

Private landownership and Walk-In Access program enrollment:
Motivating factors of landowner attitudes and participatory decision-making

A THESIS

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Dedication

This thesis is dedicated to my mother, Inez Allison Salcido, and my father, Pedro Jacinto Salcido. To my mother, thank you for always encouraging me to move ever forward, and for lending a much-needed ear at the best and worst of times. To my father, thank you for teaching me to believe in the best of us, and instilling in me your love for this world we were born into. I thank you both for the wonderful life you have given me.

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CHAPTER 1

Landowners' motivations for participation in Minnesota's Walk-In Access program

ABSTRACT

Hunter recruitment and retention could be improved by securing public hunting access to private properties, especially for members of the public without means to purchase hunting lands of their own. However, private landowner participation in such “walk-in access” (WIA) programs tends to be limited. To persuade landowners to open their lands and resources to the public, it is first necessary to gain a deeper understanding of what internal factors will most effectively impact their intent to do so. We conducted a self-administered mail-back questionnaire of private landowners in Minnesota with properties eligible for or enrolled in the state’s WIA program, and gathered data was assessed through the development of two linear regression models. The first model was based upon Ajzen’s Theory of Planned Behavior, regressing landowners’ behavioral intentions towards WIA on their WIA-related attitudes, subjective norms, and perceived behavioral control. The second model incorporated factors demonstrated by previous research to be integral to landowners’ conservation decision-making, regressing landowners’ WIA-related attitudes on their land ethic agreement, sense of personal responsibility, and prioritization of financial gain, community opinions, and non-human impacts. Our first model found low impact of perceived behavioral control on behavioral intentions, a deviation from previous TPB research. Of the factors included in our second model, only agreement with a land ethic contributed significantly to landowners’ WIA-related attitudes. Future studies may consider modifications to and further measurement of subjects’ land ethic to further measure its validity as a motivator of attitudes.

KEY WORDS: human dimensions, motivations, private landowners, walk-in access

INTRODUCTION

Federal and state agencies have historically enjoyed broad powers to implement conservation measures and manage public lands for the benefit of all citizens, thanks in part to the centrality of the public trust doctrine in environmental law (Blumm and Paulsen, 2013). However, public lands are not extensive enough to provide habitat for all species of concern, nor to provide recreational opportunities for all interested members of the public. These difficulties are exacerbated in countries with strong traditions of private landownership, such as the United States, where public lands are often scattered among large tracts of private lands.

Walk-In Access (WIA) programs are state-run initiatives that seek to provide new public hunting opportunities on private lands enrolled in existing conservation programs, or containing high-quality wildlife habitat. These programs are voluntary for landowners, who receive monetary compensation based upon the amount and quality of land enrolled, and the length of time the land is enrolled. Landowners are customarily protected under state recreational use laws that limit their liability for incidents on their property, with trespassing and hunting violations being handled by the state DNR's conservation officers. In most cases, access to these properties is limited to foot traffic, and access can be prohibited when the landowner is harvesting or otherwise actively utilizing their property.

In theory, a WIA program creates new recreational possibilities for members of the public with an interest in hunting, without needing to privately purchase and own large tracts of prime hunting land. However, the voluntary enrollment aspect of these programs means that managers remain heavily dependent on the largesse of current private landowners in order to achieve their goals and expand agency capabilities. In

order to more effectively persuade private landowners to willingly enroll their lands in Walk-In Access and other programs that aim to promote wider recreational accessibility, it is necessary to achieve a deeper understanding of what factors have consistently motivated them to do so.

The purpose of our research was to determine the relative strengths of factors influencing private landowners' behavioral intentions towards enrolling some of their eligible property in Minnesota's WIA program. Our study focuses on "private landowners" due to the continuation and growth of WIA being dependent on the voluntary choice of private landowners to enroll eligible land in the program. This study was grounded in use of the Theory of Planned Behavior (TPB) proposed by Ajzen (1985).

Previous Research Findings

Incentives, especially financial incentives, are a commonly used tool to entice landowners' participation in government-backed programs. The ability of these incentives to motivate private land access depends on the individual landowner's priorities, and whether the incentive offered can help them meet those priorities. In previous research, landowners with lower incomes prioritized financial matters more highly when making land management decisions, whereas landowners who possessed more acres of land – inferred to correlate with higher income – assigned higher priority to what was better for nature (Bastian, Coatney, Meador, Taylor, and Meiman, 2014). And while the promise of a reward may motivate landowners to initially cede some control over their lands and buy into an agency program, relying too heavily on payments and monetary valuations to motivate environmental protection could ultimately generate

ineffective outcomes. By framing conservation as a voluntary pursuit rather than an inherent responsibility of landownership, reliance on financial incentives could undermine morale and fundamental ideals of environmental stewardship (Neuteleers and Engelen, 2015). Findings from Farmer et al. (2017) supported this hypothesis, indicating that landowners who are primarily driven by financial considerations are significantly less likely to implement conservation strategies on their land. They suggested a movement towards performance payment by rewarding landowners proportionate to actions taken as an option to encourage greater conservation action by landowners motivated by financial gain (Falmer et al. 2017).

Ramsdell, Sorice, and Dwyer (2016) found that most farmers participating in a bird conservation program indicated a willingness to continue with the program even if the financial incentive ended. This finding was hypothesized to be a result of the program's flexibility fostering a sense of self-directed motivation in the farmers, as farmers who perceived themselves as participating in the program of their own volition were more likely to be highly engaged in the program. Selinske et al. (2017) confirmed that landowners' initial motivations for joining a conservation program rarely turn out to be the factors that drive their continued participation. Sorice, Haider, Connor, and Ditton (2011) conclude that financial incentives are best utilized as a tool to appeal to private landowners who are 'on the fence', i.e. landowners who hold slightly positive attitudes towards conservation but have no other pressing reason to enroll in a program.

When considering the influence of norms on landowner behavior, Sorice et al. (2011), Bastian et al. (2014), and Siemer, Decker, and Stedman (2016) indicated that most landowners care very much about what their friends and neighbors think. Sorice et

al. (2011) indicated that normative considerations were important determinants of whether a landowner would participate in an endangered species conservation program, with landowners who felt considerable social pressure from their peers being more likely to join a conservation program despite lower incentives, or to refrain from any program regardless of the incentives offered. Bastian et al. (2014) found that concern over impacting their neighbors motivated landowners to prioritize nature in their land management decisions; this concern also made them less likely to try finding a balance between nature and finances, suggesting these landowners expected their neighbors to have similar attitudes. Siemer et al. (2016) reported that landowners in a fee hunting program did not expand hunting access to their lands primarily because they preferred to reserve hunting privileges for their friends and family, and distrusted unknown hunters. Despite the hunting program's goal of managing the expansion of the local deer population, respondents expressed greater concern about allowing more hunters onto their property than they did about an increasing deer population. Considering these studies and results, social considerations such as preserving autonomy, communal cohesion, and distrust of external influence appear to more consistently influence landowner's abstention from conservation programs than financial reasons.

Pro-environmental ethics and worldviews can drive program participation by private landowners, especially for initiatives that are explicitly directed towards conservation. Drescher, Warriner, Farmer, and Larson (2017) found existing pro-environmental worldviews to be one of the strongest determinants of program participation when studying conservation programs in Ontario, Canada. Landowners who highly value nature or conservation often need little convincing to lend their support to

programs that are clearly and tangibly catered towards advancing those causes (Drescher et al. 2017). Likewise, Olive and McCune (2017) found the majority of landowners in southern Ontario to hold positive attitudes towards conservation and endangered species, while Selinske, Coetzee, Purnell, and Knight (2015) found that the strongest motivations for landowners to join a private land conservation program in South Africa were previously existing conservation values and emotional attachment to their lands. Similarly, Sorice et al. (2011) observed that landowners who held more positive views were generally willing to join a program with fewer incentives offered.

When studying landowner willingness to lease their land to a fee hunting program, Deng and Munn (2015) concluded that some landowners simply use their land in ways that they feel are incompatible with certain programs, and are unlikely to participate regardless of the incentives offered. While these landowners still cared about conservation, their values disinclined them to engage with governmental conservation programs (Deng and Munn, 2015). This finding reflects a trend seen throughout conservation literature: Private landowners' attitudes veer towards autonomy, and many are loath to join programs that appear to threaten their ability to freely and fluidly decide how to manage their lands. Sorice et al. (2013) found that the most common reason cited by landowners for their disinterest in conservation programs was the potential for government involvement, with landowners holding more positive attitudes towards program options that explicitly preserved their autonomy. Olive and McCune (2017) corroborate these views, with landowners commonly expressing fear that the presence of an endangered species on their property would lead to the government coming in and attempting to wrest control of that property. Raymond and Schneider (2014) found that

landowners broadly support the belief that they should be able to use their property largely without government interference.

However, it is worth noting that the landowners surveyed in these studies were not completely opposed to allowing any conservation efforts on their land. Olive and McCune (2017) found that landowners expressed a willingness to make moderate changes to the way they managed their lands, on the condition that they receive further details on the species being protected, and find a way to reconcile that species' needs with their own. Raymond and Schneider (2014) reported landowners' belief in personal autonomy as only slightly broader than the belief in preventing extinction on moral principles. Drescher et al. (2017) found landowners with a high focus on traditional values, namely prioritizing family safety and self-discipline, were negatively inclined to participate in conservation programs. Increasing political conservatism, inferred to be directly linked to traditional values, was related to an increasing personal obligation to preserve the environmental features on one's own land (Drescher et al., 2017).

Considering these previous studies, many landowners' interest in preserving personal autonomy appears borne out of the belief that they are capable of being responsible land stewards and do not want government agencies and programs to unnecessarily restrict or dictate their land management behavior.

Guided by these previous research findings, we applied the Theory of Planned Behavior (TPB) to help understand private landowners' intentions to participate in the Walk-In Access program. As an expansion of the Theory of Reasoned Action developed by Fishbein and Ajzen (1975), the TPB proposes that peoples' behavioral intentions (BI) are influenced through the two volitional variables of attitudes (AT) and subjective norms

(SN) identified by the Theory of Reasoned Action, as well as a non-volitional variable of perceived behavioral control (PC). As defined by Fishbein and Ajzen (2010), ‘Attitudes’ refers to the subject’s positive or negative opinions regarding a potential behavior; ‘Subjective Norms’ refers to perceived social pressure from friends, colleagues, family, and leaders to perform or not perform the behavior; and ‘Perceived Behavioral Control’ refers to the perceived ease or difficulty with which the subject could perform the behavior of interest. While the TPB has been repeatedly applied to predict environmental behavior and enjoys high levels of empirical support, it has also been critiqued by the natural resource management community for underrepresenting the impact of morality on environmental behavior (Klößner and Blöbaum, 2010). To that end, we were interested in determining whether and to what extent the strength of landowners’ attitudes (AT) could be predicted by their sense of environmental ethics (LE), perception of personal responsibility for pro-environmental behavior (PR), and property management prioritization of personal finances (FI), local opinions (OP), and local impacts (IM).

Our research objectives were to 1) determine the relative impact of private landowners’ attitudes, social norms, and perceived behavioral control on their behavioral intentions towards enrolling land in WIA, and 2) determine the relative impact of private landowners’ environmental ethics, perceived responsibility, and management priorities on their mean attitudes towards enrolling land in WIA.

METHODS

Our study population of interest was private landowners who owned at least 40 acres of natural property in one of the 46 southwestern Minnesota counties participating in WIA (Figure 1.1). Our initial study sample (n = 2,885) was drawn from both a publicly

available 2017 Environmental Working Group (EWG) database of Conservation Reserve Program (CRP) recipients (<https://farm.ewg.org>, accessed 1 November 2017), and from a 2017 database of WIA participants that was provided by the Minnesota Department of Natural Resources (MNDNR). The initial sample size of landowners from the EWG database – representing landowners whose properties were eligible for WIA enrollment – was $n = 2635$, and the initial sample size of landowners from the MNDNR database – representing landowners who had already enrolled some of their land in WIA – was $n = 250$.

Private landowners were sent self-administered mail-back questionnaires based on an adapted Tailored Design Method (Dillman, Smyth, & Christian, 2014). Participants were contacted three times between February 2018 and June 2018. In the initial contact, a personalized cover letter, survey booklet, and business-reply envelope were mailed to all potential study participants. The personalized cover letter explained the purpose of the study and made an appeal for respondents to complete and return the survey in the enclosed business-reply envelope. Different versions of the survey booklet were sent to landowners whose properties were eligible for WIA enrollment, and to landowners who had properties currently enrolled in WIA (Appendix A). Approximately 4 weeks after the first mailing, a second mailing that included a personalized cover letter and replacement questionnaire with business-reply envelope, was sent to all individuals with valid addresses who had not yet replied. Approximately 4 weeks after the second mailing, a third mailing that included a personalized cover letter, replacement questionnaire with business-reply envelope, and a \$1 incentive was sent to all individuals with valid addresses who had not yet replied. Full-length surveys were collected and data was

entered through August 15, 2018. In August 2018, a shortened version of the survey questionnaire (Appendix B) was mailed to all individuals with valid addresses who had not replied to the full-length survey, serving as a non-response check. Non-response check surveys were collected and data was entered through September 14, 2018.

Study data were entered and managed using REDCap electronic data capture tools hosted at the University of Minnesota (Harris et al., 2009). Data were analyzed on a personal computer using the statistical program R (Version 3.4.2., www.r-project.org, accessed 1 August 2018). Basic descriptive statistics and frequencies were calculated for both full-length survey respondents and non-response survey respondents. The results between landowners drawn from the EWG database and landowners drawn from the MNDNR database were combined, and data from each study group were weighted to reflect population proportions.

