

ABSTRACT

In Driftless Area agroecosystems of Wisconsin, USA, the steep topography of unglaciated drainages provides most farms with some uncultivable forestland, known locally as woods. Most woods in the region have been heavily impacted historically by high-grading in timber extraction and livestock overuse. These land uses have sparked nearly a century of efforts to understand and influence farmer behavior, yet their persistent impact – as well as contemporary social and ecological trends – makes understanding farmers' perspectives on their woods imperative for landscape-scale conservation. Concerns include the region-wide decline of disturbance-dependent oak ecosystems, soil erosion, impacts of forest cover and hillside infiltration on stream flow regimes, and climate uncertainty. Politically, contrasting property tax rates for forestry, agriculture, and non-commercial land uses incentivize vastly different management actions and accompanying regulations. We conducted 18 in-depth interviews with farmers regarding how they use and value their woods. While interviewees commonly valued woods for timber, fuel, hunting, and pasture, along with aesthetic and lifestyle benefits that play a strong role in sense of place, diverse perspectives emerged in discussion of management motivations and objectives. Analysis of interviews suggested four types of perspectives toward farm woods: incidental owner, practical manager, working naturalist, and ecocentric member. We distinguished these types in part by emphasis on instrumental or intrinsic values, as well as active or passive management of woods. Many farmers were also concerned with threats to woods

and way of life posed by various forces and entities outside their control. In comparing the typology of perspectives herein with select other studies of family forest owner and farmer characteristics, we note influences of epistemology on interpretation. We also discuss implications of diverse perspectives on farm woods for policy, outreach, and future research.

INTRODUCTION

Conservation outcomes in mosaic landscapes depend on human actions across land use continua (Perfecto and Vandermeer 2010, Ravenscroft et al. 2010). Landscape conservation therefore requires interventions tailored to the contexts of actors involved in those land uses. Socio-ecological approaches grounded in perspectival diversity can illuminate those contexts and potential points of intervention (Bawa et al. 2007, Atwell et al. 2009, Brondizio et al. 2009, Knoot et al. 2010, Hobbs et al. 2011, Menz et al. 2013).

In agroecological landscape matrices, conservationists, foresters, and land managers might lament that farmers make decisions about their land from the perspective of their farm operation, rather than a broader perspective. Moreover, farmers are characterized as difficult to engage in regional conservation efforts, particularly compared to non-farming rural residents. However, in mosaic landscapes where farmers own or manage substantial areas less suitable for intensive agriculture, landscape-scale conservation outcomes – such as water quality, wildlife habitat,

carbon sequestration, and greenhouse gas reductions – depend on the decisions and actions of farmers on these lands.

Complex contexts

This is the case in the Driftless Area agroecosystems of Wisconsin, USA, where steep topography of unglaciated drainages provides most farms with some uncultivable forestland, known locally as woods. Most woods in the region have been heavily impacted by land-use. Natural resource professionals have sought to understand and influence farmers' land-use for almost a century, an efforts that has had mixed success. Two primary problems have drawn the most attention: high-grading – i.e. “take the best, leave the rest” timber extraction – and livestock overuse. The extent to which these problems persist and impact regional conservation concerns remain important questions.

The confluence of contemporary social and ecological trends also makes understanding farmers' use of their woods imperative. First, current contrasting property tax policies for forestry, agriculture, and non-commercial land uses incentivize vastly different management actions. Additionally, the increasing average age of farmers portends substantial acreage changing ownership in the near future, which is likely to lead to parcelization of management units and, especially given the property tax context, potential conversion of woodland fragments to other uses (USDA 2014). Elevated commodity crop prices may lead farmers to convert

woodlands or expiring Conservation Reserve Program acreage to annual crops or pasture (Secchi et al. 2008). Conversely, market demand for low-grade woody biomass for steam heat and power generation could provide farmers with a financial incentive to engage in more active management their woodlands (Tyndall et al. 2011).

Broad social and ecological trends also relate to farm woodland use. Decline of disturbance-dependent oak ecosystems threaten the diversity and value of forests throughout the region (Knoot et al. 2010). Forest cover and hillside infiltration have also been associated with stream flow regimes, important for water quality and habitat suitability for the economically important trout fishery (Juckem et al. 2008). Finally, the context of a changing climate with increasing extreme weather events adds risk and uncertainty that may be best addressed by adaptive co-management by broad groups of stakeholders (Kucharik et al. 2010).

Besides traditional family farm woodland owners, other private and public stakeholders in the region have grown in significance, including real estate investors, occasional large farm and ranches, Amish Mennonite communities, “back-to-the-land” homesteaders, absentee and recreational landowners, as well as Federal, state, and tribal Ho-Chunk land owners (Heasley 2005). As natural resource policies and initiatives are shaped by and for this milieu, attention to the unique

perspectives represented in these stakeholder groups is critical for appropriate and effective conservation interventions (Hobbs et al. 2011).

Describing perspectives

Numerous studies have demonstrated that farmers and woodland owners have diverse perspectives and respond to nuanced contexts in ways difficult to predict. Typologies are commonly used for analyzing and ordering complex agricultural systems, especially for informing policy and outreach efforts (Kostrowicki 1977, Burton 2014). Typologies are also commonly used to characterize family forest owners (Butler and Leatherberry 2004, Ficko and Boncina 2013). Many typologies – of both farmers and family forest owners – use quantitative metrics and analysis (e.g. probability models and cluster analysis) to develop typologies. While these approaches offer indispensable means for validation and predictive power required for modeling (e.g. (Valbuena et al. 2008), some researchers have called for qualitative and mixed methods contributions to social segmentation studies (Vanclay et al. 2006, Brodt et al. 2006, Bohnet et al. 2011, Ficko and Boncina 2013, Burton 2014). Ficko and Boncina (2013) specifically highlighted the need for further research on the contexts, values, and objectives for private forest owners motivated by non-economic considerations. In a similar vein, Greiner and Gregg (2011) examine farmers' non-economic motivations, and suggest that outreach and policy instruments should be informed by studies that profile the contexts and differences in these motivations. Citing demographic characteristics as insufficient guidance for

improving natural resource management, Bohnet et al. (2011) used qualitative analysis of interviews to construct a typology of graziers based on values and motivations. Qualitative comparative analyses can also be used to develop models that relate and discriminate farm types according to multivariate axes (Landais 1998). Rather than predictive models, however, qualitative typologies offer insights into key contexts and perspectives – or how to “speak the language” – necessary to provide relevant information and incentives for interventions involving diverse populations (Daniels et al. 2010, Bengston et al. 2011).

What leads farmers to neglect their woodlands for decades only to log the high-grade timber or sell the lot outright in tight financial times? Is it lack of time, money, or interest? Are these stereotypes accurate? Questioning this conventional wisdom – and seeing what the exceptions say about the diverse perspectives of farmers – forms the starting point for this research. Due to the complexity of influences, it has been difficult to identify causes or demographic predictors of farmers’ environmental behaviors (Burton 2014). Therefore, this research sought to provide contextual understanding of the values, motivations, and constraints at play in farmer perspectives and actions in their woodlands. We posit that this approach offers promise to inform local and regional efforts to engage farmers in conservation actions.

METHODS

Study area

The Kickapoo River watershed of Wisconsin's unglaciated Driftless area spans nearly 2000 km² of dendritic drainage. Pre-settlement vegetation types were primarily oak woodland and savanna west of the river, and maple-dominant forests to the east; this difference is presumably due to the river acting as a fire-break. Since European settlement, fire suppression and selective logging of high-grade timber have driven region-wide mesophycation—succession to shade-tolerant vegetation (Nowacki and Abrams 2008). Extensive grazing has also exerted a strong influence on post-settlement vegetation patterns and associated resource concerns (Cawley 1960).

Because much of the landscape is too steep for cultivation, 47% of the land area of the watershed is forested with broadleaf deciduous trees. Open pasture and hay account for another 30% of the land use, and row crops cover 17%. Remaining land cover in the watershed includes relatively small areas of wetlands, grasslands, coniferous forests, and villages populated by more than no more than 5000 residents (USDA NASS 2013). Over half the land in Vernon and Crawford counties, which contain the majority of the watershed, consists of active farms. Forested areas cover 32% of the farmland in these counties, and about 38% of those woods are pastured (USDA NASS 2012).

In addition to this mix of land cover and land uses, a number of landscape challenges and aligned efforts make this region well-suited for an investigation of perspectives on farm woods and related issues. Woodland degradation, soil erosion, flooding, water quality, and groundwater recharge – all associated with topography and land use in the region – are historic and contemporary resource concerns. The decline of oak ecosystems and fire suppression in this region has also been well-documented, without major successful interventions, despite work by natural resource professionals in local and national organizations, county forestry offices, and the Wisconsin Department of Natural Resources to engage private landowners in sustainable land management (Rogers 2006). Most recently, the Driftless Forest Network, a coalition of university, agency, and organizational partners, has recently initiated an effort to engage landowners in forest management via in-depth client information and social marketing strategies (Knoot et al. 2014).

In-depth interviews

We conducted 18 interviews on farms in or within 30 km of the Kickapoo River watershed. Interviewees were selected via online business directories, plat maps, recommendations from area natural resource professionals, and suggestions from interviewees (i.e. snowball sampling). In the interest of a representative selection of interviewees, we employed purposeful sampling stratified by number of generations on farm, farm and farm wood size, and organic certification. Of the 18 farms total, 15 raised cattle, 14 were multi-generation farms, 11 were over 80

hectares, 9 were dairies, and 7 were organic (Table 1). Three interviews included both spouses, one included a grown son involved in the farm operation, two were with individual women, and the rest were with individual men. We conducted interviews until reaching saturation regarding our primary research topics (Guest et al. 2006).

Interviews were semi-structured, in that a general script ensured that all interviews covered the planned topics, while additional probing questions and flow of discussion varied among interviews (Patton 1990). All interviews were conducted on the farmers' premises; seven included walks with the interviewees in their woods. Topics included 1) use and value of farm woods, 2) management strategies and actions, 3) sources of forest management information 4) motivations and constraints on forest management, 5) perceptions of how woods had and would change in the region. Most interviews included reference to a printed contemporary aerial photograph of the farm; an historic aerial photograph from 1937-44; and copies of hand-written Public Land Survey documents that described topography, soil, and vegetation near the farm prior to European settlement in the 1840s. Interviews lasted between 50 and 210 minutes.

Qualitative data analysis

Interviews were recorded, transcribed, and imported into Nvivo 10 data management and analysis software package (QSR 2013). This software facilitated

coding of interview data into topical and descriptive categories (Miles and Huberman 1994), as well as identification of emergent themes (Ryan and Bernard 2003, Thomas 2006). Analysis of correspondences and contrasts among categories, themes, and emphases therein were used to develop a typology of perspectives on farm woods.

RESULTS

Results are organized in approximately reverse order of their emergence from analysis. The typology of perspectives—presented first—arose via inductive comparisons of differing perspectives farmers had toward the topics considered in the following sections. Perspectives on the use of woods for pasture and timber were of particular importance to this analysis, so we present these topics next, within the framework of the typology. Perspectives toward threats also varied among farmers, without clear differentiation according to the perspectives described previously; these are conveyed next, with an emphasis on ways the shrub *Rosa multiflora* is perceived as a threat. The final results presented are those first identified in analysis as themes common to most farmers with the least amount of variation, including affirmation that farmers value woods as part of the farm, desire for more time to spend in the woods, connect with family via values and activities associated with farm woods.

1. Typology of perspectives on farm woods

The farmers we interviewed shared a diversity of attitudes, experiences, and intentions concerning their woods. We characterized this diversity within a typology of four broad perspectives on farm woods. We labeled these perspectives *incidental owner*, *practical manager*, *working naturalist*, and *ecocentric member*. For the sake of clarity, the following descriptions categorize these types as individuals distinct in terms of identity, cultural meanings, interaction with social-ecological systems, and behaviors. However, individual interviewees did not wholly correspond with a single type. Some of the actual fluidity and variation with which individual farmers take these perspectives is addressed in the conceptual model of the typology discussed in Section 1.5 and presented in Figure 1.

1.1. Incidental Owner

Incidental owners saw the woods as peripheral to their primary enterprises as a farmer. Accordingly, the woods were minimally integrated with farming system and lifestyle. Active management of the woods was sporadic or absent. Passive recreational use such as taking walks and riding horses occurred, but these uses were limited by time spent on primary farm activities and busy lifestyles. Lack of maintenance activities such as trail clearing also limited these uses. Uses such as hunting and cutting fuel wood were often granted to family and friends. Incidental owners often expressed regret for not being more active in using and managing

their woods, but justified their behaviors based on more important responsibilities to farm and family.

1.2. Practical Manager

Like incidental owners, practical managers' primary concerns when considering their farm woods were farm and family obligations. Financial considerations weighed heavily in this perspective toward farm woods as well. By contrast, this perspective looked to use the resources of the woods in ways that practically integrate with other farm enterprises. Examples included pasturing woods to reduce property taxes and using revenue from timber harvests for farm infrastructure and equipment upgrades. One farmer interviewed leased hunting rights to their woods, providing an uncommon but telling expression of this perspective. Practical managers often appealed to cultural values such as making the most of what you have and a wise-use ethic when emphasizing the instrumental values of their woods.

1.3. Working naturalist

Like practical managers, working naturalists aimed to use the woods in ways that benefit other farm enterprises, and balanced investments in woods management activities with the demands of other enterprises. However, working naturalists considered natural qualities as the primary value of the woods, especially wildlife habitat, and sought to enhance those qualities in their management. For example,

some farmers used tree tops and cut brush for wildlife habitat improvement, so had little interest in selling this woody material as a biofuel. In general, working naturalists were critical toward other perspectives that place personal utility over the condition of the woods. Some working naturalists also emphasized the multigenerational aspect of woods stewardship. They spoke of benefitting from trees planted by earlier generations, and some described working with their children to improve the financial and natural values of their woods.

1.4. Ecocentric member

Like working naturalists, ecocentric members emphasized the natural values of the woods, but they took a relatively “hands-off” approach to their woods. Another contrast with working naturalists was that instead of emphasizing intergenerational stewardship of the woods on their individual farm, this perspective highlighted the potential for woodland conservation across property boundaries. Ecocentric members also explained the significance of the woods to the farm and their lifestyle in explicitly spiritual terms that encompassed broader ecosystems beyond their farm. Furthermore, where working naturalists gave more attention to the positive qualities of their woods, ecocentric members identified the woods as unhealthy and in need of help. Because of this sense that the woods need help, farmers taking this perspective expressed self-criticism for not doing more work to improve the condition of their woods due to lack of information, resources, capacity or time.

However, on the issue of time, ecocentric members were critical of how financial valuation of time on the farm limited time in the woods.

1.5. Conceptual model of typology

Because individual interviewees represented qualities of each perspective, we related the four types within a conceptual model based on continuous spectra rather than discrete characters. The model consists of two axes of variation in how farmers use and value their woods (Fig 1). The first axis contrasts emphasis on personal utility derived from farm woods versus emphasis on the intrinsic value and health of farm woods. The second axis contrasts a “hands off” approach with intensive management of farm woods. These axes do not explain all of the variation among the types, but represent primary points of comparison that characterize the perspectives of farm woodland owners we interviewed.

2. Pasture

2.1. Taxes

Because taxes represent a significant cost of doing business, most farmers seek to minimize the property taxes on their land. Interviewees reported several strategies for minimizing taxes on forested acreage: 1) agricultural use of woods for pasture or maple syrup production, 2) enrollment in a state forestry program called the Managed Forest Law (MFL), or 3) selling forested acreage and buying parcels with

minimal forested acreage. Interviews also expressed different reasons for not pursuing these strategies.

