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Comparing Urban and Rural Perceptions of and Familiarity With the Management of Forest Ecosystems

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Forests generate market (e.g., timber) and nonmarket (e.g., wildlife) values to individuals, and multiple-use forest management involves making trade-offs between different management goals. This research uses results from six focus-groups to under-stand how the public perceives these trade-offs and examines differences between urban and rural groups in Michigan's Central Upper Peninsula. Results reveal differences between rural, timber-dependent and urban, non-timber-dependent participants' famili-arity with forest management and ecological interactions within forests. Results support the idea that rural, timber-dependent community members are very concerned about the continued provision of both market and nonmarket forest outputs. Urban, non-timber-dependent community residents have milder concerns for sustaining multiple forest outputs but expressed strong concerns for maintaining recreational opportunities for personal uses. The results do not support the hypothesis that rural/urban views lie as expected along an anthropocentric–biocentric continuum.

Keywords focus-groups, forest management, public perceptions, timber depen-dence, urban/rural

The focus of forest management on public and private lands has changed considerably over the past decade due to increased public concern for wildlife,

recreation, and aesthetics (Steel et al. 1994; Tarrant and Cordell 2002). As a result, management of forests for multiple uses has emerged as an important goal for forest land managers. Multiple-use forest management involves trade-offs between frequently conflicting forest management goals. For example, the resources provided by forest ecosystems generate both market (e.g., timber) and nonmarket (e.g., wildlife) values to individuals. This research uses the results of six focus-group discussions to understand how the public perceives these trade-offs and to examine differences between urban and rural groups in an area of Michigan's Central Upper Peninsula.

Information on public preferences for forest management is critical for effective resource management decision making (Bingham et al. 1995; Boxall and Macnab 2000; Dennis 1998; Jacobson and Marynowski 1997; McFarlane and Boxall 2000; Stein et al. 1999; Tarrant and Cordell 2002; Zinkhan et al. 1997). Social acceptability is important to the forest policymaking process (Kearney 2001), and clear communication of management options to the public can help increase public acceptability of forest policies (Shindler et al. 2002). This communication process begins by understanding public preferences for and knowledge of different forest management alternatives, and this process is a key to connecting management regimes with publicly acceptable ecosystem outcomes.

Public preferences for forest ecosystem management may vary by demographic characteristics (Bourke and Luloff 1994; Dietz et al. 1998; Jacobson and Marynowski 1997; McFarlane and Boxall 2000; Reading et al. 1994; Steel et al. 1994; Tahvanainen et al. 2001) or by the level and type of interaction with the resource (Gobster 2001). Numerous studies have examined the influence of socioeconomic factors on forest values and attitudes (Bourke and Luloff 1994; Dietz et al. 1998; McFarlane and Boxall 2000; Reading et al. 1994; Solecki 1998; Steel et al. 1994). Attitudes toward and preferences for natural resource management may differ between rural and urban groups (Brunson et al. 1997; Ribe and Matteson 2002; Tremblay and Dunlap 1978). In addition to the urban/rural distinction, it is also possible to differentiate communities based on whether or not they are dependent on timber for economic stability. The "jobs versus owls" controversy in the northwest United States is often portrayed as an urban/rural issue but may be better described by timber-dependent versus non-timber-dependent households (Brunson et al. 1997). There may be differences in forest management preferences between timber-dependent rural and non-timber-dependent rural populations (Xu et al. 2003). Other studies have examined the effects of geographic location on resource management preferences in the context of community-based ecosystem management (Bandara and Tisdell 2003; Cordell and Tarrant 2002; Noss and Cuellar 2001; Obiri and Lawes 2002; Stein et al. 1999).

Many studies in the social forestry literature have concluded that residents of timber-dependent (often rural) communities tend to be more in favor of resource extraction, and residents of communities not dependent on timber (often urban) tend to favor resource protection (Brunson et al. 1997; McFarlane and Boxall 2000; Steel et al. 1994; Tarrant and Cordell 2002; Tremblay and Dunlap 1978). This theme in the social forestry literature is sometimes referred to as the "anthropocentric/biocentric continuum," in which timber-dependent communities fall at the anthropocentric end, and non-timber-dependent communities fall at the biocentric end (Tarrant and Cordell 2002). In other words, residents of communities that are dependent on forest resources for economic stability are more likely to support forest management that

promotes resource extraction and emphasizes instrumental values of forests and are less likely to be concerned about the intrinsic value of forests for their own sake or their ecological and life support values, and vice versa (Steel et al. 1994; Tarrant and Cordell 2002). Drawing on this literature, the guiding hypothesis of this study is that rural, timber-dependent community residents will hold strong anthropocentric views of forest management and urban, non-timber-dependent community residents will hold strong biocentric views of forest management. This hypothesis is examined for a managed forest ecosystem in Michigan's Upper Peninsula. The forest ecosystem includes rural, timber-dependent communities and draws recreational users from a nearby urban area.

