

**Cannon River Watershed:
Landowner Survey on Water Resources
and Conservation Action**

by

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A Project Report by
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**CANNON RIVER WATERSHED: LANDOWNER SURVEY ON WATER RESOURCES AND
CONSERVATION ACTION**

A Project Interim Report

by

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STUDY BACKGROUND

This report describes the findings of a landowner survey administered in the Cannon River watershed, Minnesota. The study was conducted by the Department of Forest Resources at the University of Minnesota in partnership with the Cannon River Watershed Partnership. This study is part of a larger project investigating landowner and farmer perspectives on water resources and conservation programming. The purpose of the study is to assist water resource professionals and community decision-makers in better understanding landowners' beliefs, attitudes and behaviors associated with water resources and conservation action. Specific study objectives were to assess (1) landowner values and beliefs about their communities, the environment, water quality issues and water resource conservation; (2) landowner current and future conservation actions; and (3) who or what influences landowners' conservation decisions.

Data were collected through a self-administered survey distributed to 1,082 landowners in the Cannon River watershed. The findings of this study are organized in six sub-sections that respond to 16 unique research questions. A preliminary synopsis of study findings is presented. Full datasets in tabular form are presented in Appendix F.

The preliminary recommendations provided in this report are intended to inform, enhance, and facilitate future community and water resource planning and management initiatives in the study watershed and across the state. Recommendations include strategies for designing and implementing communication, education, and outreach programs that respond to landowner needs and promote conservation actions that protect and enhance water resources.

RESEARCH DESIGN AND METHODS

The study was conducted through a self-administered survey of a stratified, random sample of landowners in the Cannon River watershed. The Cannon River watershed, a subwatershed of the Mississippi River watershed, stretches across Dakota, Le Sueur, Goodhue, Waseca, Steele

and Rice counties (see map in Appendix C). The surveys were administered from October through December 2013.

A list of property owners within the Cannon River watershed was obtained from publicly available property tax records. A random sample of landowners (approximately 200) from each of 5 subwatersheds within the Cannon River watershed was selected. The final sample including replacement of 82 initial undeliverable questionnaires was 1,082 landowners. Overall, 292 landowners completed and returned the survey for a final response rate of 38% (adjusted for 246 surveys returned undeliverable).

Survey instruments were designed based on an extensive literature review and feedback from pre-tests of the instrument. The survey questionnaire included a variety of fixed-choice and scale questions. Several questions were adapted from survey instruments used in previous studies of attitudes, beliefs, and values of conservation behaviors (Blasczyk, Your views on local water resources, 2010; Harland, Staats, & Wilke, 2007; Matsumoto, Weissman, Preston, Brown, & Kupperbusch, 1997; Prokopy et al., 2009; Schultz, 2001; Schwartz, 1977; Stern, Dietz, & Guagnano, 1998; Stern, Dietz, & Kalof, 1993; Seekamp, Davenport, & Brehm, Lower Kaskaskia River Watershed Resident Survey, 2009). Each questionnaire was labeled with a unique identification number to track responses for subsequent mailings.

An adapted Dillman's (2009) Tailored Design Method was used to increase response rates. The survey was administered in three waves: the questionnaire (Appendix A) with a cover letter (Appendix B), watershed map (Appendix C), and self-addressed, business reply envelope; a reminder letter (Appendix D); and a replacement questionnaire with cover letter (Appendix E) and envelope.

Returned questionnaires were logged into the respondent database. Response data were numerically coded and entered into a database using Statistical Package for Social Sciences (SPSS release 19.0). Basic descriptive statistics were conducted to determine frequency distributions and averages of individual variables. Inferential statistics were also conducted to test for significant differences between respondent subgroups. Subgroup comparisons were conducted across watershed land use/density (i.e., rural/agricultural and urban/agricultural subwatersheds) and across levels of intended civic engagement in water resource issues (i.e., high, moderate and low).

STUDY FINDINGS

I. Sociodemographic and Property Characteristics

1. Who are respondents and what are their property ownership characteristics?

- The majority of respondents in the watershed (79%) were male. More than one-third of respondents (42%) had attained at least a college degree (Table 2).

- The median age of respondents was 61 (Table 2).
- The vast majority of the respondents were white (97%) and not of Hispanic or Latino descent (99%) (Table 2).
- Almost three-quarters of respondents (73%) reported an annual household income of less than \$100,000 (Table 2).
- Respondents reported living 30 years in the community (median) (Table 2).
- Most respondents own 5 or fewer acres (64%) (Table 4). Almost one-third of respondents (29%) reported using their land/property for agricultural production. Most respondents (74%) do not depend on their property for income (Table 3).
- A majority of respondents (83%) own and manage their land/property. Most respondents (86%) make their own decisions about how to manage their land/property (Table 3).
- A slight majority of respondents (53%) reported owning or renting land with a stream or ditch located on or bordering their property (Table 3).

