high school early but we've always taken good care of the land...we only harvest the dead and dying and the mature trees. So our timber stand is probably improved over the last 40 years, more so than a lot of other places, without having anything official written down." (LI-12)

Though deriving income from their land is generally not the primary reason for ownership, stewarding land does take money. Thus, approaches such as conservation easements held by qualified land trust organizations or Purchase of Development Right (PDR) programs may be appropriate for the Missouri Ozarks. Both provide a substantial economic enticement in the form of state, federal, and estate tax breaks while preserving land in perpetuity. What makes these incentive programs unique is that they aren't tied specifically to having a written plan, which many cost share programs necessitate, but still require appropriate land stewardship practices be maintained.

Future land use

When asked to describe future land use intentions and how it may impact forested areas and associated natural processes, some respondents described forest resources in general as having little change during their lifetime and/or they didn't expect the forested landscape to change much in the future; and therefore, didn't see the point on trying to restore forested systems that in their view hadn't really declined. More importantly, landowners did not indicate a connection between their individual land management choices and potential forest resource declines along with related issues such as soil erosion and water quality.

Alternatively, one respondent had indeed noticed forestland use changes across the landscape by pointing to the increased housing density; especially in forested areas. The landowner further supposed that housing development will only grow in the future, saying,

“I can think of two big subdivisions within a mile of me right now, and I never dreamed that would happen. They are just carving places out of the woods, if you can carve it someone will buy it.” (LI-1)

Probing of their future land use intent and ownership realities revealed that some respondents had discussed inheritance and stewardship issues with their families, while others had not. Upon asking them to describe how their heirs will steward the property, only four owners could confirm that the land would remain in a working context, as opposed to being divided up into smaller parcels and sold off. Two respondents had written timber management plans, and one father and son had a written stewardship plan aimed at enhancing wildlife habitat.

Local forest issues

Similar to land use responses, a variety of issues intertwined with forestland stewardship were expressed. For instance, one interviewee was concerned with ATV trespassers on private land, one local owner was angry that an absentee owner tried to stop a timber harvest on his land, two were concerned about a large pig farm upstream from their property, and another alluded to repeated stream contamination from a local wood products mill.

A noted problem associated with owning forestland is improperly and inaccurately marked parcel boundaries which had led to issues like timber theft and wildlife poaching.

“Yeah, a really big problem down here is the property boundary thing...I mean it’s mostly forest down here and nobody really knows where the lines are anymore, heck if three surveyors looked at the same piece of land none of them would agree, some of the deeds are old so there’s a lot of disagreement between landowners as to who owns what exactly” (LI-7).

One NIPF owner strongly expressed discontent regarding timber theft and the difficulties encountered in recovering the loss,

“...we had some logger come over onto our land like 100 feet, taking some of our best trees...I took the landowner and the logger to court and I had a hard time finding a lawyer to take the case...it was a joke, the courts don’t take it seriously and nothing really happened ‘cause they said I didn’t have my boundary line marked properly...well, I tell you I was mad as [expletive] about that, I mean shouldn’t the logger have some kind of responsibility in that? It’s just wrong!” (LI-4).

An absentee landowner talked about trespassing and wildlife poaching saying,

“I can’t get down there every weekend, but my son and his friends like to hunt so we’ve put in a bunch of food plots...the problem is when we’re not around people just use our land and they leave ruts in the ground, make fires on it, leave trash and beer cans, and help themselves to the deer and turkeys out there. Now, I know I don’t own the wildlife but they think they can just do what they want because they hunted the property before I bought it...” (LI-6).

Another landowner described similar abuses occurring regularly on his land.

“We know they are coming off and on. We have a problem with young people in that creek shooting towards our farm, shooting in the stream. I’ve had to remove two groups and they’re not nice [extra emphasis] about it. When they find out they’re on your land they still think ‘Well, my father lived down here for years and he did what he wanted,’ they still have that attitude. We’ve even had people tell us ‘We’re gonna hunt on your land whether you like it or not cause we always have.’ It makes me real mad that kind of stuff.” (LI-10)

Social context

Individual Environmental Perceptions and Values

Place attachment

Both local and absentee landowners expressed a long generational and historical attachment to land in the Ozarks.

“I was born and raised here...been in the same valley 44 years...I’ve been able to piece back together some of the original property owned by my family. My great-grandfather had a better part of two sections...and over the years the land was split up and sold off.” (LI-1)

Another interviewee had grown up in the area and moved away as an adult but still owns land in the study area. He proudly related that their land has remained in the same family for several generations and told stories of family members that were forced off their land in the South, mostly in response to Civil War disruptions, thus settling this area of the country.

“We’d like to keep this land in the family because that piece of the land, you know that 80 acre parcel you were on, has always been in my family...from my great-great grandmother’s day all the way to now...it’s got a lot of civil war history, they shot one of my great-grandfathers and hung a couple of others because they were out of South Carolina and they came here to settle.” (LI-9)

There are also nearby resources and places identified as important or special to them.

“I like hiking...just hiking in the mountains – up over Tomsauk Mountain is great, the Amadon Forest, the shut-ins is a place where the Castor River narrows, just east of town here. Oh, we like hiking over by the Current River some, too, but that is almost two counties away.” (LI-1)

“My great-grandfather’s home was down there on a place called the Blue Hole...my cousin and I used to spend a lot of time there when we were 11 years old, swimming and playing, we had a good time. I spent a lot of years with my grandfather down on his farm down there.” (LI-9)

Adding with a tone of disappointment, "...now it's a junk store."

An absentee landowner nicely summed up sentiments expressed by all.

"The entire Ozark region is special to me. The whole system. As I told you before, I've probably dipped a flyer rod in every stream down there somewhere. I just love the whole place." (LI-6)

Networks and trust

This interview data supported the notion suggested by the key informant interviews that there is a long standing and deep-seeded distrust of government agencies. For instance, when asked "Do you feel that you can trust county or state natural resource agencies for information or advice on your land?" One landowner practically exploded, answering,

"NO! I do not trust many in any government agencies. Somebody says, 'I'm from so and so agency and I'm here to help'...well, my experience with governmental agencies overall has been that they can never do as efficiently as they claim...they are going to do it by their grand management plan, whatever that is." (LI-8)

Lack of trust can also be extended to landowners who are considered outsiders. When asked "Do you feel as though you are part of the community?" landowners that grew up here and still live here all agreed that they felt connected to the community in general. Not surprisingly, some absentee landowners recognize the difference.

"No, I know I'm an outsider. I think it would take, if I lived there full time that would be accepted...as it is right now, I'm still seen and will always be seen an outsider that is there...It's not quite as bad as somebody coming from St. Louis coming and owning the land, but they're always going to look and say, 'you're an outsider, you don't live here, you're not from here, you don't make your living here'." (LI-8)

Not all absentee landowners felt that they were considered an outsider though. One explained,

“I don’t feel like an outsider because my relations, like I say the place we own even...I’ve got a whole history...my people came to this country in 1750 and I’ve got it traced all the way back from there to presently at this location, our farm.” (LI-9)

A married couple that recently moved to the area gave a mixed response because their community interactions are limited to only a few landowners and they do not participate in community events like church or clubs,

“Not too much really...we don’t do the church thing or other town stuff...with our neighbors, I mean, that’s our main relationship to the community...and then that relates out to his sons, and people that live just down the road. And in the summertime, when we buy hay, we get to know the seller pretty well...the hay people, that’s one of our favorite relationships...we get to be friendly, see them year after year. We look forward to that, you know, seeing them.” (LI-2a and LI-2b)

Overall, distrust and suspicions aimed at “outsiders” were readily evident as the number of landowners consenting to talk with me for this study was few compared to the overall number of landowners. This may have occurred because many of landowners in the study area are related either by blood or marriage and as a result the tracts of land are often sold and traded amongst one another. Thus, a key finding of the interview process was that if one landowner declined or could not be reached then, and not too surprisingly, related landowners also declined to be interviewed or simply could not be contacted. This effect also occurred with unrelated but neighboring landowners with whom they have friendly exchanges.

Factors affecting collaboration

In terms of willingness to collaborate, an informal assistance network already exists among a few neighboring landowners for the purposes managing their farms, prescribed burning, or timber and wildlife activities. But, most were quite suspicious of a formalized

alliance and were unsure as to why they would need to participate in a local landowner group. This may stem from their overall lack of trust for land management agencies and outsiders, as well as a deep-seeded fear that if they started down that road it would result in more land regulations or that the process would be mandated.

Another aspect preventing landowners to work together in a collaborative decision-making atmosphere is the perceived line drawn between “the from here’s” and “the from there’s.” The influx of new landowners and their different ideas about what is considered “right” or “wrong” activities in forested landscapes is a cause of concern for many long term local landowners.

Also inhibiting a formal joint resource management group from taking root in this part of Missouri is the independent, self-reliant, private nature of the landowners themselves. For instance, one respondent said,

“Well the people I know are nice people. They mind their business and I mind mine. If I ever meet them or need them I am sure I could have help. And I would do the same for them. But they keep to themselves and I keep to mine [emphasis added].” (LI-13)

Summary of Interviews

There are about 14 million acres of forestland in Missouri and approximately 83% of it is privately owned; consequently, meaningful long-term stewardship of forestland and its associated ecological benefits are largely in the hands of NIPF owners.

Historically entrenched private property rights views is one impediment to achieving sustainable forestland management on privately owned land. This issue is especially prevalent in the Ozarks region of Missouri and will indeed be difficult to overcome.

However, landowners in the study area demonstrated their strong emotional ties to geographic places such as where their land is located, other nearby natural resources, and in some instances to the local community as well. Leveraging these attachment feelings, for instance encouraging stewardship practices to protect the legacy of their land or their community's way of life or the rural landscape, may be one approach to promoting creative stewardship programs without actually having to overcome ingrained property rights beliefs.

The trust issue is much more difficult to address because the responses were varied, the root causes were individualized, and the level of distrust with regard to government agencies as opposed to other landowners are two separate issues. In general, data provided through the interview process suggested that distrust levels are often related to time spent living in the community and following through on promises made. Therefore, investing time and hard work with NIPF owners, as well as demonstrating patience and persistence, may in fact lessen the degree of distrust embedded in the social fabric of the southeastern Missouri Ozarks.

Although landowners described positive attitudes toward the concepts of collaboration and ecosystem stewardship, much like the key informants indicated, their propensity to participate in a formalized group is uncertain. Informal networks currently exist among a few neighboring landowners and these relationships and processes warrant further exploration. Meanwhile, using established informal networks over time to build a more cohesive, somewhat formal collaborative decision-making group may be an appropriate technique. The caveat, however, is similar to addressing the trust issue because the

collaborative ecosystem stewardship approach to sustaining forested landscapes in the Ozarks will take a great deal of time, persistence, and patience on behalf of an organizer.

The overriding challenge facing forest management in the Ozarks was eloquently expressed as the ability to strike a balance between sustainable harvests with long-term forest stewardship and the ever-changing societal demands on all forests.

“We’re in forested habitats and society are always going to require timber products and forest harvesting is always going to be part of the local environment, but how to do that with some forethought and long term stewardship is kind of our challenge, to show people the way so to speak.”
(KI-102)

Phase II: Collaboration Incentives and Mechanisms

Landowner forums and informal dinners

Interviews revealed that though Madison County landowners often attend forest management related programs in neighboring counties, to date none had been offered within the county. It was also noted that the recent influx of new landowners is creating social tensions, and therefore, neighbors aren’t developing the traditional networks and relationships. Thus, it was reasoned the formation of a collaborative ecosystem stewardship group may be facilitated via informal occasions presented in a relaxed atmosphere in which landowners could meet one another and discuss common issues or concerns. If warranted, these opportunities should be held on a regular basis.

It was critical to create forums having a structured agenda thereby encouraging interaction and discourse among participants. At the first open forum maps were displayed of the study area with individual parcels digitized in GIS. Following and informal dinner provided by a local restaurant, attendees were asked if they could identify

their property on the map. Using landscape identifiers such as creeks, streams, and roads, to place themselves on the map, the process opened a friendly discussion regarding who lived where. And for the first time some landowners were able to put a face with people that lived over the ridge, across the creek or down the road from them. At the close of the forum participants were asked if they would like to continue meeting on a semi-regular basis. The support was unanimous.

Across the country past joint decision-making groups often formed due to a specific crisis or issue. However, different people are concerned by different things and in the study area there was not one readily evident issue around which to coalesce. Therefore, following dinner at the second forum the Consensus Method (ICA 2002) technique was used to clarify common issues or concerns among participants. The following question was posed to landowners: What are some of the natural resource issues or concerns of private landowners in your area of Madison County? This question was chosen because both the landowner and key informant interview data from Phase I indicated that no single common concern existed among those interviewed. However, after guiding participants through the Consensus Method, four topics of concern emerged. The topic categories were named by the participants, not the facilitator, thus creating agreement or consensus and personal ownership around the suggested issues.