Forest ecosystems provide timber, wildlife habitat, recreation, aesthetics, clean air, water filtration, and other ecological functions. Forest management decisions result in different levels of these market and nonmarket outputs, and trade-offs must be made between competing needs of different stakeholders. In the study area, prior forest management decisions have had ecological effects on forest structure, deer populations, and forest migratory songbird habitat. Forest management also affects the local timber-dependent economy in this area, resulting in numerous complex interactions among humans, forests, and wildlife.

This study was undertaken to provide policymakers and resource managers with information on public preferences for and familiarity with forests and forest management in this area of Michigan. The following research objectives were identified: (1) identify forest ecosystem services recognized by the public; (2) explore public familiarity with and perceptions of forest management, forest land ownership and forest/human/wildlife interactions in an area of Michigan's Upper Peninsula; and (3) determine whether urban/rural differences exist with respect to the topics explored in objectives 1 and 2.

Study Area

The study focuses on an area of about 500,000 ha of forested land in Michigan's Central Upper Peninsula and includes parts of Baraga, Dickinson, Iron, Marquette, and Menominee counties (see Figure 1). This region was chosen for its diverse ecological landscape, variety of industrial and recreational uses of its forests, and for the presence of various forest management methods. In order to achieve research objective 3 and to test the hypothesis that timber-dependent community residents will hold anthropocentric views of forest management and non-timber-dependent community residents will hold biocentric views, the study area is defined as a rural, timber-dependent area and the views of its residents are compared to Marquette, a nearby urban area that is not timber dependent.

Ecological Characteristics of the Study Area

The study area consists of forest ecosystems in which complex interactions exist between forest management practices, forest structure and composition, deer populations, and forest migratory songbirds. The study area provides unique and important breeding habitat for many species of neo-tropical migratory forest songbirds (Howe et al. 1995). Winter deer density in this area is higher in locations with high-intensity timber harvests (unpublished data, Michigan Department of Natural Resources). Decreases in regeneration rates of some trees, such as northern white
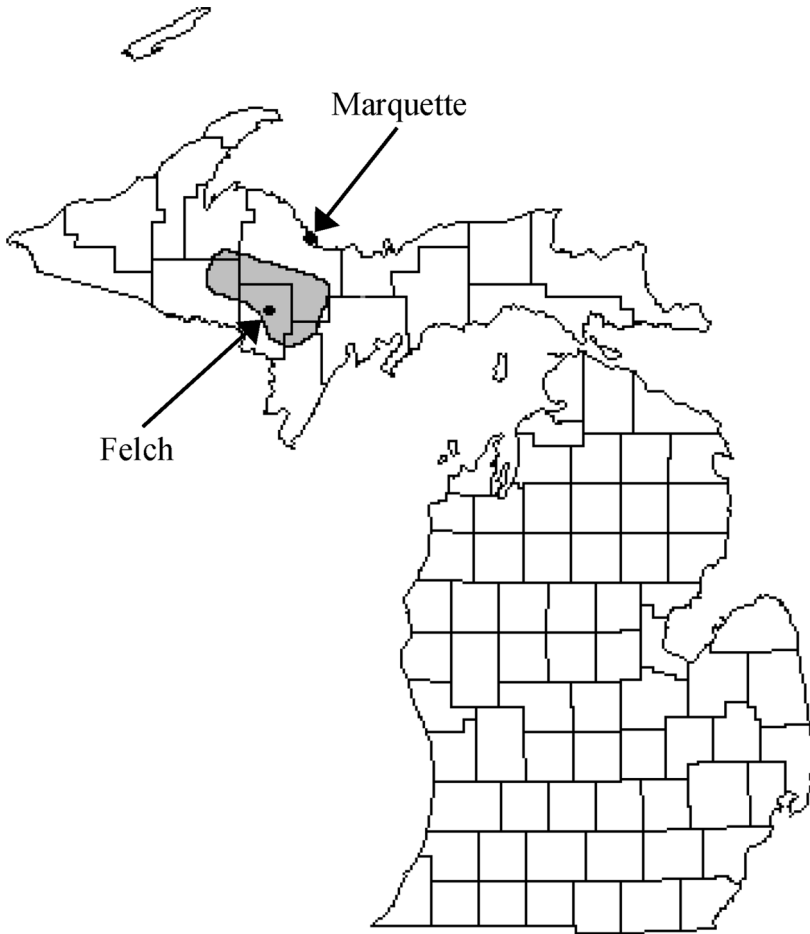
Figure 1. Map of Michigan with study area highlighted.