2. How do respondents define their community?

- A majority of respondents in both watersheds define “their community” as the city or township in which they live (60%) (Table 5).

II. Cultural and Environmental Values and Beliefs about Water Issues

3. What cultural and environmental values are important to respondents?

- Overall, respondents rated cooperating with and helping other members of their community as the most important cultural values (Table 6).
- On average, respondents in both watersheds rated respecting the earth as the most important environmental value. Protecting private property rights also was rated “very important” to “extremely important” by a majority of respondents (70%) (Table 7).

4. What are respondents’ beliefs about water quality, problems and links to land uses?

- Most respondents agreed that water pollution can affect human health (98%) and that conservation practices protect aquatic life (93%).
- The majority of respondents (80%) at least somewhat agreed that water resources in Minnesota need better protection (Table 8).
- Most respondents (62%) reported that they were not at all to only slightly familiar with water resource issues. One-quarter of respondents did not know their property was within the Cannon River watershed (Table 9).
- More than half of respondents (54%) viewed water quality in the stream, ditch, lake or river closest to them as fair to good (Table 26). About the same percentage (53%) viewed water quality in the Cannon River as fair to good (Table 27). About 17% and 25% reported not knowing the quality of the water in the nearest water resource (Table 26) or in the Cannon River (Table 27), respectively.

5. Are respondents concerned about the consequences of water pollution?

- An overwhelming majority of respondents in both the watersheds expressed concern about the consequences of water pollution for future generations (94%), wildlife (93%) and aquatic life (93%) (Table 11).
- The five pollutants/issues in the watershed rated on average as the biggest problems include phosphorus, herbicides, nitrogen in surface water, pesticides, and non-native and invasive aquatic plants (Table 13). As for the sources of pollutants/issues in the watershed, respondents overall rated use of fertilizers for crop production, soil erosion from farm fields, farm drainage, excessive use of lawn fertilizers, and urban/suburban stormwater runoff as the biggest problems (Table 14).

6. Who do respondents think should be responsible for responding to water quality issues?

- A large majority of the respondents (97%) agreed that it is their own personal responsibility to make sure that what they do on their land doesn't contribute to water pollution (Table 12).
- Most respondents also agreed that other landowners in the community (96%), lakeshore/streamside landowners (95%), and upstream landowners (92%) should be responsible for protecting water quality (Table 12).
- Most respondents agreed that they feel a personal obligation to do whatever they can to prevent water pollution (87%) and to use conservation practices on their land/property (87%) (Table 20).
- However, decidedly fewer respondents feel the same obligation to engage in civic action such as attend a meeting or community discussion about a water resource issue (34%), work with other community members to protect water quality (50%) or talk to other community members about conservation practices (50%) (Table 20).

III. Current and Future Conservation Behaviors

7. Do respondents engage in conservation practices on their property?

- A majority of respondents (85%) reported maintaining their septic systems and that they follow manufacturer's instructions and do not over-apply when fertilizing lawn or garden (78%) in all possible locations (Table 16).
- A majority of respondents reported that they use conservation tillage practices in all possible locations on their farm (54%) (Table 16).
- Fewer respondents reported that using a porous (permeable) pavement to minimize runoff and allow infiltration (45%) or a rain barrel (21%) in at least one location on their property (Table 16).

8. What civic actions have the respondents engaged in the past 12 months related to environmental issues?

- While a majority of respondents (63%) reported that they have heard about a CRWP initiative (e.g., rain barrel workshop, annual watershed cleanup, newspaper column)

- at least once in the past 12 months, a vast majority of respondents (79%) reported that they have not participated in a CRWP initiative or attended a meeting, public hearing or community discussion unrelated to the CRWP about a water resource issue (91%) in the past 12 months (Table 17).
- Over half of the respondents (54%) have talked to others about conservation practices at least once in the last 12 months. However, a vast majority of respondents (80%) have not worked with community members to protect water quality in the last 12 months (Table 17).

9. What are respondents' intentions to engage in conservation actions to protect water resources in the future?

- A majority of respondents reported that they probably or most certainly will do whatever they can to prevent water pollution (81%) and use conservation practices on their land/property (70%). However, fewer respondents expressed similar intentions to contact the Cannon River Watershed Partnership about water resource initiatives (15%), attend a meeting or community discussion about a water resource issue (25%), or work with other community members to protect water quality (32%). talk to others about conservation practices (46%) in the future. Almost half (49%) of respondents reported that they intended on talking to others about conservation practices (Table 18).