- government accountability
- forest and wildlife management
- water quality and stream structure quality
- respect for private property

After naming the categories, a discussion of each topic was facilitated, with an eye toward focusing on an issue that could be jointly addressed. Though the topic of

government accountability stirred up strong emotions, the issue was not directly related to individual land stewardship, and therefore, was beyond the intended scope of the group. Participants felt the remaining topics were issues that could be explored and suggested educational workshops, and more informal meetings to encourage the interaction of area landowners. It is important to note here that they looked to the facilitator to create, organize, and implement the ideas. Neither internal group leadership skills nor group or individual capacity to self-organize was a reality.

Attendance at previous open forums was low relative to the overall number of landowners in the study area. As a result, the third meeting consisted of an informal discussion during and after dinner regarding ways to encourage more landowners to participate. Highlights of the conversation are summarized in bulleted points.

- Participants could invite a friend or neighbor to come with them
- Try varying the meeting days or times, maybe a weekend day
- Advertise the meetings in the local newspaper, or hang flyers at the feed store or in local shops
- Have activities or speakers that interest area landowners

The first two suggestions were incorporated into the design and implementation of field days and the demonstration workshop. The third bulleted point, while crucial to developing an interest and encouraging participation on a larger scale, county-wide for instance, it was not appropriate given the limited scope of this research project. The final bulleted point led to a general discussion regarding stewardship interests and education needs of landowners in the study area. Field notes and participants comments are summarized below in Table 8.

Table 8. Stewardship interests and education needs of area landowners

Stewardship interests and education needs of area landowners
Field days & workshops were interesting and fun
Personalized letters instead of mass mailings
Dinners were a nice; especially for night meetings and those that traveled
Meeting places were easy to drive to or find
Forestry and wildlife habitat education – especially appreciated by landowners from urban areas or landowners new to the county
Nice to meet other landowners with similar interests

Field days and a demonstration workshop

Based on information gathered via the open community forums, a field day was held one Saturday on a privately owned property within the study area. The event was created to show recent land management activities designed to enhance wildlife habitat, for quail in particular. To support positive connections between landowners and resource managers, a Missouri Department of Conservation Private Lands Division biologist and a Natural Resource Conservation Service employee were invited to explain what activities were occurring on the property and to answer technical questions. A representative from the Eastern Ozarks Forest Council, a regional landowner driven not-for-profit group, was also invited to extend an invitation attend their meetings. This event received encouraging comments and attendees suggested that similar occasions were warranted.

To promote forest management education in the Ozarks a mechanized logging and forest thinning demonstration workshop, jointly sponsored by the Missouri Department of Conservation and the Eastern Ozarks Forestry Council, was held on state-managed forest in neighboring Wayne County. This event was not created expressly for the purposes of this research project; nonetheless, landowners from the study area were expressly invited. Over 150 people were present at this event, but only two landowners from the study area

attended. Since a vast majority of the specifically invited landowners from Madison County don't own or manage their property for commodities, the timber extraction oriented demonstration workshop was not of interest to them.

The second field day was held at "Amidon Memorial Conservation Area," which is public owned and managed by Missouri Department of Conservation. An agency forester and a private land biologist led the participants on a short walk around the property. Along the way, landowners saw and discussed various ongoing wildlife habitat management activities. The landowners also viewed several forest stands, each in varying stages of forest management regimes. This opportunity also received constructive comments and appreciation from participating landowners.

Collaborative ecosystem stewardship focus group

To assess the processes used to encourage the formation of a collaborative ecosystem stewardship group in the study area, the first focus group activity asked participants to discuss three questions: (1) What did you like best about the collaboration and incentive mechanisms employed during this project? (2) What were some impediments to forming a collaborative ecosystem stewardship group in general? (3) Can you provide some suggestions that may encourage landowners to support the future formation of a collaborative ecosystem stewardship group? Responses to each question and participants' comments were summarized and categorized below in Table 9, Table 10, and Table 11.

Table 9. Summary of focus group responses regarding preferred collaboration and incentive mechanisms employed during this project.

Preferred Collaboration Incentives and Mechanisms
Field days & workshops were interesting and fun
Personalized letters instead of mass mailings
Dinners were a nice; especially for night meetings and those that traveled
Meeting places were easy to drive to or find
Forestry and wildlife habitat education – especially appreciated by landowners from urban areas or landowners new to the county
Nice to meet other landowners with similar interests

Table 10. Summary of focus group responses regarding perceived impediments to forming a collaborative ecosystem stewardship group in the study area.

Impediments to Forming a Collaborative Ecosystem Stewardship Group
Time constraints with meeting during the week
Fall is a busy time of year to meet (hunting, holidays, farm work)
Fear of having to open their land to the public
Issues with and perceptions of the Missouri Department of Conservation:
<ul style="list-style-type: none"> • They don't follow through on what they say • Not in private land conservation for the long haul • Constantly start new projects & lose interest in old ones • Unfair distribution of funding and resources; especially cost share programs • Not enough technical assistance, too busy to help landowners • Poor program continuity and follow through

Table 11. Summary of focus group responses regarding suggestions to encourage landowner support of a collaborative ecosystem stewardship group in the future.

Suggestions to Encourage Landowner Support
Hold local meetings and workshops for St. Louis area residents or other absentee landowners
Maybe someone living in the area should organize the events – some fear “outsiders”
Have picnic lunches on a landowner's property – maybe after church on Sundays
Invite more people to attend – not just a small group like this project did
Hang flyers in local shops, advertise in local paper
Promote economic benefits of “good conservation” practices

For the second focus group activity, each focus group participant was given three different colored stickers and asked to rank given reasons for managing their land by placing a sticker next to each preference listed on a poster board. This was a difficult exercise for the participants. Most had difficulty choosing between their first and second choices or their second and third choices. Attempting to ease their discomfort, participants asked for more than three stickers. However, they were only allowed one of each color. Describing the anxiety expressed by group members, one participant explained,

“It’s hard to choose. I mean, improving wildlife habitat and attracting more game is important to me, but being a good steward of the land is just as important. And darn it, leaving something nice for my kids and grandkids is pretty important, too.”

Trouble choosing between options notwithstanding; results from the exercise were intriguing (Table 12). While all participants either chose “for wildlife habitat improvement” or “to take care of land/good stewardship” as their first preference, the category “to improve forest or woodland health” received the most stickers overall. This was closely followed by “for wildlife habitat improvement” and “for heritage or legacy purposes” each receiving three stickers. Along with the reason “for agriculture or farming practices,” the concept of “good stewardship” only received two stickers each. However, the latter reason was ranked as the first choice for those that selected it. Concomitantly, the preferred second choice was “for heritage or legacy purposes” while the preferred third choice was “to improve forest or woodland health.”

Table 12. Ranking of preferred reasons to steward privately owned forestland.

Suggested Reasons for Stewarding Private Land	First Choice	Second Choice	Third Choice	Totals
For timber production			1	1
For wildlife habitat enhancement	3			3
To take care of land/good stewardship	2			2
To improve forest or woodland health		1	3	4
For agriculture or farming practices		1	1	2
To earn income from land				0
For heritage or legacy purposes		3		3
Other*				0

* This option was given in case a landowner had a reason not represented; however, no one offered another reason.

The mixed results may rise from the difficulty participants faced in only being able to select one first, second, and third choice. Regardless, this focus group exercise supported the landowner interview data that NIPF owners in this part of the Ozarks do not primarily own their forestland to derive income from it. Consequently, propensity to steward land is driven by moral or legacy reasons, as well as the desire to enhance wildlife habitat and forest health in general. While the latter reasons to steward forestland are known to professional resource managers, the former stewardship drivers are not well recognized.

Phase III: Technology Intervention

A key component of this project was to employ action research techniques using “intervention experiments” in the form of technological innovations such as testing a forest management decision education tool and the use of GIS generated maps to facilitate a focus group on collaborative ecosystem stewardship.

Forest management decision education tool

Landowners were invited to participate in a planning exercise where they examined a computer-based forest management education decision support tool that provided qualitative information regarding the economic, visual, and ecological impacts of various management choices. After examining the tool, participants were asked to complete a short survey; descriptive statistics are summarized in Appendix C.

Overall, participants thought the education tool was not boring and would be helpful to landowners to understand their forest management options; however, there were a number of issues with this particular version. Some respondents indicated there was too much reading involved and didn't really give them a good visualization regarding different forest management choices and their impacts. For instance, this tool did not mention how to determine which tree is the right one to be cut in a specific stand. It was also noted that the provided pictures only looked at the boles and not the forest canopy, which is where forest management decisions actually take place. Also, seasonal pictures were not included and these depictions are important regarding wildlife habitat use during various times of the year. Furthermore, forest attributes of interest to these landowners, such as songbirds, deer, quail, rabbits, etc., were not included in this education tool.

Geographic Information System (GIS) maps – a tool for land use planning

Invited landowners attended an informal dinner and focus group held at a local restaurant. A land use preference map served to facilitate a focus group whereby landowners in the study area could collectively compare and contrast various transboundary management scenarios. Discourse regarding collaborative ecosystem stewardship scenarios visualized

through GIS generated maps has several potential applications, including but not limited to, landowner education through outreach and extension, the identification of natural resource hot spots, and to facilitate sustainable resource management.

Before addressing the focus group questions, attendees were given a few minutes to look at the map to familiarize themselves with it and where there land was located. After that three main topics were discussed: (1) potential cooperative stewardship scenarios, (2) engaging non-participant landowners, and (3) usefulness of maps for visualization.

First, the group was asked if they would be open to some type of joint stewardship activity. Using creeks identified on the map, projects such as a neighborhood stream team or riparian zone restoration were suggested to get the discussion started. These ideas were well received; members liked the idea of working together to monitor water quality or to clean up the local creek. However, when parcels along the creek marked as non-participant landowners were discussed, the groups' enthusiasm for a cooperative activity lessened. Concerns over negative community or neighbor pressure and possible sabotage of collective efforts were voiced.

Next, collaborative land management activities such as establishing wildlife corridors, managing forest stands, enhancing wildlife habitats, and projects to improve overall ecosystem health were suggested. These ideas met with more resistance than did previous suggestions which focused on area creeks. Private property rights, property boundaries, trespassing, and wildlife poaching were some of the obstacles discussed.

Sensing the lack of support by non-participant landowners may significantly thwart collaborative ecosystem stewardship efforts, the second topic of discussion centered on ways to engage reluctant landowners. Having intimate knowledge of landowners in the study area, focus group members agreed that encouraging these landowners to participate would require that an “insider” (i.e. a close friend, family member, or neighbor) contact them to explain the idea. Also, examples of voluntary on-the-ground projects, as opposed to mandated or regulated practices, demonstrating positive results may be helpful. All agreed that it would patience and persistence to reach disinclined landowners.

Lastly, the participants were asked if colored-in maps of different land uses were useful to, (1) visualize how their land use could affect the health of forestland at a larger scale, and (2) facilitate the concept of collaborative stewardship. The responses, while generally affirmative, were mixed with varying degrees of responsibility regarding how their land uses contribute to overall ecosystem health. One member believed that a small number of landowners, whether enhancing or abusing their resources, would not create a significant imbalance in natural communities. Comments regarding the use of maps to visualize issues or topics which occur at a landscape scale were quite positive. However, much like this research project, the crux of forming a collaborative ecosystem stewardship group lies in actually getting people to participate, as well as engaging them throughout the process.

CHAPTER 5. DISCUSSION

This bound case study demonstrates the difficulty in achieving collaborative ecosystem stewardship in landscapes dominated by private forestland ownership in the southern Missouri Ozarks. For example, the initial data collection phase attempted to conduct face-to-face interviews with all private forestland owners within the study area. Interestingly enough, approximately one-third of the sample consented, while about one-third declined, and the remaining third could not be reached despite numerous attempts. In essence, one-third was interviewed while two-thirds were not, which is obviously not an encouraging response rate. A myriad of complex and interrelated reasons such as long-standing property rights issues and historically entrenched distrust of outsiders certainly hindered the interview phase of the study. Furthermore, cold calling landowners on the phone prior to meeting and developing relationships with landowners only served to increase their distrust and suspicions of the interview effort. Future research must recognize that nurturing and cultivating trust will vary from place to place; regardless, the principal investigator must be prepared to commit at least the first year of the project to living and socializing in the geographic community. Thus, establishing a foundation of trust and developing the relationships necessary for forestland owners, especially in the Missouri Ozarks, to consent to be interviewed and agree to participate in the collaborative process. Further complicating the collaborative ecosystem stewardship portion of this project were insufficient levels of capacity to sustain the effort in absentia of the principal investigator.

Capacity to collaborate

Increased capacity contributes to empowerment which has been shown to lead to sustained and meaningful actions, particularly those related to conservation efforts (Figure 2). However, an assumption inherent in most natural resource management plans that involve the publics' participation is that stakeholders and the agencies involved possess adequate levels of capacity to engage effectively and efficiently in collaborative decision-making processes. As previously discussed in detail capacity can be divided into three broad categories with interrelated characteristics: institutional, community, and individual.