We developed two models to assess the relationship among the variables in the study. The first model (Figure 1.2) was a straightforward adaptation of the TPB to predict future WIA-enrollment intentions of Minnesota landowners. The purpose of this model was to test for effect size of landowners' Attitudes (AT) towards WIA; Subjective Norms (SN) towards WIA; and Perceived Behavioral Control (PC) of WIA enrollment on Behavioral Intentions (BI) towards WIA (Table 1.1). The second model (Figure 1.3) utilized variables identified through previous studies as potentially impacting landowners' decisions regarding program enrollment. This model was used to test for the effect size of landowners' broad agreement with a land ethic (LE) for farmers to serve as environmental stewards as espoused by Aldo Leopold (1949); sense of personal responsibility (PR) for implementing pro-conservation land management practices;

prioritization of personal financial gain or loss (FI); prioritization of the local community's opinions (OP) of management practices; and prioritization of impacts of management practices on local non-human systems (IM) on landowners' Attitudes (AT) towards WIA (Table 1.2). Analysis variables were selected based on literature supporting their impact on landowners' private land access decision-making. Individual questions from our survey instrument were grouped together into variable measurement scales, and the data from all questions included in the scale were averaged in order to create mean variables for use in our linear models. Cronbach's alpha was used to estimate internal consistency of each measurement scale and to check for and remove items that reduced the scales' alpha values. No further items were removed once the scales' alpha values exceeded our cutoff of $\alpha = 0.7$.

RESULTS

Descriptive Results

Of the 2,885 full-length questionnaires mailed, 124 were undeliverable due to being sent to a deceased property owner or an invalid mailing address. Of the remaining 2,761 surveys, 1074 were returned by the study deadline, resulting in an aggregate response rate of 38.9%. Of these 1074 respondents, 633 provided answers to all questions utilized to create our measurement scales. A total of 222 non-response check surveys were returned after the study deadline. WIA-eligible landowners returned a total of 920 full-length and 199 non-response surveys, and current WIA enrollees returned a total of 154 full-length and 23 non-response surveys.

Among all respondents, 35.2% indicated they had at least a four-year college (bachelor's) degree, and 98.6% identified as Caucasian/white. A supermajority (80.9%)

of all respondents self-identified as either a farmer or a rancher, and among the 62.1% of respondents who volunteered an approximate annual household income range for 2017, the median income range was \$90,000 to \$99,999 prior to taxes. The non-response check indicated that respondents were slightly older ($M = 68$) on average than non-respondents ($M = 65$), as well as slightly more likely to be male (84.6%) than non-respondents (82.9%). A slightly lower percentage (75.7%) of non-respondents identified as either a farmer or a rancher, and among the 82.0% of non-respondents who volunteered an approximate household income range for 2017, the median income range was \$80,000 to \$89,999, slightly lower than the median income range of respondents.

Model 1

The mean score of landowners' BI ($M = 2.33$) on a 7-point scale was low, indicating that most of the landowners in our study sample had little intention of enrolling some of their land in WIA within the next year. The mean scores of landowners' AT ($M = 3.32$) and landowners' SN ($M = 2.40$) on a 7-point scale were also low, indicating that most of these landowners held slightly negative opinions about WIA and did not perceive a great deal of social pressure to enroll land in WIA. The mean score of landowners' PC ($M = 4.17$) on a 7-point scale was average, indicating that most landowners were moderately certain of their own ability to participate in WIA. Internal consistency testing returned Cronbach's alpha coefficients of 0.932 for the AT scale and 0.919 for the PC scale, indicating high levels of internal consistency (Table 1.3).

The variables of AT and SN were positively correlated with landowner BI, while the PC variable was found to be negatively correlated with landowner BI (Figure 1.4). Of the three variables included in Model 1, AT and SN were both found to be statistically

significant, with the single-item SN variable being the strongest predictor of BI ($\beta = 0.631, P < 0.05$). Only PC was found to be statistically non-significant as a predictor of BI ($\beta = -0.016, P = 0.461$). The three variables included in Model 1 (AT, SN, PC) were able to collectively explain 77.0% of the variance in BI ($R^2 = 0.770, F(3, 629) = 704.5, P < 0.05$).

Model 2

The mean score of landowners' AT ($M = 3.32$) on a 7-point scale was low, indicating that most landowners held slightly negative opinions about WIA. The mean scores of landowners' LE ($M = 5.96$) and PR ($M = 6.09$) on a 7-point scale indicated strong senses of environmental ethic and personal responsibility among most landowners. The mean scores of landowners' FI ($M = 3.16$), OP ($M = 2.79$), and IM ($M = 3.42$) on a 5-point scale indicated that most landowners prioritized the impact of their decisions on local non-human communities slightly more highly than personal financial gain, which was in turn considered slightly more important than how landowners' actions might be viewed by others. Internal reliability testing provided Cronbach's alpha coefficients of 0.955 for the LE scale and 0.920 for the PR scale, indicating high levels of internal consistency in both scales. Reliability testing also provided alpha coefficients of 0.864 for the FI scale, 0.827 for the OP scale, and 0.765 for the IM scale, indicating acceptable levels of internal consistency for each of these scales (Table 1.3).

The variables of LE and OP were positively correlated with landowner AT, while the PR, FI, and IM variables were found to be negatively correlated with landowner AT (Figure 1.5). Of the five variables included in Model 2, only LE was determined to be statistically significant as a predictor of AT ($\beta = 0.200, P < 0.05$). PR ($\beta = -0.068, P =$

0.217), as well as the three management priorities variables of FI ($\beta = -0.068$, $P = 0.126$), OP ($\beta = 0.039$, $P = 0.401$), and IM ($\beta = -0.050$, $P = 0.345$) were all found to be statistically non-significant as predictors of AT. The five variables included in Model 2 (LE, PR, FI, OP, IM) were able to collectively explain 2.3% of the variance in AT ($R^2 = 0.023$, $F(5, 627) = 3.942$, $P < 0.05$).

DISCUSSION

Model 1

Our first model indicated that landowners' attitudes towards the Walk-In Access program and their perceptions of social pressure to enroll land in Walk-In Access exerted a significant and positive influence on their intentions to enroll land in WIA. These results are consistent with previous studies in different contexts that have utilized the TPB to assess behavioral intentions (Verma and Chandra, 2018). However, our study results differ from previous TPB-based research in that 1) landowners' subjective norms were a more powerful predictor of WIA-related behavioral intentions than attitudes, and 2) the perceived ease or difficulty with which landowners could participate in WIA did not have a significant impact on landowners' behavioral intentions.

The effect of landowners' attitudes on intentions demonstrated that a landowner's positive or negative personal opinions of the WIA program affected their intentions accordingly. Therefore, program managers would be advised to focus more effort on highlighting the positive individual or communal impacts generated through landowners' choice to open their land to programs like WIA. Conversely, program managers should seek to more prominently advertise the mitigation of consequences arising from voluntary land enrollment – such as generous incentives that offset landowners' loss of

income, or flexible terms of property usage that soften the effect of landowners' loss of autonomy – that landowners would perceive as negative.

Subjective norms' significant influence on landowners' intentions showed that the perception of pressure from respected peers (e.g., family, friends, and coworkers) could increase the landowner's behavioral intention to open their lands to WIA. Interestingly, landowners' subjective norms had a more pronounced impact on their behavioral intention compared to their personal opinions of the WIA program. The primary lesson for program managers to glean from these results are that landowners place high priority on maintaining cohesion and harmony within their communities, and recruiting a wider base of enrollment will be significantly more difficult if a given program is not widely recognized within a community. Disseminating information about programs of interest and making that information part of the community's conversations – along with widened recognition of and testimony from current enrollees within the community – could help to sway perceived norms within a community, and influence more landowners to give land-access programs like WIA a fair chance.

We found no significant influence exerted by perceived behavioral control on landowners' intentions, in contrast to previous studies that found perceived behavioral control to be one of the most significant variables influencing participants' intentions (Hu, Zhang, Wang, Yu, and Chu, 2018; Zhang, Gu, Shan, Xiao, and Darko, 2018). This indicates that among landowners in our study, the ease or difficulty with which they could participate in WIA was irrelevant to their intentions to participate in the program. An alternative interpretation of these results might be that, while ease of program participation does play a small role in formulating WIA-eligible landowners' behavioral

intentions, it is simply one of many factors that is ultimately overshadowed by other considerations. Program managers can apply these results towards prioritizing the promotion and realization of their programs' tangible benefits for landowners and their communities, and endeavoring to facilitate ease of access or continuation for landowners once these have been disseminated among the target audience.

Model 2

Among the potential predictors of attitudes that we developed and tested in our second model, landowners' agreement with a land ethic was the only predictor to exert a significant impact on their attitudes towards WIA. Landowners' land ethic was found to exert a positive but weak influence on their attitudes, implying that landowners with more pronounced beliefs in farmers' duty to preserve the integrity of the natural communities on their property are marginally more likely to view programs like WIA positively. This finding is consistent with findings from studies such as Drescher et al (2017), wherein pro-environmental worldviews were determined to be one of the most significant factors in program participation, with the caveat that these studies have typically regressed subject's behavioral intentions – rather than attitudes – on their variables of interest. WIA, while predominantly focused upon the expansion of hunting opportunities, generated a significant positive relationship between ethics and attitudes. Programs that can be easily marketed as being accordant with a shared sense of environmental ethics are likely to find more substantial returns from their efforts to appeal to landowners on ethical grounds.

Our study finding that the land ethic exerted a significant and positive influence on landowner attitudes appears contrary to one of the other results generated within our

second linear model. Descriptive statistical analysis indicated that landowners' perception of their personal responsibility for environmental stewardship was generally higher than their sense of environmental ethics; however, our study variable of perceived responsibility did not exert a statistically significant impact on landowners' attitudes toward WIA. This finding is consistent with the findings of previous studies wherein landowners' sense of their own ability to be good land stewards did not correspond to positive views of conservation program enrollment (Deng and Munn, 2015; Raymond and Schneider, 2014). Landowners may also have not perceived the WIA program as a potential means of advancing personal conservation or management goals, and therefore would not have factored their sense of personal responsibility for environmental stewardship into their attitudinal assessment of WIA.

Personal finances, community opinions, and non-human impacts did not have a significant impact on landowners' attitudes towards WIA. The lack of influence by personal finance on attitudes – and by extension, the relative influence of the land ethic – may be partially explained by the reported annual income of our survey respondents, consistent with Bastian et al (2014). Although only 62.1% of respondents chose to provide an annual income range, the reported range nevertheless implies that respondents' income levels are sufficiently high for these landowners to assign a lower degree of importance to the personal financial impacts of their land management choices, and a higher degree of importance to the impact of those choices on nature. This finding would seem to be at odds with the lack of demonstrable influence exerted on landowners' attitudes by their concern for non-human impacts. As with the results generated for our personal responsibility variable, this result may be due to landowners perceiving the WIA

program as insufficiently impactful to non-human communities for this variable to warrant serious consideration when formulating their attitudes. Finally, the finding that landowners' attitudes towards WIA were not significantly impacted by what their communities might think about their land management actions is likely to be a result of the more personal nature of attitudes compared to behavioral intentions and actions. While landowners might be persuaded to join a program if only to conform to community norms and opinion, it appears their privately-held attitudes about these programs are not as easily swayed.

Limitations

There are several research limitations to the study we conducted, in addition to opportunities for future studies to improve upon the data gathered and results generated. In contrast to the multi-item scales that we used to measure landowners' attitudes and perceived behavioral control, the subjective norms variable used in our first linear model was based upon landowners' responses to a single item. This limitation was the result of imperfect survey design, with the survey used to gather our data lacking additional questions that could be used as part of an internally consistent subjective norm measurement scale. Without the inclusion of additional items to form a robust measurement of subjective norms, we cannot discount the potential for the results of our first linear model to be biased in favor of subjective norms, thus making this aspect of the TPB appear to be more integral in formation of our study participants' behavioral intentions than it truly was.

The second linear model proposed and tested in this study was intentionally limited in scope, under the premise of controlling for a handful of variables – adherence

to a land ethic, sense of personal responsibility, and management priorities – that previously conducted studies have indicated as playing a significant role in private landowners’ decision-making process. Only a single variable had a significant effect on landowner’s attitudes towards WIA, and our model explained less than three percent of the variation in landowners’ attitudes, leaving the preponderance (97.7%) of landowners’ attitudinal variance unexplained. It is also worth noting that our land ethic measurement scale was highly focused on farmers, under the assumption that most of our study subjects would self-identify as farmers and/or ranchers. Future studies may consider including a modified land ethic measurement scale within their own proposed models to predict subject attitudes, and test whether the amount of variation explained by subjects’ conformity to a land ethic remains sufficiently high relative to other proposed variables to warrant its continuing inclusion as a predictor variable in attitudinal models.