IV. Social Norms and Influences of Conservation Behavior

10. To what extent is there a perceived social norm of conservation behavior?

- Over two-thirds of respondents (69%) somewhat to strongly agree that people who are important to them expect them to do whatever they can to prevent water pollution. A majority of respondents (59%) also somewhat to strongly agree that people who are important to them expect them to use conservation practices on their land (Table 19).
- A majority of respondents somewhat to strongly agree that people who are important to them do whatever they can to prevent water pollution (62%) and also use conservation practices on their land (56%) (Table 19).
- Half of respondents (50%) however, held were uncertain or neutral in their beliefs about whether important others expect them to attend meetings, public hearings or community discussions about water resource issues (Table 19).
- Respondents also reported being influenced by important others in their decisions and behaviors. A greater proportion of respondents (48%) agreed that people who are important to them influence their decisions and behavior. However, over a third of respondents (35%) neither agreed nor disagreed that important others influence their decisions and behaviors (Table 19).

11. Who influences respondents' conservation practices?

- Overall, respondents rated family as most likely to influence their decisions about conservation practices. MN Department of Natural Resources, county Soil and Water

Conservation Districts, neighbors, and the MN Pollution Control Agency were also highly rated by respondents as influential in their decision-making (Table 21). These county and state agencies along with the Cannon River Watershed Partnership were also identified as the most trusted sources of information about water quality (Table 22).

12. Do respondents and their communities have the ability to protect water resources?

- Most respondents (79%) agreed that their use of a conservation practice contributes to healthy water resources. Most respondents (73%) agreed that their community has the ability to change the way land will be developed in the future to protect water resources (Table 15).
- Less than half of respondents agreed that their community has the financial resources (40%) and leadership (23%) it needs to protect water resources (Table 15).
- Less than half of respondents (39%) agreed that they have the financial resources they need to use conservation practices (Table 15).

13. What would increase the likelihood that respondents would maintain conservation practices?

- Learning how to maintain conservation practices for water quality and wildlife benefits, as well as knowing more about how to implement and maintain conservation practices were on average the most highly rated factors in terms of increasing the likelihood that respondents would adopt or maintain conservation practices (Table 23).

V. Attitudes toward Water Resource Management

14. What are respondents' attitudes toward management actions to protect the quality of water in Minnesota?

- The majority of respondents expressed at least some support for all of the management actions listed. Respondents expressed the most support for actions such as promoting voluntary adoption of conservation practices through education and outreach (80%), coordinating land use and water planning across communities (75%), enforcing existing land use laws and regulations (74%), and conducting more water resource research and monitoring (74%). Respondents expressed the least support for actions such as increasing regulations on private property owners to protect water resources (56%) and streamlining existing programs that offer financial incentives to property owners/farmers for conservation practices (68%) (Table 24).

VI. Respondent Subgroup Comparisons

15. How do respondents in urban and rural agricultural landscapes vary in their water resource perspectives?

- Some notable differences were identified in beliefs about conservation. Rural/ag (RA) respondents agreed to a greater extent than urban/ag (UA) respondents that environmental laws limit personal freedoms. RA respondents also agreed to a greater extent than UA that financial compensation would increase their likelihood of adopting or continue conservation practices (Table 31).
- UA respondents agreed to a greater extent that the state is responsible for protecting water quality and that their community has the ability to change the way land is currently used and has the financial resources it needs to protect water quality (Table 31).
- These subgroups also varied in their perceptions of water resource problems and sources of problems. UA respondents rated flooding, confined animal feedlot operations, grass clippings and leaves entering storm drains, and multiple forms of stormwater runoff as bigger problems than did RA respondents (Table 32).

16. How do respondents with high, moderate and low intentions for civic engagement in water resource issues vary?

- Some notable differences were identified between those with high and moderate or low intentions for civic engagement in water resource issues.
- Respondents with *high intentions for civic engagement* (HCE) were unique in their higher level of agreement that water pollution can affect their lifestyle, that conservation practices contribute to quality of life in their community, and that conservation practices contribute to healthy water resources (Table 36).
- HCE respondents also placed more responsibility for protecting water quality on landowners and property owners than did other groups (Table 36).
- HCE respondents also reported higher levels of past civic engagement than did the other groups (Table 37).
- HCE respondents reported being more likely to be influenced by university researchers, the Cannon River Watershed Partnership, multiple state and local agencies/representatives, environmental advocacy organizations, and farming organizations than did the other groups (Table 38).
- HCE respondents were also unique in their higher level of agreement that 11 of the 14 factors listed would enhance their conservation practices. The biggest differences were recorded in factors such as attendance at a community workshop or field day, learning how to maintain practices for soil conservation and water quality, and enrollment in conservation stewardship registry program (Table 39).
- Finally, HCE respondents with high intentions for civic engagement were unique from other groups in their perception of flooding as a severe problem (Table 40).
- Respondents with low intentions for civic engagement (LCE) were unique in their lower level of agreement that water pollution can affect their lifestyle and that Minnesota water resources need better protection (Table 36).