With the exception of one farmer with a small woodlot, all farmers with livestock we interviewed used at least some of their woods for pasturing cattle. Each of these farmers cited tax benefits as a motivation for the practice, since pasturing qualifies as an agricultural use. In Wisconsin, as in many other states, land used for agriculture is assessed and taxed according to its potential income from that use rather than its value in the real estate market. This translates into property taxes 10 to 30 times lower (Wisconsin Department of Revenue 2013). One farmer explained it this way:

Right now, honest-to-God, in this state of Wisconsin if you can pasture some place you're gonna pasture it, because it's more than, well it's, I think it's about \$100 assessed value [for agricultural use] versus \$1000 [as forest or undeveloped land]. Really. That's a problem when it comes to paying taxes."

2.2. Perspectives on pasturing woods

The value of using woods for pasture was more significant for practical managers and working naturalists than incidental owners or ecocentric members (Fig. 2). None of the farmers who strongly demonstrated ecocentric member perspectives had cattle. Incidental owners pastured woods where it conveniently fit with their main farm enterprises, but it was not important, in some cases because they did not own substantial woods acreage, and in other cases because they fed dairy livestock

pre-mixed rations. Property tax benefits were a strong reason for practical managers to pasture their woods, and so they were willing to invest time and resources into building and maintaining fences where it was logistically feasible. Working naturalists downplayed the importance of tax benefits for pasturing woods, and emphasized other reasons for this practice, including sheltering livestock from sun and wind, providing supplemental forage during times of drought, and assisting in brush control. Some farmers maintained that livestock management needs were their primary motivations for pasturing woods.

The quotations in Figure 2 typify distinct farmer perspectives on pasturing woods, but many farmers held a mix of perspectives as demonstrated in attitude and practice. For example, when asked if he would pasture his woods the same way if taxes were different, one interviewee claimed that “taxes ain’t got nothing to do with it,” but immediately qualified that he was working on fencing one unpastured area of woods on the farm where taxes were much higher.

2.3. Mitigating negative livestock impacts on woods

Especially among working naturalists and practical managers, farmers considered overuse and improper management the causes of negative impacts to woods from livestock, rather than viewing livestock use and proper woods management as inherently incompatible. Appropriate stocking rates and rotational or seasonal access to woods pastures were cited as management techniques for mitigating

negative impacts of livestock on woods, often expressed in terms such as “common sense” and “moderation.” Nevertheless, some farmers admitted that occasional circumstances led to livestock overuse of woods, including overstocking in drought and poor livestock markets. Furthermore, some farmers pointed out neighbors whom they thought overstocked their woods.

Farmers generally expressed disapproval for the visible impacts of livestock overuse, including exposed tree roots, disturbed and eroded soil, and inhibited forest regeneration. Livestock damage to tree seedlings was seen as a negative but acceptable tradeoff when comparing the benefits of pasturing woods with the long-range returns of timber. Few farmers cited slowed growth of trees or diminished soil capacity for water infiltration and retention as problems. Soil compaction was generally considered avoidable via the aforementioned techniques. Several farmers hypothesized that tree growth would accelerate due to livestock manure. No one mentioned potential introduction of weed seeds to woods via manure. Negative impacts of livestock use on the diversity of understory flora or wildlife were rarely mentioned by interviewees, although one farmer speculated that bird diversity had increased in the decade following livestock exclusion from one woodlot.

2.4. Aesthetics of woods pastures

Numerous farmer also expressed preferences for an open understory without a dense shrub layer, based on aesthetics and recreation. This preference was also

given as a reason for pasturing woods, often expressed via comparison with dense shrub layers of neighboring areas no longer grazed. One farmer explained this view by saying,

You go and look in some of these areas where nothing is pastured. And what have you got to enjoy in some of that? Because a lot of it probably is growing up to brush. A lot of it's probably such a wilderness some if it you couldn't even crawl through. How could you really appreciate that either? Who can really enjoy that? Even for hunting or anything. If you had enough cattle, they would keep some of that brush down. I had a neighbor who brought in a lot of beef in the spring, and they kept down the prickly ash with the intense grazing. If you had sheep or something, but the cattle won't eat those darn roses [Rosa multiflora] or honeysuckle [Lonicera spp.], I thought maybe they'd chew those off like cotton candy, but unfortunately they don't. I do think that there's woods that if you take care of it, people can enjoy it more.

3. Timber

3.1. Perspectives on timber use and management

Timber harvests provided occasional important financial support for farmers across perspectives (Fig. 3). Uses of money from timber sales included capital investments such as cropland, a grain truck, and a milking parlor; mortgage payments to keep the farm; and covering medical costs. Farmers cited harvest intervals of 10 to 30 years, along with conditional statements about timber markets and times of

financial need. Especially among practical managers, timber was commonly cited as being a crop, along with stated preferences for harvesting trees at maturity before a decline in commercial value. However, these interviewees also readily recognized that their intentions to manage their timber as a crop were limited by other priorities, available time, and negative impacts of pasture use. Furthermore, many practical managers and incidental owners perceived that although occasional timber harvests were practical, the costs, time, and pasture-use limits to improve timber resources were not. As one farmer said,

It boils down to a dollars and cents. You have to get as much out of the land that you have, to justify it. If you could make more, yeah, absolutely, keeping the cattle out of it raising more timber, and be guaranteed of that, but that's the problem that I have.

Additionally, for farmers for whom financial considerations predominated in woods management decisions, the returns on their efforts to improve timber – as well as participation in state-sponsored incentives for timber management that prohibit grazing – were perceived as risky and uncertain, compared to the assurance of tax savings and benefits to livestock of having access to woods, as explained by another farmer:

How do you know that 10 years down the road the state's [not] gonna run out of money and they're gonna say 'that's what it used to be but not anymore, the rules have changed.'

Some working naturalists and all ecocentric members emphasized dislike of the concept of their woods as a crop with a primary purpose of financial return. For example, one farmer said,

What we do have left as far as forest is not a money thing for us. That will never be the bottom line. The bottom line would be to have the enjoyment and pleasure of being able to go out and harvest here and there what we need and that. But it needs to be taken care of better....But going along with caring for it in terms of harvesting lumber of it for an income? No, we all see that that is not the end we want to see.

Nevertheless, many farmers with negative attitudes toward management of the woods as a crop still harvested timber. For example, the farmer quoted directly above also described a past event in which he had hired a logger in a time of financial duress. He and his family were devastated by the harm they felt inflicted on their land, as reflected in the phrase "what we do have left as far as forest." By contrast, working naturalists tended to balance woods health and viewing timber as a crop in a more positive fashion, as demonstrated by these observations one farmer made of his woods:

There's older trees that are past harvesting, but you see squirrels and woodpeckers living in there. Plus the trees are hollow, but they're still producing nuts and stuff. Overall, I think [the woods] are in pretty good shape.

3.2. *Planting trees*

Extensive tree planting was not highly valued or practiced among most farmers interviewed. Several farmers reported that they or their children had helped plant pine plantations decades ago, but they attached little apparent value to this. The four notable exceptions – farmers who had planted substantial numbers of hardwoods on their farms – were all multi-generation farms, three of which were organic dairies. Two of these dairy farmers talked about tree planting in reference to their teenage children taking an active interest in managing the woods. These two justified tree planting, managing competing vegetation, and pruning of young trees in terms of benefits to future generations and, in the case of one farmer, to “give Mother Nature back what you took.” The dairy farmer without children on the farm planted numerous poplar, oak, and walnut for the purpose of providing livestock with shade. He farmed on a largely treeless plateau to the south of the roughly half-forested Kickapoo watershed where most interviewees farmed. Besides providing his livestock with shade, his purpose was also aesthetic:

I wish there was more people planting trees and stuff. Most of these [neighboring farmers], it's just a damn weed to them. They don't have any time for it...they're always fighting the brush, cutting the trees down, it just makes me sick. I guess it's because they have so many, they think there'll be no end to them. Me, one goes down, and I feel bad, like jeepers, getting pretty bare

around here. If I had a farm with a whole bunch of trees, maybe I'd be the same as them. But it's almost all bare ground around me.

The fourth farmer who had extensively planted trees, whose main enterprise was beef cattle, was not optimistic about prospects for tree planting on his, or most other farms:

I know that there is a problem, and the problem is that us traditional farmers that are here, different styles, whether it's a dairy farm, a beef farm, a grass farm, a crop farm, you probably aren't going to get an awful lot done. Probably I've done as much planting trees – with what we've planted around this spring and this type of thing – as anybody around. Is it enough? No, it's nowhere near enough. There should be a lot – I should be doing a lot more than I am. My age now, am I going to? No, because I'm going to be turning it over to a younger generation and he's going to be thinking corn.

3.3. Logging

Interviewees described hiring loggers, working in cooperation with loggers, and doing logging on their own or with extended family, friends, and neighbors. All these arrangements were common and the only detectable pattern was that practical managers and working naturalists often described being able to use their own equipment and machinery for cutting and extracting logs.

Some farmers were responsive to markets and logged when they heard prices were favorable for certain trees, or waited if prices were stagnant. Others considered a timber harvest when a logger approached them.

Most farmers did not use a professional forester to plan harvests, but some did. There was no detectable pattern as to who used the services of a forester, except that the farmers enrolled in MFL were required to do so.

Mistrust of loggers was common, but most farmers expressing this also noted that it was based mostly on reputation rather than their own negative experiences. Most farmers who described working with loggers said that the loggers did what they asked them to do. The most common complaint about loggers was building access roads without taking the proper precautions to prevent erosion. Extended family was also an important linkage in providing referrals to loggers that could be trusted to avoid damage to standing timber and soils, and to offer scrupulous financial transactions.

3.4. Managed Forest Law

Three of the four interviewees who had land enrolled in the MFL were organic dairies. Two of these farmers had inherited land already enrolled, but they had no plans to unenroll their acreage from the MFL when the contract term expired,

despite some misgivings about having to harvest on a shorter rotation than they preferred.

Most farmers interviewed did not enroll land in the MFL. Many of them explained this choice in terms of strong preferences for harvesting timber according to their own timing and selections, and for ability to pasture woods. Some farmers thought that the MFL was a suitable program for landowners without knowledge to manage their woods, but that their own experience and capacity made it unnecessary for them. The public access provisions associated with the MFL also caused some concern, although most farmers understood that it was possible to enroll woods in the MFL as closed to the public. Some farmers simply did not want to associate with the Department of Natural Resources. Another common complaint about MFL was that the associated property tax reductions were causing financial difficulty for local municipalities and unfairly shifting the tax burden. This complaint was often associated with frustrations at lack of community involvement from the growing number of non-resident and non-farming neighbors. As one farmer explained:

You want to know what I get irritated about? So somebody comes in and buys 160 acres. They put all the work land in the [USDA Cropland Reserve Program] so they can get a check from the government. So they don't have to fuck with any of the neighbors or anybody else, or their local co-op. They don't have to buy any seed from them or do anything to help the community, nothing. Ninety-

eight acres of woods is put into managed forest [MFL] and the township gets zippo just about out of it. You hear my resentment?

4. Outside threats

The resentment expressed in the quotation above represents a common theme expressed throughout interviews: certain people and forces outside the local sphere of influence represent some threat. The targets for such feelings and attitudes varied among interviewees, but across all perspectives and political views farmers expressed concerns regarding security, sense of control, and well-being of their farm business, their woods, their family and way of life. These threats included various levels and agencies of government, farm and land-use policies, taxes, volatile markets, real estate investors, absentee and recreational landowners, loggers, conventional farmers and their practices, alternative farmers and their practices, climate change, invasive species, deer overpopulation, and forest pathogens. Unlike views on use and value of the woods for timber and pasture, attitudes towards threats were not clearly associated with particular perspectives. Nevertheless, the emphasis on outside threats in interviews underscores their significance in shaping the how farmers relate with their woods.

One key threat that was not a part of the interview script but was discussed in all but three interviews was Multiflora rose [*Rosa multiflora*]. Interviewees commonly noted that government agents introduced this shrub. Up until the 1970s, the Soil

(now Natural Resource) Conservation Service encouraged planting of *R. multiflora* as a “living fence” hedge to exclude cattle from the woods, but this shrub now extensively invades woods on edges and areas of thin canopy, as well as open pastures, where cattle avoid it. A number of farmers also described working with agency personnel on cost-share programs to manage it, but for many farmers this species serves as a lasting reminder of the problems caused by government intervention on their farms and in their woods. The interviewer was sometimes associated with these same government agents, and discussion around management strategies for *R. multiflora* suggested that despite some degree of blame and mistrust, many farmers are still open to advice and collaboration with outsiders to negotiate the challenges posed by this invasive shrub. Farmers generally expressed skepticism toward alternative management techniques such as goat browsing or prescribed fire. By contrast, the most common management techniques—mowing, manual removal, and application of herbicides—were all already practiced for other purposes on the farm.

5. Other significant farm woods themes

Strong themes across many of the interviews included 1) value of woods as part of the farm for financial, use and non-use benefits 2) a desire to spend more time in the woods, and 3) a connection to family mediated by the woods.

5.1. *Value of the woods*

All interviewees expressed the positive value of their woods. With only one exception, a neutral reply, all interviewees responded negatively when asked how the farm would be different without woods, although many added that they would also like to have more open, flat land for growing crops.

5.1.1. *Financial benefits*

Financial benefits of the woods were more important to farmers with more wooded acreage. The most common financial benefits of the woods came through timber extraction and pasture use, as discussed above. One farmer leased wooded acreage for hunting and another marketed wild mushrooms from the woods on his farm.

5.1.2. *Use benefits*

Use benefits of the woods for most farmers and their families included fuel wood, deer and turkey hunting, foraging wild foods for personal use, and various recreation activities. Most farmers heated their home with fuel wood; many primarily used dead wood rather than cutting live trees. Deer hunting – and family and community traditions associated with it – were often the first and most commonly cited benefit of having farm woods. Harvesting timber for personal use was more common in previous generations; numerous farms had old buildings made from on-site lumber but only two farms had modern buildings that used on-site lumber.

5.1.3. *Non-use benefits*

Although some farmers considered the environmental benefits of the woods, non-use benefits were mostly associated with aesthetic and quality of life values. All but two interviewees specifically remarked on the beauty of the woods or of the landscape with woods. Environmental benefits of the woods farmers commonly cited included erosion control, local climate moderation, and wildlife habitat. Two farmers mentioned carbon sequestration, but one did so in the context of explaining his belief that annual crops sequestered more carbon. No one mentioned water infiltration or aquifer recharge.

5.1.4. *Health and intrinsic value*

Practical managers and incidental owners did not often speak explicitly about the health or intrinsic value of the woods, beyond the direct or indirect benefits to them. However, these themes were significant enough with working naturalists and ecocentric members to provide a basis for differentiating these farmer perspectives. Working naturalists often expressed these themes in terms of non-game wildlife, whereas ecocentric members referred to the “well-being” of woods and historic ecological processes. One farmer put it this way:

I'd like to see some trees that we could call old-growth growing again. I'd like to understand the cycles that land goes through... and more about how all that works.

Then I could help the land to work towards that and encourage that, rather than constantly harvesting just because I need money.

5.2. Limited time for the woods

Most farmers thought of their time for managing their woods as limited. Many farmers explained this time limitation as due to the farm's other time demands. As one farmer described a common feeling, "I wish I had more time to spend time in the woods. Regular crops, taking care of cattle and stuff, takes a lot of time." Other farmers explained their time limitation as an uncertain return on their investment of time, such as this comment:

To say, I should get in there and cut that ironwood out. Yeah, I should, but it isn't very cost-effective for what you're going to get a return unless you want to just come out here and look at your oak trees and say, hey, look, this is what I've done and that's really great. You could have a field tour and a farm tour. But did you make anything? Was it cost-effective? I don't know. I don't know.

The two most common management actions farmers would take if time were not limited were timber stand improvement and invasive species management.

Specifically, farmers spoke about thinning stands by removing trees such as box elder (*Acer negundo*), ironwood (*Ostrya virginiana*), elm (*Ulmus spp.*), red cedar (*Juniperus virginiana*), ash (*Fraxinus spp.*), soft maple (*A. rubrum* and *A. saccharinum*), poplar (*Populus spp.*), and basswood (*Tilia americana*). Over the

course of an interview, most farmers identified several of these tree species as targets for thinning, if they had more time. Many farmers also mentioned that they would do more improvement of timber quality by pruning lower branches if they had more time.