cedar and sugar maple, may be related to these high winter deer densities (Miller 1997; Miller et al. 1990; DeCalesta 1997; LeBouton et al. 2003). Changes in tree regeneration may, in turn, be adversely affecting habitat for neo-tropical migratory forest songbirds in the area (Laurent et al. 2003). In addition, these changes may affect the local economy by decreasing future timber availability as well as changing the structure and composition of forested areas used for recreation. The existence of these and many other complex interactions between people, forests, and wildlife within this managed forest ecosystem makes it an appropriate setting in which to examine public preferences for multiple use forest management.

Economic and Demographic Characteristics of the Study Area and Marquette

The study area is also characterized by economic dependence on timber resources. Dominated by public and private forest lands, it is a sparsely populated region made up of natural resource-dependent communities that rely on timber, tourism, and recreation for income, employment, and economic sustainability, making it similar to many other areas of the Upper Peninsula (McDonough et al. 1999;

Potter-Witter 1995). Two common indicators of resource dependence are employment levels in a particular sector and the percent of land devoted to a particular industry (Bailey 2004; Machlis and Force 1988). Direct forest-based employment (logging, sawmills and wood product manufacturing) accounts for 12 to 28% of total employment in the study area (U.S. Census Bureau 2001). Two large industrial landholders and several small mills in this area produce valuable forest products such as dimensional lumber, poles, posts, veneer, and pulp. This area is 90% forested, and the land is owned primarily by forest industry (43%) and the state (42%) (Pugh et al. 2001).

The nearby city of Marquette and its surrounding area are not timber dependent. In the Marquette ZIP code area, 4% of the land is owned by the forest industry, and 17% is state owned (Pugh et al. 2001). Direct forest-based employment in the Marquette area is less than 1% of total employment (U.S. Census Bureau 2001). In the ZIP code area of Negaunee, adjacent to the Marquette ZIP code area, employment in forest-based jobs accounts for 1 to 3% of total employment in that area. Moving further west to the ZIP code area of Ishpeming, adjacent to Negaunee, employment in forest industry accounts for 4 to 9% of total employment (U.S. Census Bureau 2001). Employment in forest products industry increases as distance from the city of Marquette increases. Although Marquette County produces large amounts of timber, Marquette city is not timber dependent and is substantially different in this respect from our study area.

Marquette and the study area also differ in population and population density. Populations of communities within the study area range from 350 to 2,064 (U.S. Census 2000b), and are defined as rural according to the U.S. Census definition (less than 2,500 residents) (U.S. Census Bureau 1995). The city of Marquette is an urban area with a population of 19,598 and is the largest city in the Upper Peninsula (U.S. Census 2000a). The population density of the city of Marquette is 120 to 1,999 people per square mile, and Marquette Township has a population density of 60 to 119 people per square mile (MTA 2000). By contrast, almost all of the townships that fall within our study area have population densities of less than 20 people per square mile, with 1 township having 20 to 59 people per square mile (MTA 2000).

Although Marquette is not a typical large urban center, the intent of this study was not to compare views of residents in the study area with those of a large urban area such as Detroit. Rather, the study sought to compare urban and rural residents' views of a natural resource with which both groups have some familiarity. There are substantial differences in population, population density and economic dependency between Marquette and our study area, which, along with the existing literature, suggest that the views of their residents may also be different.