- LCE respondents expressed less agreement than other groups that it was their own personal responsibility to protect water and to reduce their land's contribution to water pollution (Table 36).
- LCE respondents talked to others about conservation practices fewer times in the past 12 months than the other groups (Table 37).
- LCE respondents reported being less likely to be influenced by university researchers, the Cannon River Watershed Partnership, the county Soil and Water Conservation District, and environmental advocacy organizations than did the other groups (Table 38).
- LCE respondents were also unique in their lower level of agreement that 6 of the 14 factors listed would enhance their conservation practices. The biggest differences were recorded in factors such as learning how to maintain practices for soil conservation and water quality, and knowing more about how to implement and maintain conservation practices (Table 39).

PRELIMINARY PROJECT RECOMMENDATIONS

I. **Build landowner understanding of local stream conditions, their causes, and consequences.**

Study findings suggest that landowners generally have a high level of concern about the consequences of water pollution on future generations, wildlife, and aquatic life. Consistent with these concerns, the vast majority of respondents expressed the belief that water resources need better protection in Minnesota. At the same time, landowners appear less certain about the status of water resource protection in their own communities. Findings show that most landowners are only slightly familiar or not at all familiar with water resource issues in their own watershed and about one-quarter admit that they do not know the quality of the water in the Cannon River. Thus, while general concern about water pollution in the state may be high, awareness of problems or certainty about conditions at the local level appears relatively low.

- We recommend tailored communication and engagement strategies. The most effective communication campaigns establish conditions and problems in the local area (i.e., impairments in stream reach A or neighborhood B), their potential consequences (i.e., impacts to aquatic life in A or B), and solution alternatives (i.e., streamside buffer installation or wetland restoration near A or B). In rural agricultural landscapes, township and county level conditions/consequences/solutions will be most relevant to community members. In urban agricultural landscapes municipal level conditions/consequences/solutions will be most relevant.
- When possible, an individualized approach is recommended for interested landowners that might include shoreland audits, conservation equipment rental programs, and other technical resources or training programs for enhancing understanding of conservation practices. Study findings show that landowners perceive knowledge as somewhat of a constraint to their own conservation action. Most participants agreed

that learning more about how to implement and maintain conservation practices for water quality and wildlife benefits would increase the likelihood that they would adopt or maintain conservation practices. Individualized, specific, and timely information will make water resource protection more personal to landowners and, when accompanied by programs aimed at encouraging personal commitment to conservation action, are more likely to result in behavior change. Mass media campaigns are believed to be far less effective in changing behavior than personalized approaches (Abrahamse, Steg, Vlek, & Rothengatter, 2005).

- Requesting personal commitments, setting specific goals, and providing feedback has shown promise (Abrahamse et al., 2005) in increasing conservation action. Personal commitment in the form of a verbal or written pledge to change (or maintain) a behavior establishes personal (if made to oneself) or social (if made public) norms. These promises become even more resolute when matched with a commitment to a particular plan of action (e.g., I promise to install a streamside buffer next spring by planting native grass species and by not mowing along the stream) (Steg & Vlek, 2009). Goal-setting is an effective strategy for promoting behavior change and is commonly used in combination with providing feedback. For example, local resource professionals might set streamside buffer goals of 80% compliance among streamside landowners or 90% of shoreland miles buffered within a township or municipality. Providing frequent feedback on the extent to which goals are being met to a neighborhood or to a group of landowners living along a stream creates a social norm in favor of buffer adoption and further connects landowners to water resources and to each other. In similar studies of household energy conservation, combinations of strategies including encouraging personal commitments, setting goals, and providing feedback to households or groups has been effective at promoting behavior change (Abrahamse, Steg, Vlek, & Rothengatter, 2007).