Other actions some farmers would take with more time available included planting trees and protecting young trees from deer browsing damage. Many farmers also spoke about hunting, foraging, and recreation as things they would do more of if they had more time. However, no one described not having enough time for the deer-hunting season.

Limited time was also a key issue for management of two introduced shrub species, multiflora rose and honeysuckle. These shrubs were most often thought of as pasture weeds interfering with the growth of more desirable vegetation. Some farmers described the problems posed by the aggressive competition and spread of these plants as distinct from native pioneer shrubs such as brambles (*Rubus spp.*) and prickly ash (*Zanthoxylum americanum*).

5.3. *Family and the woods*

The significance of family in the use and value of farm woods was expressed by all interviewees in diverse ways. Family imbued meaning to farm woods via shared activities, identity with place, legacy, land ethics, and security. Deer hunting was the

most common shared activity, as well as various forms of recreation. The woods were involved in treasured family memories shared by farmers. Many multigenerational farmers spoke about spending abundant time in the woods growing up, and several farmers spoke with pride and satisfaction about the interest and enjoyment their own children took in the woods. Actions intended to improve the desired qualities of the woods were justified in terms of the value to future generations, and several farmers described positive expectations for the future of their woods based on the children's interest in them. Several farmers spoke with gratitude of previous generations who had planted trees. By contrast, some farmers who did not have children that would potentially inherit the farm expressed less motivation to improve the woods, as exemplified by this comment:

If I had all the time in the world I might get around to... [making] a timber crop out of it. And nothing like that has been done like that in the last 100 years, so you'd be playing a lot of catch up, and to what avail? For somebody 50 years down the road, and you might not care for him, if you ever had chance to meet him.

DISCUSSION

This exploratory and qualitative study revealed commonalities as well as considerable differences among farmers' perspectives toward their woods in hilly southwest Wisconsin. Farmers interviewed commonly expressed the value of their woods as part of the farm and family's lifestyle, although that value was variably

attributed to financial, use, and non-use benefits. Some farmers also ascribed intrinsic value independent of utility to the woods. Interviewees also varied in their attitudes toward and extent of intervention in their woods. Via inductive analysis, we categorized these differences in how farmers' relate to their woods in four primary types: incidental owners, practical managers, working naturalists, and ecocentric members. We organized this typology in a conceptual model contrasting types according to emphasis on personal utility versus intrinsic value and attitude toward and degree of intervention (Fig. 1).

Challenges of segmentation

The management of small forest parcels – originally called farm woodlots and farm forests, then non-industrial private forests, and now family forests – has been a matter of national attention and research for over a century, and the subject of hundreds of studies (Harrison et al. 2002, Straka 2011,).(Harrison et al. 2002, Straka 2011). The objectives of this field of research have changed as social values and desired outcomes from forests have changed, but the problem remains for natural resource professionals to encourage family forest owners to act for their own benefit, and to act for the common good (Bengston 1994, Daniels et al. 2010, Hujala et al. 2013). One approach to inform this objective has been market segmentation of family forest owners, an effort that can be improved via in-depth explication of how family forest owners see their forest (Bengston et al. 2011).

We chose to segment farm woodland owners according to personal perspectives, as the information collected in interviews includes multiple parameters commonly assessed in classifications of forest owners and farmers: attitudes, objectives, goals, intentions, motivations, and constraints. We also use the term perspective to encompass identities, meanings, phenomenological experiences, knowledge, values, and worldviews. Broadly speaking, each perspective we identified reflects a distinct pattern of how farmers relate with their woods. A single heuristic aiming to incorporate all these factors is necessarily imprecise – incommensurable epistemologies assess these respective characteristics – but potentially more holistic and germane (Bengston 1994, Bland and Bell 2007, Wilson et al. 2013).

Qualitative studies of small samples usually identify important and common themes in relatively homogenous groups. By contrast, our study purposefully sampled across several socio-demographic characteristics that we suspected would help capture the diversity of perspectives farmers have toward their woods, including multi/first generation farms, size, and organic/conventional (Table 1). This approach exposed heterogeneity within our study population, as expected, and our analysis suggested four types of perspectives toward farm woods explained this diversity. However, we stopped short of describing relationships among socio-demographics and these perspectives or assigning individuals to exclusive categories. Such efforts would require metrics to characterize perspectives, validation of types via cluster analysis of factors, a larger sample, and tests for

correlation of factors with demographic indicators. Additionally, individual perspectives can be flexible, dependent on contexts, and do not fit well in discrete categories for the reasons noted above.

Classification and epistemology

Numerous studies have classified forest owners in order to describe heterogeneity in characteristics of interest for researchers and forestry professionals. More specifically, sub-groups of family forest owners have been investigated qualitatively for motivations, attitudes and experiences, e.g. women (Redmore and Tynon 2011); non-participants in management (Steiner-Davis and Fly 2004); and NIPF owners in various geographies (Bliss and Martin 1989, Daniels et al. 2010). Despite the recognition in many studies of forest owners that farmers segment differently (Erickson et al. 2002, Boon and Meilby 2004, Bengston et al. 2011), few have examined farm forest owners specifically (but see Dolisca et al. 2007, Moser et al. 2009, and Howley 2013). Nonetheless, our categorization of farmer perspectives toward their woods coincides with other classifications of family forest owners (Table 2).

Considerable nuance lies in similar but non-equivalent terms of values, motivations, and objectives. An extended comparison with an influential study of woodland ownership will highlight some of these subtleties. Our typology corresponded with the four family forest owners categories defined via multivariate cluster analyses of

responses to the National Woodland Owner Survey (NWOS), with some important differences (Butler et al. 2007).

An important distinction is how farmers view the capital or market value of their land. One might expect that most farmers would be classified as “working the land,” the most multi-objective category, and that this study would further segment that category. However, even 25% of “ready to sell” forests are part of farms, a category with which incidental owners share many characteristics. For example, one farmer described selling his home farm because it had too many woods, and then buying a nearby farm with more open cropland. Most practical managers and working naturalists would be most readily described as “working the land,” demonstrating the diversity of perspectives within this “multi-objective” category. Further examination demonstrates that half (49%) of the forests in the “supplemental income” category are part of farms, and some of the farmers we interviewed who were very active in timber management could also fit this profile.

Epistemology also plays a role in how categories are defined. The ecocentric member profile in this study does not readily correspond with any of the family forest owner categories defined by the quantitative approach used by Butler (2007). The closest analogue would be the “woodland retreat” category, characterized as seeking to maximize the amenity values of owning forestland, such as privacy and aesthetics. Ecocentric members also enjoy amenities, but by contrast, they seek to

optimize ecosystem health on a regional scale that transcends their personal property and individual benefit, in recognition of the intrinsic value of forests.

The primary bases for the attitudinal segmentation in NWOS are ‘reasons for ownership’ and ‘intended future actions.’ Our qualitative approach allowed an open-ended exploration of meanings associated with forests, which allowed themes independent of ownership to emerge. This distinction in methodology highlights the limitations of defining values via predetermined categories and interpreting responses via utility maximization theory. This economic theory presupposes personal gain as the primary motivation of human behavior. In the case of family forests, this gain is defined in either monetary profit or non-monetary amenities such as privacy and scenery. The farmers we interviewed enjoyed similar personal gains from their forests, but some of them also valued the woods in ways that cannot be explained in terms of their own satisfaction with aesthetics, wildlife habitat, or societal benefits such as carbon storage provided by their forests. These farmers ascribed an intrinsic value to the forests independent of their own benefit from owning it. While our study did not determine how extensive or pervasive this attitude may be, the salience of this finding has been demonstrated by empirical evidence that policies that provide incentives based on self-interested behavior can discourage altruistic or other moral motivations (Bowles 2008, Greiner and Gregg 2011).

Key traits of farm woods owners

Finances and multifunctional objectives

Various studies conflict on the question of farmers' financial motivations for forest management. Boon and Meilby (2004) found farmers in Denmark placed less financial importance on forest ownership than survey respondents identifying as 'forest owners' or 'other.' In Indiana, economic aspects of forest ownership are more important for farmers than non-farmers (Erickson et al. 2002). It can be useful to consider farmers as a group with distinct motivations and practices, but our results agree with other studies showing that farmers are diverse in their emphasis on economic, lifestyle and multifunctional objectives of forest ownership (Moser et al. 2009, Howley 2013, Daloğlu et al. 2014). Furthermore, social and moral considerations can influence farmer behavior and adoption of novel practices as strongly as economic considerations (Mzoughi 2011). Our results agree with other studies of family forest owners that have demonstrated that family legacy, ethical, and conservation values often provide more motivation than economic or other benefits, suggesting that policies designed to encourage forest management via financial incentives may be misdirected (Daniels et al. 2010). Natural resource professionals and policy makers must also understand the diversity of perspectives among farmers to effectively target education efforts and stewardship policies.

In our study, even for farmers with financial aspects at the foreground of forest management decision-making, diverse motivations were at play. Working with a

selective sample of interviewees recognized for their success in managing for timber production, Bliss and Martin (1989) described the motivations of family forest owners in Wisconsin as a continuum spanning production, improvement, utilization, and protection, and noted that by virtue of their sampling, none of them were motivated by “preservation for preservation’s sake.” Given their motivations and level of management, had the forest owners in that study been farmers in the present study, they would likely have been categorized as *practical managers*. Just as Bliss and Martin (1989) emphasized that qualitative methods enabled their research to “dispel the view of timber-producing NIPF owners as one-dimensional profit-maximizers;” in our interviews *practical managers* expressed recreation, family, and identity as important dimensions of their relationships with their woods, underscoring the considerable diversity within this category. Furthermore, Bliss and Martin (1989) reported perception of outsiders – both unfamiliar loggers and government via forestry incentive programs – as a threat to their identity as independent managers of their land; *practical managers* in the present study often expressed similar sentiments.

Family

The importance of family in the value of farm woods came up in most interviews, without any clear pattern. Multigeneration farmers expressed each of the perspectives, in contrast with the findings of Majumdar et al. Multigeneration farmers expressed all the perspectives, in contrast with the findings of Majumdar et

al. (2009) that inheritors manage for timber and non-timber products, while non-inheritors value conservation, amenities, and recreation. We did note that some farmers who described implementing timber stand improvement and tree planting justified it in terms of their inheritors, and other farmers without inheritors did not undertake these activities due to the long-range of returns. However, our findings agree with Steiner-Davis and Fly (2004) that forest owners who do not engage in management can still attach strong meaning to intergenerational experiences and sentiments involving their forestland.

Pasture use

The use of forests for pasture has been identified by several studies as a key difference in family forest owners (Kurtz and Lewis 1981, Hardesty et al. 1993). Our findings included the use of farm woods as pasture as an important management strategy. Many farmers pointed out similar benefits – shade, shelter, forage, and reduced property taxes – and claimed that proper management mitigates drawbacks of livestock overuse. In our study area in the Kickapoo River watershed, a reduction in grazing and concomitant increase in forest cover on hillslopes over the last 80 years has been attributed as a major factor influencing increased stream flow (Juckem et al. 2008), so further study on the extent and impact of using farm woods for pasture is recommended.

Implications for outreach and policy

Precedents, contexts, and informed ignorance

Outreach and education to land owners to encourage conservation among private landowners in the Driftless Area go back at least to the Soil Conservation Service's early efforts in the Coon Creek watershed, adjacent to the Kickapoo watershed (Leopold 1935). Fencing livestock out of hillside woods was one of the practices encouraged via education (through such activities as public performances featuring antagonist "Old Man Erosion"), as well as incentives in the form of free seeds, fencing materials, and labor. Today, state-supported conservation programs that provide tax and financial incentives and technical support from local agents struggle to enroll and maintain farmer interest (USDA NASS 2012). The primary forest owner association in the region, the Kickapoo Woods Coop (KWC), has also attracted few farmer members. This is likely because the KWC's main activity has been helping landowners write plans to qualify for the Managed Forest Law, which most farmers are not interested in (Paul Bader, KWC forester, *pers. com.*). Most farmers we interviewed irregularly and infrequently received professional advice about their forest, suggesting that most forest information transmits horizontally through informal social networks. Education efforts by forestry professionals in our study region and elsewhere which seek to facilitate peer-to-peer learning as an alternative to traditional "top-down" outreach models may have more promise for difficult-to-engage groups such as farmers (West et al. 1988, Korhonen et al. 2012, Ma et al. 2012, Kueper et al. 2013, Hamunen et al. 2014). to engage groups such as

farmers (West et al. 1988, Korhonen et al. 2012, Ma et al. 2012, Kueper et al. 2013, Hamunen et al. 2014). More recently, the Driftless Forest Network's Woodland Advocate program, although not targeted specifically at farmers, holds promise for creating a network of neighbors trained to provide advice and link landowners with resources (Knoot et al. 2014).

Conservation efforts—including outreach, research, and other programs—that fail to consider farmers' perspectives are likely to leave farmers out. For example, this has largely been the case with Wisconsin's Managed Forest Law, a tax-incentive forest management program, which prohibits woodland grazing, whereas agricultural use tax programs effectively incentivize this practice. Instead, conservation efforts should be attentive to farmers' contexts. For example, using cattle to manage invasive vegetation is likely to be perceived as more attractive to many farmers than conservation strategies that exclude livestock (e.g. Harrington and Kathol 2009).

Even with this sort of inclusive intent, it remains difficult to determine which aspects of farmers' perspectives are the most important drivers of actions regarding their woods. Furthermore, farmers make decisions within manifold contexts. Additionally, limited time, money, and knowledge often constrain actions, even if the results are expected to be beneficial. Farm, family, and many other contexts also shape interests and actions involving woods. Therefore, efforts to engage farmers

will likely be most effective with an approach of *informed ignorance*, i.e. working with the best available knowledge of important contexts for farmers, but without presumption of knowing a best solution to a given conservation problem. This will allow approaches that are responsive and adaptive, rather than prescriptive based on predictions of farmer response. In that spirit, the following recommendations should be considered initial approaches, to be tested and reconfigured strategically according to farmer interest and effectiveness at achieving conservation objectives.

Emphasize benefits, use familiar information channels, and work toward shared goals

In our study area, most of the farmers did not prioritize management or conservation actions in their woods. However, many identified as care-takers having varying degrees of success, so there is reason for increased efforts to engage farmers with their woodlands. Successful outreach and policy efforts actions will offer farmers strategies and actions integrate with their existing contexts and perspectives.

For farmers who emphasize the personal utility of their woods, outreach should emphasize the benefits of desired actions. Those benefits ought to be framed in terms of the key values of the woods, whether financial, use, or non-use benefits. For example, management of an invasive species might be perceived as worthwhile to one farmer if it promises to improve growth of other more palatable forage for their

livestock. Another might value improved game habitat, or the aesthetics of a “clean woods.”

In a similar fashion, educational outreach regarding sustainable forest management might emphasize techniques such as crop tree management. A focus on teaching principles and practices to farmers, rather than enrollment in programs, will appeal to practical managers and other farmers who like to do their own forestry work. Using agricultural language, and communicating via farm periodicals or other media, such as farm programs on local radio, could be effective means of communicating the potential benefits and how-to of sustainable forestry practices. No-cost educational teleconferences could also be marketed to farmers this way. Non-traditional outreach via targeting peer thought-leaders and information sources such as seed/feed suppliers may also have merit for hard-to-reach farmers. In general, initial communications should build on shared goals, rather than reprimanding bad behavior, as the latter is unlikely to attract further engagement.

Field days and workshops, especially on working farms, can help build community and capacity among these farmers necessary for more technical practices, such as timber stand improvement or the use of fire in oak ecosystem management. Cost-sharing that does not require excessive administrative burden could also facilitate these practices among some farmers, especially those who are already accustomed to working on a cost-share projects. In addition, a number of farmers in this study

described walking through their woods with a DNR forester or woodland-owner organization representative, and highly-valuing the information they received.