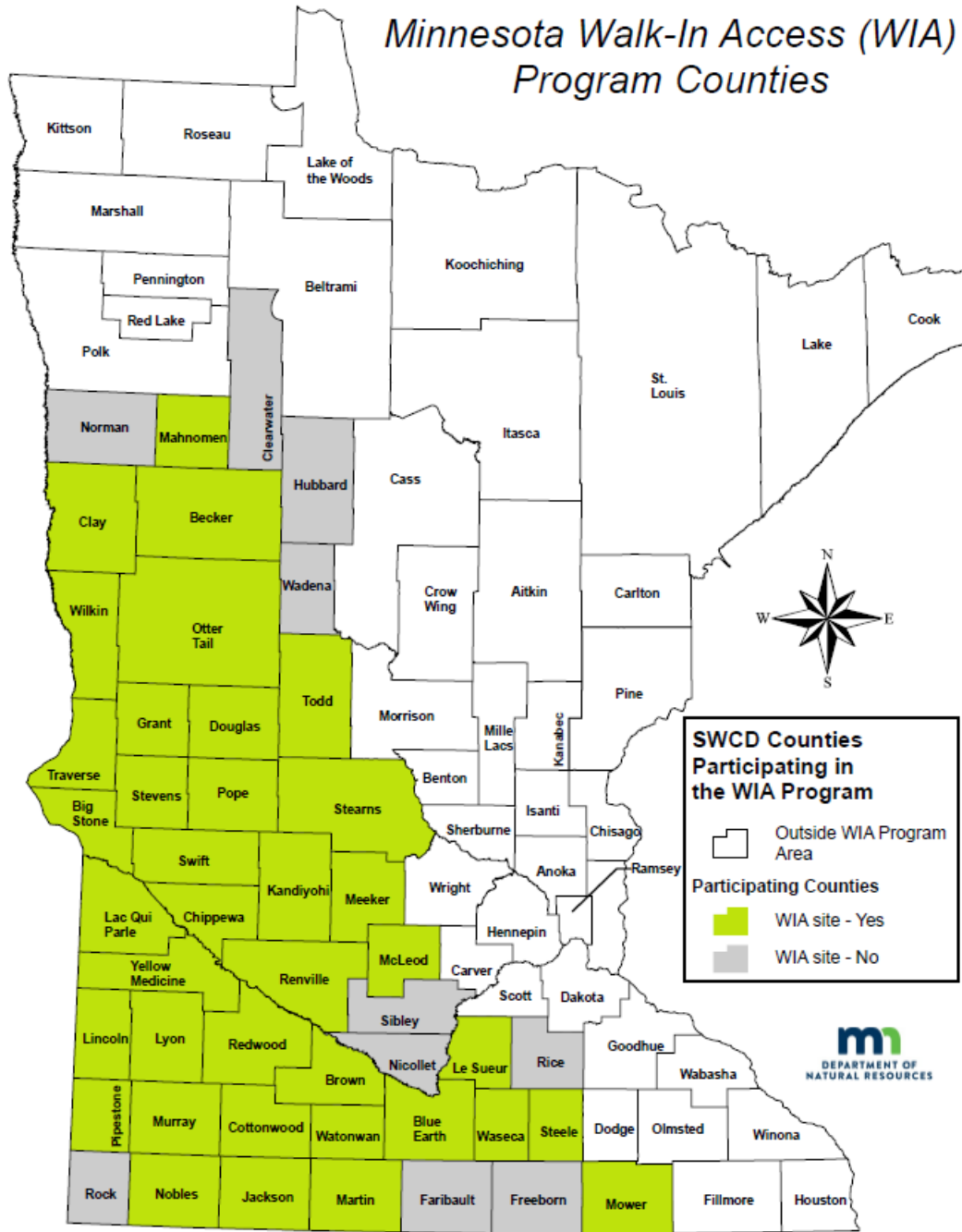


Figure 1.1. Walk-In Access landowner survey study area

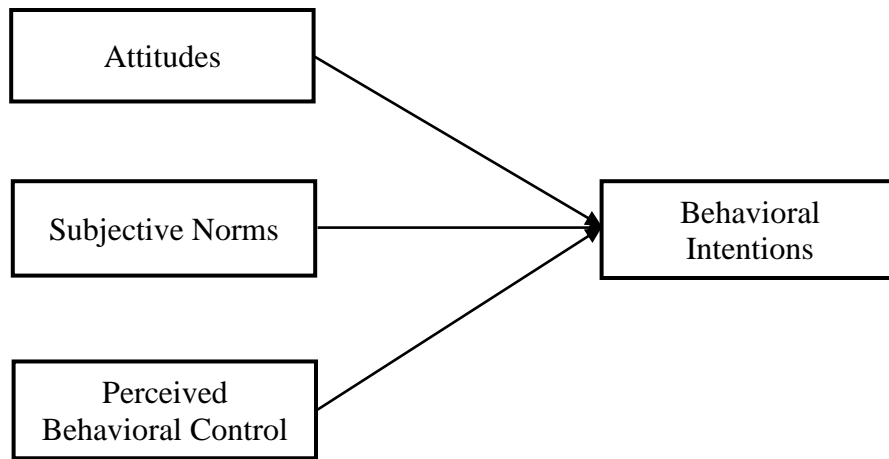


Figure 1.2. Planned behavior model

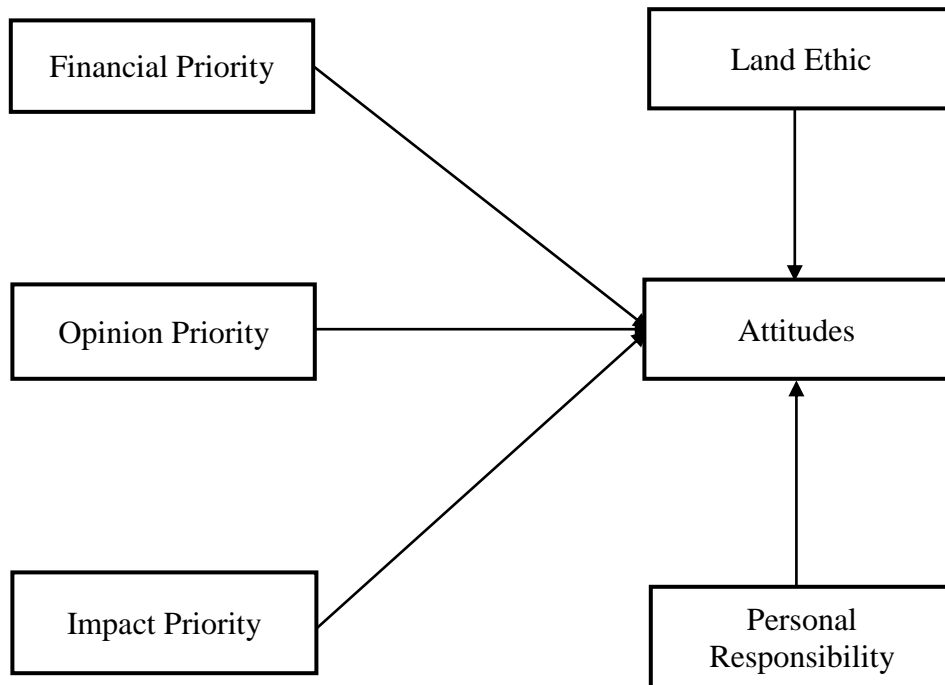


Figure 1.3. Landowner motivations model

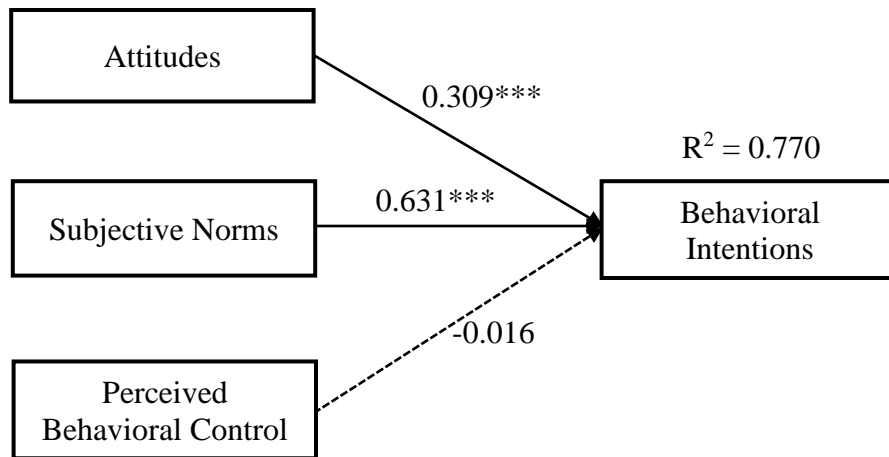


Figure 1.4. Results of the planned behavior model
Note. Solid lines indicate significance; dotted lines indicate non-significance
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

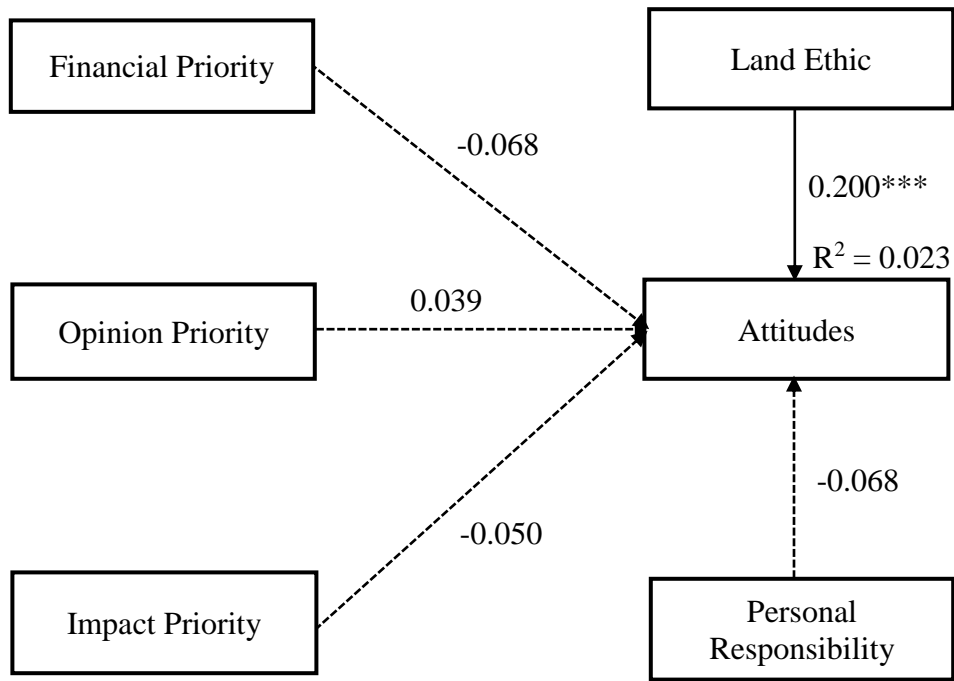


Figure 1.5. Results of the landowner motivations model
Note. Solid lines indicate significance; dotted lines indicate non-significance
 *p<0.05, ** p<0.01, *** p<0.001

Table 1.1. Description of variables included in the planned behavior model

Variable	Description
Behavioral Intention (BI) [Dependent Variable]	Landowner's expressed intent towards enrolling land in WIA (How likely are you to enroll some of your land in the WIA program within the next year?)
Attitudes (AT)	Landowner's opinions of enrolling land in WIA (Would you say enrolling some of your land in the WIA program within the next year is...)
AT1	Extremely negative (1) – extremely positive (7)
AT2	Extremely harmful (1) – extremely beneficial (7)
AT3	Extremely foolish (1) – extremely wise (7)
Subjective Norms (SN)	Landowner's perception of social pressure to enroll land in WIA (Would you say, most people who are important to you think you should enroll some of your land in the WIA program within the next year?)
Perceived Behavioral Control (PC)	Landowner's perception of their ability to maximize WIA participation. (I am confident that I could...)
PC1	Obtain and understand information about the program
PC2	Work through any financial challenges in participating in the program
PC3	Work through any family challenges in participating in the program
PC4	Work through any disagreements or challenges with others about participating in the program
PC5	Work through any time challenges with participating in the program

Note. BI and SN were measured from Extremely Unlikely (1) to Extremely Likely (7); PC was measured from Could not do at all (1) to Completely certain could do (7)

Table 1.2. Description of variables included in the landowner motivations model

Variable	Description
Attitudes (AT) [Dependent Variable]	Landowner's opinions of enrolling land in WIA (Would you say enrolling some of your land in the WIA program within the next year is...)
AT1	Extremely negative (1) – extremely positive (7)
AT2	Extremely harmful (1) – extremely beneficial (7)
AT3	Extremely foolish (1) – extremely wise (7)
Land Ethic (LE)	Landowner's perception of human moral responsibility towards the natural world.
LE1	For human communities to stay healthy, we have to recognize that we depend on a larger community of plants and animals.
LE2	Farmers should be good stewards of the wildlife habitat around their farms.
LE3	The quality of my farmland is positively influenced by the diversity of native plants and animals that live on or around it.
LE4	Moral commitments to community should include commitments to the soil, water, plants and animals as well as people.
LE5	Farmers should respect the larger natural community on which they farm.
LE6	Farming should be done in a way that conserves water quality and wildlife habitat.
LE7	The best farmers understand a lot about the complex natural systems that make up their farmland.
LE8	The land I farm is more than just the soil and involves a complex chain of plants, animals and energy.
LE9	Farmers should farm in a way that maintains the function of natural ecosystems on their land.
LE10	Farms should be thought of as a part of a larger natural community of soil, water, native plants and wildlife.
LE11	It's important to know that the land I farm is a complex web of interconnected ecological processes.
LE12	Farmers should conserve soil, water, native plants and wildlife habitat as an important part of their farming practices.
LE13	You really need to know a lot about native plants and animals to be a good farmer.
LE14	Farmers have an obligation to protect water quality and wildlife habitat.
LE15	Farmers should minimize the negative impacts of farming on water and wildlife habitat.

Note. LE was measured from Strongly Disagree (1) to Strongly Agree (7)

Table 1.2cont. Description of variables included in the landowner motivations model

Variable	Description
Personal Responsibility (PR)	Landowner's perception of responsibility to manage personal property for the benefit of the local environment.
PR1	I have a responsibility to implement land management practices that protect water quality.
PR2	I have a responsibility to implement land management practices that protect wildlife habitat.
PR3	I have a responsibility to minimize the level of nitrates and other farm chemicals I might use.
PR4	I feel a strong obligation to protect the local environment where I own land.
Management Priorities	Landowner's considerations for managing and using their property (My land management decisions are motivated by...)
Finance (FI)	Landowner's prioritization of personal financial gain or loss
FI1	Short term economic gains.
FI2	Long term economic gains.
FI3	Short term economic risks.
FI4	Long term economic risks.
Opinion (OP)	Landowner's prioritization of how others will view their actions
OP1	Opinions of neighbors & local community.
OP2	Opinions of friends and colleagues.
OP3	Opinions of family members and loved ones.
Impact (IM)	Landowner's prioritization of the impact of their decisions on non-human communities
IM1	Impact of decisions on domesticated animals.
IM2	Impact of decisions on native wildlife.
IM3	Impact of decisions on domesticated crops.
IM4	Impact of decisions on native vegetation.