II. Support civic dialogue and community-building around water resource issues.

Study findings indicate that cooperation with and helping other community members are important guiding principles in the lives of many landowners. However, survey respondents also noted that being self-reliant versus dependent on other community members is almost equally as important. These findings might suggest that while many landowners are ready and willing to pitch in to help others in the community, landowners themselves are unlikely to ask for help when it is needed. As other landowner surveys have shown (Davenport & Pradhananga, 2012), strong communal or collectivistic cultural norms may not be activated in water resource protection issues. This study also highlights a significant gap between private-sphere behavior and public-sphere behavior when it comes to water resources. While many landowners have intentions to do whatever they can do to prevent water pollution and to use conservation practices on their land, decidedly fewer landowners have intentions to engage civically, that is to talk to others about conservation practices, to work with others to protect water quality, or to attend a community meeting or discussion about water resource issues. As a result, many landowners may not know what their fellow neighbors or community members are thinking or doing with respect to conservation practices on their land.

On average respondents reported that family, the MN Department of Natural Resources and the county Soil and Water Conservation District are most influential on their conservation decisions. However, almost half of respondents reported that their neighbors influence their conservation decisions moderately or a lot. Without peer-to-peer communication around water resource protection, landowners are unlikely to know they need help (or that help is available) and landowners are unlikely to know when help is needed by other landowners. Furthermore, landowners may not know how to provide help, if help is needed. Finally, fear about challenging a cultural norm or damaging one's own cultural identity may also inhibit willingness to start a dialogue or offer assistance. As this study confirmed, for many landowners protecting private property rights is an important guiding principle in their lives.

- The gap between individual and collective conservation knowledge and action can stymie the diffusion of knowledge and adoption of innovative solutions (Rogers, 1995). Strategies that build social support for and role modeling of conservation practices through peer-to-peer networks, community events, demonstration areas, and citizen recognition programs build the notion that like-minded landowners have adopted conservation practices and, furthermore, that being a proactive member of the community means doing what one can to protect local water resources.
- We suspect that guidance is needed in how to talk to others about conservation practices. We recommend that resource managers develop simple guidebooks (e.g., how to talk to your neighbor about conservation) that establish why it is okay and important to talk to your neighbor about conservation and provide suggestions on how to have those sometimes difficult conversations. For example, scholars in organizational management (www.blogs.hbr.org) emphasize the need to listen first and avoid assumptions, build common understanding about the urgency and impact of the issue, to maintain two-way dialogue and open-mindedness throughout, and to establish a personal connection around the issue. Companion guidebooks for rural landowners and farmers (e.g., how to talk to your renter/ farmland owner about conservation) and urban/rural residents (e.g., how to talk to your local leaders about conservation) could offer more specific strategies and examples.
- As Morton and Brown (2011) contend, landowner commitment to water resource protection can be dramatically influenced by the "citizen effect" or social norms and pressures favoring certain actions. Civic dialogue around the successes of conservation action also has the effect of reducing uncertainty and perceptions of risk, often a barrier in behavior change (Rogers, 1995). Stories of coordinated action and cooperation further build on success by pooling knowledge and expertise, increasing access to technology and equipment, fostering trust, and building community pride in accomplishments.

III. Tailor civic engagement programs to particular communities: one size does not fit all.

Differences were noted between landowners in watersheds with rural/ag (RA) and urban/ag (UA) land uses and population densities. UA watershed landowners perceived several water pollutants and issues to be more of a problem in their watershed than RA landowners did, though they were less likely to report being adjacent to a stream, river, ditch or lake. RA

watershed landowners had higher agreement than UA landowners that environmental regulations would limit their choices and personal freedoms. RA landowners believed to a lesser extent than UA landowners that their community has the capacity to protect water resources. Financial incentives and compensation appear to be more of a motivator for conservation to RA landowners than UA landowners.

- We recommend that programs continue to speak to the unique opportunities and challenges in subwatersheds with varying land uses and population densities. Study findings point to some opportunities for conservation programming in RA watersheds in particular including addressing potentially limited awareness of problems, responding to more resistance to regulations and acknowledging the perceived higher need for capacity building including financial payments for conservation.

Previous research on personal norms for conservation, or the moral obligation to act pro-environmentally, reveals that personal norms are activated by three sets of beliefs: awareness of consequences of environmental problems, ascription of personal or local responsibility and an ability to alleviate the problem (e.g., Harland et al., 2007; Kaiser, Hübner, & Bogner, 2005; Stern, Dietz, Abel, Guagnano, & Kalof, 1999). Thus, landowners are more likely to feel a personal obligation to protect water resources if they are aware of the consequences of water pollution, believe that they and their community are responsible for protecting water resources, and perceive that they have the ability to protect water resources. Comparisons between respondent subgroups with varying levels of intended civic engagement revealed significant differences in personal norm activators that warrant attention in future conservation programming.