For farmers who seek to enhance the non-use benefits and intrinsic value of their woods, efforts should focus on supporting shared conservation goals. Cost-share opportunities may or may not attract participation, but these payments should not be presented as the reason for these practices. Improvements to wildlife habitat are likely to be a draw in forestry related outreach for many of these farmers. It should be noted, however, that many farmers recognize deer as overpopulated, and do not look favorably on the crop damage they cause.

On payments for ecosystem services

The success of payment for ecosystem service programs with farmers in our study area would likely depend on how it was administered and structured. Crucially, if financial benefits of woods are not among primary values, incentives such as payments for ecosystem services will either be ineffective or require untenable payment amounts to attract participation. Furthermore, if conservationists and policy-makers depend on payments for ecosystem services as a motivator for conservation actions, they run the risk of “recidivism” if, at a future date, those payments no longer match the profit potential of alternative land uses. Such has been the case with many grasslands in the Driftless Area, as commodity crop markets have risen and acreage has been removed from the Cropland Reserve

Program for cultivation. In any case, allowances for appropriate use, and generally avoiding unnecessary restrictions and regulations, will increase the attractiveness of for payment for ecosystem service programs to many farmers. Working through county conservation offices or other familiar venues will also be more palatable than working with the state Department of Natural Resources on such programs. A number of farmers also raised another concern—that property values of woodlands, and land in general, were rising as a result of market pressure from outsiders. Payment for ecosystem services that have similar effects may not be well received by those who already perceive themselves as threatened by this trend.

Perspectives in context, contexts in perspectives

Timber production is not the primary interest most farmers have in their woods, though many will harvest trees according to circumstance or need. Many farmers understand timber as a crop that benefits from proper management, but most do not consider management a priority. Our findings corroborate other studies demonstrating that most many farmers are similar to other family forest owners in valuing amenities such as wildlife habitat (for hunting and otherwise) and scenic enjoyment more than timber production (Roberts et al. 1988, Butler and Leatherberry 2004, Moser et al. 2009).

Incidental owners are most likely to be interested in activities that provide some direct benefit and involve little effort or risk on their part. Key concepts in outreach should be ease, efficiency, and benefit. As one farmer explained:

The vision I would have to have is that okay somebody was in the chipping business and he'd come around and say okay you mark 100 trees and I'll give you \$32 a piece for them and we'll get them out of there and then you, and then we'll send in this forester and he'll show you this program that if you do this your woods will grow in value for your children, or you know, plant some of these trees in the under, in the shade and eventually your forest will blossom into this million dollar woods. And then I can say okay let's do this. But if it's going to mean me going out cutting some stumps, it just isn't going to happen.

Practical managers envision themselves as capable, so they may be most receptive to outreach that recognizes and adds to their skills and knowledge. Familiar language may also attract more interest from this group, e.g. 'noxious weeds' instead of 'invasive species' and 'crop tree management' instead of 'sustainable forestry.' Since they see the woods as integrated in their farming enterprise, outreach to practical managers should come through recognized channels, such as field days, peer networks, farm industry and trade publications, and crop advisors. They are unlikely to participate in widely recognized means of engagement for forest owners, such as forestry associations, state forestry programs, conservation easements, green certifications, or seeking the advice of a professional forester, unless the increased value of information or participation is readily apparent. As one farmer explained:

I think [Managed Forest Law] is a good program because it's good for people that buy land and don't know what they're doing. But I've been in the woods for 60 years. I pretty well know when a tree is ready to harvest and I know what will make pasture and what won't, and just kind of what fits my situation and I figured it out myself.

Working naturalists highly value the health of their woods, and balance this value with their own desires in management. Outreach content focused on maintaining and improving the condition of the woods could hold more interest if terminology such as 'management,' 'production,' and 'treatments' is avoided. Rather, the intrinsic values of the woods were expressed by working naturalists in terms of specific types of trees or wildlife, so benefits of actions ought to be targeted and tangible. To gain traction, suggestions can integrate with common uses of the woods: hunting, recreation, timber, firewood, and pasture. Intergenerational themes may also resonate with this group. An example of how this group sees their woods was expressed this way:

The woods on this farm has a good future because my son's kind of interested in what I've been doing. He's helped plant trees, and I've told him before that you have to take care of stuff, if you want to have anything.

Ecocentric members correspond with non-farmer family forest owners with keen interest in nature conservation, so may be more likely to participate in forest owner

associations. Timber management is of little interest to this group, but many would like to improve wildlife habitat, ecological restoration, and ecosystem services in their woods. Distrust of government and professional foresters intentions was not absent from this perspective, but some desire more personal assistance. Many would also like to see conservation values and practices beyond their own property, which could potentially make this group the most open to cross-boundary cooperation. Outreach strategies such as hosting practical workshops to demonstrate stewardship techniques could simultaneously provide assistance and help overcome the cultural differences and contrasting motivations that make cross-boundary cooperation difficult. As one farmer with a strong ecocentric perspective explained:

I feel like I don't know so much. It's very daunting to think about how much bureaucracy and legal stuff there is with, there's lots and lots of programs out there, and they are very difficult to negotiate, it just takes a lot of time. I go into the FSA office, and I see literature around, and people around. I wish that it were sitting down with someone like we are, and they would say there's this and this, instead of you have to know what program you want. It doesn't feel like the programs are set up that they're actually looking to actually support you in doing what you want to do. You have to know what you want and come prepared to do the paper work. That's hard, it could be a full time job just to look at that stuff ...

CONCLUSION

Farm woods represent an integral element of the mosaic landscape of the Driftless area. Critical conservation priorities – such as oak regeneration, wildlife habitat, and water quality – require action across the landscape. To encourage actions that foster desired conservation outcomes, policy, outreach and education strategies need to be tailored to the distinct attitudes and priorities of different types of land users.

Distinguishing the varied perspectives of farmers – a key target audience in many landscapes – provides a basis for such efforts. Attention to these perspectives will also help identify potential intervention points where interests among stakeholders overlap, such as restoration of oak ecosystems that provide wildlife, timber, family legacy, and aesthetic values. Financial incentives will not appeal to all farmers, nor will reliance on concepts such as biodiversity and ecological resiliency. Rather, effectual conservation in mosaic landscapes will reflect the diverse values of landholders. In-depth interviews and qualitative analysis offer rich nuance for engaging people in conservation in ways coherent and meaningful with their own visions of the landscape.

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>80 hectare	Organic	Multigen	Dairy	Total Interviewees
X	X	X	3	3
	X	X	1	3
X		X	3	6
		X	0	2
X	X		0	0
	X		0	1
X			2	2
			0	1
			9	18

Table 1. We conducted eighteen interviews, grouped here according to associated farm characteristics, including size (80 hectares is roughly equal to average farm size in the study region), organic certification, and whether the farm includes or has included multiple generations of adult operators. Number of dairy farms within each group are also tallied. All interviews took place on farms between October 2012 and May 2013 in or within 30 km of the Kickapoo River watershed.

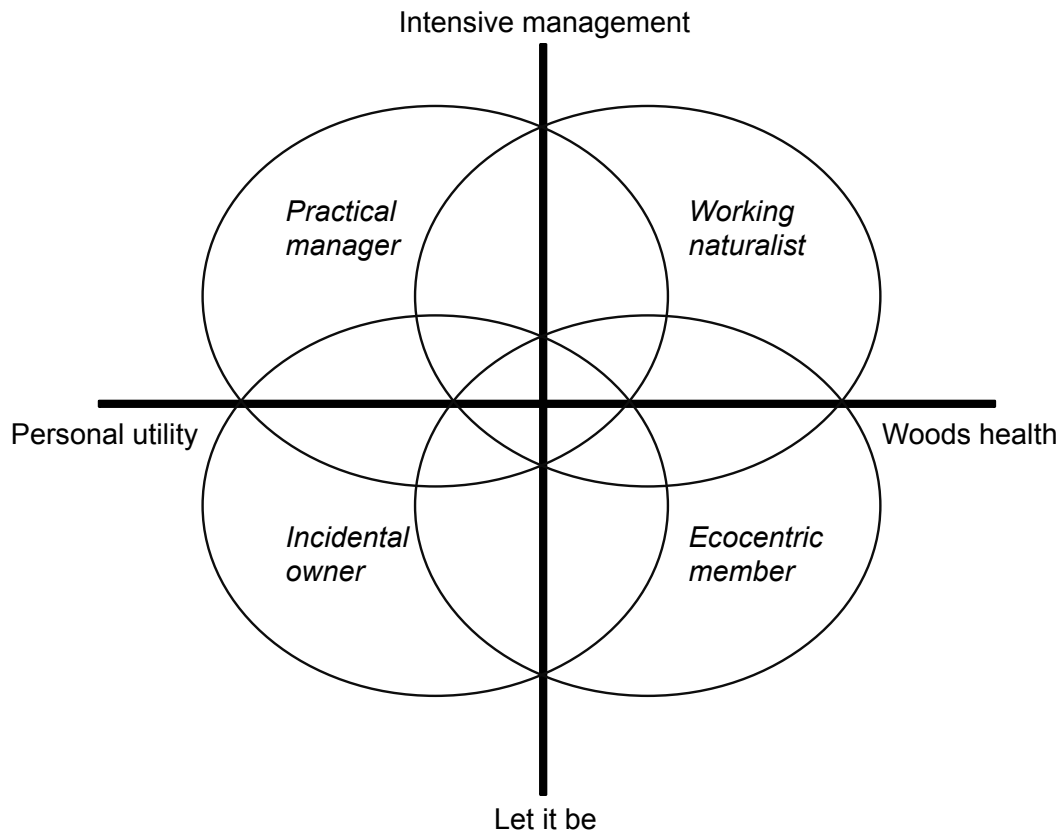


Figure 1. A typology of perspectives on farm woods in the Driftless area of Wisconsin. Perspectives were defined via qualitative analysis of in-depth interviews. The overlapping ovals in represent the indiscrete nature of perspectives.

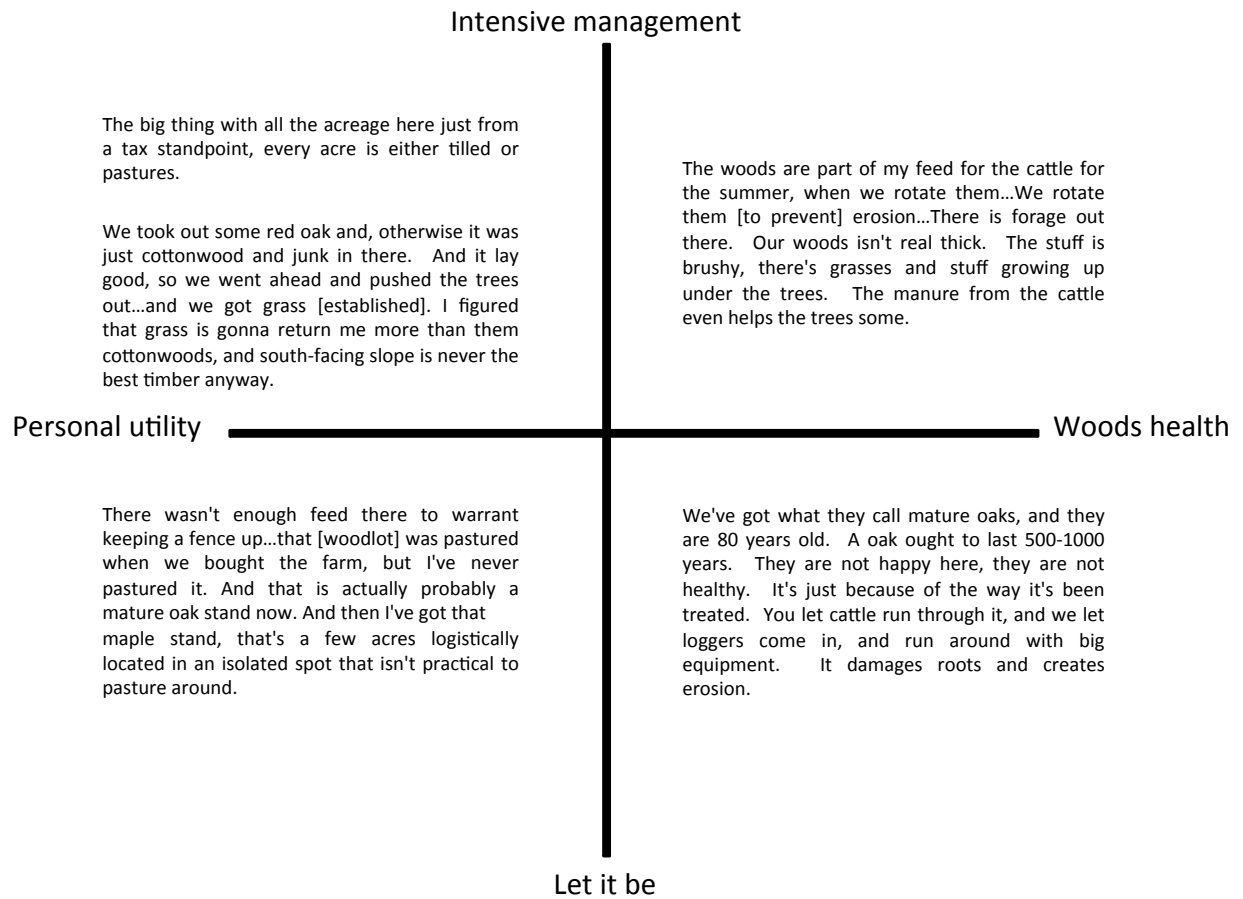


Figure 2. Select quotations from interviewees that exemplify distinct perspectives on using farm woods for pasture.

Intensive management

It boils down to a dollars and cents. You have to get as much out of the land that you have, to justify it. If you could make more...keeping the cattle out of it raising more timber, and be guaranteed of that, but that's the problem that I have, how do you know?

We took out some red oak and, otherwise it was just cottonwood and junk in there. And it lay good, so we went ahead and pushed the trees out...and we got grass [established]. I figured that grass is gonna return me more than them cottonwoods, and south-facing slope is never the best timber anyway.

I went in and cut a chunk of trees down and I replanted walnuts and oaks. Been trying to get a control on honeysuckle and multiflora rose. Honeysuckle's taking over in spots. I have friends that come in and cut up dead elm, for the fences, for firewood, any thing that falls on a fence or field, they cut up. We did some planting over here, and down in through here [pointing at aerial photograph of farm]. We planted oak, walnut and some maple down in there. Not a lot because there was a lot of young, volunteer stuff coming. We try to keep the box elder down, which is a battle. There's a lot of cherry coming, that should be cut, that's mature. Most of the planting we did, is the north part of the farm, where there isn't as much cattle activity. Early 90s we did most of that. The big planting of the north part of the farm was done after we did the timber harvest. Then we been planting a few trees each year that we think needs to be done. The planting in the north looks really good, we've actually pruned the trees once, and a few years it'll look like a decent woods.

Personal utility

I want to get some more time and, like I say, trim some of the stuff out...When I bought this place, I should have went and cut that ironwood up, planted some pine trees, and then I'd have pine trees this tall now, but I haven't gotten that done.

We could just as well have good trees growing in there as ironwood and soft maples, you know, but I've let myself down and I haven't followed through on it.

Woods health

We used to have a lot of oak trees, and I see they're on the way out. I've planted a lot of hybrid poplars and cottonwood trees, and willows, these fast growing trees, because they were cheap, and I didn't have any money, and I wanted something that would grow real fast...I try to plant more oaks and cottonwoods now, I try to go more native now. I wish I'd done cottonwood, they'll grow fast, and they'll last. If I could do it again, that's how I'd do it.

As far as I would like to see in the woods, I'd like to see some trees get to a big healthy ripe old age, and learn how to make them healthy again. And learn more about the whole evolutionary process of a piece of land. The cycles that they go through, and if I understand correctly, it was predominately pine. Because you look at this [aerial photograph of farm from 1940], they really clearcut this place, compared to this [contemporary aerial photograph of farm].