Note. PR was measured from Strongly Disagree (1) to Strongly Agree (7); FI, OP, and IM were measure from Not Important (1) to Extremely Important (5)

Table 1.3. Means, standard deviations, and reliability of analyzed variables

Variable	Item	Mean	S.D.	T-value	Cronbach's alpha	Cronbach's alpha if item deleted
AT	AT1	3.03	1.94	15.480	0.932	0.95
	AT2	3.53	1.68	1.056		0.89
	AT3	3.44	1.74	2.282		0.88
SN		2.40	1.86	41.184		
PC	PC1	4.83	1.78	-2.172	0.919	0.92
	PC2	4.31	1.89	-1.447		0.90
	PC3	3.92	1.94	3.190		0.90
	PC4	3.83	1.82	2.636		0.89
	PC5	3.94	1.80	1.329		0.89
LE	LE1	5.90	1.24	2.121	0.955	0.96
	LE2	6.25	1.06	-0.595		0.95
	LE3	5.78	1.33	0.579		0.95
	LE4	5.99	1.17	0.066		0.95
	LE5	5.89	1.27	2.245		0.95
	LE6	6.16	1.08	0.417		0.95
	LE7	5.98	1.24	0.618		0.96
	LE8	6.13	1.07	-1.622		0.95
	LE9	5.95	1.15	-2.301		0.95
	LE10	5.93	1.20	1.880		0.95
	LE11	5.90	1.19	-0.972		0.95
	LE12	6.07	1.12	0.699		0.95
	LE13	5.18	1.56	-0.163		0.96
	LE14	5.90	1.31	1.647		0.95
	LE15	5.97	1.20	-1.079		0.96
PR	PR1	6.22	1.03	-0.298	0.920	0.89
	PR2	5.91	1.22	1.533		0.90
	PR3	6.04	1.20	0.046		0.92
	PR4	6.27	1.00	-0.334		0.90
FI	FI1	2.72	1.18	0.450	0.864	0.85
	FI2	3.62	1.16	-0.157		0.83
	FI3	2.85	1.14	-1.656		0.81
	FI4	3.42	1.21	0.234		0.81
OP	OP1	2.45	1.16	1.067	0.827	0.73
	OP2	2.58	1.16	0.112		0.64
	OP3	3.44	1.21	-1.419		0.90
IM	IM1	2.96	1.25	-1.346	0.765	0.72
	IM2	3.74	1.04	0.966		0.71
	IM3	3.32	1.15	0.106		0.75
	IM4	3.59	1.05	0.211		0.67

Note. AT = attitudes, SN = subjective norms, PC = perceived behavioral control, LE = land ethic, PR = personal responsibility, FI = finance, OP = opinion, IM = impact

Table 1.4. Model-level statistics of the planned behavior and landowner motivations models

Variable	B	SE	β	T-value	p	F	R ²
<u>Planned Behavior Model</u>						704.5	0.770
AT	0.374	0.036	0.309	10.463	< 0.001		
SN	0.693	0.031	0.631	22.236	< 0.001		
PC	-0.020	0.027	-0.016	-0.737	0.461		
<u>Landowner Motivations Model</u>						3.942	0.023
LE	0.332	0.090	0.200	3.714	< 0.001		
PR	-0.113	0.091	-0.068	-1.236	0.217		
FI	-0.112	0.073	-0.068	-1.532	0.126		
OP	0.063	0.075	0.039	0.840	0.401		
IM	-0.094	0.100	-0.050	-0.945	0.345		

Note. AT = attitudes, SN = subjective norms, PC = perceived behavioral control, LE = land ethic, PR = personal responsibility, FI = finance, OP = opinion, IM = impact

CHAPTER 2

The influence of place attachment and trust on landowners' attitudes towards Minnesota's Walk-In Access Program

ABSTRACT

Government-backed initiatives such as Minnesota's Walk-In Access (WIA) Program rely on the willingness of landowners to relinquish partial control over lands that are often invested with emotional or utilitarian significance. We conducted a self-administered mail-back questionnaire to measure place identity, place dependency, and trust levels among private landowners in Minnesota with properties eligible for or enrolled in the state's WIA program. Hierarchical regression was used to analyze three linear models: Our first model regressed landowners' WIA-related attitudes on their personal place identity and place dependency; our second model included willingness to trust others as a third variable; and our final model added willingness to engage with others as a fourth variable. Place dependency, willingness to trust, and willingness to engage were significant predictors of landowners' attitudes in all three models, but place identity was not found to be a significant attitudinal predictor in any model. In both models where it was included as a variable, willingness to trust was the most powerful predictor of landowner attitudes. Future studies may consider including trust measurement questions in their data-gathering instruments and contributing further analysis to corroborate whether willingness to trust is truly a powerful, reliable predictor of attitudes.

KEY WORDS: private landowners, human dimensions, place attachment, trust

INTRODUCTION

Emotional attachment to place is a fundamental piece of the complicated human psyche, and a critical component for understanding human behavior beyond the narrow scope of logical self-interest. Although not every human may possess or develop a sense of environmental altruism, scholars such as Tuan (2002) have synthesized common human ideals such as ‘the heartland’, a desire for ‘home’, or simply a need for personal space which drive the process of bonding with natural spaces. Understanding how these bonds are developed and how deeply they motivate stakeholder attitudes is important for initiatives such as Minnesota’s Walk-In Access (WIA) Program. WIA and programs like it fundamentally rely on stakeholders’ willingness to relinquish partial control over lands that often come pre-invested with emotional or utilitarian significance. Likewise, public natural resource management professionals have commonly accepted that building an atmosphere of mutual trust between themselves and their stakeholders – rather than a relationship of mutual self-interest – is crucial to their continued ability to execute their resource management duties under the public trust doctrine (Smith, 2011). Achieving a more concrete understanding of how stakeholders’ willingness to extend trust to governmental agencies is capable of impacting their decision-making will improve the ability of these agencies to cultivate attitudes – and by extension, actions – favorable to their mission.

Place Attachment

While many well-known conservation programs have focused on the importance of preserving charismatic megafauna such as bears, wolves, and whooping cranes, existing place attachment literature indicates that wildlife and plants play only a

supporting role in determining people's attitudes towards a place. In their study of perceived attractiveness of green places, Folmer et al. (2016) did not find flora and fauna to be particularly integral pieces of building place attachment. Although charismatic flora and fauna were reported as playing a slightly larger role in attachment to national places than to local places, in general wildlife and plant life were relatively unimportant reasons for a place's perceived attractiveness. Likewise, Zhang et al. (2015) reported that subjects' attitudes towards places were predominantly driven by perceptions of the broader ecological and cultural contexts of these places, with peoples' perceptions of wild or plant life barely being mentioned as significant drivers in the development of their place attitudes. In their observations of place attachment being disrupted as a result of decreased opportunities to harvest wildlife, Willox et al. (2012) reported participants valued wildlife not simply for its own sake, but for the personal satisfaction that the existence of this wildlife provided. These results indicate that wildlife and plant life are supplementary rather than focal components of a satisfactory green place, enhancing but not defining a natural place.

In contrast to the minor role of specific flora and fauna in establishing attachment to place, the literature indicates that people have a strongly positive attitude towards conserving larger ecological communities, or at least appear to care about maintaining the integrity of familiar surroundings. An examination of place meanings and participatory planning intentions indicated that ecological integrity was the dimension of place meaning that most strongly impacted participatory planning intentions among the study participants (Kil, Holland, and Stein, 2014). This desire for ecological integrity could possibly extend to a desire for community and harmony with other individuals. The

desire to maintain place integrity can also be strong enough to override more self-oriented concerns. In a study of participation rates in Nambian conservation programs, both a strong attachment to a place and preferences for social cohesion motivated people to comply with conservation initiatives even when previously promised economic incentives fail to materialize (Silva and Mosimane, 2014).

The body of literature definitively notes that, for better or for worse, people's attachment to places influence their exhibited behaviors and decisions. Larson, Stedman, Cooper, and Decker (2015) found emotional attachment to the land and the accompanying positive experiences in nature to be significant predictors of pro-environmental behavior. Golden, Peterson, DePerno, Bardon, and Moorman (2013) reported that landowners who were also hunters or had family who hunted were more likely to participate in wildlife management activities. The authors theorized that this was due to hunters feeling an obligation to contribute to wildlife conservation as part of the role of being a good sportsman. Olive and McCune (2017) found that landowners frequently drew a connection between their desire to live in a rural community and their desire to see and experience an abundance of nature. These landowners often referenced personal experiences of wonder in nature, with a sense of a personal connection to the land and other living things emerging as a theme in virtually every interview (Olive and McCune, 2017).

Likewise, Silva and Mosimane (2014) found marked contrast between two African residential communities that participated in their study: Most of the study's Mayuni Conservancy residential group had been born in the area, with very few ever living elsewhere; meanwhile, a majority of the Uibasen Conservancy residential group

were born in a different region and settled in the study area once the conservancy was established. Mayuni residents consistently expressed great pride in their living place, and explicitly connected their attachment to that place with membership in the conservancy. In contrast, Uibasen residents tended to be motivated primarily by financial incentives and expressed generally weaker attitudes towards their community (Silva and Mosimane, 2014).

Conversely, feelings of detachment from a place – in both the physical and psychological sense – have been shown to produce weaker commitments to carrying out pro-conservation behaviors. Ulrich-Schad, Babin, Ma, and Prokopy (2016) found that farmland owners who did not personally operate their lands widely supported conservation in the abstract, but their support fluctuated as soon as specific practices started to be identified. These landowners also tended to take a softer approach towards realizing their conservation attitudes, preferring to informally encourage their tenants to utilize specific conservation practices rather than including provisions related to conservation in the tenant's lease. Likewise, Petrzelka and Armstrong (2015), in their study of absentee landowners, found that conservation was a prominent land management motivation only among absentee landowners who used their land for recreation. In a measurement of the effect of landscape experience cognition on environmental conservation behaviors of tourists, it was most effective to encourage more generalist conservation attitudes, such as caring for all forms of life and complying with environmental laws and regulations. A generalist approach was both easier and timelier than encouraging senior conservation attitudes like donating money towards

environmental conservation or actively dissuading people from damaging the environment (Zhang et al., 2015).

By fulfilling the desire to find self-fulfillment and peace of mind, the strength of an individual's place attachment may also serve as an indicator of their health and well-being. Out of the thirteen categories of potential psychological benefits of place attachment that were examined by Scannell and Gifford (2017), the most commonly mentioned among the study subjects were memories, relaxation, and a sense of belonging. Similarly, the study by Kyle, Jun, and Absher (2014) indicated that a strong sense of identification was able to positively predict three other dimensions of place: Affective attachment, place dependence, and social bonding. Kyle et al. (2014) also continued to verify the importance of self-worth in place attachment processes through indication that rather than existing on the same temporal plane, the process of identification drives the other affective and conative factors that underlie the process of attachment to physical environments. When measuring the effects of climate change on sense of place, Willox et al. (2012) found that climate change – via changing the local landscape and disrupting outdoor activities such as hunting, fishing, and foraging – negatively impacted study subjects' feelings of place attachment, which impacted physical, mental, and emotional well-being. In their efforts to quantify the effect of place attachment on perceptions of social and environmental conditions along the Appalachian Trail, Kyle, Graefe, Manning, and Bacon (2004) found that study participants with a strong sense of place identity were possessed of stronger and more critical opinions regarding the conditions encountered along the trail. In contrast, study subjects who

exhibited higher levels of place dependency were more tolerant and favorable in their evaluation of these same environmental conditions.

Trust

Trust is broadly defined as willingness by one party, such as private landowners, to accept vulnerability to the discretionary actions of another, such as a federal or state agency (Riley, Ford, Triezenberg, & Lederle, 2018). Trust is predicated on one party's ability to be confident that the other party intends to provide reliable information when called upon. When one party in a relationship lies to another – or omits uncomfortable details in hopes of obtaining a more beneficial decision – and is subsequently discovered, trust is eroded; both short- and long-term relationships between the parties are poisoned, and the lying party has significantly diminished their own power and influence (Suskind and Thomas-Larmer, 2000). Credibility – the quality of being trusted or believed in – is a crucial quality that agencies must cultivate if they are to be capable of generating productive solutions to problems with the stakeholders they represent (Sarabia-Sanchez and Rodriguez-Sanchez, 2016).

De Young (2011) acknowledges that in the face of urgent and accelerating environmental problems, waiting for slow change sounds less appealing than simply using scientific evidence and authority to push for immediate change; however, heavy-handed approaches that damage credibility rarely generate durable change over time. Trust-building studies such as Davenport, Leahy, Anderson, and Jakes (2007) have instead concluded that institutional trust is best developed through increased engagement between institutions and their communities, along with finding innovative ways of adapting standardized public involvement processes to the local context. Cravens and

Ardion (2016), when following the process of bridging a credibility gap between a California state agency and its stakeholders over a geospatial decision support tool, found the act of discussion – or social learning – was more important in determining what stakeholders perceived as credible and legitimate data than whether their points of view were ultimately incorporated into the data.

When reviewing the history of two biosphere reserves in western Africa, Bouamrane et al. (2016) noted that initial lack of involvement or dialogue with local stakeholders led to ignorance of local knowledge, practices, and needs. The result was that despite good intentions and diverse incentives, once these protected areas were created, local communities suddenly lost access to their natural resources, creating environmental injustice and damaging perceptions within the local community. In contrast, a similar effort to establish a biosphere reserve in France spoke with and disseminated information to stakeholders from the outset, leading to smoother implementation and wider acceptance within the local community (Bouamrane et al., 2016).

Furthermore, even when stakeholders value agencies' ability to execute their duties and gather scientific data, disseminating information to the public will have little impact if stakeholders are not primed to believe in and follow the people providing that information. In Zhen, Barnett, and Webber's (2018) study of public trust in Shanghai's urban water authorities, participants were moderately confident in their water suppliers' basic competence, but less assured of these organizations' commitment to fairness, and even less confident that water companies would tell them the truth if their drinking water was not safe. The authors noted that in the absence of improvements in suppliers' public

engagement and transparency, the increasing education and urbanization of Shanghai's population could be expected to result in further diminishment of trust levels (Zhen, Barnett, and Webber, 2018).

Parkins et al. (2017), in their examination of public engagement on energy-related issues in Canada, raise the important prospect that there is such a thing as excessive trust between stakeholders and the agencies that represent them. While the authors expected – and observed – higher levels of distrust to correlate with decreased public engagement, a similar deficiency in public engagement was observed among people who expressed high levels of uncritical trust. Parkins et al. (2017) noted that there was also a middle ground of critical trust – a “sweet spot” representing productive tension between public concern on one hand and public trust on the other – where study participants were more likely to engage with their agencies. These results are corroborated by the work of Smith, Leahy, Anderson, & Davenport (2013), wherein local community members' dispositional trust and belief in the shared values and competence of a management agency were found to have a negative relationship with involvement in resource-related activities. Given these results, Smith et al. (2017) drew attention to the complex trust-distrust relationship faced by natural resource management agencies: Trust must be built in order to promote more efficient planning and desirable outcomes, but too much trust can undermine the very same democratic processes that agencies operate on and discourage necessary dissent from the communities they preside over.