Landowners with high levels of intended civic engagement (HCE) in water resource protection had stronger beliefs about the need for and benefits of water resource protection than landowners with low levels of intended civic engagement (LCE), and in some cases than those with moderate levels of intended civic engagement (MCE). HCE landowners appear to assign more personal responsibility to water resource protection than LCE landowners. They also perceive more community capacity to change land use in the future to protect water resources. HCE landowners are influenced to a greater extent by a variety of professionals and organizations, as well as their neighbors, than LCE landowners. They also appear to be more inclined to be affected by conservation programming than LCE landowners, especially programs that involve experiential learning (e.g., workshops and field days), include social recognition (conservation stewardship awards), and facilitate learning about practices that protect soil health and water quality.

- We recommend that water resource managers continue to build momentum with HCE landowners, who account for about 28% of the landowners surveyed. Programs that appeal to their beliefs, sense of personal responsibility, and even optimism about the likelihood of conservation action (their own and their community's) should be well-received. These landowners appear to be strong advocates for getting involved civically and perhaps need only the right venues and "talking points" to do so. HCE landowners are likely to be champions for conservation and could be important local leaders for

shifting social norms of conservation. Leadership development programming is best suited for this group and will likely propel their civic advocacy.

MCE landowners are more like HCE landowners in some ways and more like LCE landowners in others. Though they demonstrated an awareness of consequences of environmental problems and ascription of personal responsibility, their perceived ability to alleviate the problem with conservation practices may inhibit their development of a personal norm of conservation action. While MCE landowners parallel HCE landowners in their beliefs about water pollution and their perceptions of water resource problems, they appear more skeptical of or less confident in the value of conservation practices in *solving* water resource problems, as do LCE landowners. Like HCE landowners, MCE landowners ascribe personal responsibility for protecting water resources, but they believe that conservation programming is less likely to influence them than HCE landowners do. They are influenced to a significantly lesser extent than HCE landowners by most individuals and organizations listed, though still significantly more so than LCE landowners are.

- Opportunities exist to develop conservation champions among MCE landowners, which account for 42% of the landowners surveyed. Programs that appeal to their beliefs, concerns and sense of personal responsibility associated with water resource problems and demonstrate past successes of conservation practices will directly respond to MCE landowner uncertainties. The findings reveal that MCE landowners have not been very civically engaged in water resource issues in the past, so they may require some nontraditional programming that also emphasizes the benefits of conservation practices. Peer-to-peer knowledge exchange, family-friendly community events, demonstration sites may be most effective for this group. Furthermore, MCE landowners may benefit more than any other group from an individualized approach including shoreland audits, conservation equipment rental programs, and other technical resources or training programs for enhancing their understanding of and comfort with conservation practices.

LCE landowners' development of a personal norm of conservation action appears to be inhibited more so than any group by lower levels of awareness of consequences of environmental problems, ascription of personal responsibility, and perceived ability to alleviate the problem with conservation practices. LCE landowners, who account for about 31% of landowners surveyed, include the highest proportion of farmers or farmland owners of any group (41%). As noted earlier, when compared to HCE or LCE landowners, they have significantly less agreement that water resources need better protection, that the consequences of pollution will affect them, or that they are personally responsible to protect water quality. Like MCE landowners, they are more skeptical of the benefits of conservation practices than HCE landowners; they are influenced by others the least of any group. This group parallels MCE landowners in their beliefs that conservation programming is less likely to influence them than HCE landowners do.

- Personal responsibility is the recognition of having a duty or civic obligation to engage in actions that address a water resource problem or need. Responsibility requires a sense of connection to water resources which may be in the form of a recognized relationship

with water, a sense of usefulness to improving its condition, or being “causally connected” (i.e., knowing personal actions contributed to the water resource problem). Emergencies or crisis events can also prompt a sense of responsibility (Schwartz, 1977, p. 246). Conservation programming aimed at LCE landowners that emphasizes, in particular, a sense of usefulness (i.e., efficacy) and causal connections may enhance their sense of personal responsibility. Besides family, the MN Department of Natural Resources, MN Pollution Control Agency, neighbors, and county Soil and Water Conservation Districts seem most likely to influence LCE landowners in their perceptions of problems, consequences, causes and solutions, suggesting that programming that incorporates these groups or integrates messaging from these groups would be most effective.

- Recent qualitative research on farmer and farmland owner conservation action in Minnesota (Davenport & Olson, 2012; Olson & Davenport, unpublished data) has revealed that farming values and identity including independence, mastery, economy (i.e., efficiency), and resource stewardship underpin a conservation ethic and ultimately drive appraisal of conservation practices. Aspects of the farming ethic, especially dimensions within farmer identity and values and social norms of farm management parallel (Burton, Kuczera, & Schwarz, 2008) conceptualization of cultural capital transactions among farmers that are dependent upon first, farmer identity expression of the time invested in, skills required of, and demonstrated productivity of farming and then second, the recognition of these embodied skills by other farmers. These authors argue that to increase conservation practice adoption, conservation programs should attend to the “embodied cultural capital” that is central to the farming community. Importantly, this means conservation practices must demonstrate, in an accessible and visible way, success to other members of the farming community.