Let it be

Figure 3. Select quotations from interviews that exemplify distinct perspectives on using farm woods for timber.

Study	Subject	Classification	Family forest owner category			
			Incidental owners	Practical managers	Working naturalists	Ecocentric members
Butler et al. (2007)	US American landowners	Attitudes	Ready to sell	Working the land	Working the land	Woodland retreat
Ross-Davis and Broussard (2007)	US Indianan landowners	Motivations	Passive owners	Managers	Managers	New owners
Hugosson and Ingemarson (2004)	Swedish landowners	Motivations	Amenities	Utilities; economic efficiency	Conservation, utilities	Conservation, amenities
Howley (2013)	Irish farmers	Objectives	Lifestyle	Economic	Multifunctional	Lifestyle
Ficko and Boncina (2013)	Slovene landowners		Materialist	Materialist	Materialist; non-materialist	Non-materialist
Daniels et al. (2010)	US American landowners	Objectives	Benefit/profit	Benefit/profit; legacy	Benefit/profit; legacy; doing the right thing	Benefit/profit; legacy; doing the right thing
Marty et al. (1988)	Wisconsinite landowners	Types		Forest utilitarians	Resource conservationists	Forest recreationists; resource conservationists
Kurtz and Lewis (1981)	Missourian landowners	Types	Range pragmatists	Range pragmatists	Timber conservationists	Forest environmentalists
Finley and Kittredge (2006)	Massachusetts landowners	Types	Jane Doe		Thoreau	Muir
Maybery et al. (2005)	Australian farmers	Values	Economic	Economic	Conservation	Lifestyle

Table 2. Comparison of selected studies that categorize family forest owner and farmer characteristics, relative to types of perspectives on farm woods developed in this study.

Appendix 1

Kickapoo farm woods outreach and research agenda-building network meeting:

Compiled notes and next steps

Contributors: Bethany Laursen, Buddy Huffaker, Steve Swenson, Mark Renz, Alanna Koshollek, Jerry Greenberg, Mark Rickenbach, Doug Duren, Steve Ventura, Richard Wedepohl, Carol Nielsen, Curt Meine, Vance Haugen, Craig Dunnum, Mike Finlay

Process: Following introductions, I presented the themes from my conversations with farmers about how they use and value their woods. After some discussion of these themes, I asked the meeting attendees to consider, in light of my findings, what kind of future research and outreach on farm woods would contribute to their own programs and goals, and meet the needs of farmers. I invited them to think about what I could accomplish in the next six months of our Nuzum Kickapoo Reforestation Fund grant, and to also think about longer-term landscape priorities. Bethany then led an agenda-building exercise where everyone had the opportunity to write their suggestions for both the content and form of future research and outreach. Bethany and Alanna categorized the suggestions, and Bethany took a vote of which categories they saw as priorities.

Based on these compiled suggestions and my own interests, I propose here potential next steps. I focus on an idea to develop and pilot an informational resource that

farmers could use to self-assess their woods' health and productivity, and use that information to adaptively manage their woods. I also briefly suggest several other possible next steps.

Here are the suggestions for the *content* and *form* of future farm woods research and outreach (categories and priority votes underlined, followed by bullet points for each suggestion in that category):

Content

Land use trends and demographics – 2 votes

- Segmentation: Parameters of farmers who are receptive to actions we desire for them to take on their woods.
- Survey of Stakeholders/Farmers
- Use themes to help inform quantitative research on barriers and benefits to action
- Difference between farmers and other landowners
- Summary of changing land use trends in the Driftless: a single source of info
- Want to know more general statistics about:
 - o # Farmers
 - o Size of farm
 - o Acres of woods, crop, and pasture

- Does the Driftless Forest Network have any currency/credibility or even “neutrality” among farmers?

Management practices – 5 votes

- Silvopasture grazing practices
- Best management practices should work like professionals think they do before telling people to do them, e.g. riparian grazing was once frowned upon and is now recommended
- Multiple benefits from one management action
- Forest management plan – what comprises one
- Given interest in multiflora rose by farmers, it represents an opportunity for government correction of a problem they helped create. Need trusted messenger and solutions.
- Research/demonstration on grazing to control invasive species (including other livestock)

Communication – 8 votes

- Need to understand:
 - o Outcome(s) we seek
 - o Actions needed
 - o Barriers to those actions
 - o Benefits/motivation to taking those actions
 - o And then communication strategies
- Prioritize farmers to reach maximum impact

- Develop metrics to assist in selection
- Who do they trust and how do they want to get the information they need?
- Farms rely on financial benefits from timber, but their practices are taking timber values in the wrong direction. We need to highlight the effects of short-sighted management on future economic returns from timber harvests.
- Determine effective methods to reach “targeted” audience with education/outreach
- Worth testing “information flow” and/or messages on these issues?
- Ag-knowledge sharing networks

Relationships between meaning and land outcomes (one suggestion) – 2 votes

Taxes – 4 votes

- Tax rates: MFL/Forest vs. Ag/Pasture
 - Managed woods as Ag
- Legislative perceptions of forests and property tax
- Local understanding of the cost of local services and tax policy
- What is the nature of a property tax structure that rewards “good” woods management – including a wider range of ecosystems services (e.g. long-term productivity)?

Form

Continued dialogue – 8 votes

- Related to woodland grazing
- Science talks with DNR and other groups

- More conversations like this

Outreach to farmer networks – 8 votes

- Compile list of trusted friends/relatives used to give “logging” advice and provide training and resources to them to circulate
- From advisors who speak to finance of the entire operation, e.g. agronomists and crop advisors
- Integrate with efforts to keep the farm
 - o Legacy planning
 - o Business plan to include woods

Outreach to agencies and professionals – 4 votes

- County forester, FSA, other agencies
- How best to share “findings/themes” w/ professional community in region?
Webinar?
- Easy-to-read description of findings about farmer attitudes and trust to share with DNR
- Educating professionals about how to communicate with famers

Outreach to farmers – 6 votes

- Can we build an information resource that includes monitoring and assessment tools to support adaptive management of woods and grazing?
- On their land
- Model farm woods demo sites

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- Identify several demonstration sites/farms to do research and development on woodlot grazing
- Need trusted messenger and solutions

Cost-share programs – 4 votes

- Can new EQIP money be used to connect with farmers for invasives
- Develop program (e.g. cost-share for invasive species management) to motivate activity

Next steps

One suggestion above asks if we could create an information resource that includes monitoring and assessment tools to support adaptive management of woods and grazing.

I propose to create and pilot such a print resource. It will provide farmers a means for self-assessment of their woods health and productivity, and assist them in evaluating management strategies and outcomes. This resource could provide a comprehensive introduction to woodland care for farmers, or could provide a more sophisticated focus on a narrow suite of practices and woods health indicators, such as grazing (another possibility would be invasive species management). The latter will likely be more feasible for the scope of this grant, and the resource could be offered in conjunction with the *My Healthy Woods* handbook, which accomplishes the former quite well.

To develop this resource, I would:

Gather input from the literature, graziers, foresters, botanists, and soil scientists on what indicators to use for assessing grazing impacts on woods. For example, these may include, depending on the desired level of sophistication:

- Woods type
- Use history – logging, grazing, fire
- Current grazing practices – livestock breed, stocking density, rotation length
- Browse intensity
- Forest soil health
 - Erosion from gullies and cow trails
 - Compaction
 - Duff layer and invasive earthworms
- Invasive plant abundance and distribution
 - Include ID keys for multiflora rose, honeysuckles, buckthorns, Japanese barberry, garlic mustard
- Tree seedling recruitment – species and density
- % cover for canopy, sapling, seedling, shrub, grass, and herbaceous layers

Gather input from field focus groups with farmers (in association with pasture/woods walks) to assess the resource’s relevance and usability, and then use their recommendations to adapt the resource

Pilot dissemination via:

- Farm woods/pasture walk field day(s)

- Insert for *My Healthy Woods* booklet
- Direct mailings to select farmers

Work with project partners to plan publication and dissemination of the resource.

Other possible next steps (some of which may be beyond the scale of the Nuzum grant):

- More intensive collaborative data-gathering with select farmers to inform Best Management Practices for woodland grazing
- Silvopasture research and demonstration – on-farm and/or sites such as Badger Munitions and Kickapoo Valley Reserve
- Intensive study of information flow among agriculture networks
- Extensive study of farm demographics and receptivity to supports and interventions for conservation actions
- Landscape/spatial analysis of woods pastured and taxed under agricultural use-value, Managed Forest Law, and productive forest (*ad valorem* tax)
- Farm woods policy analysis and/or white paper
- Further education/dialogue on these themes with natural resource and agriculture professionals, and/or targeted opinion leaders of farming communities
- In-depth case studies of successful farm woods management

Appendix 2

Managing Wooded Pastures in Southwest Wisconsin:

Information for farmers and rural landowners

Introduction

The woods of southwest Wisconsin can provide significant aesthetic, environmental and economic value to landowners and managers, including:

- Forage and shelter for livestock
- Timber and firewood
- Protecting soil and water resources
- Hunting
- Scenery
- Wildlife habitat
- Mushrooms and other wild foods
- Other ways woods improve quality of life for you and your neighbors

A basic understanding of the ecology of wooded areas is necessary to ensure that landowners can realize these values through proper stewardship and management.

Unintended negative impacts due to poor management practices may cause resource damage and decrease the aesthetic and economic value of wooded areas (Cawley 1960, Whitney and Somerlot 1985).

Understanding and recognizing symptoms of livestock overuse is necessary to determine how to properly manage grazing and other livestock use of wooded areas. This guide introduces some of these common signs of overuse, and outlines

basic grazing management practices to prevent damage to wooded pastures due to livestock use for grazing, shade, and shelter.

Healthy woods

Woodland health is more than the absence of disease. It includes the vigor and variety of vegetation, the condition of the soil, the functioning of water, and how well it supports various uses. How you define health for your woods will lead to your management goals and strategies. To develop a definition of woodland health, consider the multiple functions of your woods, including qualities important to you but not listed above. For example, you may be looking for reduced runoff, improved wildlife habitat, increased timber production, or enhanced oak regeneration, depending on the type of woods you have and your goals for them.

One handy rule-of-thumb for quickly assessing the health of many types of woods is to look for an abundance and variety of native wildflowers, especially in the springtime (D. Waller, pers. comm.)

For more information on healthy woods: <http://mywisconsinwoods.org/>

What type of woods do you have?

Each woodlot is different. The impacts of livestock use will vary based on many factors: types and ages of trees, understory vegetation, steepness and direction of hill slopes, drainage, soil type, as well as history of fire, logging, and grazing.

Importantly, woods vary in how much light passes through the canopy, which can vary across a range of conditions. In southern and western Wisconsin, we generally

expect to see upland sites in a range between open woodland and dense closed canopy forests. Here are three common examples (Curtis 1959):

Open-canopy oak-dominant woodlands and savannas have grass sod and brush in the understory and are generally more resilient to some grazing use (Demchik et al. 2013).

For more information on oak openings:

<http://dnr.wi.gov/topic/EndangeredResources/Communities.asp?mode=detail&Code=CTSAV004WI>

Closed-canopy oak-dominant woodlands often have seedlings and saplings of more shade-tolerant species, such as maple and basswood, in the understory.

Grazing impacts can vary widely according to site characteristics and should be monitored closely in such woods.

For more information on oak woodlands:

<http://dnr.wi.gov/topic/EndangeredResources/Communities.asp?mode=detail&Code=CTFOR010WI>

Closed-canopy maple-dominant forests, typically have understory plants and soils that are sensitive to livestock impacts and should not be heavily used as pasture.

For more information on mesic forests:

<http://dnr.wi.gov/topic/EndangeredResources/Communities.asp?mode=detail&Code=CTFOR016WI>

In all types of woods, attention to livestock impacts on soils, water, and plants can help identify sensitive areas where grazing management can be improved to help protect your land and resources. For example, sandy soils prone to erosion or heavy soils at risk for compaction may require limited livestock access to prevent damage from overgrazing and livestock trails (Zhao et al. 2007). Livestock use of wetlands and vernal pools (seasonal woodland ponds) should also be limited to prevent degradation of the flood mitigation and wildlife habitat values these areas offer (Dambach 1944). In general, woodlands are more vulnerable to overgrazing, though careful observation and management can mitigate the risks of resource damage (Shiflet 1963, Milchunas and Lauenroth 1993).

Principles of woodland grazing management

A few guiding principles should be kept in mind in management of woodland grazing.

- Because **less sunlight** penetrates the canopy, **woods produce less forage** than improved pastures ((Ahlgren et al. 1946, Milchunas and Lauenroth 1993, Demchik et al. 2005).
- **Many woodland plants are slow to recover from grazing** (Van Uytvanck and Hoffmann 2009).
- Generally speaking, **limiting grazing periods** and using **longer rest intervals** within the framework of a multi-paddock rotational grazing system helps minimize resource damage (Uytvanck et al. 2008).

- Timing of grazing is critical: **spring grazing can cause compaction** of wet soil and damage to wildflowers (Greenwood and McKenzie 2001).
- Abundant **whitetail deer in woodlands can amplify livestock impacts** on tree regeneration and spring wildflowers (Wiegmann and Waller 2006).

All pastures can benefit from developing a rotational grazing system to improve pasture productivity and drought-resilience through strategic management of livestock grazing impacts (Teague et al. 2011, Franzluebbbers et al. 2012). Managed grazing systems also provide a means of protecting woodlands from overuse (Demchik et al. 2005). Learn more in *Pastures for Profit: a guide to rotational grazing* (UW-Extension publication A3529).

To find *Pastures for Profit* online:

<http://learningstore.uwex.edu/assets/pdfs/A3529.PDF>

What to watch for in woods pasture: symptoms of livestock overuse

Livestock overuse can impair soil, water, wildlife, trees, and other vegetation in your woods. Just as diverse and abundant wildflowers offer a rule-of-thumb indicator of healthy woods, **bare soil is the most obvious symptom of overuse.**

Overgrazing and hoof action can expose the soil by stripping it of vegetation and leaf litter. This can lead to many other problems, including erosion, soil compaction, invasive weeds, and exposed tree roots (Tate et al. 2004) . Moreover, livestock cannot eat bare soil!

The following symptoms are common signs of livestock overuse in wooded pastures. If you notice these symptoms, consider alternative management strategies. Many of the negative consequences of overuse are not visible until after the damage has been done, and recovery can be a matter of seasons or of centuries, depending on the severity and duration of overuse (Patric and Helvey 1986). When dealing with woodland pasture degradation, an ounce of prevention is worth a pound of cure!

Soils and water (Steinbrenner 1951, Stoeckeler 1959)

- 1) Areas of bare soil with no leaf litter or plant cover
- 2) Soil compacted outside of cattle trails. *Uncompacted soil will generally be “springy”*
- 3) Runoff forming gullies across cattle trails and bare areas
- 4) Other evidence of erosion

Trees (Adams 1975, Kuiters et al. 1996)

- 1) Exposed tree roots
- 2) De-barked trunks
- 3) Browsing or trampling damage to tree seedlings and saplings
- 4) Coppicing (multiple stems in one clump) of young trees

Other plants and wildlife (Steinbrenner 1951, Cawley 1960, Gordon and Prins 2008)

- 1) Few spring wildflowers
- 2) A clear “browse-line” below which there is very little growing except less palatable plants such as ironwood, elm, brambles, prickly ash, red cedar, hawthorn, and non-native brush
- 3) Increased abundance of weed species such as thistles, garlic mustard, multiflora rose, honeysuckle
- 4) Decreased abundance of birds, small mammals, and amphibians (Martin and McIntyre 2007)

For more information about wildlife habitat requirements in woods:

http://mywisconsinwoods.org/wp-content/uploads/2012/03/MWW_Wildlife_3.12.pdf

Livestock overuse is not the only factor that can lead to these conditions.