Institutional capacity

Existing within resource management agencies at local, state, and federal levels are individuals with the desire and skills to lead, encourage, and support the concept of collaborative ecosystem stewardship on privately owned forestlands. However, a number of institutional constraints beyond staff-level control hinder efforts to develop meaningful and long-term capacity to sustain such an effort. Despite the public personification that natural communities dependent on privately owned lands are a priority for many resource agencies, the institutional will to support the extensive and time consuming efforts necessary to effectively engage the general public is simply not there. The fiscal and staffing constraints placed on private landowner outreach and education is significant compared to budgets aimed primarily at managing public owned lands. In addition, resource managers in general find themselves overburdened with bureaucratic processes that require an inordinate amount of time spent in the office, and therefore, less time is available to foster connections with landowners. Furthermore, the heavy workload

combined with the extensive geographical range covered my most resource managers hinders their ability to deliver the much needed technical assistance and expertise.

Therefore, many resource agencies are simply unable to meet the private forestland stewardship demand.

Community and individual capacity

As previously discussed, the overarching concept of community is comprised of nested communities of interest, place, and geography community. Similarly, community capacity includes the relationship and network linkages among those individuals within the aforementioned communities, as well as the level of commitment, fiscal and technical resources, and leadership skills found amongst those persons. Individual capacity includes participants' sense of belonging to or identification with the previously defined nested concept of community, including a sense of common purpose, shared values, and history. Therefore, to facilitate a coherent discussion regarding levels of community and individual capacity characteristics, the concepts will be presented concurrently.

Data collected through semi-structured interviews, participant observations, and focus groups demonstrate that relationships between landowners in this study are partially dependent on perceived identities within the community. In this part of the southeastern Ozarks individual identity is primarily connected to land tenure and somewhat to land use. As previously discussed in this document both local and absentee landowners expressed personal, generational, and historical attachment to land in the Ozarks. Also, a majority of the landowners value their forestland for non-commodity reasons. Landowners in the study area identified with or felt a degree of connection to the broader

community. On the one hand, landowners that grew up there and never left or moved away but came back all strongly agreed they are connected to the broader community. On the other hand absentee landowners and new local landowners recognize a difference and feel less strongly they are part of the overall community. Though a social disconnect exists between local and absentee landowners, they revealed relational linkages to other landowners through family, marriage, participation in community events, through church, and farm or land related business arrangements. From these relationships a strong sense of reciprocity developed; thus, despite apparent differences among landowners in the study area, most remain willing to help each other when needed. Therefore, one avenue for fostering collaborative stewardship is building upon the reciprocity relationship which may result in legitimized views within a diverse population of NIPF owners.

It was readily apparent throughout this study that if not but for the external researcher providing the leadership, organizational, group facilitation and management skills, in addition to the fiscal support, the collaborative process would not have been initiated. Technical knowledge, leadership skills, and fiscal support to internally catalyze and sustain a collaborative ecosystem stewardship group are certainly insufficient. Also, lacking are the educational opportunities necessary to develop these skills; however, a strong interest in learning information to realize their personal goals does exist. Therefore, the opportunity to further promote and develop the full complement of capacity skills indispensable to initiating and sustaining a collaborative ecosystem stewardship group is there to be cultivated.

People-place connections – Adding to the concept of capacity, is the notion of people-place connections. Broadly speaking, place is the physical landscape which reflects the self-definition of people within a particular cultural context. For many landowners, the meaning of place was correlated with their relational linkages and the ability of a place to provide for a desired lifestyle. Findings from this study indicate such attributes could translate into shared values and a common sense of purpose. For instance, presenting collaborative ecosystem stewardship as a means to sustain rural heritage or to maintain forestland for family legacy purposes may act as a catalyst for group formation. Indeed, Richter (2005) identified two types of landowners, those that perceived their forestland as part of their rural heritage, and those that viewed their land as a family legacy. Findings support results presented here that financial investment and commodity driven programs are not of primary interest to these two groups of landowners. However, the outright expense of owning and properly managing forestland, which benefits not only the landowner but society as well, cannot be ignored. Consequently, there is a need to develop programs and policies which not only encourage the voluntary long term stewardship of privately owned forestland, but also partially ease financial burdens associated with forestland stewardship, thereby reducing the parcelization of land to support the remaining tract. For instance, federal and state tax credits for land in designated historic or heritage districts, the reduction of estate taxes to encourage the legacy aspect of forestland ownership, payment for ecological services such as clean water and carbon sequestration which are provided by contiguous forest cover and society enjoys free of cost, or conservation easements which protect land in perpetuity.

Collaboration in the Missouri Ozarks

Capacity and place connections are key elements of a successful collaboration effort and both influenced the outcomes of incentives and mechanisms employed during this project. For example, generally optimistic attitudes expressed during Phase I regarding collaborative ecosystem stewardship suggested prevalence for participation in the forums designed to foster collaboration. Yet, this attitudinal characteristic did not necessarily translate into behavioral outcomes. Attendance ranged from two to seven people with the average being five or 33% of the interviewed landowners. This occurred because all three types of capacity were inadequate and people-place connections were insufficiently explored. Accordingly, at the close of this case study landowners did not continue meetings of their own accord. Nevertheless, participants did realize positive outcomes from attending the open forums and educational opportunities designed to encourage collaboration. For instance, landowners were able to connect names with faces of other area landowners, learn from and share their stewardship experiences with each other, and develop constructive friendships with both neighboring landowners and resource managers. Consequently, the potential for collaborative stewardship exists even though full capacity is deficient. The challenge facing future collaborative efforts is not only to develop adequate levels of institutional, individual, and community capacity, but to transform those increased skills into action.

CHAPTER 6. CONCLUSIONS AND LESSONS LEARNED

Conclusions

This exploratory case study sought to contribute to the growing body of private forestland conservation literature primarily by assessing institutional, community, and individual capacity of NIPF owners via qualitative research. It is important to note this study was bounded, and therefore, caution against moving to broad generalizations outside the study area itself. Indeed, landowner attitudes, cultural beliefs, and demographics vary greatly from county to county across the Missouri Ozarks. Likewise, landscapes and the people living there differ from state to state across our Nation. In addition, institutional incentives and constraints affect locales to varying degrees. Therefore, presented methods and results should not be considered cookie cutter techniques to be broadly applied. Instead, approaches ought to be viewed as additional tools in the sustaining private forestland toolbox. The discussed results serve as a useful template to advance collaborative ecosystem stewardship efforts in other landscapes dominated by privately owned forestland.

Private forestland stewardship policy

The dynamic web of interlocking environmental, economic, and social factors affecting sustainable forestland stewardship on private land makes creating and implementing broad-based policy that is seamlessly effective from federal to state to local levels incredibly complicated and given the interwoven nature of bureaucracy, nearly impossible to achieve. Fiscal constraints felt throughout all levels of government, the constant merging old and new programs, and poor marketing and implementation of current policies and programs makes private land stewardship a daunting task indeed.

Concomitantly, developing appropriate policies is extremely difficult given the protracted conflicts between political parties. However, if something is not done in the very near future to address private forestland conservation issues, both landscape and social fragmentation will continue to increase; thus, making stewardship a more complicated and contentious issue. The question then becomes, “How can private landowners be encouraged to steward their forestland long term?”

Realities of fiscal and political climates notwithstanding, enacting policies and programs aimed at protecting and sustaining land for rural heritage, family legacy, natural resources with a significant historical or ecological contribution, and open space is one way to begin mitigating land parcelization. The crux, of course, is funding these incentives without taking money from one program to pay for another.

Conservation Easements - A donated conservation easement is a tool commonly used by landowners throughout the United States to protect their land in perpetuity. A conservation easement is a permanent agreement between a landowner and a qualified conservation organization such as a land trust or The Nature Conservancy. The easement limits parcelization and restricts future development on the property to a mutually agreed upon level. Each easement is unique and the terms are negotiated to meet the land protection goals of the landowner within broad guidelines set forth by the Internal Revenue Service. The IRS treats easement donations just like any other charitable donation given in a calendar year. Therefore, donating a qualified conservation easement allows for a federal income tax deduction equal to the current fair market value of the development and/or parcel subdivision rights extinguished. The deduction is limited to 30

percent of adjusted gross income in the year of the gift, which if not used up, may be carried forward for an additional five years. Lowering the federal income tax translates into lowered state taxes as well.

In addition to the established federal tax benefit, a policy which could be enacted at the state level in Missouri is allowing a tax credit for easement donations. It makes donating a conservation easement more affordable for landowners that are characterized as land rich but cash poor, which is certainly the case for the average forestland owner in the Missouri Ozarks. However, the easement tax credit is a politically unpopular legislative approach due to the net decrease in tax revenues and requires a state to make a significant commitment to conservation of natural resources with their border.

The Virginia Land Conservation Incentives Act of 1999 (Virginia Code Sec. 58.1-510-513) does just that. This Act enables landowners who donate conservation easements to a qualifying public agency or a private conservation group to claim up to 50 percent of the assessed fair market value of the donation on their taxes. In 2002, the amount of credit which can be claimed was capped at \$100,000 and the credit used in any one year cannot exceed the amount of the tax due, but may be carried forward for an additional five years. In addition to claiming the credit, if a landowner cannot use, or chooses not to use, all or any portion of their tax credit, they are permitted to sell tax credits to other taxpayers; albeit at a reduced exchange rate. This allows landowners to generate additional income from the easement donation which most generally funnel back into managing and improving the land.

In addition to the federal and state income tax benefits, a conservation easement may also provide for an estate tax reduction. Section 203(c) of the IRS Code is “The Farm and Ranch Protection Act of 1997” which allows that up to 40 percent of the value of the land placed under conservation easement may be exempt from estate taxes, depending on the appraised value. Yet another possible tax incentive linked conservation easements is the reduction of local property tax. However, if a county already assesses land at “use value”, in other words, if the property is already enrolled in a local Land Use Assessment Taxation Program, additional reductions in taxes is unlikely to be supported by a county government.

Forest fragmentation

As previously noted, forest fragmentation occurs on two basic levels: (1) the division or parcelization of larger, single-ownership forests tracts into smaller parcels with diverse ownership, and (2) the reductions in forest patch size within the smaller parcels. In recent years the natural resource management paradigm focus has begun to shift from one centered primarily on managing publicly owned lands, to one which also recognizes the importance of implementing sustainable stewardship practices on privately owned lands. Undeniably, a complex and interconnected web of area-specific social, economic, and historic land use factors drive the trend to divide forested land into smaller parcels. Consequently, insufficient individual, community, and institutional capacity development at all three levels only serves to intensify the social fragmentation which is occurring across the Missouri Ozarks as more forestland is bought by absentee landowners. In turn, social fragmentation complicates and exacerbates landscape scale fragmentation of

forestland and the associated ecological benefits. It is indeed a vicious cycle that perpetuates itself.

Lessons Learned

Living in the community where you work

The culture of Ozarks residents strongly supports private property rights and autonomy from outside influences; especially those encouragements which come from governmental agencies or organizations that are perceived as contrary to their traditional way of life. Consequently, this project may have met less resistance if, (1) the researcher spent more than two years working in the study area, and (2) the researcher had familial connections with the community. Moreover, living in the community as opposed to traveling to the study area to carry out the research objectives may also have reduced the inclination to view the researcher as an outsider. This point cannot be stressed enough. Indeed, obtaining unbiased responses and garnering broad participation from this population of interest, requires one to develop community relationships which encourage trust and assuage deep-seeded fears. This approach takes several years and cannot be forced or appear insincere; landowners will recognize the difference.

Interdisciplinary and multi-institutional research

Another valuable lesson learned is two-fold. First, using qualitative research techniques to understand a human population is time consuming, potentially costly, and can be a very frustrating process. Learning from people so much more challenging than traditional natural resource research projects which measure and mark trees or collect wildlife samples. Therefore, in my opinion, a qualitative survey is a more difficult approach to implement than quantitative survey research. Second, conducting interdisciplinary and

multi-institutional research is also incredibly time consuming and frustrating. On one hand it was somewhat surprising that given the focus of the collaborative planning and policy component, as well as the interdisciplinary nature of the overarching project, that principle investigators and researchers themselves found it difficult to collaborate during the course of the study. On the other hand, the lack of capacity to collaborate among academic researchers and graduate students is reflective of the insufficient institutional capacity found in resource agencies working in the Ozarks.

21st century natural resource management

Working with the general public, southeastern Missouri Ozarks landowners in particular, to steward natural resources is a historically contentious process and just plain difficult. People are not trees to be measured or wildlife to be monitored. Individuals have a wide range of natural resource values and beliefs which may be quite different from resource managers and contrary to established agency missions. The differences certainly inhibit two-way communication and learning, thus preventing mutual respect and understanding to evolve. This in itself erodes trust and the willingness to cooperate with one another, which has led to protracted conflicts often resulting in litigious legal battles.