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APPENDIX A: SURVEY QUESTIONNAIRE

Cannon River Watershed Survey



Cannon River Watershed Partnership
Northfield, MN
and
Department of Forest Resources
University of Minnesota
St. Paul, Minnesota



Before you begin:

- We are conducting this survey to better understand property owners' beliefs and behaviors and to improve communication and conservation programming for property owners.
- This survey is voluntary and confidential.** It should take about 20 minutes to complete this questionnaire. Please answer the questions as completely as possible.

Once you've completed the survey:

- Please fold it in thirds and mail it back in the enclosed self-addressed stamped envelope.

Please keep in mind the following definitions while you are completing this survey:

Water resources include both surface water (lakes, streams, rivers, etc.) and groundwater.

A conservation practice refers to any effort or practice that prevents and/or minimizes degradation of water resources.

Thank you for your help!

I. Perspectives on Your Community

First, we would like to know your thoughts on your community.

1. When you think of your community, what geographic area primarily comes to mind? (Please check one) Neighborhood Township City County Watershed

2. How important are each of the following as guiding principles in your life? (Please circle one number for each row)

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
a. To identify myself as a member of my community.	1	2	3	4	5
b. To be different from members of my community.	1	2	3	4	5
c. To cooperate with members of my community.	1	2	3	4	5
d. To pursue my personal goals even if they conflict with broader community goals.	1	2	3	4	5
e. To nurture or help other members of my community.	1	2	3	4	5
f. To be self-reliant rather than depend on other community members.	1	2	3	4	5

II. Perspectives on the Environment

Next, we would like to know your thoughts on the natural environment.

3. How important are each of the following as guiding principles in your life? (Please circle one number for each row)

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
a. To preserve nature for its own sake.	1	2	3	4	5
b. To conserve natural resources for human use.	1	2	3	4	5
c. To use natural resources for personal income.	1	2	3	4	5
d. To protect nature for human health and well-being.	1	2	3	4	5
e. To maintain unity with nature.	1	2	3	4	5
f. To protect private property rights.	1	2	3	4	5
g. To respect the earth.	1	2	3	4	5
h. To conserve natural resources for my use (e.g., recreation, production, etc.)	1	2	3	4	5
i. To share natural resource benefits among all people.	1	2	3	4	5

4. To what extent do you agree or disagree with the following statements? (Please circle one number for each row)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. Protecting water resources will threaten jobs for people like me.	-2	-1	0	1	2
b. Laws to protect the environment limit my choices and personal freedom.	-2	-1	0	1	2
c. Water pollution can affect human health.	-2	-1	0	1	2
d. Water pollution can affect my lifestyle.	-2	-1	0	1	2
e. Conservation practices contribute to quality of life in my community.	-2	-1	0	1	2
f. Conservation practices protect aquatic life.	-2	-1	0	1	2
g. Water resources in my community are adequately protected.	-2	-1	0	1	2
h. Water resources in Minnesota need better protection.	-2	-1	0	1	2

III. Perception of Water Resources Problems and Conservation

In this section, we ask more specific questions related to your perspectives on water resources.

5. How familiar are you with water resource issues in your watershed? (Please check one)

Not at all familiar Slightly familiar Moderately familiar Very familiar

6. Before this survey, did you know your property is in the Cannon River Watershed? (see enclosed map) Yes No My property is not in the Cannon River Watershed

7. To what extent do you agree or disagree with the following statements? (Please circle one number for each row)

I am concerned about the consequences of water pollution for...	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. My or my family's health	-2	-1	0	1	2
b. Future generations	-2	-1	0	1	2
c. Wildlife	-2	-1	0	1	2
d. My lifestyle	-2	-1	0	1	2
e. Aquatic life	-2	-1	0	1	2
f. People in my community	-2	-1	0	1	2

8. To what extent do you agree or disagree with the following statements? (Please circle one number for each row)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. It is my personal responsibility to help protect water quality.	-2	-1	0	1	2
b. It is my personal responsibility to make sure that what I do on my land doesn't contribute to water pollution.	-2	-1	0	1	2
c. Landowners/property owners in my community should be responsible for protecting water quality.	-2	-1	0	1	2
d. The federal government should be responsible for protecting water quality.	-2	-1	0	1	2
e. The state government should be responsible for protecting water quality.	-2	-1	0	1	2
f. Local government should be responsible for protecting water quality.	-2	-1	0	1	2
g. Landowners upstream should be responsible for impacts downstream.	-2	-1	0	1	2
h. Lakeshore and streamside landowners should be responsible for protecting water quality.	-2	-1	0	1	2