The purpose of our research was to determine the relative influence of landowners' attachment to their properties and trust in government agencies on their attitudes towards Minnesota's Walk-In Access program. Our research objectives were to:

1) determine the relative impact of place identification and place dependence on landowners' mean attitudes towards enrolling land in WIA: and 2) determine the relative impact of private landowners' willingness to trust others and willingness to engage with others on their mean attitudes towards enrolling land in WIA.

METHODS

Our study population of interest was private landowners who owned at least 40 acres of natural property in one of the 46 southwestern Minnesota counties participating in WIA (Figure 1.1). Our initial study sample ($n = 2,885$) was drawn from both a publicly available 2017 Environmental Working Group (EWG) database of Conservation Reserve Program (CRP) recipients (<https://farm.ewg.org>, accessed 1 November 2017), and from a 2017 database of WIA participants that was provided by the Minnesota Department of Natural Resources (MNDNR). The initial sample size of landowners from the EWG database – representing landowners whose properties were eligible for WIA enrollment – was $n = 2635$, and the initial sample size of landowners from the MNDNR database – representing landowners who had already enrolled some of their land in WIA – was $n = 250$.

Private landowners were sent self-administered mail-back questionnaires based on an adapted Tailored Design Method (Dillman, Smyth, & Christian, 2014). Participants were contacted three times between February 2018 and June 2018. In the initial contact, a personalized cover letter, survey booklet, and business-reply envelope were mailed to all potential study participants. The personalized cover letter explained the purpose of the study and made an appeal for respondents to complete and return the survey in the enclosed business-reply envelope. Different versions of the survey booklet were sent to

landowners whose properties were eligible for WIA enrollment, and to landowners who had properties currently enrolled in WIA (Appendix A). Approximately 4 weeks after the first mailing, a second mailing that included a personalized cover letter and replacement questionnaire with business-reply envelope, was sent to all individuals with valid addresses who had not yet replied. Approximately 4 weeks after the second mailing, a third mailing that included a personalized cover letter, replacement questionnaire with business-reply envelope, and a \$1 incentive was sent to all individuals with valid addresses who had not yet replied. Full-length surveys were collected and data was entered through August 15, 2018. In August 2018, a shortened version of the survey questionnaire (Appendix B) was mailed to all individuals with valid addresses who had not replied to the full-length survey, serving as a non-response check. Non-response check surveys were collected and data was entered through September 14, 2018.

Study data were entered and managed using REDCap electronic data capture tools hosted at the University of Minnesota (Harris et al., 2009). Data were analyzed on a personal computer using the statistical program R (Version 3.4.2., www.r-project.org, accessed 1 August 2018). Basic descriptive statistics and frequencies were calculated for both full-length survey respondents and non-response survey respondents. The results between landowners drawn from the EWG database and landowners drawn from the MNDNR database were combined, and data from each study group were weighted to reflect population proportions.

Gathered landowner data were tested through the development and hierarchical regression of three linear models. These models were developed using variables in the survey instrument that were associated with landowners' attachment to their properties,

and with landowners' willingness to extend trust to others. The purpose of these models was to test for effect size of landowners' place identity (PI), place dependence (PD), willingness to trust (TR), and willingness to engage (TC) on landowners' Attitudes (AT) towards WIA (Table 2.1).

Our first conceptual model (Figure 2.1) contained two variables that collectively measured landowners' attachment to their properties: Place identity and place dependence. We defined place identity as attachment rooted in construction of personal identity or emotional fulfillment, and a measurement scale was created by selecting questions in our survey that asked landowners to assign meaning to their properties on an emotional basis. Place dependence was defined as attachment rooted in a place's ability to fulfill practical needs and goals, and was measured using questions that asked landowners to assign utilitarian significance to their properties.

Our second conceptual model (Figure 2.2) retained the two variables from our first conceptual model, and added a third variable: Willingness to trust. We defined willingness to trust as the categorical expectation that space and property rights would be respected, and measured this variable with questions asking landowners to rate the extent to which they unconditionally trusted other parties to respect their individual landownership rights.

Our third conceptual model (Figure 2.3) retained all three of the variables used in our second conceptual model, and added a fourth variable: Willingness to engage. Willingness to engage was defined as openness to conducting a constructive dialogue with others, and a measurement scale was created by selecting questions that measured how amenable landowners were to entering a serious conversation with other parties.

Individual questions from our survey instrument were grouped together into our four variable measurement scales, and any negatively worded questions were reverse-coded prior to running calculations. Data from all questions included in the scale were averaged in order to create mean variables for use in our linear models; only data from landowners who had provided answers to all questions in our measurement scales were used to calculate our hierarchical regression conceptual model variables. Cronbach's alpha was used to estimate internal consistency of each measurement scale and to check for and remove items that reduced the scales' alpha values. No further items were removed once the scales' alpha values exceeded our cutoff of $\alpha = 0.7$.

RESULTS

Descriptive Results

Out of the 2,885 full-length questionnaires that were mailed to our sample of valid study participants, 124 were undeliverable due to being addressed to a deceased property owner or an invalid mailing address. Of the remaining 2,761 surveys, a total of 1074 full-length surveys were returned by the study deadline, resulting in an aggregate response rate of 38.9%. A total of 222 non-response check surveys were returned after the study deadline. A total of 920 full-length and 199 non-response surveys were returned by WIA-eligible landowners from the EWG database, and a total of 154 full-length and 23 non-response surveys were returned by WIA enrollees from the MNDNR database. A total of 712 respondents provided answers to all questions utilized to create our measurement scales.

Among all respondents, 35.2% indicated they had at least a four-year college (bachelor's) degree, and 98.6% identified as Caucasian/white. A supermajority (80.9%)

of all respondents self-identified as either a farmer or a rancher, and among the 62.1% of respondents who volunteered an approximate annual household income range for 2017, the median income range was \$90,000 to \$99,999 prior to taxes. The non-response check indicated that respondents were slightly older ($M = 68$) on average than non-respondents ($M = 65$), as well as slightly more likely to be male (85%) than non-respondents (83%). A slightly lower percentage (75.7%) of non-respondents identified as either a farmer or a rancher, and among the 82.0% of non-respondents who volunteered an approximate household income range for 2017, the median income range was \$80,000 to \$89,999, slightly lower than the median income range of respondents.

Model Results

Cronbach's alpha coefficients of 0.843 for the place identity scale and 0.883 for the place dependence scale indicated acceptable levels of internal consistency for both scales (Table 2.2). The mean scores of landowners' place identity ($M = 5.90$) indicated that most of the landowners in our study sample held a high level of symbolic and emotional attachment to their lands. The mean score of landowners' place dependence ($M = 5.22$) on a 7-point scale was also high, indicating that most of the landowners in our sample also felt a high level of attachment to their lands as a result of those lands' ability to support their individual goals and activities.

Cronbach's alpha coefficients of 0.902 for the willingness to trust scale and 0.859 for the willingness to engage scale indicated acceptable levels of internal consistency (Table 2.2). The mean score of landowners' willingness to trust ($M = 3.57$) on a 7-point scale was slightly below the midpoint, indicating that most of the landowners in our study sample were slightly reluctant to trust members of their local, state, and federal

government to manage and respect their own ability to manage their lands. The mean score of landowners' willingness to engage ($M = 4.50$) on a 7-point scale was slightly above the midpoint, indicating that on average, landowners in our sample were slightly willing to converse and negotiate with their neighbors, as well as members of their local, state, and federal government.

Results for conceptual model 1 (Figure 2.4) indicated that place identity ($\beta = -0.068, P = 0.207$) was not a significant predictor of AT, but place dependence ($\beta = -0.125, P < 0.05$) was a significant negative predictor. The two predictor variables included in conceptual model 1 explained only 3.0% of the variance in AT ($R^2 = 0.030, F(2, 709) = 11.89, P < 0.05$).

Results for conceptual model 2 (Figure 2.5) indicated willingness to trust ($\beta = 0.285, P < 0.05$) to be the strongest predictor of AT, although place dependence ($\beta = -0.173, P < 0.05$) continued to be a significant predictor. The three predictor variables included in conceptual model 2 were able to collectively explain 10.9% of the variance in attitudes ($R^2 = 0.112, F(3, 708) = 29.87, P < 0.05$).

Results for conceptual model 3 (Figure 2.6) indicated willingness to engage ($\beta = 0.083, P < 0.05$) was a significant predictor of attitudes, although willingness to trust ($\beta = 0.241, P < 0.05$) remained the strongest predictor variable, and place dependence ($\beta = -0.164, P < 0.05$) remained significant. The four predictor variables included in conceptual model 3 were able to collectively explain 11.2% of the variance in AT ($R^2 = 0.112, F(4, 707) = 23.49, P < 0.05$).

DISCUSSION

Place Attachment

All three of our conceptual models demonstrated a negative relationship between landowners' place identity and their attitudes towards WIA, indicating that landowners who hold stronger emotional bonds with their property will be less likely to have a positive view of Walk-In Access and related programs (and by extension, these landowners will be less likely to willingly enroll their lands into those programs). However, in contrast to studies such as Vaske and Kobrin (2001) that have established emotional attachment to place as an important predictor of subjects' behavior, the relationship between place identity and landowner attitudes in our study was determined to be non-significant in all our study models.

Landowners' place dependence was also shown to exert a negative impact on their attitudes towards WIA, indicating that the better-suited landowners consider their land to be for their individual activities and goals, the more likely they are to hold negative views of WIA and similar programs. Unlike our place identification variable, place dependence continued to be a significant predictor of landowner attitudes across all three of our models. Place dependence was also the second-strongest predictor of attitudes – after willingness to trust – in the conceptual model that combined our place attachment and trust variables.

The relationships demonstrated by both of our place attachment variables contrast with results from previous research such as Payton, Fulton, and Anderson (2005), where emotional place attachment has been the stronger predictor variable. However, these studies have typically measured the effect of place attachment upon realized behaviors,

whereas our study is testing for a direct effect of place attachment on attitudes with the understanding that attitudes impact behavior. Most questions used to create our place identification and place dependence scales were modeled after measurement items first established by Williams and Roggenbuck (1989). However, our final place identification scale included a question asking landowners how highly they value their property as a 'home' (an emotional valuation), and our final place dependence scale included a pair of questions asking how landowners value their properties from a functional perspective. Our decision to include these non-standard questions in our place attachment measurement scales may have also impacted our results.

Based on our results, Minnesota landowners' attitudes towards WIA are impacted predominantly by the functional aspects of their attachment to their properties, rather than any emotional ties. This finding may reflect the relative immediacy of functional versus emotional outcomes of enrollment: Opening their properties up for strangers to hunt on is likely to impact whatever personal significance landowners have assigned to those properties slowly, if at all. Conversely, the impacts of expanded hunting access on the ability of the landowners' property to be used for their personal benefit can be more readily realized. Given the negative relationship between our place dependence variable and attitudes towards WIA, landowners consider the program's impacts to be in opposition to their own ability to use their lands to satisfy their needs.

Despite this, and despite our study participants generally demonstrating high levels of both place identity and place dependence, Minnesota landowners' attachment to their properties does not appear to have played a particularly large role in how they formed their attitudes towards WIA. Our first conceptual model – which utilized only the

variables of place identification and place dependence – was able to explain only three percent of the variation in landowner attitudes towards the WIA program (Figure 2.4), leaving most (97%) variation unexplained. From a program management standpoint, this indicates that even when the tenants of a voluntary program – in this case, expanded hunting access – conflict with landowners’ attachment to their properties’ functional qualities, there are still significant factors contributing to attitude formation that managers can utilize in order to counter this negative impact.

Trust

The two conceptual models that included landowners’ willingness to trust as a predictor variable found a positive influence on these landowners’ attitudes towards the WIA program, meaning that landowners who have stronger levels of unconditional trust in their government are more likely to hold positive attitudes about WIA. Consistent with previous studies such as Anheier and Kendall (2002) that have shown trust to significantly influence the choice to get involved in voluntary initiatives, willingness to trust was determined to be the most powerful predictor of attitudes among the variables tested in this study. Including willingness to trust as a predictor variable in our second model produced a slightly higher than threefold increase in explanatory power compared to our first model, with 10.9% of the variation in landowner attitudes explained (Figure 2.5).

In our third and final conceptual model, landowners’ willingness to engage was found to have a significant positive effect on their attitudes towards WIA. This indicates that landowners who are open to engaging in serious dialogues with representatives of their government will be more likely to view the WIA program positively. However,

while willingness to engage was determined to be a significant predictor variable, adding this variable into our third model did not greatly improve the model's explanatory power compared to our second model. Our final combined model explained 11.2% of the variation in landowner attitudes (Figure 2.6), with the addition of willingness to engage providing an increase of less than one percent in variation explained over our second model. Furthermore, the low β -value demonstrated by our willingness to engage variable indicates a less pronounced effect on landowner attitudes compared to the other two significant predictor variables – place dependence and willingness to trust – included in the model.

Given that willingness to trust was shown to exert the most pronounced impact on WIA-related attitudes in both models that included it as a predictor variable, the most prudent path towards improving landowners' WIA attitudes appears to be increasing landowners' willingness to trust. On average, the landowners in our study veered negatively towards trusting government representatives to respect their landownership rights, but positively towards engaging seriously with government representatives. Given the importance of dialogue established by Cravens and Ardion (2016), the latter factor represents a continued opportunity for improving trust between landowners and agencies: Willingness to engage can be tapped in order to increase willingness to trust. Engagement may also be a means of altering which factors landowners use to determine their overall trust in representatives: For example, participants in Leahy & Anderson (2008) initially relied on cues such as government trust and social trust to determine their trust in a water resource management agency – in this case, the U.S. Army Corps of Engineers – but

came to rely on different sets of beliefs – such as beliefs about technical competence and shared values – as they learned more about the Corps.

It must also be noted that our observed trends in landowner trust were more pronounced at differing levels of government, with landowners being more willing to engage with and less unlikely to extend trust towards representatives of their local government, while the opposite was true for representatives of the federal government. Landowners may be more open to programs like WIA if their local government has at least some ability to engage with – if not outright control – the program, and even for programs that are more wide-ranging in scope, local representatives might be engaged to serve as intermediaries who can better sway local landowners than the more distant officials who truly control the program.