Methods

Focus groups are a research method that collects data using group discussions based on a topic defined by the researcher (Morgan 1997, 6). The goal of this study is to understand differences in perceptions and the range of understanding that rural, timber-dependent and urban, non-timber-dependent community residents have of forests and forest/human/wildlife interactions. Focus groups are a well-accepted method of eliciting information from participants through open-ended questions, allowing participants to respond in a manner of their own choosing (Kreuger and Casey 2000, 5; Morgan 1997, 5). By obtaining information on familiarity and

perceptions of forest management in an open-ended discussion format, results of focus-groups allow us to gain an understanding of public views of forest resources.

The goals of focus-groups are to listen to people, encourage them to share their points of view in a permissive environment, and gather information about people's perceptions by listening to their discussion (Kreuger and Casey 2000, 4). This method allows respondents' discussions to reveal their familiarity with a subject, as well as their preferences, beliefs, and opinions. Numerous studies have used focus-groups to assess public preferences for and perceptions of natural resources and their attributes (Kaplowitz and Hoehn 2001; Minnis et al. 1997; Pomeroy and Beck 1999; Smith and McDonough 2001; Winter and Fried 2000). They have also been used in studies to evaluate forest recreation preferences (Mitra 1994) and to understand why people value forests (Hull et al. 2001).

To accomplish the outlined research objectives, six focus-groups were conducted in Michigan's Central Upper Peninsula. Planning the study is an integral part of conducting focus-group research (Kreuger and Casey 2000, 21). The structure of the focus-group discussions was carefully developed based on input from ecologists and foresters collaborating on this project. The discussions were structured around the following topics: perceptions of forest services and uses of forests; goals of forest management; forest land ownership; effects of management on forests, deer and other wildlife; and effects of deer on forests and wildlife.

The ideal size of a focus-group is between 6 and 8 participants (Kreuger and Casey 2000, 73). It is typical to overrecruit for a focus-group because of the risk of no-shows (Morgan 1997, 42). Therefore, 15 individuals were recruited for each group to ensure that 8 people would arrive and participate. Focus-group recruitment was conducted by systematic random sampling of individual names from area telephone directories for the city of Marquette and Felch Township to form the urban and rural groups, respectively. Potential participants were told that the discussion would be about issues concerning Michigan's Upper Peninsula but were given no further details on the topic of the discussion groups.

All individuals who showed up for a focus-group were paid a $40 honorarium, and 8 people were kept to participate in the discussions. Following standard practice, when more than 8 individuals arrived, some individuals were dismissed and sent home with their honorarium (Goldman and McDonald 1987, 34). All urban participants resided in the city of Marquette, and all rural participants lived in small towns in the study area (Felch, 8; Foster City, 7; Hardwood, 4; Vulcan, 1; Ralph, 3), with the exception of 1 participant from Kingsford (population 5,666), which shares a telephone exchange with Felch.

Discussions were structured around the previously mentioned topics and lasted about two hours. Each discussion was tape recorded, and a systematic analysis was conducted of the focus-group data (Kreuger and Casey 2000, 128). Discussion questions were designed to allow participants to become familiar with topics before launching into key questions. Information from notes taken by the assistant moderator was incorporated in the results, and the transcribed discussions were analyzed for content. Transcripts were coded by attaching labels to each theme every time it appeared (Kreuger and Casey 2000, 130). Transcripts were reviewed carefully in order to ensure that participant comments were correctly interpreted. This is a method of verifying the intent of participant comments after the focus-groups have been conducted (Kreuger and Casey 2000, 128). Debriefing occurred between the moderator and assistant moderator following the discussions in order to exchange

impressions and main points that emerged from the groups. Comments made by participants were organized into theme groups to illustrate similarities and differences between the urban and rural discussions.

The use of numbers in reporting focus-group results is controversial (Kaplowitz 2000). Caution should be used when reporting numbers, and some researchers recommend not using numbers in focus-group reporting at all (Kreuger and Casey 2000, 141). However, others assert that frequency counts of coded comments, or "descriptive counting," is especially useful in studies that seek to compare different types of groups to reveal how often different topics were mentioned in each group (Morgan 1997, 61; Shively 1992). Descriptive statistics on participants are reported in Table 1, and frequencies and extensiveness of comments are reported in Table 2. It is important to emphasize that these numbers should not be used to generalize to the population because the sample size is too small. Importance of comments should be determined by the specificity, detail, emotion, and intensity of comments as well as extensiveness, or how many people made each type of comment (Kreuger and Casey 2000, 136). Therefore, Table 2 reports comment frequencies and extensiveness as supplements to the detailed presentation of the discussion content in order to illustrate the differences between the urban and rural groups.