Concomitantly, one must recognize that natural resource professionals entered their respective field of expertise not because they wanted to spend their valuable time working with the public, but generally because they love being outdoors and want to protect the resource. Hence, they acquire the necessary academic training to pursue their individual interests. However, in response to professional accreditation constraints most college level programs are narrowly focused and curriculum generally reflects

departmental expertise, which is driven by attracting research dollars, as opposed to promoting a broad, interdisciplinary knowledge base specific to natural resource management. Thus, graduates are often well equipped with the technical skills and academic knowledge to manage natural resource communities, but rarely adequately prepared to collaborate with other resource disciplines, much less with the general public. Relying on an undergraduate student, and even established professionals, to voluntarily seek additional community development, public affairs, collaboration, facilitation, and action research skills beyond their field of expertise is one reason why institutional capacity within resource agencies does not exist or limited at best. Undeniably, the ability to steward natural resources within the ever-changing social context in which natural communities are embedded is and will continue to be the greatest challenge facing resource managers on both public and private lands. Thus, efficient and effective natural resource management for the 21st century requires a paradigm shift to include the social context in which resources are embedded. Indeed, when I began my academic career a decade ago I was cautioned by a wise professor that natural resource professionals spend about 10 percent of their time managing resources and 90 percent of their time managing people; *not* the other way around! Thus, the values, needs, beliefs, and goals of NIPF landowners must be central to the understanding of those working in natural resource management if the creation of effective landscape scale opportunities and strategies for private forestland conservation are to be cultivated and successfully implemented.

LITERATURE CITED

- Agee, J.K. and D.R. Johnson. 1988. Introduction to ecosystem management. In: Ecosystem management for parks and wilderness (J.K. Agee and D.R. Johnson, eds.), University of Washington Press, Seattle and London. 3-14 p.
- Argyris, C. and D. Schon. 1991. Participatory action research and action science compared: a commentary. In: *Participatory Action Research* (W.F. Whyte, ed.), Sage Publications, Newbury Park, NJ. 85-96 p.
- Babbie, E.R. 2001. The practice of social research. 9th Ed. Wadsworth/Thomson Learning, Belmont, CA. 498 p.
- Baker, M. and J. Kusel. 2003. Community forestry in the United States: learning from the past, crafting the future. Island Press, Washington, DC. 241 p.
- Barham, E. 2001. Ecological boundaries as community boundaries: the politics of watersheds. *Society and Natural Resources*, 14:181–191.
- Barham, E. 1993. “Public participation and technological decision making: the case of GIS.” Unpublished thesis. Cornell University.
- Beattie, M. 1996. An ecosystem approach to fish and wildlife conservation. *Ecological Applications*, 6(3):696 – 699.
- Belin, D.L., Kittredge, D.B., Stevens, T.H., Dennis, D.C., Schweik, C.M., and B.J. Morzuch. 2005. Assessing private forest owner attitudes toward ecosystem-based management. *Journal of Forestry*, 103(1):28 – 35.
- Bengston, D. N., Xu, G. and D.P. Fan. 2001. Attitudes toward ecosystem management in the United States, 1992 – 1998. *Society and Natural Resources*, 14:471–487.
- Best, C. and L.A. Wayburn. 2001. America’s private forests: status and stewardship. Island Press, Washington, DC. 268 p.
- Birch, T.W. 1997. Private Forest Landowners of the central hardwood forest. In: 11th Central Hardwood Forest Conference, Columbia, MO, March 23 - 26, 1997.
- Birch, T.W. 1996a. Private forest landowners of the United States, 1994. In: Symposium on nonindustrial private forests: learning from the past, prospects for the future, Washington, D.C. February 18 – 20, 1996.
- Birch, T.W. 1996b. Private forest landowners of the northern United States, 1994. Resource Bulletin NE-134. Radnor, PA: Forest Service, USDA, Northeastern Experimental Station.

- Bonnicksen, T.M. 1991. Managing biosocial systems: a framework to organize society-environment relationships. *Journal of Forestry*, 89(10):10–15.
- Boyce, M.S. and A. Haney. 1997. Ecosystem management: applications for sustainable forest and wildlife resources. Yale University Press, Cambridge, MA. 361 p.
- Bradbury, H. and P. Reason. 2001. Conclusion: broadening the bandwidth of validity: issues and choice-points for improving the quality of action research. In. (H. Bradbury and P. Reason, eds.). *Handbook of Action Research: Participative Inquiry and Practice*. Sage, London, UK. 447-455 p.
- Brunson, M.W. 1996. A definition of “social acceptability” in ecosystem management. In. Defining social acceptability in ecosystem management: a workshop proceedings (M.W. Brunson, L.E. Kruger, C.B. Tyler, and S.A. Schroeder, tech. eds.). Gen. Tech. Rep. PNW-GTR-369. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. 7-16 p.
- Brunson, M.W. 1998. Social dimensions of boundaries: balancing cooperation and self-interest. In: Stewardship Across Boundaries (R.L. Knight and P.B. Landres, eds.). Island Press, Washington, D.C. 65-68 p.
- Brunson, M.W., Yarrow, D.T., Roberts, S.D., Guynn, D.C., and M.R. Kuhns. 1996. Nonindustrial private forest owners and ecosystem management: can they work together? *Journal of Forestry*, (94):14–21.
- Bureau of Land Management (USDI). 1994. Ecosystem management in the BLM: from concept to commitment. Gov. Pub. BLM/SC/Gi-94/005+1736.
- Burroughs, R. 1999. When stakeholders choose: process, knowledge, and motivation in water quality decisions. *Society and Natural Resources*, 12:797–809.
- Butler, B.J. and E.C. Leatherberry. 2004. National Woodland Owner Survey: 2003 Preliminary Results. USDA Forest Service. Unpublished document online www.fs.fed.us/woodlandowners/publications/nwos_draft_tables_july_2004.pdf
- Cassingham, K., Sills, E., Pattanayak, S., and C. Mansfield. 2003. Spatial assessment of a voluntary forest conservation programme in North Carolina. In: *Forest Policy and Private Forestry: Global and Regional Challenges* (Teeter, L., B. Cashore, and D.Zhang, eds.). CABI Publishing, New York, NY. 129-141 p.
- Cheng, A.S. and S.E. Daniels. 2003a. Examining the interaction between geographic Scale and ways of knowing in ecosystem management: a case study of place based collaborative planning. *Forest Science*, 49(6):841–854.

- Cheng, A.S., Kruger, L.E., and S.E. Daniels. 2003b. "Place" as an integrating concept in natural resource politics: propositions for social science research agenda. *Society and Natural Resources*, 16:87–104.
- Cook, T.D. 1993. Quasi-experimentation: its ontology, epistemology and methodology. *Beyond method: strategies for social research*, (G. Morgan, ed.). Sage, Beverly Hills, CA. p.
- Coleman, J.S. 1990. *Foundations of Social Theory*. Harvard University Press, Cambridge, MA. 993 p.
- Costanza, R., Norton, B.G., and B.D. Haskell. 1992. Ecosystem health: new goals for environmental management. Island Press, Washington, D.C. 269 p.
- Creighton, J.H., Baumgartner, D.M., and K.A. Blatner. 2002. Ecosystem management and nonindustrial private forest landowners in Washington state, USA. *Small-scale Forest Economics, Management and Policy*, 1(1):55–69, 2002.
- Creswell, J.W. 2003. Research design: qualitative, quantitative, and mixed methods approaches. 2nd Ed. Sage Publications, Thousand Oaks, CA. 245 p.
- Creswell, J.W. 1998. Qualitative inquiry and research design: choosing among five traditions. Sage Publications, Thousand Oaks, CA. 189 p.
- Cunningham, J.B. 1993. Action research and organizational development. Praeger Publishers, Westport, CT. 274 p.
- Daniels, S.E. and G.B. Walker. 1996. Collaborative learning: improving public deliberation in ecosystem based management. *Environmental Impact Assessment Review*, 16:71-102.
- Daniels, S.E. and G.B. Walker. 2001. Working through environmental conflict: the collaborative learning approach. Praeger Publishers, Westport, CT. 328 p.
- DeCoster, L.A. 2000. Summary of the forest fragmentation 2000 conference: how forests are being nibbled to death by DUCs, and what to do about it. Proceedings of the Forest Fragmentation 2000 Conference. Online, www.sampsongroup.com.
- Duane, T.P. 1997. Community participation in ecosystem management. *Ecology Law Quarterly*, 24:771–797.
- Edmunds, H. 1999. *The Focus Group Research Handbook*. Sage Publications, Thousand Oaks, CA. 124 p.
- Egan, A. and S. Jones. 1993. Do landowner practices reflect beliefs? Implications of an extension-outreach partnership. *Journal of Forestry*, 91(10):39-45.

- Elmendorf, W.F. and A.E. Luloff. 2001. Using qualitative data collection methods when planning for community forests. *Journal of Arboriculture*, 27(3):139-151.
- Finley, A.O. 2002. Assessing private forest landowners' attitudes towards, and ideas for, cross-boundary cooperation in western Massachusetts. Thesis, University of Massachusetts, Amherst, MA. 28 p.
- Flader, S.L. and J.B. Callicott, Eds. 1991. The river of the mother of God and other essays by Aldo Leopold. University of Wisconsin Press, Madison, WI. 384 p.
- Flora, C.B. and J.L. Flora. 1995. "The Past and Future: Social Contract, Social Policy, and Social Capital." [Increasing Understanding of Public Problems and Policies](#). 53-64 p.
- Garson, D. 2003. Focus Group Research. Class website: quantitative methods in public administration. Unpublished document online, www.chass.ncsu.edu/garson/pa765/focusgroups.htm.
- Global Institute of Sustainable Forestry. 2003. Organization website, online, www.research.yale.edu/gisf/ppf/index.
- Governor's Advisory Committee on Chip Mills. 2000. Final Report. GACCM, Jefferson City, MO. 187 p.
- Goedeke, T., and J.S. Rikoon. 1998. The Ozarks Highlands Man and the Biosphere Reserve: a study of a failed nomination effort. Report for the U.S. Man and the Biosphere Program. U.S. Department of State Press, Washington, D.C. Published report available online, www.ssu.missouri.edu/publications/Ozarks/.
- Gray, B. 1985. Conditions facilitating interorganizational collaboration. *Human Relations*, 38:911–936.
- Green, S.B. and N.J. Salkind. 2003. Using SPSS for Windows and Macintosh: analyzing and understanding data (3rd Ed.). Prentice Hall. Upper Saddle River, NJ. ? p.
- Greider, T., and L. Garkovich. 1994. Landscapes: the social construction of nature and the environment. *Rural Sociology*, 59:1–24.
- Grumbine, R.E. 1994. What is ecosystem management? *Conservation Biology*, 8(1):27–38.
- Hahn, J.T. and J.S. Spencer, Jr. 1991. Timber Resource of Missouri. Resource Bulletin NC-119. St. Paul, MN: USDA Forest Service, North Central Experiment Station.
- Healey, P. 1997. Collaborative planning: shaping places in fragmented societies. Macmillan Press, London. 338 p.

- Herr, K. and G.L. Anderson. 2005. The Action Research Dissertation: A Guide for Students and Faculty. Sage Publications, Thousand Oaks, CA. 157 p.
- Hodge, S.S. 1996. Challenges for ecosystem management in Virginia with NIPF owners. In: Symposium on nonindustrial private forests: learning from the past, prospects For the future, Washington, D.C. February 18 – 20, 1996. St. Paul, MN: Extension Special Programs, Minnesota Extension Service, University of Minnesota.
- Horner, L.A. 2004. “Assessing Capacity for Collaborative Land Management in a Western Tennessee Community.” Unpublished thesis. University of Tennessee – Knoxville. 127 p.
- ICA. 2000. “Technology of Participation: Group Facilitation Methods.” The Institute of Cultural Affairs, Phoenix, AZ. 78 p.
- Jacobson, M.G. 2002a. Ecosystem management in the southeast United States: interest of forest landowners in joint management across ownerships. *Small-scale Forest Economics, Management and Policy*, 1(1):71–92.
- Jacobson, M.G. 2002b. Factors affecting private forest landowner interest in ecosystem management: linking spatial and survey data. *Environmental Management*, 30(4): 577–583.
- Jacobson, M.G. and A. Long. 2002. Ecosystem management (EM) as a basis for forest stewardship on private lands. Florida Cooperative Extension Service, Institute of Food and Agriculture Sciences, University of Florida.
- Jacobson, M.G., Abt, R.C., and D.R. Carter. 2000. Attitudes toward joint forest planning among private landowners. *Journal of Sustainable Forestry*, 11(3):95-112.
- Jacobson, S. and S. Marynowski. 1997. Public attitudes and knowledge about ecosystem management on Department of Defense land in Florida. *Conservation Biology*, 11(3):770 – 781.
- Jones, S.B., A.E. Luloff, and J.C. Finley. 1995. Another look at NIPFs: Facing our “myths.” *Journal of Forestry*, 93(9):41-44.
- Katz, A.M. and J. Shotter. 1996. Resonances from within the practice: social poetics in a mentorship programs. *Concepts and Transformations*, 1(2/3):239-247.
- Kemmis, D. 1990. Community and the politics of place. University of Oklahoma Press, Norman, OK. 150 p.