Overabundant deer, runoff into woods from upland farm fields, land use history, and even invasive earthworms can all lead to some of these symptoms (Patric and Helvey 1986, Vavra et al. 2007, Fisichelli et al. 2012). Nevertheless, poor livestock management will worsen these conditions and associated loss of woodland value, so the symptoms are still reliable signs that careful observation and management of livestock use is prudent.

Woods Gullies

In overgrazed areas with bare and/or compacted soil, more water runs off overland instead of infiltrating, increasing soil erosion and gully formation (Patric and Helvey 1986). Runoff into woods from croplands and overgrazed pastures can also cause

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gullies (Patric and Helvey 1986). Grassy strips (buffers) managed for hay and/or moderate grazing use can slow runoff, catch sediment, and provide more forage for livestock than shaded brushy field edges (Helmers et al. 2012). Cost-share funds may be available for installing grassy strips. For more information, contact your county Land Conservation or local USDA Natural Resources Conservation Service office.

To find your county Land Conservation office:

<http://wisconsinlandwater.org/about/county-land-conservation>

To find your local NRCS office <http://offices.sc.egov.usda.gov/locator/>

Invasive Species

Overgrazing can encourage growth of unpalatable weedy plants, since livestock graze more palatable vegetation first, allowing more unpalatable weeds to flourish (Rook et al. 2004, Mayer and Huovinen 2007, Rinella and Hileman 2009). Here are some invasive weeds to watch out for in your woods:

- Bush honeysuckle
- Buckthorn
- Garlic mustard
- Multiflora rose
- Japanese barberry

To learn more about preventing and managing invasive species in your woods:

<http://www.wisconsinforestry.org/initiatives/other/invasive-species-bmps/forestry-bmps>

Poor tree regeneration

Livestock differ in their preferences for woody forage, but will browse many species of tree seedlings and saplings (Mountford and Peterken 2003). If stocking rates are too high and alternative forage is scarce, this can prevent new generations of potential canopy trees from developing (Mountford and Peterken 2003, Mayer et al. 2005, Uytvanck et al. 2008). Even at low stocking rates, livestock can influence which trees become more common in a stand (Reimoser 2003). For example, cattle avoid ironwood and elm, giving these species a competitive advantage over other more palatable hardwoods with more benefit for timber and wildlife (Cawley 1960, Apsley et al. 1984). Young trees that are repeatedly browsed can develop multiple stems and other characteristics detrimental to timber value (Reimoser et al. 1999). Indirect effects of livestock use, such as soil compaction, can also influence tree regeneration. Compacted soil holds less moisture, which can leave tree seedlings vulnerable to desiccation (Diller 1937). Soil compaction can also slow the growth of mature trees.

Silvopasture: A method for integrated woodland and livestock management

Silvopasture is the intentional integration of trees, forages, and livestock, intensively managed as a single system. It is not “turning the cattle out into the woods” with limited management. Silvopasture systems are designed and managed to maximize the returns from growing trees and raising livestock in the same space, without damaging soil, water, and biological resources (Garrett et al. 2004).

Silvopasture has historically been more common in the southeastern United States with pine plantations, but some producers in the Upper Midwest are integrating hardwood trees and pastures to in order to improve livestock health, seasonal forage availability, and income potential from timber, nut and other tree crops (Lundgren et al. 1983, Demchik et al. 2013). In all places, successful silvopasture requires (Garrett et al. 2004):

- site assessment (wetlands, steep ground, and old-growth forests may not be appropriate)
- comprehensive farm planning
- intensive management

Silvopasture is supported by the United States Department of Agriculture’s Natural Resource Conservation Service (USDA-NRCS) as an agroforestry practice.

Agroforestry includes various ways of integrating trees into agriculture, including windbreaks, riparian buffers, alley cropping, and forest farming. Your local conservation office may have more information on technical and cost-share support

for improving your grazing systems using silvopasture or other agroforestry practices.

For more information about silvopasture:

Considerations for Establishing and Managing Silvopastures:

<https://www.agronomy.org/publications/fg/pdfs/2/1/2004-1209-01-RV>

Hardwood Silvopasture Management:

<http://www.centerforagroforestry.org/research/spmanagement.pdf>

The USDA National Agroforestry Center silvopasture publications:

<http://nac.unl.edu/silvopasture>

The Center for Agroforestry – University of Missouri:

<http://www.centerforagroforestry.org>

Cornell University publications: www2.dnr.cornell.edu/ext/info/pubs/#silvo

Ask your local conservation office about support for silvopasture and other agroforestry practices.

This guide is only a beginning. Beyond many published and internet resources, county foresters, grazing specialists, University Extension Services and knowledgeable neighbors can all help you define health for your woods and manage your grazing to maintain healthy woods.

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Appendix 3

For what it's worth: An essay on the history of use-value taxation of farmland in Wisconsin

Ruling the land

*We abuse land because we regard it as a commodity belonging to us.*¹

Aldo Leopold

Property taxes, in some unexpected ways, offer a window into our relationships with the land. Our sense of property plays a pervasive and foundational role in our concept of land, so much so that it is difficult to imagine our society without this underpinning. But underpinned we are, in a real and metaphorical sense, by a grid that government surveyors etched onto the land so that it could be turned into property. As William Cronon notes in *Nature's metropolis: Chicago and the Great West*, "the grid turned the prairie into a commodity, and became the foundation of all subsequent land use."² A commodity, of course, can be bought and sold, and it can be taxed.

The influence of taxation is not limited to those who own land. Anyone who benefits from schools, roads, police power, or other state services has a stake in how property value is assessed and taxes collected. State services that are not paid for

¹ Aldo Leopold, *A Sand County Almanac and Sketches Here and There*, (New York: Oxford University Press, 1949), viii.

² William Cronon, *Nature's metropolis: Chicago and the Great West* (New York: W.W. Norton, 1991), 102. Curt Meine includes this quotation in his insightful examination of the pervasive influence of the surveyed grid on land use, *Correction Lines: Essays on Land, Leopold, and Conservation* (Washington DC: Island Press, 2004), 200.

by property taxes must rely on other revenue, such as income or sales taxes. Finally – and this will be key to the history that follows – anyone who cares how the land is used also must consider that property taxes effectively require land to be profitable. The tax burdens that landowners bear compel them to produce something of value from the land in order to pay the state, or to procure the money elsewhere. Property taxes, in this view, represent a “pound of flesh” that the government levies *on land* in exchange for legitimizing ownership *of land*.³

Let us turn now to a history of a tax. What follows is a case in which citizens, academics, and legislators in the state of Wisconsin aimed to change the laws governing property taxation in order to protect farmland and other open lands from development. Many of these people thought circumscribing urban sprawl would lend itself easily to legislation. After all, such laws promised tax relief for farmers and open spaces at the urban edge for city-dwellers to enjoy. But in few cases are laws and liberties more hotly contested than when it comes to taxes, and this case

³ The influence of property taxes on land use has received little attention from environmental historians. When the matter has garnered attention, usually the matter at hand involves insufficient tax funds to pay for conservation priorities like parks or critiques of property value underassessment that give tax breaks to extractive industries. On the former see Greg Hise and William Francis Deverell, *Eden by Design: the 1930 Olmsted-Bartholomew Plan for the Los Angeles Region* (Berkeley: University of California Press, 2000); on the latter see Chad Montrie, “We Mean to Stop Them, One Way or Another: Coal, Power, and the Fight Against Strip Mining in Appalachia” *Sustain* 19 (2009): 14-21 and Paul Sabin, *Crude Politics: The California Oil Market, 1900-1940* (University of California Press, 2004). Some discussion of tax incentives to encourage farmers to keep livestock out of woodlands in Wisconsin is also included in Lynne Heasley, *A Thousand Pieces of Paradise: Landscape and Property in the Kickapoo Valley* (University of Wisconsin Press, 2005), 55. For a more thorough treatment of tax law and forestry, see James Willard Hurst, *Law and Economic Growth: the Legal History of the Lumber Industry in Wisconsin, 1836-1915* (Madison: University of Wisconsin Press, 1984), as well as Erling Day Solberg, *New Laws for New Forests; Wisconsin’s Forest-fire, Tax, Zoning, and County-forest Laws in Operation* (Madison: University of Wisconsin Press, 1961).

was no exception. The results had some unforeseen consequences for our relationships with the land.

Losing the land

The year is 1970. Imagine you are a farmer on the outskirts of Madison, Wisconsin, where your crops grow in soil that became rich and deep beneath prairies and savannahs that clothed the land for thousands of years. Though your yields have doubled since end of World War II, the costs of seeds and other inputs has also increased, and the price you receive for each bushel of corn has stayed the same.⁴ Moreover, your property taxes nearly doubled in the last decade, in part because development on the city's edge has pushed land values increasingly higher, and in part because rising demands for public services like roads and schools in your township have raised the tax rates. It has become prohibitively expensive to consider buying, or even renting more land. You wonder how much longer you will be able to stay in the game, as you have seen more than a few of your neighbors cash in their land to grow houses.

Concerned with the plight of the farmer, but also with projections that at present rates of farmland loss Wisconsin would not have any farmers left 100 years

⁴ U.S. Department of Agriculture, National Agricultural Statistics Service, *Crop Production Historical Track Records* (Washington, DC, 2012), 29-30. ISSN: 2157-8990

hence, legislators in the state began to look for a way to slow farmland loss. They reasoned that since rising property taxes were one of the main reasons farmers were selling their land to developers, relieving the pressure of the “tax squeeze” would slow sprawl.⁵ Property tax relief turned out to be anything but simple, and the reasons why were linked tightly to conceptions of land as property and to laws defining fair taxation.

Reigning tax code required that all property be taxed *ad valorem*, which is to say according to its value were it to be sold. The Wisconsin constitution in fact required this in a rule known as uniform taxation.⁶ The presumed intent of the uniform taxation rule was fairness for tax payers. When the clause was penned, most people who owned land made their living as farmers, and the amount of land a farmer owned generally reflected his or her ability to pay taxes. Moreover, since farming was the principal land use at that time, the market value for a given parcel of land tracked closely with the income that it could potentially yield. Uniform taxation thereby relied on the real estate market to arbitrate fair taxation.

Post-war urban sprawl radically changed real estate markets around cities. The income developers could generate by subdividing and building far outstripped the income from any crop a farmer could raise. As developers competed for land

⁵ Thomas M. Boykoff, *Background Information for the Special Committee on Preserving Agricultural and Conservancy Lands* (Informational Bulletin 74-3, Wisconsin Legislative Council, Madison, 1974), 17.

⁶ Article VIII, Finance, Section 1, Rule of taxation uniform; income, privilege and occupation taxes, Wisconsin Constitution, accessed December 14, 2012
http://legis.wisconsin.gov/rsb/unannotated_wisconst.pdf.

and thereby fueled the real estate market, property taxes rose in tandem step with property values inflated by development potential. The pressure grew to sell land because of these taxes.⁷

Owners of undeveloped land without productive capability, such as wetlands, faced even greater pressures, since they had little prospect of any income from the land with which to pay rising taxes. This was not a new problem – farm parcels commonly contained acreage unsuitable for cultivation or pasture – but when property values were more closely tied to the income land could yield, the taxes on these lands were relatively cheap. But these taxes rose as development potential drove rising property values. Even if a particular piece of land was unsuitable for building, local property values generally rise as a tide, and rising tax rates due to increased demands for public services could also contribute to the “tax squeeze” on landowners. The tax hike from these factors could act as an incentive for farmers to sell off the unproductive parts of their farm.

That the sprawl-induced tax squeeze applied to farm land as well as other open lands may seem inconsequential, but our tale will return to this point. For now, it is enough to note that the sprawl-fueled real estate market decoupled property taxes from the income land could yield, and that this incentivized the sale and subsequent development of land around cities. In other words, taxes forced

⁷ Farnum Alston, *Preferential Taxation of Agricultural and Open Space Lands: a Proposal for Wisconsin* (working paper, Faculty Land Use Problem Definition Seminar, University of Wisconsin, Madison, 1972), 8-9.

farmers to treat land as a commodity over and above any other way they may have conceived of their relationship with it. To people concerned with the fate of farmers and the land, this was a situation that suggested something was broken. To this end, we turn to efforts to rewrite tax laws in order to fix it.

(Un)changing rules

Differential taxes, I realize, must reach far enough back into national finance to forestall the mere local shifting of the tax burden, and must be based on some workable criterion of good vs. bad land use. How to define it? Who to define it? Are differential taxes the best...? I don't know.⁸

Aldo Leopold

Was the tax burden associated with rising property values fair to farmers, as the rule of uniform taxation ostensibly intended? What was society to do about the specter of cities sprawling unchecked across open lands? As the continued loss of farmlands and general concern about the environment began to stimulate these questions, some people suggested that *laissez-faire* reliance on the real estate market to arbitrate the answers would neglect the broad interest of the public in

⁸ Aldo Leopold, "Conservation Economics" (1934) in *The River of the Mother of God*, ed. Susan L. Flader and J. Baird Callicott (Madison: University of Wisconsin, 1991) 201-202.

land use. As early as 1956, Raymond J. Penn, a professor of Agricultural Economics at the University of Wisconsin-Madison, articulated this sentiment as follows:

In many cases the increased demands for resources conflict with agricultural use as is the case in residential subdivisions on or a new highway through farm land. ...It seems quite obvious that the solutions to these kind of problems cannot be found within the framework of agriculture alone. Rather they require an inter-play of values and judgements of interest people wherever they may be – farmers, businessmen, homemakers, laborers, technicians, administrators, and politicians. And out of it should come a group decision as to what we want from our resources and how we can go about improving them along that line.

It is not enough to hope that market price for the resources will reflect the combined values of all the people interested in the problem. It doesn't. If it did there would be no problem. Problems of inadequate water supplies, pollution...taking of good agricultural land for air fields, munition plants, or residential sites, etc. have no market place to be resolved in. Too often we as economists fear to venture out from under the shelter of the market price making mechanism for determining what is the best course of action. When we do I submit we must rely on some other system of procedures or rules

that will make group decisions effective and at the same time protect the rights and opportunities of individuals.⁹

Penn's emphasis on "group decision" implied legislative solutions to problems that would not be solved by the marketplace. In that vein, he supported efforts by legislators to slow sprawl by relieving the tax squeeze on farmers. Such a solution would require an exception to the rule of uniform taxation so that farm land could be taxed according to the income it could generate, rather than its market value. This idea was called use-value taxation.

Use-value taxation first appeared in Wisconsin's capitol building in 1963 as a constitutional amendment proposing that the taxation of agricultural land "need not be uniform with the taxation of other real property." The amendment passed both houses when it was introduced, but an amendment requires passage once again two years following, and the measure failed to do so in 1965.¹⁰ This was only the first of many difficulties that this idea would face in Wisconsin.

Though many people agreed that urban sprawl represented a serious threat to society's values concerning land use and fair taxation, continuing disagreement over what to do about it stymied action. Multiple attempts at legislating use-value taxation failed, including five bills in 1973 alone. These bills failed in part because

⁹ Raymond Penn, "Zoning and Economic Development" (lecture, National Agricultural Policy Workshop of Extension Personnel, Montreat, North Carolina, September 9-13, 1956), 3. Accessed on October 16, 2012 <https://www.msu.edu/user/schmid/Penn-%20zoning.pdf>.

¹⁰ Alston, *Preferential Taxation*, 10.

legislators recognized that without an amendment permitting departure from the constitutional rule of uniform taxation, new tax laws would face legal challenges.¹¹ They also failed to because of debate over the proper role of government in land-use control via tax reform.

This debate was not limited to the halls of government; dispute over government land-use controls heated the halls of the University of Wisconsin in Madison as well. Faculty from fields as diverse as economics, planning, and the newly-formed Institute for Environmental Studies weighed in on the issue. Their competing visions reflected the difficulty of reaching agreement on written rules to govern land use and taxation.