Table 1. Socioeconomic characteristics of urban and rural focus-group participants

Socioeconomic characteristic	Urban ($n = 24$)	Rural ($n = 24$)
Average years lived in the Upper Peninsula	31	35
Average years lived in Michigan	39	46
Property ownership in study area[b]		
Median acres owned in study area	0	43
People owning 0 acres in study area	22	0
People owning 1–50 acres in study area	0	13
People owning 50–500 acres in study area	1	10
People owning >500 acres in study area	1	1
Age[a]		
Median age group	40–49	50–59
People <50 years old	16	7
People >50 years old	8	16
Household income		
Median household income level	$26–50 K	$26–50 K
People with <$50,000 in annual household income	13	12
People with >$50,000 in annual household income	10	9
Education[b]		
Median education level	Associate's degree	Some college
People with associate's degree or lower	16	20
People with college degree or higher	8	4

[a]$p < .10.$
[b]$p < .05.$

Table 2. Theme and subtheme frequencies and comment extensiveness of urban and rural focus groups

Theme	Urban (*n* = 24)		Rural (*n* = 24)	
	Frequency	Extensiveness[a]	Frequency	Extensiveness[a]
Theme 1: Forest services				
Beauty/emotional connection	7	5	22	13
Economic values	17	14	66	21
Recreation	53	20	43	18
Theme 2: Forest management	47	19	87	24
Theme 3: Land ownership	46	18	73	23
Theme 4: Forest/human/ wildlife interactions				
Effects of forest management on wildlife	54	17	53	21
Deer browse	24	12	51	20
Effects of deer on other wildlife	16	9	28	16

[a]Extensiveness = the number of unique individuals who made each comment.

Results and Discussion

Focus-Group Participant Characteristics

The socioeconomic characteristics of focus-group participants are reported in Table 1. The rural participants had, on average, lived in the Upper Peninsula and Michigan longer than the urban participants, though these differences are not statistically significant at the ten percent level. Most urban participants owned 0 acres of property in the study area, while most rural participants owned 10 acres or more in the study area, and this difference is statistically significant.[1] Urban participant ages are more concentrated in lower age groups while rural participant ages tend toward higher age groups. The number of urban participants holding a college degree or higher is larger than in the rural groups. Urban/rural differences in age and education levels are statistically significant.[2] Information about participant occupations was also collected. In the urban groups, three participants were employed in medicine or higher education, and no participants in the rural groups had jobs in these fields. No participants in the urban groups had forest-related jobs, while in the rural groups, two participants had jobs in logging, suggesting that occupation types differed slightly between the rural and urban groups.

Focus-Group Participant Comments

Content analysis of discussion-group transcripts revealed that most rural participants were able to speak with a high degree of specificity about forest/wildlife/human interactions in the study area, and most urban participants spoke of these interactions in less detail and exhibited a lower level of familiarity with forest management than the rural participants. Rural participants exhibited a closer connection

with the forest resources and discussed with emotion a broad range of nonmarket services provided by forests. Urban participants did not display as close a connection to the resource and expressed emotion over a smaller range of nonmarket services of forests, with an emphasis on recreational uses. These results are consistent with the findings of Stein et al. (1999), who concluded that rural community residents have a closer connection to the resource and receive more nonmarket benefits of forest resources than urban residents and, in fact, may be more likely to value these forest services than urban residents. However, a few urban participants who had interacted more closely with the resource (e.g., hunters or landowners in the study area) were able to speak with greater specificity and detail about forest management and wildlife interactions. This suggests that differences in perceptions, attitudes, and familiarity with forest ecosystems are also related to experiences with the resource.

The following sections describe major themes that emerged from the discussions and highlight corresponding similarities or differences between the groups. Comments are organized around the following themes: (1) forest services, (2) forest management, (3) land ownership, and (4) management–wildlife interactions. Rural group participant comments are numbered R1 through R24, and urban group participant comments are numbered U1 through U24.

Forest Services
One research objective was to identify forest ecosystem services recognized by the public. Members of both urban and rural groups discussed the importance of forests, but their discussions of why forests are important differed. In each discussion, participants identified similar services they associated with forests, such as recreation, water filtration, erosion control, hunting, lumber, jobs, tourism, and beauty. Both groups expressed the importance of preserving forests for future generations, and many urban and rural participants discussed the importance of forests to wildlife. Although the services mentioned were similar across the groups, the discussions that followed were not. Forest beauty and emotional connection emerged as a strong subtheme in the rural discussions. Several rural participants expressed emotion and intensity when describing the forests in the area with words like "wonderful," "absolutely gorgeous," "breathtaking," and "unbelievable." Some rural participants said the forests are a principle reason they enjoy living there, and some discussed their emotional attachment to the forests.