Our third model – containing all place attachment and trust variables – represents a sizeable increase over the amount of variation explained by the model including only place attachment variables. Based on these results, landowners' willingness to extend trust and engage in dialogue with the organization running a program are not only influential in forming landowners' attitudes towards WIA, but have greater relative influence over the formation of landowners' attitudes than attachment to place. From a program management standpoint, this confirms that stakeholder trust is one of the factors contributing to attitude formation that can be cultivated in order to overcome attachment-based opposition to voluntary programs like WIA. However, the combined place attachment and trust model still leaves a great amount (88.8%) of variation in landowners' attitudes unexplained. Future studies might consider testing additional predictors alongside place attachment and trust variables to clarify whether trust is the

largest attitudinal influence among a wide number of factors, or if there is an alternative variable capable of influencing attitudes more drastically than trust.

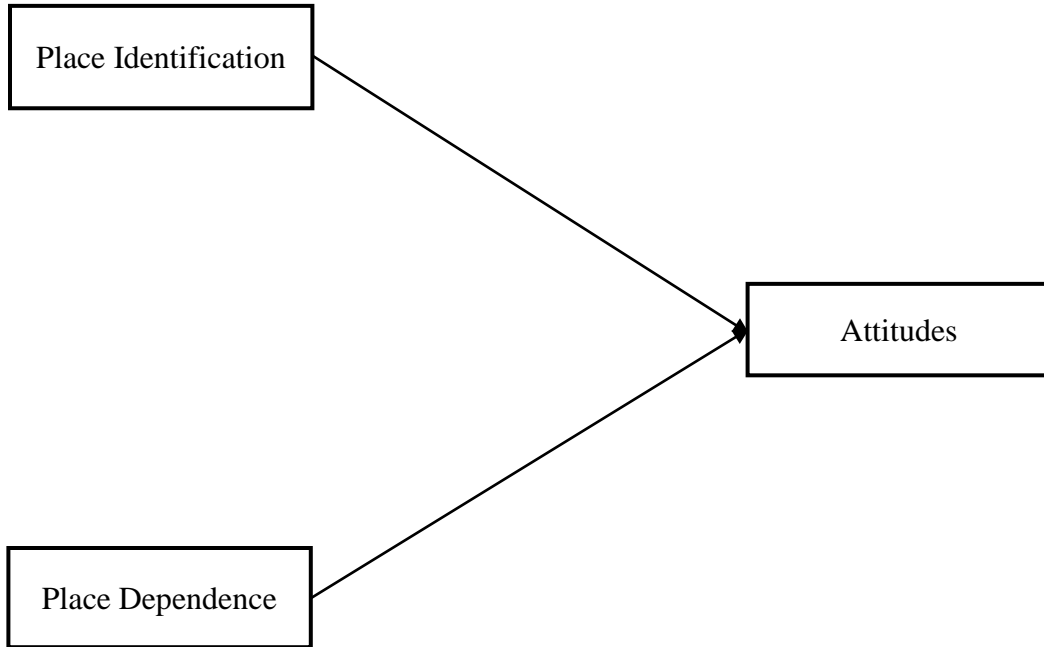


Figure 2.1. Place attachment only model

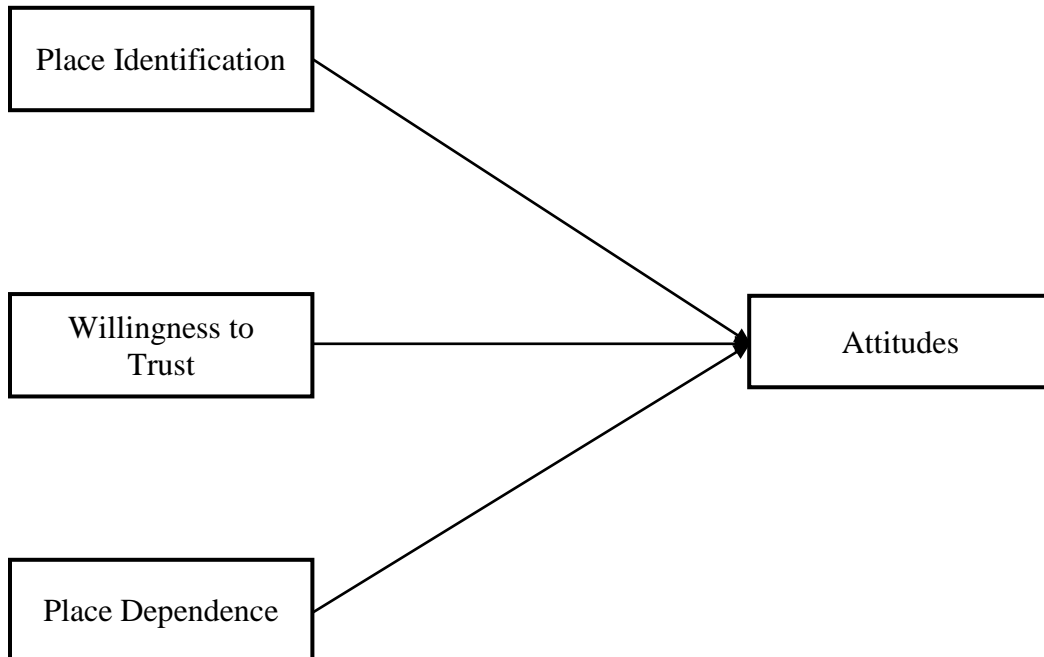


Figure 2.2. Place attachment and willingness to trust model

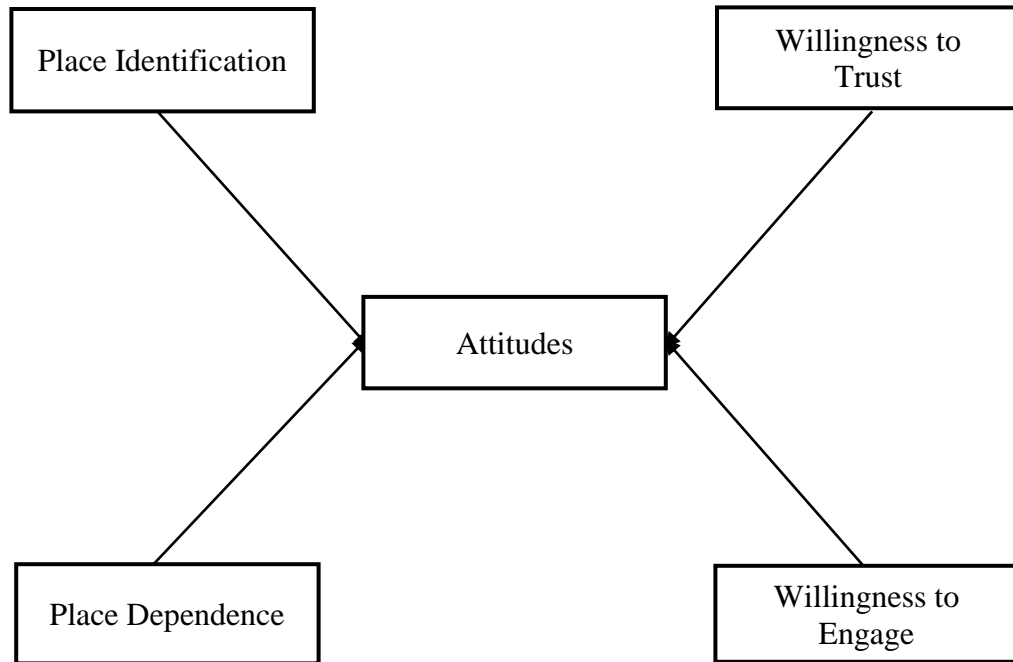


Figure 2.3. Combined place attachment and trust model

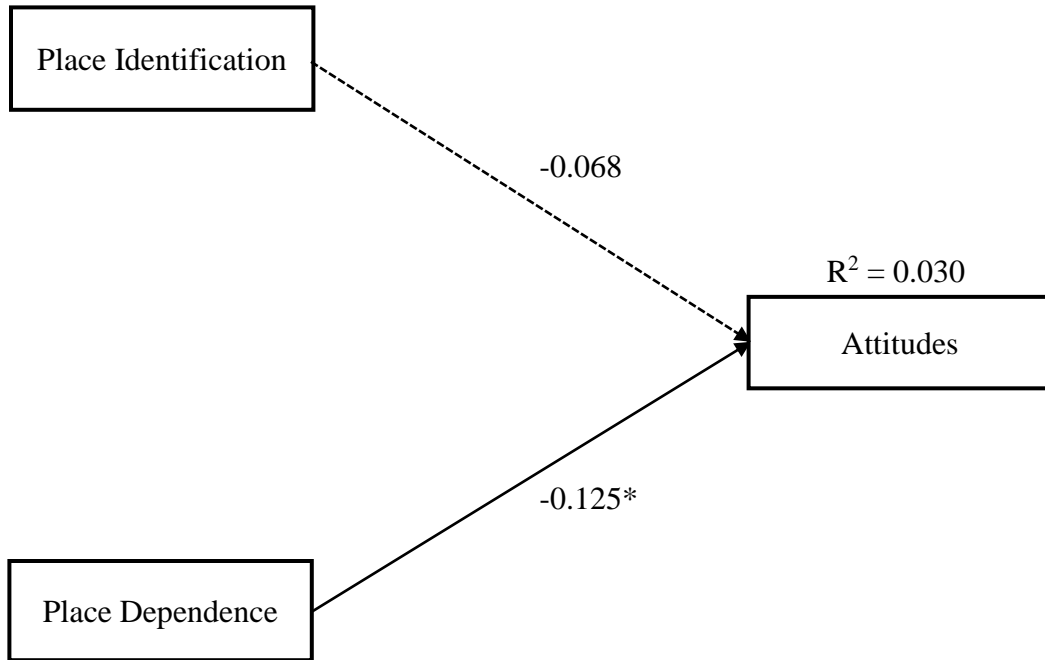


Figure 2.4. Results of the place attachment only model
Note. Solid lines indicate significance; dotted lines indicate non-significance
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

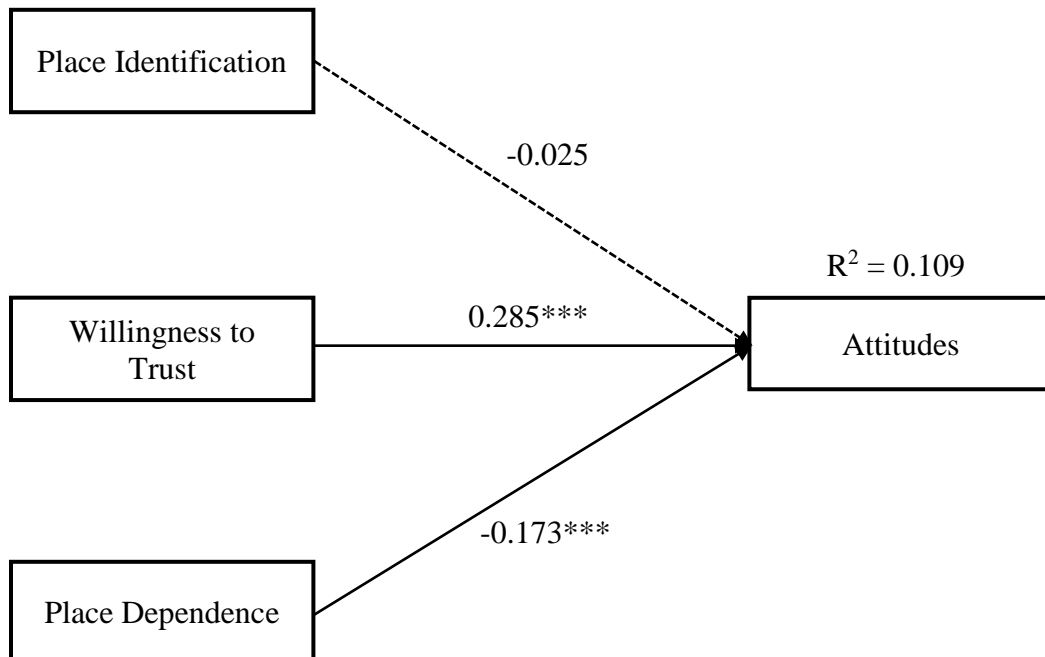


Figure 2.5. Results of the place attachment and willingness to trust model
Note. Solid lines indicate significance; dotted lines indicate non-significance
 *p<0.05, ** p<0.01, *** p<0.001

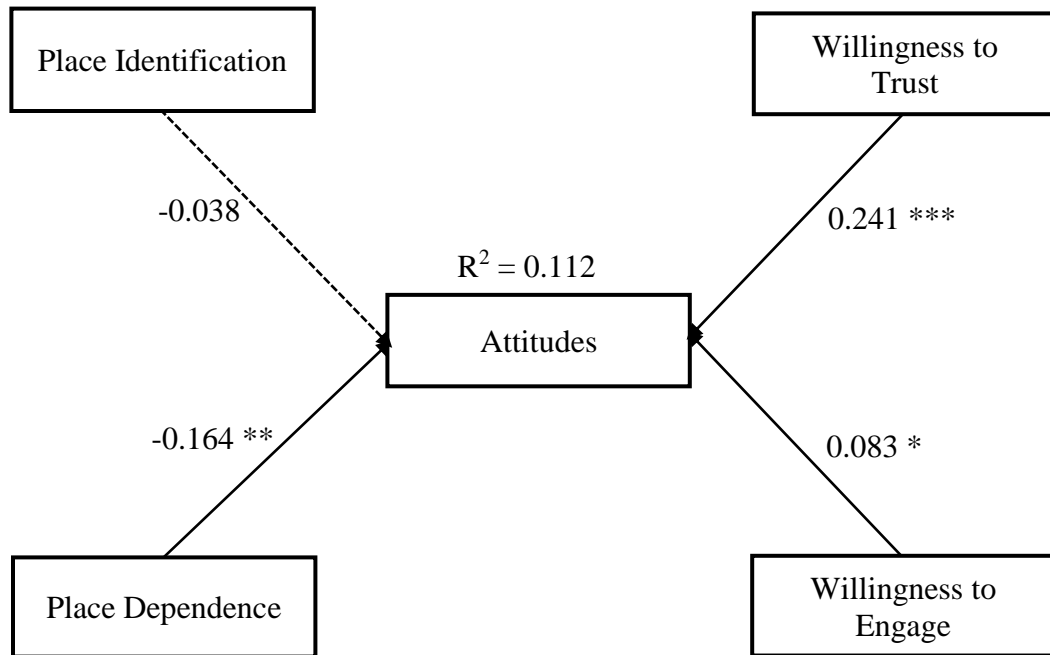


Figure 2.6. Results of the combined place attachment and trust model
Note. Solid lines indicate significance; dotted lines indicate non-significance
 *p<0.05, ** p<0.01, *** p<0.001