Some faculty emphasized the technical challenge of implementing a use-value taxation scheme. One key issue with use-value taxation was the shifting tax burden to non-agricultural landowners. Any revenue local municipalities lost due to property tax breaks for farmers would have to be made up from other sources or cut from budgets. To address this, some scholars suggested that the state share their revenue with local municipalities.¹² Economists demonstrated that though tax burdens may shift in short time scales, taking land off tax rolls does not necessarily lead to long-term higher taxes for other property owners.¹³

¹¹ Ibid., 11.

¹² Ibid., 13.

¹³ Duncan A Harkin and Frank A. Mulholland, *Tax Exempt Land and the Burden of Taxation* (Working Paper No. 5, Center for Resource Policy Studies, University of Wisconsin—Madison, 1973).

Scholars also grappled with questions of whether the use-value taxation would succeed in slowing development and providing tax relief to farmers. Faculty from the Urban and Regional Planning department concluded that while "much attention" was being given to use-value taxation as a way to curb sprawl, in many states such laws amounted to no more than "tax relief gratuity to some landowners and speculators."¹⁴ Other scholars proposed discouraging speculation by imposing penalty fees for land use conversion. This strategy, known as a "rollback" tax, would require landowners who had paid reduced use-value taxes to pay deferred market-value taxes if they developed the land. Rollback taxes, essentially a penalty for development, would temper the incentive to remove land from agricultural use. Without this disincentive, use-value taxation could simply become a subsidy via cultivation until the land was eventually developed.¹⁵

One final aspect of these academic debates bears discussion, as it framed the entire question of land use and taxation more broadly. As its title suggests, the

¹⁴ Clarenbach, Fred, Harold Jordahl, Jr., and Carlisle Runge, *Public rights in private lands: potential for implementing land use plans*, (Occasional paper no. 2, Department of Urban and Regional Planning, University of Wisconsin—Madison), 4-5, accessed November 4, 2012 <http://urpl.wisc.edu/extension/reports/1973-PublicRightsinPrivateLand.pdf>.

These authors concluded that "in Wisconsin, a farm tax preference scheme for land-use control...would probably be administratively complex and less effective than a well-devised program of development rights acquisition." Rather than use-value taxation, these scholars focused on the potential of easements – state purchase of development rights – as a way to protect farmland and other open spaces from urban sprawl.

Easements, along with zoning, represented other ways to rewrite the rules governing land use. They have their own histories beyond the scope of this tale. Suffice it to say that, despite their appeal to many academics and legislators, these strategies have also struggled to gain widespread purchase as they have chafed against competing notions of property rights.

¹⁵ Duncan A. Harkin, *Current use-value taxation for land in conservancy and exclusive agricultural zones* (Working Paper No. 4, Center for Resource Policy Studies, University of Wisconsin—Madison, 1973), 8-10.

proposal *Current use-value taxation for land in conservancy and exclusive agricultural zones*, aimed to provide not only agricultural, but also other undeveloped lands called conservancy zones with taxation according to their use-value.¹⁶ Moving beyond an explicit emphasis on farmland preservation, the focus of this proposal was to “eliminate the incentive caused by the ad valorem property tax for forced conversion of open space lands to developmental uses.”¹⁷ The proposal cited the following public benefits of conservancy zones to justify this inclusion:

1. The maintenance of the natural beauty of wetlands, shorelands, and other open space lands.
2. The regulation of water flow from wetlands.
3. The maintenance of wildlife habitat of wetlands, shorelands, and other open spaces.
4. The filtration and accumulation of nutrients in wetlands, thereby reducing the eutrophication of lakes and streams.¹⁸

What is surprising here is what is absent. This justification neglected to consider the impacts on landowner decisions if non-agricultural land were left out of use-value taxation. This land would then be subject to higher taxes. A farmer

¹⁶ Ibid., iii. Being that this paper arose from a faculty seminar in the seminal year of the Institute for Environmental Studies, and given that environmental legislation was generally having its hey-day in the 1970s, it is not surprising that the author included conservancy zones in his model use-value legislation.

¹⁷ Ibid. 2

¹⁸ Ibid.

with a wetland on his farm, for example, would then face the choice of paying the higher taxes with the income raised from the agricultural land, selling the land, or draining the wetlands in order pasture to cultivate them and receive the tax relief. Even if he expected little income from this marginal land, he may decide to put it to the cow or the plow simply to gain the tax break. The scope of land uses included in use-value taxation could thereby critically influence landowner decisions, and its subsequent imprint on the landscape. In other words, what was at stake here was whether to shelter non-agricultural lands from property taxes that could pressure farmers to make them profitable.¹⁹

The legislation proposed in *Current use-value taxation for land in conservancy and exclusive agricultural zones* eventually became a bill, but like many other proposed revisions to the tax code, it was never passed into law.²⁰ Nevertheless, even as diverse visions of the best policy mechanisms for controlling land use swirled about in academic circles, momentum for use-value legislation had continued to build in the Capitol building. A second vote from the legislature in

¹⁹ The Wisconsin Constitution was amended in 1927 to authorize non-uniform taxation of forested land. This amendment and the legislation under the Forest Crop Law that followed formed the major precedent for preferential taxation according to land uses. This precedent apparently inspired many other bills in the 1960s and 1970s that would have established tax breaks for other land uses. These lands included Nature Conservancy Land, National Audubon Society land, non-profit hunting and fishing club land, and used for pollution abatement, lands developed in conjunction with a development plan, and wetlands. Though these other land uses did not receive the attention for preferential tax treatment that agriculture did, these proposals indicate that various interests in the blossoming environmental movement were testing the willingness of the public to subsidize their causes. These proposals also presaged the aforementioned problem that agricultural use-value taxation makes undeveloped non-agricultural lands shoulder a disproportionate tax burden, and thereby incentivizes land conversion to agriculture.

²⁰ Assembly Bill 1233, 1975 legislative session, Wisconsin.

1974 approved an amendment – introduced and first passed in 1972 – that would allow exception of agricultural and other undeveloped land from uniform taxation, opening the door to laws that would tax these lands according to their use-value.²¹ Before any bills could proceed, however, the amendment was still subject to one last hurdle that all changes to the Wisconsin constitution must overcome: ratification by public ballot referendum.²²

This opportunity was to be presented to Wisconsin voters on April 2, 1974, and the question on the ballot would read:

Shall section 1 of article VIII of the Wisconsin constitution be amended to permit the legislature to define agricultural land and undeveloped land and to allow that the taxation of such classes of land need not be uniform with one another nor with the taxation of other real property?²³

The referendum generated considerable interest in the press.²⁴ Newspapers around the state emphasized that the purpose of the proposed amendment was to slow or prevent the development of open space lands. Opinion pieces from supporters of

²¹ Richard Barrows, *Use Value Taxation – Is It Right for Wisconsin?* (Working Paper Us2/4, Department of Agricultural Economics, University of Wisconsin—Madison, 1974), 1.

²² In Wisconsin, an amendment to the constitution requires a majority vote in two successive sessions of the legislature, followed by ratification via ballot referendum. See Dan Ritsche, *Referenda and recall*. (Wisconsin Legislative Reference Bureau, Madison, 2006) Accessed on November 4, 2012 http://legis.wisconsin.gov/lrb/GW/gw_13.pdf.

²³ Richard Barrows and Doug Yanggen, *Use-value Tax Amendment: Referendum Question #3* (Working Paper Us2, Department of Agricultural Economics, University of Wisconsin—Madison, 1974), 1.

²⁴ Perhaps because this was a fairly new and somewhat complex subject for most journalists, many articles drew from the working papers on the subject to help voters understand their choice. Many articles also interviewed one of the authors, Richard Barrows.

the amendment in cities emphasized the environmental aspects of the amendment.²⁵ Rural newspapers tended to cast it primarily as tax relief for farmers.²⁶ All explained that a "yes" vote on this amendment would allow the legislature to pass use-value tax laws, but it would not require law-makers to take any action, so the ultimate impacts of the amendment would depend on the specific law that was crafted in its wake.

The amendment passed narrowly, but did not split along any obvious partisan or rural-urban line.²⁷ Once the amendment allowing use-value legislation passed, law makers were at liberty to reform the tax code, and they took action to do so. They formed a special legislative committee.²⁸ They solicited special reports on the issue from legislative aides and academic specialists.²⁹ They crafted legislation following the recommendations of the reports.³⁰ One crucial recommendation from the committee and the reports was that use-value taxation would be most effective

²⁵ Staff editorial, "Lighter Open Land Tax: Fight Urban Sprawl," *Wisconsin State Journal*, March 18, 1974; Mary Lou Munts, "Munts Asks Vote for Variable Tax," *The Capital Times*, March 27, 1974.

²⁶ Harold A. Reinecke, "Use-value taxation referendum issue," *Fond du Lac Reporter*, March 18, 1974; "April vote on open space taxing," *Stevens Point Daily Journal*, March 11, 1974.

²⁷ Raymond Penn, *Use-value Taxation for Agricultural Land* (Working Paper Us2/2, Department of Agricultural Economics, University of Wisconsin—Madison, 1974), 1.

²⁸ Boykoff, *Background Information*, 1.

²⁹ Dick Barrows, *Use Value Taxation: What Kind of Law for Wisconsin?* (Staff Paper no. 78, Agricultural Economics, University of Wisconsin—Extension, 1974); Craig Adams and Richard A Lehmann, *Measures to Preserve Agricultural and Undeveloped Lands by Restricting Their Development and Promoting Improved Patterns of Urban Growth* (Staff paper, Legislative Council Special Committee on Preserving of Agricultural and Conservancy Lands, Madison, 1974); Michael Harder, Guy Phillips, and Fran Brzezinski, *The Role of Property Tax Reduction in Preserving Agricultural Land*, (Staff Paper, Legislative Council Special Committee on Preserving of Agricultural and Conservancy Lands, Madison, 1974).

³⁰ Thomas M Boykoff, *Legislation Relating to Preserving Agricultural and Conservancy Lands: A.B. 1082, Taxation and Preservation of Agricultural and Conservancy Lands* (Wisconsin Legislative Council, Madison, 1975).

in slowing sprawl if combined with zoning ordinances restricting uses of land other than agriculture. Legislators took their advice, and the chief bill that the legislators fashioned required that in order to be taxed according to use-value, land must be in zoned agricultural or conservancy districts. Then, as one newspaper opinion piece summed it up, "Farmers liked the tax relief feature but not the land-use controls. The bill died."³¹

Where we landed

[Conservation's] history in America may be compressed into two sentences: We tried to get conservation by buying land, by subsidizing desirable changes in land use, and by passing restrictive laws. The last method largely failed; the other two have produced only small samples of success.³²

Aldo Leopold

The history of this tax did not end there.³³ Agricultural use-value taxation eventually became law in Wisconsin in 1995 and was implemented in 2000.³⁴

³¹ *Wisconsin State Journal*, "Agricultural Land Tax," April 14, 1977.

³² Aldo Leopold, "Conservation Economics" (1934) in *The River of the Mother of God*, ed. Susan L. Flader and J. Baird Callicott (Madison: University of Wisconsin, 1991) 193-194.

³³ The debate did not end either. The Stevens Point Daily Journal reported in December of 1975 that three bills were being advanced for use-value taxation of farm land. One included conservancy lands, two included rollback taxes, and one titled "Farmland Tax Relief" included neither. See David Ankley, "Portage County Agricultural Report," December 9, 1975. In 1976, land use and taxation remained at the forefront of public debate. Candidates for a state assembly seat in Madison that year were asked to answer three questions for a newspaper profile; one question dealt with the state role in land use planning and

Analysis of why use-value failed to become law in the intervening years is beyond the scope or purpose of this paper, as is a full assessment of the law's effects since its inception. Several features of the bill that became law bear mentioning, however, since they harken back to the themes that opened this history. The law did not include any explicit ties to other land-use controls such as zoning or easements, nor did it provide any tax relief for non-agricultural conservancy lands. These features have resulted in some unintended consequences.

One such consequence is that use-value taxation may be acting as a subsidy for developers who keep land under cultivation until building on it.³⁵ This played out in a strange twist of the 2012 primary race for the Republican candidate for U.S. Senate. Tommy Thompson – a candidate who also happened to be the Governor who signed the use-value bill into law in 1995 – accused another candidate named Eric Hovde of tax fraud. Hovde had been sued for not paying the full amount of his property taxes after he let land previously farmed go fallow, which disqualified it from use-value taxation.³⁶ While this incident may seem trivial, it illustrates that society continues to grapple with land use and taxation.

another dealt with the restructuring the tax system to make it more equitable. See James H. Bailey “Four Dems Seek 46th District Seat,” *The Capital Times*, September 10, 1976.

³⁴ Legislative Reference Bureau, “Farmland Use-Value Assessment” (Brief 03-3, Wisconsin Briefs, 2003), accessed October 16, 2012, <http://legis.wisconsin.gov/lrb/pubs/wb/03wb3.pdf>.

³⁵ Legislative Audit Bureau, “Use-value Assessment of Agricultural Land” (Letter Report to Joint Legislative Audit Committee, Madison) 2010.

³⁶ “GOP Senate candidate Eric Hovde didn't pay property taxes until he was sued, rival Tommy Thompson says,” *Journal Sentinel Politifact*, accessed November 4, 2012 <http://www.politifact.com/wisconsin/statements/2012/aug/10/tommy-thompson/gop-senate-candidate-eric-hovde-didnt-pay-property/>.

Another unexpected consequence of this law is that it has incentivized conversion of non-agricultural land to agricultural use. As discussed above, forests and wetlands cannot readily yield income to pay the property tax burden shifted onto them by agricultural use-value, a dynamic that presses farmers to plow or pasture these parts of their farm in order to lighten the tax burden. This “pound of flesh” scenario parallels the squeeze agricultural lands on urban fringes face to develop because of inflated taxes, except in this case the incentive is convert land *to* rather than *from* agriculture. Instead of houses invading the fields, cattle invade the woods. In both cases, taxation mediates relationships with the land.³⁷

Death and taxes

*Property belongs to a family of words that, if we can free them from the denigrations that shallow politics and social fashion have imposed on them, are the words, the ideas, that govern our connections with the world and with one another: property, proper, appropriate, propriety.*³⁸

Wendell Berry

³⁷ The author’s conversations with farmers and officials in Wisconsin suggest that the practice of pasturing woodlands in order to qualify use-value tax rates is on the rise.

³⁸ Wendell Berry, “Whose Head is the Farmer Using? Whose Head is Using the Farmer?,” in *Meeting the Expectations of the Land*, Wes Jackson, Wendell Berry & Bruce Colman eds. (San Francisco: North Point Press, 1984), 19, as quoted in Eric Freyfogle, “Property and Liberty” *Harvard Environmental Law Review* 34 (2010): 75.

Taxes, property, and land use are promiscuous in their implications. The questions at the intersections of these themes have a ball-of-yarn quality: tug on one and a whole heap more come unraveling behind it. At risk of becoming tangled in them and losing the thread of this history, allow me to suggest several perspectives that could inform this history. For one, placing taxes in what geographers call the “cultural landscape” could frame how taxes drive land-use intensification.³⁹ Historical and legal studies of urban sprawl, land-use regulations, and property rights could contextualize that frame.⁴⁰ Sprawl and property rights can also be understood in terms of tenure and dispossession.⁴¹ Lastly, casting taxes as a “pound

³⁹ The works cited in the notes of this section are meant to point toward bodies of scholarship that could yield further insight into this history. I do not claim to be well-versed in these fields, only familiar enough to suggest they are worth further review. On the cultural landscape, see Carl O. Sauer, *The morphology of landscape*, (Berkeley: University of California Press, 1925), 19-54 and Carl O. Sauer, "Foreword to historical geography" *Annals of the Association of American Geographers* 31, no. 1 (1941): 1-24. For a more recent application of this theory, see Charles C. Geisler "Estates of mind: culture's many paths to land" *Society & Natural Resources* 13, no. 1 (2000): 51-60.