> "I wouldn't live anywhere else." "[We live here] because we love it." (R18 and R22—similar comments from five other people)

> "I am much more emotionally involved with where I live here . . . you never feel an emotional attachment to bricks, but you do to trees." (R1)

Although a few urban participants expressed emotion over the beauty of forests in the area, the frequency and extensiveness of comments within this subtheme were lower in the urban than in the rural groups (see Table 2).

> "I came here because I want to be here, because it made an impression when I was that young." (U8)

> "They should preserve some forest for recreational beauty." (U13—similar comment from one person)

Concerns for local economic sustainability and the community were expressed repeatedly and with strong emotion by most rural participants. They spoke with specificity about the important role of forests in providing employment in recreation and tourism, as well as the forest products industry and the ways in which this affects their community.

> "When I think of the forest, I think of recreation, a lot of jobs in this area, very important around here." (R4—four other people made similar comments)

> "[Forestry] is the only industry we have left here." (R17—similar comments made by five other people)

Rural groups independently identified the concept of balance, which did not emerge from the urban discussions. Rural participants discussed difficulties of balancing conflicting goals of forest management, such as managing to provide jobs while maintaining wildlife habitat and aesthetics. The strong emotion and specificity of these comments were tied to stated concerns the rural participants had for community stability and the importance to them of the multiple roles that forests play in their lives.

> "It just isn't one thing, it's everything together, the timber has to provide for that and the people survive off the deer hunting and the timber and the recreation is a big thing up here." (R14—three other people made similar comments)

The economic importance of forests was discussed to a lesser extent in the urban groups, which can be seen by comparing the frequency and extensiveness of comments in this subtheme in Table 2. A few participants referred to the importance of the forest products industry to the region, though comments were not specific and did not express strong emotion about the economic importance of forests to the local economy.

> "It's important to cut down [timber] for jobs, for industry, because we need to have pulp" (U13—similar comments were made by four other people)

Urban participants referred to economic issues by mentioning recreation, specifically the importance of snowmobile and ATV trails as tourism draws.

> "Snowmobiling and 4-wheelers are getting more popular, there should be trails for those also, it's a strong economic asset." (U1—similar comment from one other person)

Concern for maintaining recreational opportunities in forests was mentioned by most urban participants in the context of resource use for individual benefits. Urban participants discussed the importance of forests for a variety of recreational uses.

> "You're not going to picnic in a clearcut, you know, there's really nothing after it's clearcut, there's not much you can do there, until like they say, 40 years from now, there are some bird hunting opportunities after a few years." (U10—five other people made similar comments)

Urban comments reflect an anthropocentric view of forest management, not for favoring resource extraction, but for favoring management that enhances individual recreational opportunities. Rural comments, by contrast, reflected the importance of forests for many purposes, including instrumental as well as intrinsic values, indicating that perhaps the rural participants' views lie not at the anthropocentric end of the continuum but somewhere in the middle.

Among rural participants, concern was expressed for maintaining forest recreational services to support the local economy through tourism revenues. A few people mentioned the importance of forest aesthetics in attracting tourists.

> "I know lots and lots of people make a special trip just to come and see the [fall] colors here." (R1—three other people made similar comments)

Some rural participants also discussed the importance of forest recreation through hunting, with a strong emphasis on deer hunting and associated tourism revenues.

> "Hunting is for recreation, but it's also economy up here, because [hunters] spend a lot of money, generate a lot of money." (R18—similar comments made by six other people)

Overall, reasons for concern about forest recreational opportunities differed between the urban and rural groups. Both urban and rural participants' views of recreation can be interpreted as anthropocentric, but rural participants expressed a stronger concern for community well-being than for their own personal interests in recreational opportunities.

Forest Management
One objective established for the study was to explore public familiarity with and opinions of forest management and harvesting practices. All of the rural group participants were able to contribute something to this discussion, and most of them were able to discuss different types of forest management practices in detail. The discussion of forest management in the rural groups included many specific references to management practices (see Table 2). Many rural participants exhibited familiarity with and an understanding of different types of harvesting practices such as select cutting and clear-cutting and discussed postharvest activities such as replanting. A few people discussed the benefits of selective cutting.