- King, D.B., Roberts, E.V., and R.K. Winters. 1949. Forest resources and industries of Missouri. Resource bulletin 452. University of Missouri, College of Agriculture, Agriculture Experiment Station.
- Kittredge, D.B. 2004a. Extension/outreach implications for America's family forest owners. *Journal of Forestry*, 102(7):15–18.
- Kittredge, D.B. 2004b. The cooperation of private forest owners on scales larger than one individual property: international examples and potential applications in the United States. *Forest Policy and Economics*, 7:671–688.
- Knight, R.L. and T.W. Clark. 1998. Boundaries between public and private lands: defining obstacles, finding solutions. In: Stewardship Across Boundaries (R.L. Knight and P.B. Landres, eds.). Island Press, Washington, D.C. 175-191 p.
- Kraft, S., Lant, C., and K. Gillman. 1996. WQIP: An assessment of its chances for acceptance by farmers. *Journal of Soil and Water Conservation* 51(6):494–498.
- Kurtz, W.B. and B.J. Lewis. 1981. Decision-making framework for nonindustrial private forest owners: an application in the Missouri Ozarks. *Journal of Forestry*, 79:285–288.
- Landres, P.B., Knight, R.L., Pickett, S.T.A., and M.L. Cadenasso. 1998. Integration: a beginning for landscape-scale stewardship. In: Stewardship Across Boundaries (R.L. Knight and P.B. Landres, eds.). Island Press, Washington, DC. 337-345 p.
- Larsen, D.N. and D.A. Gansner. 1972. Pennsylvania's private woodland owners – a study of characteristics, attitudes, and actions of an important group of decision-makers. USDA Forest Service Research Paper NE-219, Northeastern Forest Experiment Station, Broomall, PA. 17 p.
- Larson, C. 2004. Unpublished master's thesis, "Modeling forest transition pathways for decision making in private forestry." University of Missouri – Columbia. 69 p.
- Leatherberry, E.C. 2005. Missouri's family forest owners. Presented at the Missouri Natural Resources Conference, February 3, Osage Beach, MO.
- Leatherberry, E. C. and T. B. Treiman. 2002. Missouri's forest resources in 2000. Resource Bulletin NC-209. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 23 p.
- Lee, T.W. 1999. Using qualitative methods in organizational research. Sage Publications, Thousand Oaks, CA. 192 p.
- Leopold, A. 1949. A sand county almanac: sketches from here and there. Oxford University Press, New York, NY. 226 p.

- Lewis, B.J. 1979. "Private nonindustrial forest landowners in the Missouri Ozarks: a q methodological establishment of types." Unpublished master's thesis, University of Missouri – Columbia. 251 p.
- Lincoln, Y.S. and N.K. Denzin. 2000. Chapter 1: Introduction: the discipline and practice of qualitative research. In: *Handbook of Qualitative Research* (2nd Ed.) (Y.S. Lincoln and N.K. Denzin, eds.). Sage Publications, Thousand Oaks, CA. 1065 p.
- Liu, A.Q. and T. Besser. 2003. Social capital and participation in community improvement activities by elderly residents in small towns and rural communities. *Rural Sociology*, 68(3):343–365.
- Lofland, J. and L.H. Lofland. 1995. Analyzing social settings: a guide to qualitative observation and analysis. Wadsworth Publishing Company, Davis, CA. 268 p.
- Low, S.M. and I. Altman. 1992. Place attachment: a conceptual inquiry. In: *Place Attachment*, (I. Altman and S.M. Low, eds.). Plenum Press, New York, NY. 1 -12p.
- Mandell, M.P. 2001. Getting results through collaboration: networks and network structures for public policy and management. Quorum Books, Westport, CT. 275 p.
- Marler, R.L. and P.F. Graves. 1974. A new management rationale for small forest landowners. Applied Forest Research Institute Report No. 17. State University of New York, College of Environmental Science and Forestry. 17 p.
- Marlin, C.B. 1978. A study of owners of small timber tracts in Louisiana. Agriculture Bulletin No. 710, Louisiana State University, Center for Agriculture Sciences and Rural Development. 65 p.
- McCarter, J.B. 1999. LMS programmer's guide. Silviculture Laboratory, College of Forest Resources, University of Washington. 101 p.
- McGaughey, R. J. 1998. Computerized tools for visualizing the impact of silviculture on multiple resources. In. Proceedings of the SAF 1997 National Convention, 1997 October 4-8, Memphis, TN; Bethesda, MD. *Society of American Foresters*, 192-199 p.
- McKee, J. 2005."What is Community?" Available online, <http://www.communityguy.com/index.cfm?commentID=172>.
- Muth, A.B. 2004. Opportunities for Deer Lodge, Tennessee: Community Development and Land Stewardship by a Collaborative Learning Community Group. Dissertation, University of Tennessee – Knoxville. 162 p.

- Nigh, T.A. and W.A. Schroeder. 2002. Atlas of Missouri Ecoregions. Missouri Department of Conservation, Jefferson City, MO. 212 p.
- Ostrom, E.O. 2000. Collective action and the evolution of social norms. *Journal of Economic Perspectives*, 14(3):137–158.
- Ostrom, E.O. 1999. Self-governance and forest resources. Occasional paper #20. Borgor, Indonesia: Centre for International Forestry Research. Sampson, N. and L. DeCoster. 2000. Forest fragmentation: implications for sustainable private forests. *Journal of Forestry*, 98(3):4–8.
- Ostrom, E.O. 1990. Governing the commons: the evolution of institutions in collective action. Cambridge University Press, New York, NY. 280 p.
- Patton, M.P. 1990. Qualitative evaluation and research methods (2nd Ed.). Sage Publications, Newbury Park, CA. 532 p.
- Pavey, J.L. 2005. Using a community of interest to revitalize a community of place in Morgan County, TN. Dissertation, University of Tennessee –Knoxville. 139 p.
- Pollio, H.R., T. Henley, and C.B. Thompson. 1997. The Phenomenology of Everyday Life. Cambridge University Press, Cambridge, UK. 398 p.
- Putnam, R.D. 1995. Bowling alone: America's declining social capital. *Journal of Democracy*, 6(1):65–78.
- Pyrch, T. and M.T. Castillo. 2001. The sights and sounds of indigenous knowledge. In: Handbook of Action Research: Participative Inquiry and Practice (P. Reason and H. Bradbury, eds.). Sage Publications, London. 378-385 p.
- Raedeke, A.H., Nilon, C.H. and J.S. Rikoon. 2001a. Factors affecting landowner participation in ecosystem management: a case study in south-central Missouri. *Wildlife Society Bulletin*, 29(1):195–206.
- Raedeke, A.H., Rikoon, J.S. and C.H. Nilon. 2001b. Ecosystem management and landowner concern about regulations: a case study in the Missouri Ozarks. *Society and Natural Resources*, 14:741–759.
- Rappaport, J. 1981. A praise of paradox: a social policy of empowerment over prevention. *American Journal of American Psychology*, 15:121-148.
- Reading, R. P., Clark, T. W., and S. R. Kellert. 1994. Attitudes and knowledge of people living in the Greater Yellowstone Ecosystem. *Society and Natural Resources*, 7(4):349–365.

- Richter, K.J. 2005. Using attitudes and motivations to segment the landowner audience: a typology of family forest owners in the Missouri Ozarks and description of management and information behaviors. Dissertation, University of Missouri – Columbia. 132 p.
- Rickenbach, M.G., Kittredge, D.B., Dennis, D., and T. Stevens. 1998. Ecosystem management: capturing the concept for woodland owners. *Journal of Forestry*, 88(11):32–38.
- Riitters, K.H., Wickham, J.D., O'Neill, R.V., Jones, K.B., Smith, E.R., Coulston, J.W., Wade, T.G., and J.H. Smith. 2002. Fragmentation of continental United States forests. *Ecosystems*, 5:815-822.
- Rogers, M.B. 1990. Cold anger: a story of faith and politics. University of North Texas press, Denton, TX.
- Rubin, H.J. and I.S. Rubin. 1995. Qualitative interviewing: the art of hearing data. Sage Publications, Thousand Oaks, CA. 302 p.
- Russell, D. and C. Harshbarger. 2003. Groundwork for community-based conservation. Alta Mira Press, Walnut Creek, CA. 322 p.
- Ryan, R. 1998. Local perceptions and values for a Midwestern river corridor. *Landscape and Urban Planning*, 2:225–237.
- Sampson, N. and L. DeCoster. 2000. Forest fragmentation: implications for sustainable private forests. *Journal of Forestry*, 98(3):4–8.
- Seaber, P.R., Kapinos, F.P., and G.L. Knapp. 1987. Hydrologic unit maps. Washington, D.C.: U.S. Geological Survey Water-Supply Paper 2294. 63 p.
- Selin, S.W., Schuett, M.A., and D. Carr. 2000. Modeling stakeholder perceptions of collaborative initiative effectiveness. *Society and Natural Resources*, 13:735-745.
- Selin, S.W., Schuett, M.A., and D. Carr. 1997. Has collaborative planning taken root in the national forests? *Journal of Forestry*, 95(4):25-28.
- Selin, S.W. and D. Chavez. 1995. Developing a collaborative model for environmental planning and management. *Environmental Management*, 19(2):189-196.
- Shelford, V. 1933. The preserving of natural biotic communities. *Ecology*, 14: 240– 245.
- Shindler, B., Steel, B., and P. List. 1996. Public judgments of adaptive management: A response from forest communities. *Journal of Forestry*, 94(6):4–12.

- Sinclair, K.D. and B.A. Knuth. 2000. Nonindustrial private forest landowner use of geographic data: a precognition for ecosystem-based management. *Society and Natural Resources*, 13:521–536.
- Solecki, W. D. 1998. Local attitudes on regional ecosystem management: A study of New Jersey Pinelands residents. *Society and Natural Resources*, 11:441–463.
- SPSS. 2001. SPSS graduate pack 11.0. SPSS, Inc. Upper Saddle River, NJ.
- Stake, R.E. 2000. Case studies. Handbook of Qualitative Research (N. Denzin and Y. Lincoln, eds.). Sage Publications, Thousand Oaks, CA. 435-454p.
- Steel, B., B. Shindler, and M. Brunson. 1998. Social acceptability of ecosystem management in the Pacific Northwest. In. Ecosystems management: A social science perspective, (D. L. Soden, B. L. Lamb, and J. R. Tennert, eds.) Kendall/Hunt, Dubuque, IA. 147-160 p.
- Stein, T. V., Anderson, D. H., and T. Kelly. 1999. Using stakeholders' values to apply ecosystem management in an upper Midwest landscape. *Environmental Management*, 24(3):399–413.
- Stoltman, A.M., Radeloff , V.C., and D.J. Mladenoff. 2004. Forest visualization for management and planning in Wisconsin. *Journal of Forestry*, 102(4):7–13.
- Strauss, A.L. and J.M. Corbin. 1990. Basics of qualitative research: grounded theory procedures and techniques. Sage Publications, Newbury Park, CA. 170 p.
- Tarrant, M. A., Overdevest,C., Bright,A. D., Cordell,H. K., and D. B. K. English. 1997. The effect of persuasive communication strategies on rural resident attitudes toward ecosystem management. *Society and Natural Resources*, 10:537–550.
- The H. John Heinz III Center for Science, Economics and the Environment. 2002. The state of the nation's ecosystems: measuring the lands, waters, and living resources of the United States. Cambridge University Press, Cambridge, MA. 273 p.
- Thomas, J.W. 1996. Forest Service perspective on ecosystem management. *Ecological Applications*, 6(3): 703 – 705.
- Thomas, S.P. and H.R. Pollio. 2002. Listening to patients: a phenomenological approach to nursing. *Journal of Nursing*, 12:452-460.
- Thompson, J.R., Elmendorf, W.F., McDonough, M.H., and L.L. Burban. 2005. Participation and conflict: lessons learned from community forestry. *Journal of Forestry*, 103(4):174-178.