⁴⁰ See Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press, 1985); Adam Rome, *The bulldozer in the countryside: Suburban sprawl and the rise of American environmentalism* (Cambridge University Press, 2001); Kenneth Stahl, "The Suburb as a Legal Concept: The Problem of Organization and the Fate of Municipalities in American Law" *Cardozo Law Review* 29 (2008): 1193-1272; Constance Perin, *Everything in its place: Social order and land use in America* (Princeton: Princeton University Press, 1977); Eric Freyfogle, "Property and Liberty"; Edella Schlager and Elinor Ostrom, "Property-rights regimes and natural resources: a conceptual analysis." *Land economics* (1992): 249-262; James E. Penner, "The Bundle of Rights Picture of Property," *UCLA Law Review* 43 (1995): 711; Eric T. Freyfogle. *The land we share: private property and the common good* (Washington DC: Island Press, 2003); Richard F. Babcock and Duane A. Feurer. "Land as a Commodity Affected with a Public Interest." *Washington Law Review* 52 (1976): 289; Fran Thomas, *Law in Action: Legal Frontiers for Natural Resources Planning; the Work of Professor Jacob H. Beuscher, Including a Bibliography of His Published Work* (Madison: Land economics journal, University of Wisconsin-Madison, 1972).

⁴¹ See David Harvey, *The new imperialism* (New York: Oxford University Press, 2005). Tenure is more commonly invoked in colonial and post-colonial contexts, but attention to dispossession of indigenous peoples, state building through the public land survey, and European settlement on these lands could also inform this history. See Lindsay G. Robertson, *Conquest by law: How the discovery of America dispossessed indigenous peoples of their lands*. (Oxford University Press, USA, 2005), and Meine, *Correction Lines*.

of flesh” demanded of land invites an inversion of property rights: what are the rights of property?⁴²

The unfinishedness of this history exposed by these perspectives reflects the tensions society continues to face in its relationship to land through property taxes. The laws that position land as saleable and taxable private property can seem so fundamental as to be unwritten custom. To the contrary, this history has demonstrated that laws concerning property taxes represent choices society makes about how to order its relations among people and the land.⁴³ In the case of use-value taxation in Wisconsin, the process of changing laws that define these relationships proved challenging and fraught with the perils of unintended consequences. Future efforts will likely continue this tradition. I believe it was in this spirit that Raymond Penn encouraged those crafting legislation shortly after the electorate of Wisconsin had approved the use-value amendment, “If the program doesn’t work, we can change it or drop it.”⁴⁴

Whether use-value taxation works, for whom it works, and if Wisconsin will change or drop it remain open questions. As noted in 1973 in the foreword of *Current use-value taxation for land in conservancy and exclusive agricultural zones*,

⁴² For an example of an ecocritical narrative that casts land as the suffering protagonist, see Mark I. Wallace, *Finding God In The Singing River: Christianity, Spirit, Nature*. (Minneapolis: Fortress Press, 2005).

⁴³ Legal scholar Eric Freyfogle describes the radical changes property rights have undergone throughout the nation’s history and presents a comprehensive bibliography in “Property and Liberty.”

⁴⁴ Raymond Penn, *Use Value*, 7.

The issues we are dealing with here exemplify an increasing challenge to education and to democracy. The challenge is whether sufficient public understanding of increasingly complex problems can be achieved to permit meaningful public participation in the decision processes through discussions with their legislators. The alternative seems to be for these decisions to be made by an increasingly narrow group of technocrats who understand the questions. Such a narrowly based decision process becomes increasingly vulnerable to pressures from well-mobilized special interests.⁴⁵

This quotation illustrates a view of property taxes as an opportunity for the voting public to assert its support for responsible landowners, with appropriate reprobation for irresponsible behaviors. Lest this awareness provoke us to dictate the finer matters of land use via tax law, let us stay grounded in a humble recognition that even laws designed with the best of intentions may have unintended consequences.

⁴⁵ Farnum, *Current use-value*, 1.

Appendix 4

Methodological reflections on insider positionality: identity, motivation, and epistemology

Introduction

The methodological challenges of researching familiar subjects require critical appraisal. Negotiating insider-outsider positionality relative to research subjects shapes epistemological and normative frames of the research. In this essay I offer a reflexive exercise in examining my positionality and its influence on my research methodology. I begin this exercise with a justification for employing a qualitative approach on the grounds that the processes I study are inherently subjective, and because the approach allows me to incorporate, rather than eliminate, bias into my findings via reflexive interpretation. I continue by implicating my intrinsic and extrinsic motivations for performing identities as a local advocate and as a university researcher in dialectical consideration of my positionality. I close with a discussion of how several other researchers have recast insider-outsider positionality as a continuum, and how their work informs my approach.

Qualitative methodology: accessing subjectivity

My research examines the values, motivations, and constraints of farmers in managing their woodlands. In this context, I am interested in the subjective and

intersubjective processes in farmers' decisions about how to manage their woods.

Although quantitative methodologies such as statistical analysis of survey responses could conceivably be used to address my research questions, my research approach consists of semi-structured interviews of farmers, followed by manual thematic coding of interview transcripts.

I have selected this approach because the individual attitudes and circumstances surrounding the decision-making process of farmers are central to the study. By contrast, a focus on documenting or analyzing behaviors would be more amenable to quantitative methodologies. Behaviors exist externally to subjects, whereas values, attitudes, identities and purposes live within them. These interior qualities and processes are inherently subjective inaccessible to direct measurement; they therefore call for qualitative understandings.

Qualitative approaches also offer a framework for making biases explicit. Rather than seeking to eliminate bias with instruments that offer replicable measurements of objects or phenomena, I recognize that my results rely on interpretation that is inextricable from my perspective. This is not a flaw of research design; interpretation represents one, if not the, central characteristic of qualitative research. Strict postmoderns claim all knowledge arises from interpretation. For my purposes, it is sufficient to establish that interior qualities and processes offer no

pre-interpretive possibilities for examination, and so also offer no way to eliminate bias inherent in the interpretive process.

In lieu of eliminating bias, qualitative researchers have developed the notions of reflexivity and positionality for dealing with it in a forthright way. Although these concepts encompass more than dealing with bias, it is worth noting that self-conscious reflection allows the researcher to maintain a critical gaze and implicate his biases into the truth claims he makes. Others can then incorporate these considerations into their own interpretation of the research, including its rigor, validity, and veracity. In this spirit, I offer an explication of my positionality.

My positionality: local advocate researcher

I come from the place of my research: the Kickapoo Valley. The watershed in southwestern Wisconsin lies in the heart of the Driftless area, a rural region predominately characterized by farm fields throughout its ridges and valleys, and forests covering the steep hillside slopes among them. My father and mother, natives of urban and rural Iowa respectively, moved into the area and worked as an apple picker and an educator when I was an infant. Members of the back-to-the-land movement, I experienced some aspects of an immigrant childhood. As I came of age in the only home I had known, I was also led to believe by some of my peers that my parents' status as "hippy" new-comers in the area made me an outsider.

Although some of this experience can be attributed to common adolescent anxieties about identity and belonging, it nonetheless colors my relationship with the place and people of my home community. I relocated to the Kickapoo Valley as a young adult, and took up farming and hunting, two activities central to the dominant culture that were not part of my family experience. I offer this note to flag my persistent, often unconscious, desire to become an insider to this culture. Could it be that my motivation to do research that gives voice to individual values and cultural processes that govern land-use decisions stems from this same desire?

It is not only questions of motivation that become salient in the context of this reflexive exercise. The way I position myself in the practice of interviews also bears examination. I often introduce myself to a potential interviewee by referencing another community member who suggested that I contact them. My emphasis on this connection is practical; I am more likely to gain access to this person if they understand me within the context of their community.

Although community membership defines the scope of insider positionality, reflexive practice around issues of identity also encompasses gender, age, race, class, religion, and other cultural affiliations. In my case, being a white married man in my late twenties presents familiar valences to the farmers I interview. I can also reference ties to a graduating from a local high school, attending a local Lutheran

church and Christian summer camp, a history of working on several area farms, my parents' home in the area, and my wife's family's farm in the area. I affect a "country" manner of speaking that echoes the subjects' speech, and wear common clothes like blue jeans and plaid shirts. By foregrounding these aspects of my identity, I position myself as an insider, a member of the community. In emphasizing my community connections, I identify myself as a local in order to gain trust and encourage open and sophisticated communication in the interviews. My insider positionality thus opens windows into intersubjective processes and shared meanings that may remain closed to a researcher who defined themselves as an outsider.

In other important ways, I am an outsider. Most prominently, I am not a farmer. Although I have planted and continue to manage a small orchard on my family's land, my livelihood does not depend on it. In a similar fashion, I was raised in the countryside, but my parents are not farmers, and they are not native to the area. The only farms I have worked at are organic, and my father works for an organic farmers marketing cooperative. Organic farming carries profound and complex counter-cultural valences in my community, so when I interview non-organic, or conventional farmers, these aspects of my identity position me as an outsider. Conversely, I can draw on this personal history for insider status when interviewing

organic farmers, many of whom share community connections with my family can relate to this “back-to-the-land” narrative.

In general, I downplay aspects of my identity will simply not reconcile with insider positionality and that I expect to position me as an outsider. For example, in conversations with conventional grain farmers, I have not specified that the area farm I was employed at for four years is an organic vegetable farm, though I would not misrepresent or withhold that detail if it seemed that was what the farmer I was interviewing wanted to know about me. In another case, I was once asked directly by a farmer what I did for a living besides interview people. I work on a part-time basis at the state Department of Agriculture, so I referenced my employment there in order to provide context for them to understand me.

Although in the above instance I downplayed my profession as a researcher, I also use this aspect of my identity to position myself as advocate, thereby offer the farmers I interview an alternative interpretation of me in an insider role. When contacting farmers or early in the course of the interview, I also explain that I come from the area, and I frame my research purpose in terms of seeking the views of people in order to "bring them back to Madison, where decisions sometimes get made in a vacuum." Madison, the city where I dwell, is home to both the University of Wisconsin campus and the state capitol. While farmers generally consider

themselves outsiders to these institutions, I can portray myself as an insider and a conduit for bringing their voice into these powerful institutions. If they accept this wager and consent to be interviewed, a certain power dynamic emerges in being a university affiliated researcher – an outsider – gives me claim to the insider status of advocate.⁴⁶

Without diminishing the methodological motivations for positioning myself as an insider, it is worth considering my personal motivations such as desire for acceptance or status in claiming such a position. By acting, or claiming to act, as an advocate I realize, on some level, my personal desire to be an insider in the culture I felt excluded from in my youth. Pursuit of self-identity as a local indubitably orients my expressed positionality in research praxis. Furthermore, the affirmations I gain from farmers who accept, however tacitly, my claims on this identity provide extrinsic (though still personal) motivation for me to position myself as a local advocate.

Additional extrinsic motivation for this positionality comes in the form of status, which is powerful motivation for many identity claims. I stand to gain status in

⁴⁶ In effort to speak authentically for farmers, I cannot characterize them as a monolithic group with a single voice. The particular perspectives of the farmers I interviewed require interpretation on their own terms. Nevertheless, I recognize that expressed fealty to this principle of authentic representation does not shield me from bias: though I may interpret them on their own terms it will still be from my perspective.

some circles of both my home and university communities by acting as a researcher-advocate. In my home community, affiliation with the university represents a degree of achievement, sometimes disdained but most often respected, if only for its exclusivity. That I have gained access to it accrues me status, if not affection.

On the other hand, with university colleagues I might highlight or down-play my role as an advocate, depending on my audience. If I am speaking with scholars whose epistemologies are friendly to insider positionality and explicit normative frames for research, I may explain my methodology in those terms. If my audience maintains a more positivist frame, I may highlight that in order to mediate bias I do not interview farmers with whom I am previously familiar, unless it seems an opportune time to open the Pandora's Box of questioning their assumptions.

On most occasions I am not consciously calculating the cultural cache of how I contextualize my relationship with my research for a particular audience, but I offer these considerations in order to complicate my insider positionality with contrasts of felt and performed identity. By accreting layers of reflexive analysis, I present opportunities for more nuanced assessment of my truth claims. I disclose for rigor. Ultimately, the sort of reflexive awareness I am cultivating here is meant to offer invitation to readers to interpret my findings with a generous -- although not comprehensive -- view of my perspective. By understanding this perspective, along

with the personal meanings I seek in this research, readers may grasp more fully the character of my claims. Such a process of sharing knowledge, where the knowledge is never disembodied from the knower, holds promise for creating meaning.

Recasting the insider-outsider duality

It may be impossible to completely untangle conscious and unconscious, epistemological and personal, motivations for performing identity in research settings, but it is worth noting that these tensions exist. These tensions point toward an insider-outsider dialectic that surpasses a simple dichotomy in terms of offering a sophisticated assessment of my positionality. Dwyer and Buckle (2009) present a similar framework. Dwyer practices hermeneutic phenomenology to research on (with) other White parents of adopted Asian children; thereby positioning herself as an insider. Buckle, on the other hand, researches bereaved parents as an outsider. Though they initially frame their respective positionalities this way, their thoughtful analysis renders the distinction between insider and outsider more complex. Consider how the following passage informs my discussion my positionality:

Although a researcher's knowledge is always based on his or her positionality ... as qualitative researchers we have an appreciation for the fluidity and multilayered complexity of human experience. Holding membership in a group does not denote complete sameness within that

group. Likewise, not being a member of a group does not denote complete difference. It seems paradoxical, then, that we would endorse binary alternatives that unduly narrow the range of understanding and experience (Dwyer and Buckle 2009).

In as much as my reflective exercise complicates the insider-outsider binary that I occupy with regards to my research, it succeeds in informing the understandings that readers may draw from it. I hold membership in the group I study in some respects, but in others I am not a member. There is neither complete sameness nor difference. This fluid complexity of group membership is what allows me to justify acting as an advocate for my research subjects by informing this identity with reflexive practice that includes dialectical insider-outsider positionality. But acknowledging that identity is fluid does not justify total liberty in epistemology: I do not identify with this group strongly enough to consider hermeneutic phenomenology a valid research approach. I am not a farmer with woods to manage, so I cannot speak *as* one, but since I share membership in the community, I am willing to speak *for* one.⁴⁷

⁴⁷ This question raises further questions regarding representation. To what extent can I consider my research "native anthropology?" How would I characterize the co-production of knowledge at play in the interviews and my analysis and interpretation of them? Would an auto-ethnography of my experience with farm forests provide a meaningful contribution to my research topic? If my interviews and other research activities lead to formal or informal collective action, what are the epistemological or ethical ramifications of implicating myself in the action? What are the intertwined integrities of identifying and acting as scholar and advocate?

Dialectical insider-outsider positionality also provides more latitude for the plethora of ways scholars implicate themselves in their research. Some researchers begin research within a community to which they already belong, while others become involved in the community as a result of their research (Breen 2007). Participatory action research and many feminist methodologies emphasize shared identity with research subjects, though it is impossible for researchers to ignore or bracket their academic identities and the differences that surface from them. Alcalde (2007) shines insightful light on the power dynamics created by her race, education, and class where tied with her “partial insider status.” Her membership in the middle class of Lima, where she conducted her field work among poor women, reinforced the very inequalities she sought to change through her research, though her class-mediated access also allowed her to act as an advocate alongside her role as an academic. In these dual roles that define this paradox, she found the lines between insider and outsider blurred, without ever disappearing. Though the farmers I interview do not face discrimination in the way the poor women Alcalde worked with and studied do, her approach informs how I negotiate my own multiple roles as researcher and advocate.

Conclusion

I have offered a critical appraisal of my positionality in researching farmer woodlot management motivations in my home community. Although I have not given the issue exhaustive treatment, it has been personally exhausting. Perhaps this explains why intensive self-appraisal is crucial to “uncomfortable reflexivity” (Reed et al. 2011). At the least I have demonstrated that a simple insider or outsider dichotomy remains insufficient to characterize complex, multi-layered, fluid relationships we have with our research subject, and offered several examples of other qualitative researchers who have cast this insider-outsider positionality as a dynamic continuum. I contend that describing my own motivations and identity issues offers readers opportunity to more carefully interpret the knowledge I present, and to incorporate this knowledge into their own meanings.

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