> "The advantages of select cutting are tremendous . . . you take trees out of a certain area that are mature, it allows the sunlight to get in, ground vegetation to start, smaller trees to mature, it's just fantastic for the whole area." (R4—five other people made similar comments)

A few rural participants recognized the inability of loggers to practice lower impact harvesting because of economic factors.

> "The market won't allow [select cutting], you've got to get volume, because prices I don't think have gone up that much, you just have to do it in volume." (R11—six other people made similar comments)

The urban participants had a less detailed discussion of forest management practices that focused on clear-cutting, which some participants viewed negatively. Most of the urban participants were not able to speak about any other harvesting practices such as select cutting.

> "Clear-cutting looks like a scar." (U4—similar comments made by four other people)

Some urban participants discussed increasing logging intensity in the area over the years.

> "It seems that we're cutting 10 times as much out of the woods as we used to, with the equipment we have now." (U11—three other people made similar comments)

Some urban participants made detailed comments about management, but these were not as extensive as those in the rural groups. Urban group discussions of the effects of intense timber harvesting on forest services were not detailed, and participants did not mention possible negative effects of harvesting on other forest services. Many rural participants discussed with specificity the economic need for timber extraction; however, many of them also discussed with great emotion negative feelings toward the intensity of extraction they see in their community. Most rural participants discussed negative effects of intense harvesting on provision of other nonmarket forest services and expressed strong concern for maintaining these other services.

Land Ownership

Participants were asked about land ownership and its implications for forest management. Perceptions of land ownership and its effects differed between the groups. Many of the rural participants view nonindustrial private landowners as protectors of the area's forests, whereas they view private industrial and public landowners as threats to forest resource sustainability.

> "The individuals who manage their land, or cut their land, they do a lot better job managing their land than the state...A person lives here knows what's going to happen if he cuts all those trees." (R12—similar comments were made by six other people)

Most urban participants held an opposite view of the role of landowners. They expressed that private owners practice uninformed management that depletes forest resources while corporate or public land management is beneficial to forest resource sustainability.

> "A private owner probably won't replant because they're getting rid of [the trees] because they want a yard, or because they want access to something, or they want the firewood." (U3—similar comments were made by three other people)

Although urban and rural groups recognized that landowner type affects the way forests are managed, perceptions of the roles of different landowners differed between the groups.

Forest Management and Wildlife Interactions

An objective of the research was to learn about familiarity with and perceptions of forest, wildlife, and human interactions. Discussions that explored this theme are divided into three subthemes: (1) effects of forest management on deer and other wildlife, (2) effects of deer on forests, and (3) effects of deer on other wildlife. Many rural participants were able to discuss with specificity and detail the effects of forest management and harvesting practices on wildlife in the area, and most participants expressed emotion when discussing the effects of harvesting on wildlife habitat.

> "We have to selective cut . . . if you get an area that has too much tree cover then you don't get the undergrowth so you don't have the animals." (R3—similar comments were made by 11 other people)

Urban participants discussed in less detail the effects of forest management on wildlife. Most were able to discuss clear-cutting, and some mentioned its effects on wildlife. Many were not able to speak about specific ways in which forest management can affect wildlife.

> "Certainly, anytime they change something in the forest, it alters all the habitat, I haven't been out in the woods doing much with wildlife, but I realize how it affects one and another." (U18—similar comments were made by six other people)

A few urban participants did not accurately understand how timber harvesting affects wildlife.

> "There's not as much wildlife in the places where they cut." (U7—similar comment made by two other people)

Perceptions of forest management and its effects on wildlife differed between urban and rural groups. While many urban participants were not aware of the ways in which clear-cutting can affect wildlife, most rural participants were able to speak in detail about these effects. Most rural participants spoke accurately and in detail about effects of forest management on wildlife. A few urban participants were able to speak in detail about these interactions, and these individuals have had more frequent contact with these forests through recreational activities. Rural participants were more strongly aware of forest/human/wildlife interactions, as evidenced by comment frequencies and extensiveness in Table 2, and they displayed concern for the instrumental values of forests as well as ecological values.