- Trokey, C.B. 1981. "An analysis of timber management potentials for private nonindustrial forest landowners." Unpublished master's thesis, University of Missouri – Columbia. 122 p.
- USDA FIA database. 1989. USDA Forest Service, North Central Forest Experiment Station. Available online, www.ncrs2.fs.fed.us/4801/fiadb/.
- USDA Forest Service. "Forests on the Edge: Housing Development on America's Private Forests." Unpublished article available online, www.fs.fed.us/projects/fote.
- Virginia Tax Code. 1999. Virginia Land Conservation Incentives Act of 1999 (VA Code Sec. 58-1-510-513). Available online, leg1.state.va.us/cgi-bin/legp504.exe.
- Wall, W.A. 1998. Boundaries or barriers: new horizons for conservation and private forests. *In:* Stewardship Across Boundaries (R.L. Knight and P.B. Landres, eds.). Island Press, Washington, D.C. 159-174 p.
- Washburn, M. P. 1996. Cross boundary management on nonindustrial private forest in Pennsylvania: a vision for the future. *In:* Symposium on nonindustrial private forests: learning from the past, prospects for the future, Washington, D.C. February 18 – 20, 1996.
- Weber, E.P. 2003. A new vanguard for the environment: Grassroots ecosystem management, accountability, and sustainable communities. MIT Press, Cambridge, MA. 317 p.
- Weber, E.P. 2000. Bringing society back in: Grassroots ecosystem management as a new environmental movement. *Society and Natural Resources*, 13:237-259.
- Williams, D.R. and M.E. Patterson. 1996. Environmental meaning and ecosystem management: Perspectives from environmental psychology and human geography. *Society and Natural Resources*, 14:29-46.
- Wondolleck, J.M., and S. L. Yaffee. 2000. Making collaboration work: Lessons from innovation in natural resources management. Island Press, Washington, D.C. 277 p.
- Yaffee, S.L. 1998. Cooperation: a strategy for achieving stewardship across boundaries. *In:* Stewardship Across Boundaries (R.L. Knight and P.B. Landres, eds.). Island Press, Washington, D.C. 299-324 p.
- Yaffee, S.L., Phillips, A.F., Frentz, I.C., Hardy, P.W., Maleki, S.M. and B.E. Thorpe. 1996. Ecosystem management in the United States: An assessment of current experience. Island Press, Washington, DC. 351 p.

Yin, R.K. 2003. Case study research: design and methods. Sage Publications, Thousand Oaks, CA. 181 p.

APPENDIX A. PHASE I: SEMI-STRUCTURED PHENOMENOLOGICAL INTERVIEWS

Key Informant

Human Subjects Consent Form

Human Subjects Consent Statement (CPP: revised 4/03)

Project Title : Sustaining Natural Resources on Private Lands in the Central Hardwood Region

General Purpose : This project is being conducted by the department of Forestry at the University of Missouri – Columbia to gather information that will be used to: (1) inform non-industrial private forest landowners in the North Central Hardwood region about the local and landscape-level economic and environmental effects over time of alternative forest land management decisions; and (2) encourage landowners to initiate sustainable forest management practices that meet their needs. This is an interdisciplinary research and education effort designed to provide socioeconomic & environmental information to support natural resource management decisions.

Voluntary Participation Statement

I understand that my participation in this study is entirely voluntary. I will be asked to respond to questions posed in a face-to-face interview that inquire about a) land characteristics and forest resources in Reynolds and surrounding counties; and b) land ownership and use in Reynolds and surrounding counties. *The duration of this interview will be approximately 90 minutes.* I understand that I may decline to respond to any question posed during the interview, and that I may decide to terminate the interview at any time. I further understand that all my responses will not be used in any way that would lead to my identification as their source. Further, my responses will be kept in a secure fashion. A cover sheet will be maintained separately under lock and key with only an identifying code attached to my answer sheets to protect and ensure my privacy.

If I have any questions regarding my rights as a participant in research, I am encouraged to contact the Campus Institutional Review Board at (573) 882-9585.

For any other questions regarding this study, the questions being asked, or how the information will be used, I can call :

Dr. William B. Kurtz
Department of Forestry
University of Missouri-Columbia
Columbia, MO 65211
Ph: 573-882-4567
FAX: 573-884-2636
E-mail: KurtzW@missouri.edu

Madison County Key Informant Interview Guide

Name:

Date:

Title/profession:

Time:

Length of time connected to Madison County:

Phone/contact info:

(Introduction) I am interested in hearing your thoughts and opinions on natural resource management in Madison County and the Upper St. Francis River watershed. I'd also be interested in hearing about any experiences you've had working with private landowners to carry out some type of land management activity. Please keep in mind that there are no right or wrong answers to my questions. I am a graduate student in the Department of Forestry at the University of Missouri – Columbia. Currently, I am working on a project focused on Ozark landowners and how they might contribute to the long-term sustainability of forests and other natural resources on their land.

With your permission, I would like to tape record this interview so later I can check and be sure my notes are accurate and reflect exactly what you've said. Before we get started, I would like to go over the informed consent form with you. This form ensures that I have discussed what the project is with you, that you are aware that the interview is being tape recorded, and that your interview responses will be kept strictly confidential. I will also sign the form and give you a copy to keep. Do you have any questions?

Let's get started: (turn tape recorder on)

1. From your perspective, how would you describe this area in terms of overall landscape and associated natural resources?
2. How about historical land use patterns in Reynolds County and the Black River watershed – are there any trends or events that come to mind as significant?
 - a. Were the impacts different across the watershed? If so, how?
 - b. What were the impacts on forests in particular?
3. What are some important current issues, trends, or concerns regarding private forestland use in the area?
4. In the present and recent past, have there been any significant efforts or actions involving private forestland management (by local government, non-profit organizations, citizen groups, or government agencies)?
Please describe these initiatives:
 - a. What prompted the initiative or action?
 - b. Who was involved and what roles did they play?
 - c. Where did the activity take place? (County or watershed-wide?)

- d. When did it begin and end? (Is it ongoing? If so, what are the expectations for its future?)
 - e. How inclusive has community involvement been in these activities?
- 5. Are there any social or cultural distinctions that characterize people living in the area? If so, please describe.
- 6. Please describe the level of trust you think private landowners have for:
 - a. Neighboring landowners?
 - b. Local government?
 - c. State or federal government?
 - d. State or federal natural resource agencies?
- 7. Do you think that landowners in Madison County are willing and able to address the forest-related issues you stated earlier? Why or why not?
 - a. How willing do you think landowners would be to work together and/or with community members to address forest management issues?
 - b. Do these capacities differ across the watershed?
- 8. Finally, do you think that any landowners in the area think much about or have some vision regarding the future of the watershed and its forests?
 - a. Are there certain landowners that seem more interested in or concerned about these things (i.e., the future of the watershed and its forests)?
- 9. What do you perceive to be some of the concerns or fears that landowners have about the future of the watershed and its forests?
- 10. What do you think is the best way to:
 - a. Foster landowner awareness of these kinds of questions related to the long-term sustainability of the forests and other natural resources in the watershed?
 - b. Help landowners translate such awareness or concern into actual natural resource management actions on their land?
- 11. Can you think of anyone else in Madison County that I should talk to regarding private forestland management issues and concerns?

Landowner

Introductory Letter

August 3, 2003

Jack and Jill Jones
Madison 414
Fredericktown, Missouri 65742

Dear Jack and Jill Jones:

The Department of Forestry at the University of Missouri – Columbia is conducting a project focusing on sustaining healthy forests on private lands in the Missouri Ozarks. I am contacting you because you own land in the St. Francis watershed. As a graduate student in Forestry, I will be conducting an interview survey of landowners in your area.

Our project is part of a much larger program titled *Sustaining Private Forests in the Central Hardwood Region*. This is a joint venture between the University of Missouri, Purdue University, and the University of Tennessee. I am enclosing a brief fact sheet for your information; however, if you have Internet access, you may view our project website, www.snr.missouri.edu/SPF.

I would like to learn about how you see your land and forests as part of your life, including where you live, what you like about owning your land, and what you might have in mind in terms of “managing” or using your land in various ways. I could best learn about these kinds of things by having you tell me in your own words; perhaps through an in-person interview that I hope to schedule at your convenience. I will be contacting you within the next two weeks to see if you might be interested in and willing to help me with my project.

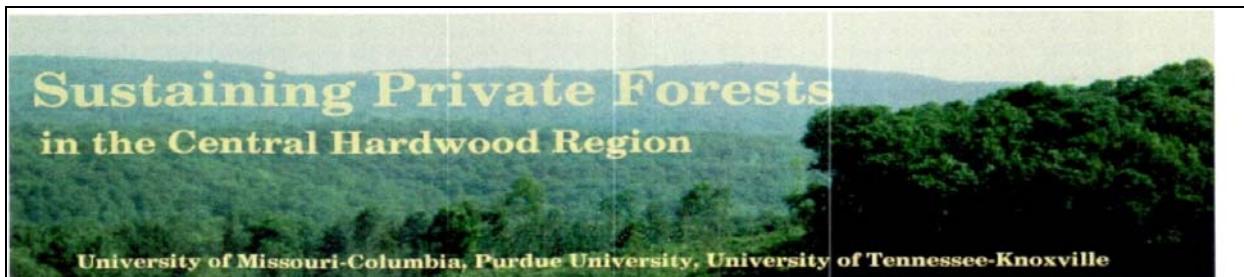
I hope you will see this as an opportunity to share your thoughts on owning forested land in the Missouri Ozarks, as well as to contribute knowledge that will help us keep our forests and other natural resources healthy. Of course, your participation in my research project is completely voluntary and all information collected as part of this project will be strictly confidential. If you have any questions, comments or concerns, please contact me at 573-884-6302 or by email at fwm3kb@mizzou.edu. In addition, please feel free to contact the project director, Dr. William B. Kurtz, who would be happy to discuss this project with you. He may be reached at 573-882-4567 or by email at kurtzw@missouri.edu.

Sincerely,

Faren Wolter McCord

Enclosure (1)

Sustaining Private Forests Fact Sheet



This cooperative project focuses on three watersheds in the Central Hardwood Region of the United States -- one each in Missouri, Indiana, and Tennessee. The project will provide information and education to encourage private forest owners to use natural resource management practices on their land. Recent ownership trends show that the number of forest landowners with smaller tracts has increased dramatically. This contributes to the breaking up of broader forest areas into smaller pieces, a process called *forest fragmentation*. This may lead to a decline in forest health, which in turn can adversely affect an area's timber, wildlife, and other natural resources. The goal of this project is to better understand why people own forest land, and to identify the kinds of information or management assistance that may help owners meet their goals while being good stewards of their land and forest resources.



The Central Hardwood Region of
the United States

Interesting Forestry Facts

- There are about 747 million acres of forests in the USA and 58% is owned by private individuals or groups.
- About 89% of the timber harvested nationally is from private lands, an increase of 76% since the 1970s.
- Central Hardwood forests extend from Missouri and Arkansas in the south to Massachusetts in the northeast.
- There are approximately 14 million acres of forests in Missouri and 87% is privately owned.
- Since 1978, the number of private forest landowners in Missouri has increased from 81,000 to more than 300,000.
- About 48% of Missouri forest landowners own tracts of less than 10 acres, 79% own tracts of less than 50 acres.
- The increasing number of landowners with smaller tracts may lead to reduced management opportunities, loss of fish & wildlife habitat, poor water quality in streams & lakes, and a loss in timber productivity.



Legend

- [Green Box] Watershed Boundary
- [White Box] County Boundary

In Missouri, the St. Francis-Black River watershed covers all or parts of Wayne, Butler, Carter, Reynolds, Iron, Madison, and St. Francois counties.

For more information,

please contact:

Dr. William B. Kurtz

124 Anheuser-Busch Natural Resources Building

Columbia, MO 65211

573-882-4567

KurtzW@missouri.edu

OR

Please see the project's website:

www.snr.missouri.edu/SPF/

Topic Areas to be Studied in Missouri



Best Management Practices



Agroforestry



Effects of Forest Fragmentation



Forest Change/Computer Modeling



Forest Taxes



Collaborative Planning & Policy



Geographic Information Systems



Human Dimensions

Human Subjects Consent Form

Human Subjects Consent Statement (revised 8/02)

Project Title : Sustaining Natural Resources on Private Lands in the Central Hardwood Region

General Purpose : This project is being conducted by the department of Forestry at the University of Missouri – Columbia to gather information that will be used to: (1) inform non-industrial private forest landowners in the North Central Hardwood region about the local and landscape-level economic and environmental effects over time of alternative forest land management decisions; and (2) encourage landowners to initiate sustainable forest management practices that meet their needs. This is an interdisciplinary research and education effort designed to provide socioeconomic & environmental information to support natural resource management decisions.

Voluntary Participation Statement

I understand that my participation in this study is entirely voluntary, and that I will be invited to participate in three different activities, several months apart, and for any of which I may decline the invitation to participate.

1. I will be asked to complete a questionnaire that inquires about a) ownership and use of my forest land; b) land characteristics and forest resources; and c) personal factors that influence my land management decisions. *The duration of this interview will be approximately 90 minutes.* I understand that I may decline to respond to any question posed during the interview, and that I may decide to terminate the interview at any time. I further understand that all responses, other than my anonymous land management decisions, will be kept strictly confidential and in a secure fashion. A cover sheet will be maintained separately under lock and key with only an identifying code attached to my answer sheets to protect and ensure my privacy.
2. I will be invited to take part in a second interview, several months after the first, during which I will have the opportunity to view a new computerized program (on a portable laptop computer) that provides visual pictures of what my forest land might look like in the future depending on whether and how I decided to manage it in the present. I understand that in this phase of the study no identifying characteristics that could link my responses back to me will be recorded; although my land use decisions will be noted and included anonymously with those of other landowners in the area on a map to be displayed later at a public meeting. *The duration of this discussion will be approximately 60 minutes.*
3. I will also be invited to participate in a group meeting with other landowners in my area where maps of the study area will be presented showing present and planned land uses and management strategies. In addition, the economic and environmental effects of land use patterns will be presented and discussed. I understand that in this phase of the

study no identifying characteristics that could link my responses back to me will be recorded; although with my approval my comments may be noted and included anonymously with those of other landowners in the area in discussions in the final project report. *The duration of this meeting will be approximately 90 minutes.*

If I have any questions regarding my rights as a participant in research, I am encouraged to contact the Campus Institutional Review Board at (573) 882-9585.