Table 2.1. Description of variables included in model analysis

Variable	Description
Attitudes (AT) [Dependent Variable]	Landowner's opinions of enrolling land in WIA (Would you say enrolling some of your land in the WIA program within the next year is...)
AT1	Extremely negative (1) – extremely positive (7)
AT2	Extremely harmful (1) – extremely beneficial (7)
AT3	Extremely foolish (1) – extremely wise (7)
Place Identification (PI)	Landowners' assignment of emotional meaning and significance to their properties.
PI1	I feel that this land is a part of me
PI2	My land means a lot to me
PI3	Owning this land says a lot about who I am
PI4	I miss my land when I am away for too long
PI5	I value my land as a place for myself and my family to call home
Place Dependence (PD)	Landowners' assignment of functional meaning and significance to their properties.
PD1	No other land can compare to the land that I own
PD2	I would not substitute any other land for the activities I do on this land
PD3	I get more satisfaction out of owning this land than I do any other
PD4	This land is the best place to do the activities I want to do
PD5	I value my land as a space where I can find privacy
PD6	I value my land as place where I can be close to nature
Willingness to Trust (TR)	Landowners' willingness to expect government representatives to respect private land and property rights.
TR1	I trust my local government to respect my rights as a landowner.
TR2	I trust the Minnesota state government to respect my rights as a landowner.
TR3	I trust the federal government to respect my rights as a landowner.
Willingness to Engage (TC)	Landowners' willingness to participate in a constructive dialogue with other land managing entities.
TC1	I would feel comfortable having a serious conversation with my neighbors.
TC2	I would feel comfortable having a serious conversation with members of my local government.
TC3	I would feel comfortable having a serious conversation with Minnesota state government officials.
TC4	I would feel comfortable having a serious conversation with federal government officials.

Note. All variables were measured from Strongly Disagree (1) to Strongly Agree (7)

Table 2.2. Means, standard deviations, and reliability of analyzed variables

Variable	Item	Mean	S.D.	T-value	Cronbach's alpha	Cronbach's alpha if item removed
PI	PI1	6.02	1.23	0.635	0.843	0.81
	PI2	6.40	0.92	-1.012		0.83
	PI3	5.92	1.31	1.616		0.81
	PI4	5.21	1.62	-1.565		0.85
	PI5	5.87	1.55	-5.057		0.86
PD	PD1	4.28	1.70	0.213	0.883	0.87
	PD2	4.59	1.68	0.455		0.86
	PD3	4.92	1.63	1.057		0.85
	PD4	5.30	1.59	-3.022		0.85
	PD5	6.07	1.29	-4.164		0.88
	PD6	6.25	1.08	1.358		0.88
TR	TR1	3.80	1.78	1.640	0.902	0.51
	TR2	3.57	1.90	3.018		0.51
	TR3	3.34	1.88	0.063		0.51
TC	TC1	5.00	1.41	-2.035	0.859	0.92
	TC2	4.56	1.65	-0.007		0.78
	TC3	4.34	1.81	2.560		0.79
	TC4	4.15	1.87	0.519		0.78

Note. PI = place identity, PD = place dependence, TR = willingness to trust, TC = willingness to engage

Table 2.3. Model level statistics of place attachment and trust models

Variable	B	SE	β	T-value	p	F	R ²	ΔR^2
<u>Place Attachment Model</u>						11.89	0.030	
PI	-0.103	0.081	-0.068	-1.264	0.207			
PD	-0.168	0.072	-0.125	-2.326	0.020			
<u>Place Attachment & Willingness to Trust Model</u>						29.87	0.109	0.079
PI	-0.038	0.078	-0.025	-0.484	0.629			
PD	-0.233	0.070	-0.173	-3.342	< 0.001			
TR	0.280	0.035	0.285	7.984	< 0.001			
<u>Combined Place Attachment & Trust Model</u>						23.49	0.112	0.003
PI	-0.057	0.079	-0.038	-0.726	0.468			
PD	-0.222	0.070	-0.164	-3.170	0.002			
TR	0.237	0.041	0.241	5.780	< 0.001			
TC	0.096	0.048	0.083	1.996	0.046			

Note. PI = place identity, PD = place dependence, TR = willingness to trust, TC = willingness to engage

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Minnesota Department of Natural Resources Walk-In Access Landowner Study



A cooperative study conducted by the University of Minnesota
for the Minnesota Department of Natural Resources

SPRING 2018

Your help on this study is greatly appreciated!

Please return your completed questionnaire in the enclosed envelope. The envelope is self-addressed and no postage is required. Thanks!

Minnesota Cooperative Fish and Wildlife Research Unit,
Department of Fisheries, Wildlife and Conservation Biology
University of Minnesota
St. Paul, Minnesota 55108-6124

First, we would like to learn more about your land and how you use it:

Q1. Please check all that apply. Do you consider yourself a ...

- Farmer Rancher

Q1A. If you consider yourself a farmer and/or rancher, are you currently: (Please check one box below)

- Full-time Part-time Retired

Q1B. If you consider yourself a farmer and/or rancher, how long have you farmed/ranched? (Please check one box below)

- 0 – 5 years 6 – 10 years 11-20 years 21-30 years More than 30 years

Q2. How much land do you currently own? (Please check one box below)

- 40 – 80 acres
 81-160 acres
 161- 320 acres
 321- 640 acres
 641 – 1280 acres
 1281 – 3840 acres
 More than 3,840 acres

Q3. About what percent of your total household income is derived from farming/ranching? (Please check one box below)

- None 1 – 25% 26 – 50% 51 – 75% 76 – 100%

Q4. How long have you owned your current property? (Please check one box below)

- Less than 5 years 6 – 10 years 11 – 15 years 16 – 20 years
 21 – 25 years 25 – 30 years More than 30 years

Q5. Of the land you own/operate, how likely would it be for you to sell some/all of it within the next 3 years? (Please check one box below)

- Highly Likely Moderately Likely Slightly Likely Slightly Unlikely Moderately Unlikely Highly Unlikely

Q6. Of the acres you own and lease, about what percent was used for each of these categories last year? (Please write in % for each space below).

Planted commodities (such as corn, soybeans, wheat, oats)	_____ %
Pasture, hay	_____ %
Native Grassland or Prairie	_____ %
Set-aside conservation program (such as CRP, WRP, CREP)	_____ %
Remaining lands (such as homestead, trees, bushes, wetlands)	_____ %
TOTAL	100%

Q7. On the land you own/operate, what % do you currently make land-use decisions about (such as commodity/livestock production, types of crops planted, participation in conservation programs)? (Please check one box below)

- None
 1 – 25%
 26 – 50%
 51 – 75%
 76 – 100%

Q8. We would like to know how much of your property provides high quality natural cover for wildlife. Please indicate if you own land in the following programs and, if so, how many acres?

(Please check “yes” or “no” and if “yes” write in the number of acres)

Program	Yes	No	If YES, how many acres?
Conservation Reserve Program (CRP)	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Conservation Reserve Enhancement Program (CREP)	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Wetlands Reserve Program (WRP)	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Reinvest in Minnesota (RIM)	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Other conservation program	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Other high quality natural cover	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____

Next, we would like to understand whether or not you are likely to enroll any of your land in the WIA program within the next year:

Q9. Beyond the information we have provided in our contact letter and survey, how much knowledge would you say you have about the Walk-in Access (WIA) Program in Minnesota? (Please circle one number below)

No knowledge at all			Moderate amount of knowledge			Great deal of knowledge
1	2	3	4	5	6	7

Q10. Would you say enrolling some of your land in the WIA program within the next year is: (Place an "X" in the space that best expresses what you believe).

Negative _____ : _____ : _____ : _____ : _____ : _____ : _____ **Positive**
 extremely quite slightly neither slightly quite extremely

Harmful _____ : _____ : _____ : _____ : _____ : _____ : _____ **Beneficial**
 extremely quite slightly neither slightly quite extremely

Foolish _____ : _____ : _____ : _____ : _____ : _____ : _____ **Wise**
 extremely quite slightly neither slightly quite extremely

Q11. How likely are you to enroll some of your land in the WIA Program within the next year? (Place an "X" in the space that best expresses your intentions).

Unlikely _____ : _____ : _____ : _____ : _____ : _____ : _____ **Likely**
 extremely quite slightly neither slightly quite extremely

Q12. Would you say, most people who are important to you think you should enroll some of your land in the WIA program within the next year? (Place an "X" in the space that best represents your answer).

Unlikely _____ : _____ : _____ : _____ : _____ : _____ : _____ **Likely**
 extremely quite slightly neither slightly quite extremely

Q13. How likely or unlikely do you believe the following outcomes are from enrolling some of your land in the WIA Program? (Please circle the ONE number that best represents your answer in each row)

Enrolling some of my land in the WIA program will...	Extremely Unlikely	Quite Unlikely	Slightly Unlikely	Neutral	Slightly Likely	Quite Likely	Extremely Likely
Increase my income.	-3	-2	-1	0	1	2	3
Protect habitat for wildlife.	-3	-2	-1	0	1	2	3
Give the government more control over what I do.	-3	-2	-1	0	1	2	3
Decrease my options for using my property.	-3	-2	-1	0	1	2	3
Increase my expenses.	-3	-2	-1	0	1	2	3
Provide hunting opportunities to people.	-3	-2	-1	0	1	2	3
Take a lot of time and effort.	-3	-2	-1	0	1	2	3
Decrease mine or my family's opportunity to hunt.	-3	-2	-1	0	1	2	3
Help support conservation efforts.	-3	-2	-1	0	1	2	3
Help ensure hunting traditions.	-3	-2	-1	0	1	2	3
Decrease wildlife on my property.	-3	-2	-1	0	1	2	3
Lead to conflicts with hunters using my property	-3	-2	-1	0	1	2	3

Q14. To what extent do you think the potential outcomes of enrolling some of your land in the WIA Program are NEGATIVE or POSITIVE? (Please circle the ONE number that best represents your answer in each row)

Enrolling some of my land in the WIA program will...	Extremely Negative	Quite Negative	Slightly Negative	Neutral	Slightly Positive	Quite Positive	Extremely Positive
Increase my income.	-3	-2	-1	0	1	2	3
Protect habitat for wildlife.	-3	-2	-1	0	1	2	3
Give the government more control over what I do.	-3	-2	-1	0	1	2	3
Decrease my options for using my property.	-3	-2	-1	0	1	2	3
Increase my expenses.	-3	-2	-1	0	1	2	3
Provide hunting opportunities to people.	-3	-2	-1	0	1	2	3
Take a lot of time and effort.	-3	-2	-1	0	1	2	3
Decrease mine or my family's opportunity to hunt.	-3	-2	-1	0	1	2	3
Help support conservation efforts.	-3	-2	-1	0	1	2	3
Help ensure hunting traditions.	-3	-2	-1	0	1	2	3
Decrease wildlife on my property.	-3	-2	-1	0	1	2	3
Lead to conflicts with hunters using my property	-3	-2	-1	0	1	2	3

Q15. Some landowners have specific concerns related to allowing access to hunters in programs like WIA. Please indicate the degree to which you disagree or agree that you have the following concerns about participating in the WIA program. (Please circle the ONE number that best represents your answer in each row)

I am concerned about...	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
Losing control over who uses my land	1	2	3	4	5	6	7
Threats to human safety	1	2	3	4	5	6	7
Keeping wildlife for myself/family/friends	1	2	3	4	5	6	7
Threats of property damage	1	2	3	4	5	6	7
Threats to livestock safety	1	2	3	4	5	6	7

Q16. We are interested in knowing your beliefs about how the WIA Program might influence liability and trespassing issues for you. (Please circle the ONE number that best represents your answer in each row)

Enrolling land in WIA would...	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
Decrease liability concerns.	1	2	3	4	5	6	7
Decrease trespassing issues.	1	2	3	4	5	6	7

Q17. Because the WIA Program is about providing hunting access, we are interested in your beliefs about hunting. (Circle one response for each statement below)

Statement	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
Hunting encourages conservation of wildlife.	1	2	3	4	5	6	7
Hunting is a positive way to enjoy the outdoors.	1	2	3	4	5	6	7
Hunting contributes to the local economy.	1	2	3	4	5	6	7
It is important to maintain the tradition of hunting in Minnesota.	1	2	3	4	5	6	7
We need to provide more hunting opportunities for people in Minnesota.	1	2	3	4	5	6	7
I am concerned about the nationwide decline in the number of people hunting.	1	2	3	4	5	6	7
Hunting is an important part of conserving wildlife in the USA.	1	2	3	4	5	6	7
Money from hunters makes wildlife management possible.	1	2	3	4	5	6	7
Hunting helps people appreciate wildlife.	1	2	3	4	5	6	7
Overall, I support hunting.	1	2	3	4	5	6	7
We should encourage people to hunt.	1	2	3	4	5	6	7
Hunting provides a lot of benefits to people.	1	2	3	4	5	6	7

Q18. How certain are you that you have the knowledge and abilities to maximize your participation in the WIA Program? (Circle one response for each statement below)

I am confident that I could...	Could not do at all			Moderately Certain could do			Completely Certain could do
Obtain and understand information about the program	1	2	3	4	5	6	7
Work through any financial challenges in participating in the program	1	2	3	4	5	6	7
Work through any family challenges in participating in the program	1	2	3	4	5	6	7
Work through any disagreements or challenges with others about participating in the program	1	2	3	4	5	6	7
Work through any time challenges with participating in the program	1	2	3	4	5	6	7

Q19. We are interested in knowing what you think is important in farming and land management. (Circle one response for each statement below)