In the second section of human/forest/wildlife interactions, participants were probed on their familiarity with the effects of deer on the forest. Most rural group participants engaged in a detailed discussion of the effects of deer browse on the forest, and a few participants had already mentioned this topic before it was initiated by the moderator.

> "Definitely, [deer affect the forest], in a stand of hardwoods, when there's too many deer. You get all this scrub brush that's never going to be worth anything, you'll never be able to afford the taxes on the land because deer eat the sugar maple." (R7—similar comments were made by 11 other people)

In contrast, urban participants did not initiate the deer browse discussion on their own, and this discussion followed the predetermined script. Many were familiar with deer browse and were able to have a general discussion about it. Of the urban participants who discussed browse, most did not mention its specific effects on the forest and some did not see it as a problem.

> "I think the deer would have to be really overpopulated for quite some time in order to have a big noticeable impact on forests." (U2—similar comments were made by four other people)

> "Yeah, you can tell when there's large numbers and there isn't a lot of food, everything from like 6 feet down will be stripped." (U17—six other people made similar comments)

Comments by rural participants about deer browse were very detailed and extensive, while comments from urban participants expressed some familiarity with deer browse but were general and not extensive (see Table 2).

In the third section on human/forest/wildlife interactions, participants were asked about possible effects of deer on other wildlife. Members of both urban and rural groups found it difficult to understand how deer could impact other wildlife. Neither urban nor rural participants initiated this topic independently. Many rural group participants made an attempt to think of ways deer could affect other wildlife, while only some urban participants contributed ideas on this topic (see Table 2). Neither group spoke on this topic with much specificity or emotion.

Conclusions

This study was undertaken in order to better understand the preferences and viewpoints of urban and rural groups with respect to the complex interactions among people, forests, and wildlife in Michigan's Central Upper Peninsula. Much of the literature suggests that rural, timber-dependent community residents would hold strong preferences for managing forests for human uses, and urban, non-timber-dependent communities would hold strong preferences for managing forests for ecological and biological uses. The guiding hypothesis of this study was that rural, timber-dependent community residents will hold strong anthropocentric views of forest management and urban, non-timber-dependent community residents will hold strong biocentric views of forest management.

The results indicate that urban/rural differences in perceptions of forests and forest/human/wildlife interactions do not fit smoothly with the two typologies defined in the literature. In contrast to some studies, the rural participants did not fall neatly on the anthropocentric end of the anthropocentric–biocentric continuum because they did not place importance simply on extractive, utilitarian uses of the forests. Similarly, the findings do not place the urban participants neatly at the biocentric end of the continuum because they did not express strong preferences for forest conservation, but they did express strong concerns about anthropocentric forest uses such as their own recreation.

Given the limitations of qualitative research, the quantitative data in this study should not be used to generalize the results to other populations. However, the qualitative findings are evidence that viewpoints of rural, timber-dependent and urban,

non-timber-dependent community residents may not fall at expected ends of the anthropocentric–biocentric continuum. In crafting natural resource policy, management, and communication strategies, our findings suggest that decision makers and other researchers should be cautious in utilizing a simple anthropocentric–biocentric continuum or similar results of previous studies, since our research suggests that relationships are more complex.

Two unique features of this study may be fruitful avenues of research aimed at better understanding this evidence. First, even though the urban area in this study is the largest in the Upper Peninsula of Michigan, it is not a major metropolitan area. Second, the urban area was close enough to the study resource to serve recreational purposes, and the findings revealed that recreational concerns were more commonly mentioned by the urban groups than biocentric concerns. Studies aimed at identifying the effect of these features might improve the robustness of the anthropocentric–biocentric continuum.

The differences in resource and forest management familiarity and opinions identified earlier can be useful to policymakers and resource managers interested in designing management strategies to more effectively satisfy public preferences. The information can also be used in designing communication and educational efforts to articulate the goals and purposes of forest management. For example, although the rural participants demonstrated a strong understanding of forest management techniques and were clear about the need to balance the competing goals of forest management, the urban participants did not express such understanding and might be better reached by messages targeting their recreational and personal use of forests. Messages to rural residents should be cognizant of the importance of balancing resource extraction and resource protection. For example, emphasizing the degree to which voluntary forest landowner incentive programs can help balance timber production with resource protection could encourage forest landowners in rural areas to implement conservation practices on their land.

Notes

1. The Mann–Whitney *U*-test was used to test statistical significance.
2. The Pearson Chi-square test was used to test statistical significance.

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