For any other questions regarding this study, the questions being asked, or how the information will be used, I can call :

Dr. William B. Kurtz
Department of Forestry
University of Missouri-Columbia
Columbia, MO 65211
Ph: 573-882-4567
FAX: 573-884-2636
E-mail: KurtzW@missouri.edu

Signature: _____

Date: _____

Madison County Landowner Interview Guide

Interview number:

Date:

Time:

Place:

(Introduction) I am interviewing you because I'm interested in hearing your thoughts and opinions on owning land, and some experiences you've had owning that land. Please keep in mind that there are no right or wrong answers – I just want to hear what you have to say in response to my questions. I am a graduate student in the Department of Forestry at the University of Missouri – Columbia, and the project I am involved with wants to know how to help Ozarks landowners sustain natural resources on their land. Basically, I'm interested in why you own your land, what you do with your land, what you think about forest management, and if you have worked with neighboring landowners to carry out some type of land maintenance activity.

For my own reference, I would like to tape record this interview if you don't mind, and before we get started, I would like to go over the informed consent form with you. This form ensures that I have discussed what the project is, that you are aware that the interview is being tape recorded, and that your interview responses will be kept confidential. I will also sign the form and give you a copy to keep. Do you have any questions?

Let's get started: (turn tape recorder on)

I. First a few questions about the land you own (or manage).

1. How many acres of land do you own?
 - a) How many tracts/parcels? [If a large number, get feel for largest tracts, overall pattern of tract sizes, etc.]
 - b) What percentage of your land is forested?
2. How long have you owned this land?
 - a) Has it been in your family?
 - b) Do you own land with other people or family members?
 - c) How long do you plan to own the land?
3. Do you live on your land?
 - i. If no, how far away do you live from your land?
 - ii. If no, how often do you visit your land?
4. Let's say I was visiting from another country and didn't know what it was like living around here at all, but wanted to learn what it was like. I might ask you to tell me an experience you've had -- kind of a story -- about living on or using

your land that would give me a picture of what its like to live here. What might you say? (If hesitant, re-remind about ‘some experience you like about living here.’)

5. We often talk about different ‘land uses.’ From that perspective, how do you use your land?
 - a. Do you use your land for recreation? What type of recreation (hunting, hiking, camping, vacations, ‘to get away’ etc.)?
 - b. Do you let others use your land for recreation? (If yes, what type of recreation?)
 - c. Have you harvested trees, wildlife, or agriculture products from your land?
 - d. Have you leased your land for hunting?
 - e. Have you leased your land to others for any other reasons?
 6. How important to you is generating income from your land?
 - a. Approximately, what percentage of your income comes from forestry, recreation, or other activities on your land?
 7. Who makes the management decisions regarding your land?
 8. Do you currently have, or have you ever had, a management plan for any portion of your property?
 - a. Did anyone help you with the management plan? (If yes, was this person a friend, a family member, a neighbor, a natural resource professional, or some other profession?)
 9. Do you feel that you can trust county or state natural resource agencies for information or advice on your land or ways of managing it? Why or why not?
 10. Have you ever applied for federal or state cost share programs?
If Yes:
 - a. Which one(s)?
 - b. Did you receive financial assistance?
 - c. If Yes, how was the money used? Projects?
- II. Now, I would like to ask you some questions about the local area and community in which you live (or own land, if absentee landowner).
1. How would you describe this area around here where you live?
 - a. If absentee: How would you describe the area in which your land is located?
 2. How long have you lived in (or owned land in) the local area?

3. Are there any nearby areas or places that are important or special to you?
4. How would you describe the community where you live (or own land)?
5. What are some of the things you like about living in this area, considering both land and people?
6. Are there any things you don't particularly like about living around here?
7. How would you say this area has changed over the time you have lived here (If Absentee: Have you noticed any ways in which the area in which your land is located has changed since you have owned the land?)?
 - a. What do you think this area will look like 30 or 40 years from now?
8. Do you tend to get involved with groups or clubs in the community in which you currently live (or own land) – church, social, civic, recreation or some other type of group or club?
9. Do you feel as though you are part of the community? How or how not?
10. Regarding natural resources such as forests, water, and wildlife, do you think there are issues or problems in your area? If so, please explain.

III. Now I'd like to tell you about a recent perspective about forests and other natural resources that has gotten some attention around the country in the past few years. It's called *ecosystem stewardship*.

Ecosystem stewardship is a view about how to manage America's public and private forested lands. It starts by recognizing that forests and other lands people own are actually part of a larger natural setting we might call the local ecosystem. For example, your land is part of this broader watershed (SHOW MAP), and water running over and through this local ecosystem drains into Clearwater Lake. Similarly, the forests in this area are part of what we call the "central hardwood region" (SHOW MAP). In this context, keeping watersheds and forest ecosystems healthy, air and water clean, and so on, depend on the actions of more than simply one landowner like you. Rather, everyone must contribute a little.

If an ecosystem perspective were to be applied on private lands, it is important that many landowners within a watershed or landscape cooperate with one another. For example, all landowners might be invited to join a partnership whose members would jointly discuss their land management activities to ensure a healthy watershed and the forests and other natural resources within it for their local area. When landowners work together to keep their lands and local ecosystems healthy, this is called collaborative ecosystem stewardship.

1. Do you think you might be interested in participating in such a partnership? Why or why not?
2. What would encourage you to participate in a collaborative stewardship group?
 - i. Would you be more interested in participating if you knew that neighboring landowners were also agreeing to participate?
 - ii. Would you be more interested in participating in a group if you knew the main objective was to help landowners increase income gained from their lands through activities like timber production, hunting, or recreation?
 - iii. Would you be more interested in participating in a group if you knew the main objective was to help landowners keep their lands and forests healthy as a place to live (or visit) and enjoy amenities like wildlife, scenic beauty, and so on?
 - iv. Would you be more interested in participating if you knew more about the concept of collaborative ecosystem stewardship before agreeing to join a group effort?
 - v. Would you be more likely to participate if you knew that natural resource professionals from state agencies would be involved or available for consultation if you so desired?
3. What do you think some of the benefits might be to working with other local landowners in an ecosystem stewardship framework?
4. What do you think some of the difficulties might be to working with other local landowners in an ecosystem stewardship framework?
5. What kinds of incentives do you think would be necessary to get local landowners involved in ecosystem stewardship, either individually or jointly?
6. What do you think some of the obstacles could be to working across property boundaries to achieve ecosystem stewardship goals?
7. There are many private land holdings along the St. Francis River and other creeks in the watershed. Do you think other landowners in the area would be willing to discuss and possibly work together on matters involving the health of the whole watershed in an ecosystem stewardship framework? Why or why not?

IV. Interview wrap-up.

1. Is there anything else that you would like to say?
2. Do you have any questions for me?

- V. Would you please fill out this card with a couple of background information items about yourself? This information is strictly confidential and only used by being combined with that of all other landowners in the study area for statistical purposes, so nothing will reveal anything about you personally. (GIVE PAPER)

Landowner Demographic Questionnaire

IFAFS: Collaborative Planning & Policy
Landowner Interview (Madison County)

Demographic Information:

1. What is your race (heritage, skin color)?
2. What is your age?
3. What is your gender (male or female)?
4. Do you have a religious preference?
5. What is the highest school grade you completed?
6. What was your total approximate household income for 2002?
7. How many people live in your house? What is their relationship to you?

APPENDIX B. PHASE II: COLLABORATION INCENTIVES AND MECHANISMS

Invitational Letter

July 5, 2004

Jack and Jill Jones
Madison 414
Fredericktown, Missouri 65742

Dear Jack and Jill Jones:

I am a forestry student at the University of Missouri – Columbia and I have been talking with landowners in Madison County over the past year for my graduate project. I am interested in learning about what landowners, such as yourself, like about owning their land, and what landowners might have in mind in terms of managing their land. I am also interested in learning from landowners whether or not they have any concerns about long term natural resources management and if landowners in the area are interested in working together to carry out land management activities.

I would like to invite you to an informal dinner at Black River Electric Co-op on July 20, 2004 from 7:00 – 8:30pm, to meet other private landowners and to talk about land issues in your area. Please fill out the enclosed post card and drop it in the mail, no postage necessary, so I will know how many plan on eating dinner.

If you have any questions, comments or concerns, please contact me at 573-884-6302 or by email at fwm3kb@mizzou.edu. In addition, please feel free to contact the project director, Dr. William B. Kurtz, who would be happy to discuss this project with you. He may be reached at 573-882-4567 or by email at kurtzw@missouri.edu.

Sincerely,

Faren R. Wolter
Graduate Student

Enclosure (1)

RSVP Card

Madison County Landowner Field Day and Lunch
at Amidon Memorial Conservation Area

Name _____

_____ I will attend

_____ Number of people

_____ I am unable to attend

Special dietary needs:

Reminder Post-card

**Madison Co Landowner Meeting and Dinner
for the
St. Francis Watershed**

**July 20, 2004
7:00 – 8:30 p.m.
Black River Electric Coop**

A community meeting to discuss land and water quality issues

We look forward to meeting with you.

Field Days and Demonstration Workshop Flyer Examples

Madison County Landowner Meeting and Field Day

September 11th from 11:00am to 1:00pm at
Marvin and Larry Smith's property

- Tree See new wildlife habitat improvements for quail, turkey, songbirds, rabbits and deer
- Tree Listen to a resource forester and the landowners talk about what land management has been done and why
- Tree Meet and talk with other area landowners over lunch – please return enclosed card
- Tree Learn about the Eastern Ozarks Forestry Council
- Tree Bring a friend and your lawn chairs

Directions: From Cherokee Pass take Hwy. 67 south for about 10 miles, turning right on Madison 411 (look for the Pisgah Church sign). Go about 2 miles, the Smith's property is on the left just before Pisgah Church. Or drive south on 'C' turning left on 'EE' and then turning right on Madison 411 when the pavement ends. Go about 2 miles, the Smith's property is on the right, just past Pisgah Church.

There will be someone at the field entrance to direct parking.

If it rains the field day will be cancelled and moved to another date.

Mechanized Logging and Forest Thinning Demonstration and Field Day

Landowners and managers, foresters, loggers, and mill operators are invited to attend a free demonstration of conventional and novel forest logging technologies in Wayne Co., Missouri on Saturday, October 30th, at 10:00 am and again at 11:30 am. An MDC "Coldwater Conservation Area" sign on the east side on Hwy 67 about 7 miles north of its intersection with Hwy 34 marks the gravel road to the demonstration area. Directions will be posted from that point.

Equipment to be demonstrated (courtesy of) include:

- Ergo 6-wheel, cut-to-length harvester with H73 head (Ponsse USA)
- Bison 6-wheel forwarder (Ponsse USA)
- Timbco 425B tracked harvester with Rolly II head (Madison Co. Wood Products)
- Bell Ultra-T 3-wheel harvester with bar saw (Madison Co. Wood Products)
- John Deere 540B grapple skidder with winch (Joe Glenn Forest Management)
- ASV RC-100 mini-crawler with ImpleMax grapple (S&H Farm Supply)
- Davco QC 1400 feller buncher (Barda)
- Baker 3667 portable bandsaw mill (Baker Products)

Attendants will be able to view stands selectively felled and extracted by some of the above harvesting equipment to visually assess their impact on the soil and trees. Expert foresters will explain how trees were selected for removal or retention as crop trees. Operators and sales reps will be available to discuss handling properties and working efficiencies of the equipment.

Sustainable forest management is possible only through a collaboration of landowners, foresters, loggers, and mill operators. The Missouri Department of Conservation (MDC) and the Eastern Ozarks Forestry Council (EOFC) are jointly sponsoring a trial to identify which conventional or novel technologies can increase the profitability of thinning young and old Ozark hardwood stands. Thinning is expected to improve forest health and productivity, create new employment and marketing opportunities, and a more mechanized approach should increase operator safety.

Please indicate your intention to attend or confirm arrangements (there is no rain date) by contacting the MDC office in Piedmont, MO (ph: 573-223-4525). Drinks will be provided; pre-teens should not attend for reasons of safety.