Statement	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
For human communities to stay healthy, we have to recognize that we depend on a larger community of plants and animals.	1	2	3	4	5	6	7
Farmers should be good stewards of the wildlife habitat around their farms.	1	2	3	4	5	6	7
The quality of my farmland is positively influenced by the diversity of native plants and animals that live on or around it.	1	2	3	4	5	6	7
Moral commitments to community should include commitments to the soil, water, plants and animals as well as people.	1	2	3	4	5	6	7
Farmers should respect the larger natural community on which they farm.	1	2	3	4	5	6	7
Farming should be done in a way that conserves water quality and wildlife habitat.	1	2	3	4	5	6	7
The best farmers understand a lot about the complex natural systems that make up their farmland.	1	2	3	4	5	6	7
The land I farm is more than just the soil and involves a complex chain of plants, animals and energy.	1	2	3	4	5	6	7
Farmers should farm in a way that maintains the function of natural ecosystems on their land.	1	2	3	4	5	6	7
Farms should be thought of as a part of a larger natural community of soil, water, native plants and wildlife.	1	2	3	4	5	6	7
It's important to know that the land I farm is a complex web of interconnected ecological processes.	1	2	3	4	5	6	7
Farmers should conserve soil, water, native plants and wildlife habitat as an important part of their farming practices.	1	2	3	4	5	6	7
You really need to know a lot about native plants and animals to be a good farmer.	1	2	3	4	5	6	7
Farmers have an obligation to protect water quality and wildlife habitat.	1	2	3	4	5	6	7
Farmers should minimize the negative impacts of farming on water and wildlife habitat.	1	2	3	4	5	6	7

Q20. We would like to understand your beliefs about your responsibilities as a landowner.
(Circle one response for each statement below)

Statement	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I have a responsibility to implement land management practices that protect water quality.	1	2	3	4	5	6	7
I have a responsibility to implement land management practices that protect wildlife habitat.	1	2	3	4	5	6	7
I have a responsibility to minimize the level of nitrates and other farm chemicals I might use.	1	2	3	4	5	6	7
I feel a strong obligation to protect the local environment where I own land.	1	2	3	4	5	6	7

Q21. We would like to understand what you consider in the process of making land management decisions. *(Circle one response for each statement below)*

My land management decisions are motivated by...	Not Important	Slightly Important	Moderately Important	Very Important	Extremely Important
Short term economic gains.	1	2	3	4	5
Long term economic gains.	1	2	3	4	5
Short term economic risks.	1	2	3	4	5
Long term economic risks.	1	2	3	4	5
Opinions of neighbors & local community.	1	2	3	4	5
Opinions of friends and colleagues.	1	2	3	4	5
Opinions of family members and loved ones.	1	2	3	4	5
Impact of decisions on domesticated animals.	1	2	3	4	5
Impact of decisions on native wildlife.	1	2	3	4	5
Impact of decisions on domesticated crops.	1	2	3	4	5
Impact of decisions on native vegetation.	1	2	3	4	5

Q22. We would like to understand how you feel about the land that you own.
(Circle one response for each statement below)

Statement	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I feel that this land is a part of me	1	2	3	4	5	6	7
My land means a lot to me	1	2	3	4	5	6	7
Owning this land says a lot about who I am	1	2	3	4	5	6	7
I miss my land when I am away for too long	1	2	3	4	5	6	7
No other land can compare to the land that I own	1	2	3	4	5	6	7
I would not substitute any other land for the activities I do on this land	1	2	3	4	5	6	7
I get more satisfaction out of owning this land than I do any other	1	2	3	4	5	6	7
This land is the best place to do the activities I want to do	1	2	3	4	5	6	7
I would enjoy the activities I do on this land just as well elsewhere	1	2	3	4	5	6	7
I think I could find better land than this land	1	2	3	4	5	6	7

Q23. We would like to understand what aspects of your land you value most highly.
(Circle one response for each statement below)

I value my land as...	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
A place for myself and my family to call home.	1	2	3	4	5	6	7
A reliable source of income.	1	2	3	4	5	6	7
A space where I can find privacy.	1	2	3	4	5	6	7
A place where I can be close to nature.	1	2	3	4	5	6	7

Q24. We are interested in knowing how much you are willing to trust others with your land. (Circle one response for each statement below)

Statement	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I trust in my own ability to make land management decisions.	1	2	3	4	5	6	7
I trust my neighbors to make good land management decisions.	1	2	3	4	5	6	7
I would feel comfortable having a serious conversation with my neighbors.	1	2	3	4	5	6	7
I trust my local government to respect my rights as a landowner.	1	2	3	4	5	6	7
I would feel comfortable having a serious conversation with members of my local government.	1	2	3	4	5	6	7
I trust the Minnesota state government to respect my rights as a landowner.	1	2	3	4	5	6	7
I would feel comfortable having a serious conversation with Minnesota state government officials.	1	2	3	4	5	6	7
I trust the federal government to respect my rights as a landowner.	1	2	3	4	5	6	7
I would feel comfortable having a serious conversation with federal government officials.	1	2	3	4	5	6	7

Finally, we have a few questions about you:

Q25. Have you ever hunted?

- YES
- NO → If “NO” please skip to Question Q28
-

Q26. What year did you first hunt in Minnesota? (Write in year)

_____ CALENDAR YEAR (For Example: 1977)

Q27. How many total years have you hunted in Minnesota?

_____ YEARS

Q28. Do you currently hunt?

- YES
- NO

Q29. We are interested in knowing what type of hunting is most important to you. Please rate how important each hunting activity listed below is to you. (Circle one number for each)

	Not at all important			Moderately Important			Extremely Important	DO NOT HUNT
Deer	1	2	3	4	5	6	7	9
Waterfowl	1	2	3	4	5	6	7	9
Turkey	1	2	3	4	5	6	7	9
Pheasant	1	2	3	4	5	6	7	9
Other small game	1	2	3	4	5	6	7	9
Other (write in): _____	1	2	3	4	5	6	7	9

Q30. We are interested in knowing what you see yourself as. Please rate how strongly you identify yourself as a... (Circle one number for each)

	Not at all	Slightly	Moderately	Strongly	Very Strongly
Farmer	1	2	3	4	5
Hunter	1	2	3	4	5
Conservationist	1	2	3	4	5
Environmentalist	1	2	3	4	5
Conservative	1	2	3	4	5
Liberal	1	2	3	4	5

Q31. How many years have you lived in Minnesota? (Write in number of years)

_____ YEARS

The following questions are completely voluntary but are helpful in understanding any differences in survey response rates.

Q32. What was your annual household income from all sources, before taxes, in 2017? (Please check only one)

- | | | |
|---|---|---|
| <input type="checkbox"/> Less than \$10,000 | <input type="checkbox"/> \$60,000 to \$69,999 | <input type="checkbox"/> \$150,000 to \$174,999 |
| <input type="checkbox"/> \$10,000 to \$19,999 | <input type="checkbox"/> \$70,000 to \$79,999 | <input type="checkbox"/> \$175,000 to \$199,999 |
| <input type="checkbox"/> \$20,000 to \$29,999 | <input type="checkbox"/> \$80,000 to \$89,999 | <input type="checkbox"/> \$200,000 to \$224,999 |
| <input type="checkbox"/> \$30,000 to \$39,999 | <input type="checkbox"/> \$90,000 to \$99,999 | <input type="checkbox"/> \$225,000 to \$249,999 |
| <input type="checkbox"/> \$40,000 to \$49,999 | <input type="checkbox"/> \$100,000 to \$124,999 | <input type="checkbox"/> \$250,000 or more |
| <input type="checkbox"/> \$50,000 to \$59,999 | <input type="checkbox"/> \$125,000 to \$149,999 | |

Q33. Which of the following best describes your race? (Check all that apply)

- African American/black
- Asian
- Pacific Islander
- American Indian or Alaskan Native
- Caucasian/white
- Other

Q34. Do you consider yourself Hispanic/Latino/Spanish? (Check one)

- Yes
- No

Q35. What is the highest level of education you have completed? (Check one)

- | | |
|---|---|
| <input type="checkbox"/> Grade school | <input type="checkbox"/> Some college |
| <input type="checkbox"/> Some high school | <input type="checkbox"/> Four-year college (bachelor's) degree |
| <input type="checkbox"/> High school diploma or GED | <input type="checkbox"/> Some graduate school |
| <input type="checkbox"/> Some vocational or technical school | <input type="checkbox"/> Graduate (master's or doctoral) degree |
| <input type="checkbox"/> Vocational/technical school (associate's) degree | |

Q36. Would you be willing to share an e-mail address with us that we could use to contact you concerning the WIA Program in the future?

e-mail address: _____

Please make any comments you may have in the space below:

Thanks for your help! Please return your survey in the enclosed, self-addressed, reply envelope. No postage is required.

Minnesota Department of Natural Resources Walk-In Access Landowner Study



A cooperative study conducted by the University of Minnesota
for the Minnesota Department of Natural Resources

SPRING 2018

Your help on this study is greatly appreciated!

Please return your completed questionnaire in the enclosed envelope. The envelope is self-addressed and no postage is required. Thanks!

Minnesota Cooperative Fish and Wildlife Research Unit,
Department of Fisheries, Wildlife and Conservation Biology
University of Minnesota
St. Paul, Minnesota 55108-6124

Q1. Please check all that apply. Do you consider yourself a ...

- Farmer Rancher

Q1A. If you consider yourself a farmer and/or rancher, are you currently: (Please check one box below)

- Full-time Part-time Retired

Q1B. If you consider yourself a farmer and/or rancher, how long have you farmed/ranched?

(Please check one box below)

- 0 – 5 years 6 – 10 years 11-20 years 21-30 years More than 30 years

Q2. How much land do you currently own? (Please check one box below)

- 40 – 80 acres
 81-160 acres
 161- 320 acres
 321- 640 acres
 641 – 1280 acres
 1281 – 3840 acres
 More than 3,840 acres

Q3. About what percent of your total household income is derived from farming/ranching?

(Please check one box below)

- None 1 – 25% 26 – 50% 51 – 75% 76 – 100%

Q4. How long have you owned your current property? (Please check one box below)

- Less than 5 years 6 – 10 years 11 – 15 years 16 – 20 years
 21 – 25 years 25 – 30 years More than 30 years

Q5. Of the land you own/operate, how likely would it be for you to sell some/all of it within the next 3 years? (Please check one box below)

- Highly Likely Moderately Likely Slightly Likely Slightly Unlikely Moderately Unlikely Highly Unlikely

Q6. Of the acres you own and lease, about what percent was used for each of these categories last year? (Please write in % for each space below).

Planted commodities (such as corn, soybeans, wheat, oats)	_____ %
Pasture, hay	_____ %
Native Grassland or Prairie	_____ %
Set-aside conservation program (such as CRP, WRP, CREP)	_____ %
Remaining lands (such as homestead, trees, bushes, wetlands)	_____ %
TOTAL	100%

Q7. On the land you own/operate, what % do you currently make land-use decisions about (such as commodity/livestock production, types of crops planted, participation in conservation programs)? (Please check one box below)

- None
 1 – 25%
 26 – 50%
 51 – 75%
 76 – 100%

Q8. We would like to know how much of your property provides high quality natural cover for wildlife. Please indicate if you own land in the following programs and, if so, how many acres?

(Please check “yes” or “no” and if “yes” write in the number of acres)

Program	Yes	No	If YES, how many acres?
Conservation Reserve Program (CRP)	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Conservation Reserve Enhancement Program (CREP)	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Wetlands Reserve Program (WRP)	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Reinvest in Minnesota (RIM)	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Other conservation program	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____
Other high quality natural cover	<input type="checkbox"/>	<input type="checkbox"/>	ACRES _____

Next, we would like to understand whether or not you are likely to enroll any of your land in the WIA program within the next year:

Q9. Beyond the information we have provided in our contact letter and survey, how much knowledge would you say you have about the Walk-in Access (WIA) Program in Minnesota? (Please circle one number below)

No knowledge at all			Moderate amount of knowledge			Great deal of knowledge
1	2	3	4	5	6	7

Q10. Have you ever hunted?

- YES
- NO → If “NO” please skip to Question Q13

Q11. What year did you first hunt in Minnesota? (Write in year)

_____ CALENDAR YEAR (For Example: 1977)

Q12. How many total years have you hunted in Minnesota?

_____ YEARS

Q13. Do you currently hunt?

- YES
- NO

Q14. How many years have you lived in Minnesota? (Write in number of years)

_____ YEARS

Q15. Which of the following best describes your race? (Check all that apply)

- African American/black
- Asian
- Pacific Islander
- American Indian or Alaskan Native
- Caucasian/white
- Other

Q16. Do you consider yourself Hispanic/Latino/Spanish? (Check one)

- Yes
- No

Q17. What is the highest level of education you have completed? (Check one)

- | | |
|---|---|
| <input type="checkbox"/> Grade school | <input type="checkbox"/> Some college |
| <input type="checkbox"/> Some high school | <input type="checkbox"/> Four-year college (bachelor's) degree |
| <input type="checkbox"/> High school diploma or GED | <input type="checkbox"/> Some graduate school |
| <input type="checkbox"/> Some vocational or technical school | <input type="checkbox"/> Graduate (master's or doctoral) degree |
| <input type="checkbox"/> Vocational/technical school (associate's) degree | |

**Q18. What was your annual household income from all sources, before taxes, in 2017?
(Please check only one)**

- | | | |
|---|---|---|
| <input type="checkbox"/> Less than \$10,000 | <input type="checkbox"/> \$60,000 to \$69,999 | <input type="checkbox"/> \$150,000 to \$174,999 |
| <input type="checkbox"/> \$10,000 to \$19,999 | <input type="checkbox"/> \$70,000 to \$79,999 | <input type="checkbox"/> \$175,000 to \$199,999 |
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| <input type="checkbox"/> \$40,000 to \$49,999 | <input type="checkbox"/> \$100,000 to \$124,999 | <input type="checkbox"/> \$250,000 or more |
| <input type="checkbox"/> \$50,000 to \$59,999 | <input type="checkbox"/> \$125,000 to \$149,999 | |

Thanks for your help! Please return your survey in the enclosed, self-addressed, reply envelope. No postage is required.