APPENDIX C: PHASE III: TECHNOLOGICAL INTERVENTIONS

Forest Management Decision Education Tool Survey Protocol

This document contains two components:

- 1) The logic and protocol for landowner evaluation of the FDET; and*
- 2) The draft evaluation form to be filled out by the FDET users (landowners)*

The following attributes of the DST will be evaluated by asking landowners to respond to a set list of questions. The attributes to be evaluated include:

1. The presentation of FDET content
2. The educational quality of the FDET content
3. The quality of the FDET Documentation and Supporting Materials
4. The quality of the user (landowner) interaction with the FDET
5. The effectiveness of having the FDET be presented as a computer program
6. The quality of the FDET's instructional management
7. The overall format of the FDET

A brief discussion of the each attribute is given below.

1. The presentation of FDET content
 - a. Accuracy and error free
 - b. Up to date or current
 - c. Unbiased and free of stereotypes
 - d. Presented in a non-confusing manner
 - e. Content is compatible with other sources of knowledge
2. The educational quality of the FDET content
 - a. Production Concerns
 - i. Possible to identify program goal and objectives
 - ii. Enhances, supports landowner's objectives
 - b. Presentation of Information
 - i. Material is packaged in small well-sequenced units
 - ii. Information presented more than once (learning through repetition)
 - iii. Builds from familiar to new content
 - c. Suitable for intended audience
 - i. Program requirements matched the intellectual level of the user
 - ii. Reading level was appropriate for the user
 - iii. Type of responses consistent with the skills of the users
 - iv. The type and amount of use is compatible with program
3. The quality of the FDET Documentation and Supporting Materials / Appropriate Use of Technology
 - a. Clear concise and easy to follow
 - b. Documentation occurs in a logical order

- c. Uses good organizational aids (>>>)
 - d. Follow up activities are appropriate
- 4. The quality of the user (landowner) interaction with the FDET
 - a. User controls the pace of the program
 - b. User can control the direction of the program
 - c. Appropriate level of user interaction
 - d. User can change their responses
- 5. The effectiveness of having the FDET be presented as a computer program
 - a. Screen is not crowded or cluttered
 - b. Graphics emphasizes or highlight key points
 - c. Good use of color
 - d. The use of sound to give directions, enhance presentation
 - e. Sounds can be turned off
- 6. The quality of the FDET's instructional management
 - a. Saves the users responses /security of responses
 - b. Ease and presentation of printing assessment
- 7. The overall format of the FDET (*a simulation style education program*)
 - a. Objectives match instructional objectives
 - b. User responses determine results of the program
 - c. User can stop program and return to it later without penalty
 - d. Holds the interest of the user
 - e. Includes essential elements of the real situation being simulated
 - f. Interrelationships between elements are accurate
 - g. Sophistication level of program matches that of the user

Forest Decision Education Tool (FDET) Survey

First, I want to thank you for taking the time tonight to “test” a newly created computer-based forest education tool. The program was designed to provide an educational opportunity for landowners. Specifically, the FDET was designed to spark landowner’s interest in the potential outcomes of active forest management, which can be used to improve timber or wildlife habitat quality. Your input tonight will help us to make the program better so that in the future landowners may use this program to learn about their forests and various ways to manage it.

Your answers are strictly confidential and your participation is completely voluntary.

On a scale of 1 to 5 (1 being totally disagree and 5 being totally agree) please tell me how much you agree or disagree with the following statements.

Section I: FDET Documentation

- 1.** The directions provided in the program were clear and easy to follow.

O 1	O 2	O 3	O 4	O 5
Totally Disagree				Totally Agree

- 2.** The wording was well organized and had a good flow.

O 1	O 2	O 3	O 4	O 5
Totally Disagree				Totally Agree

- 3.** There was too much reading throughout the program.

O 1	O 2	O 3	O 4	O 5
Totally Disagree				Totally Agree

- 4.** There was NOT enough explanation or direction throughout the education tool.

O 1	O 2	O 3	O 4	O 5
Totally Disagree				Totally Agree

Section II: Quality of Interaction

- 1.** It was easy to take my time and work at my own pace.

O 1	O 2	O 3	O 4	O 5
Totally Disagree				Totally Agree

2. I could go easily go back and forth through the program without any trouble (e.g. losing my place).

O 1 O 2 O 3 O 4 O 5
Totally
Disagree

Totally
Agree

3. There were too many questions to answer.

O 1 O 2 O 3 O 4 O 5
Totally
Disagree

Totally
Agree

4. I was able to change my answers easily and as many times as I wanted.

O 1 O 2 O 3 O 4 O 5
Totally
Disagree

Totally
Agree

Section III: Quality of Content

1. From the information provided it was easy to identify how the program was going to help me.

O 1 O 2 O 3 O 4 O 5
Totally
Disagree

Totally
Agree

2. The program helped me understand what I can do with my forest and what impacts different activities might have.

O 1 O 2 O 3 O 4 O 5
Totally
Disagree

Totally
Agree

3. The information or skills I needed to know to use the program was too technical.

O 1 O 2 O 3 O 4 O 5
Totally
Disagree

Totally
Agree

4. The land management information provided by the program was too complex and technical.

O 1 O 2 O 3 O 4 O 5
Totally
Disagree

Totally
Agree

Section IV: Overall Format

1. The education tool was boring.

O 1	O 2	O 3	O 4	O 5
Totally				Totally
Disagree				Agree

2. Sometimes I felt confused while using the education tool.

O 1	O 2	O 3	O 4	O 5
Totally				Totally
Disagree				Agree

3. The information provided by the education tool was too basic for me.

O 1	O 2	O 3	O 4	O 5
Totally				Totally
Disagree				Agree

4. I think this kind of education tool would be helpful for landowners to understand their land management options.

O 1	O 2	O 3	O 4	O 5
Totally				Totally
Disagree				Agree

Section V: Presentation of Content

1. I believe the program gave me accurate forest management information.

O NO O YES

2. The information presented in the program was different from how I think about managing my forest.

O NO O YES How?

3. I noticed errors in the program. If Yes, where?

O NO O YES Where?

4. The program was missing ways of how I see or use my land. If yes, what ways are needed?

O NO O YES What ways are needed?

Any Other Comments or Suggestions? Please write on back of page

FDET Survey Results

Section I: FDET documentation

Variable description	N	Minimum	Maximum	Mean	Std. Deviation	Variance
directions were clear and easy to follow	6	3.0	5.0	3.833	.9832	.967
wording was well organized and had a good flow	6	3.0	5.0	3.667	.8165	.667
too much reading	6	1.0	5.0	2.667	1.3663	1.867
NOT enough explanations or directions	6	1.0	5.0	2.500	1.6432	2.700

Section II: Quality of interaction

Variable description	N	Minimum	Maximum	Mean	Std. Deviation	Variance
easy to take my time and work at own pace	6	2.0	5.0	4.167	1.3292	1.767
easily move around program without losing place	6	2.0	3.0	2.667	.5164	.267
too many questions to answer	6	1.0	3.0	2.167	.9832	.967
easy to change answers	6	3.0	5.0	4.000	.8944	.800

Section III: Quality of content

Variable description	N	Minimum	Maximum	Mean	Std. Deviation	Variance
easy to identify how the program would help me	6	2.0	5.0	2.667	1.2111	1.467
program helped me understand forest management options and impacts	6	2.0	5.0	3.167	1.1690	1.367
information or skills needed to use the program were too technical	6	1.0	3.0	2.333	.8165	.667
management info was too complex and technical	6	1.0	3.0	2.333	1.0328	1.067

Section IV: Overall Format

Variable description	N	Minimum	Maximum	Mean	Std. Deviation	Variance
education tool was boring	6	1.0	4.0	2.167	1.1690	1.367
using the tool was confusing	6	1.0	5.0	3.000	1.4142	2.000
information provided in the tool was too basic for me	6	1.0	4.0	2.833	1.1690	1.367

education tool would be helpful to landowners to understand their options	6	4.0	5.0	4.500	.5477	.300
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Section V: Presentation of content

Variable description	N	Minimum	Maximum	Mean	Std. Deviation
program provided accurate forest management info	6	6	7	6.50	.548
info provided was different from how I think about managing my forest - How?	6	6	8	6.83	.753
errors in the program - Where?	6	6	7	6.17	.408
the program was missing ways of how I see or use my land - What ways are needed?	6	6	7	6.50	.548

Collaborative Ecosystem Stewardship Focus Group Letter

September 11, 2005

Jack and Jill Jones
Madison 414
Fredericktown, Missouri 65742

Dear Jack and Jill Jones:

Well, it has been a few months since the landowner field day in June when several of us visited the Amidon Memorial Conservation Area. As many of you know, there is a time (and funding) limit regarding my efforts to form a collaborative stewardship group of private landowners in the Missouri Ozarks. I have enjoyed the time I've spent getting to know the landowners in Madison County, but all good things must come to an end, and so does this project.

I would like to invite you to the very last informal dinner for Madison County landowners on September 22, 2005, from 7:00 – 9:00 in the evening. This final gathering will NOT be held at the Black River Electric Co-op; instead, it will be held across Hwy. 67 at Seitz Café.

I am very appreciative of all the help and guidance I have received from area landowners over the past four years (gosh, has it really been that long?) and am looking forward to this final gathering to thank you in person. If you have any questions, comments or concerns, please contact me at 573-884-6302 or by email at fwm3kb@mizzou.edu.

Sincerely,

Faren R. Wolter
Graduate Research Assistant

Focus Group Protocol

Final Landowner Meeting and Focus Group (7 – 9:00pm)

Opening Questions (30 mins)

1. What did you like about the landowner meetings and gatherings? (write responses on the Easel board) [approx 7 mins]
2. What did you NOT like about the landowner meetings and gatherings? (write responses on the Easel board) [approx 7 mins]
3. Give list of management options (include no management, take care of land/good stewardship, and other) and give them three stickers each to rank preferences. (on easel board with stickers) [approx 7 mins]
4. Give list of reasons to manage or take care of your land (include heritage/legacy, wildlife habitat game and non-game, recreation, to earn money/supplement income, stream quality/fish habitat, forestry, farming, and other) and give them three stickers each to rank preferences. (on easel board with stickers) [approx 7 mins]

Maps (40 – 45 mins)

5. Would you be open to some type of joint management? Say, along Trace and Twelvemile Creeks – stream clean, water quality monitoring, riparian zone restoration projects (explain it!), wildlife management like QDM or for quail habitat projects (they require large acreage of diverse habitat requirements). These should be mapped scenarios on paper to be discussed – block out some fictitious tracts to represent “what-if” options – what about a development option? [approx 20 tops]
6. These tracts of land (the ones marked non-participant) – they are also important landowners in any of these potential projects, so how do we get them to join such a group or at least talk about options? (write suggestions on easel board) [approx 7 mins]
7. Using these colored-in maps of different landscape options, is this kind of approach or process helpful in visualizing how your tract(s) of land are important to healthy natural resources at a larger scale (the creek zone, part of the St. Francis watershed)? Yes/No? (write suggestions on easel board) [approx 7 mins]
8. What other ways could private landowners use these maps? (write suggestions on easel board) [approx 7 mins]

Closing Comments & pass out thank you gifts.

APPENDIX D. TABLES

Table 13. Descriptive demographic data for landowner interviews.

	Local Landowners	Absentee Landowners
Race/Heritage[±]	White = 10	White = 5
Age	39 and less = 0 40 to 49 = 3 50 to 59 = 1 60 to 69 = 1 70 to 79 = 0 Over 80 = 1	39 and less = 0 40 to 49 = 0 50 to 59 = 1 60 to 69 = 1 70 to 79 = 0 Over 80 = 1
Gender[±]	Male = 7 Female = 3	Male = 4 Female = 1
Religious Preference	Protestant = 1 None = 5	Baptist = 2 Catholic = 1 None = 2
Education	Less than high school = 2 High school = 2 Junior college = 1 College = 1	Less than high school = 1 High school = 1 Junior college = 1 College = 2
Approximate Household Income 2002	55K = 1 65K* = 1 Retired = 2 Did not answer = 2	75K+ = 1 50K = 1 Retired = 2 Did not answer = 1
Number of People Living in Household	One to household = 1 Two to household = 5	Two to household = 2 Five to household = 1
Declined Survey	4	2

[±] Not all surveys were answered; therefore, totals were derived from field notes. * Combined spousal income; however spouses were counted as individuals for interview purposes because each answered questions separately and in different ways.

VITA

Faren R. Wolter was born March 1, 1969, at Newport Naval Base in Newport, Rhode Island. She was raised primarily in rural Virginia where she attended public school and graduated from Poquoson High School in 1987. Following high school, she entered Virginia Commonwealth University but left to pursue her dream of becoming a professional equestrian. After achieving many of her equestrian goals, she refocused on higher education and received the following degrees: A.S. in law from Greenville Technical College (1996); B.S. in aquaculture, fisheries, and wildlife biology, with minors in forest resource management, and environmental science and policy from Clemson University (2001); Ph.D. in forestry with a graduate certificate in society and ecosystems from University of Missouri – Columbia (2006). She is presently employed as a private land conservation officer with the Piedmont Environmental Council, a land trust in Virginia.