9. In your opinion, how much of a problem are the following water pollutants/issues in your watershed (see map)? (Please circle one number for each row)

	Not a problem	Slight problem	Moderate problem	Severe problem	Don't know
a. Sediment (cloudiness)	1	2	3	4	DK
b. Phosphorus	1	2	3	4	DK
c. Nitrogen in surface water	1	2	3	4	DK
d. Nitrogen in drinking water	1	2	3	4	DK
e. Flooding	1	2	3	4	DK
f. Drought	1	2	3	4	DK
g. <i>E. coli</i> (bacteria)	1	2	3	4	DK
h. Pesticides	1	2	3	4	DK
i. Herbicides	1	2	3	4	DK
j. Non-native and invasive aquatic plants	1	2	3	4	DK
k. Non-native and invasive aquatic animals	1	2	3	4	DK
l. Soil loss	1	2	3	4	DK

10. In your opinion, how much of a problem are the following sources of potential water pollutants/issues in your watershed (see map)? (Please circle one number for each row)

	Not a problem	Slight problem	Moderate problem	Severe problem	Don't know
a. Industrial discharge to streams, rivers, and lakes	1	2	3	4	DK
b. Land development (e.g., residential, commercial)	1	2	3	4	DK
c. Improperly sized/maintained septic systems	1	2	3	4	DK
d. Soil erosion from farm fields	1	2	3	4	DK
e. Use of fertilizers for crop production	1	2	3	4	DK
f. Confined animal feedlot operations (CAFOs)	1	2	3	4	DK
g. Excessive use of lawn fertilizers	1	2	3	4	DK
h. Farm drainage (e.g., ditches, tiling)	1	2	3	4	DK
i. Grass clippings and leaves entering storm drains	1	2	3	4	DK
j. Urban/suburban storm water runoff	1	2	3	4	DK
k. Natural causes (e.g., natural erosion, wildlife)	1	2	3	4	DK

11. To what extent do you agree or disagree with the following statements? (Please circle one number for each row)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. My use of a conservation practice contributes to healthy water resources.	-2	-1	0	1	2
b. What I do on my land does not make much difference in overall water quality.	-2	-1	0	1	2
c. If I wanted to, I have the ability to change the way I use my land/property to protect water resources.	-2	-1	0	1	2
d. I have the financial resources I need to use conservation practices on my land/property.	-2	-1	0	1	2
e. I have the knowledge and skills I need to use conservation practices on my land/property.	-2	-1	0	1	2
f. I have the time to use conservation practices on my land/property.	-2	-1	0	1	2
g. My community has the ability to change the way land is currently used to protect water resources.	-2	-1	0	1	2
h. My community has the ability to change the way land will be developed in the future to protect water resources.	-2	-1	0	1	2
i. My community has the financial resources it needs to protect water resources.	-2	-1	0	1	2
j. My community has the leadership it needs to protect water resources.	-2	-1	0	1	2

IV. Conservation Practices and Community Engagement

Now, we have a few questions about your conservation practices and community engagement.

12. Please identify the extent to which you are currently engaged in the following conservation practices. (Please circle one response for each row)

	Not at all	In one to a few locations	In about half of the possible locations	In most possible locations	In all possible locations	Not applicable
a. I maintain a conservation buffer along streams and ditches in my property/land.	no	few	half	most	all	NA
b. I use a rain barrel on my property.	no	few	half	most	all	NA
c. I follow manufacturer's instructions and do not over-apply when fertilizing lawn or garden.	no	few	half	most	all	NA
d. I have porous (permeable) pavement to minimize runoff and allow infiltration.	no	few	half	most	all	NA
e. I plant native vegetation in my lawn or garden (e.g., rain garden).	no	few	half	most	all	NA
f. I properly maintain my septic system.	no	few	half	most	all	NA
g. I use conservation tillage practices on my farm.	no	few	half	most	all	NA
h. I follow a comprehensive nutrient management plan on my farm.	no	few	half	most	all	NA
i. I plant cover crops on my farm.	no	few	half	most	all	NA
j. I have a controlled drainage management system (conservation drainage) on my farm.	no	few	half	most	all	NA
k. I use University of MN recommendations for the timing, method, and rate of fertilizer application on my farm.	no	few	half	most	all	NA

13. How often have you engaged in the following actions in the past 12 months? (Please circle one response for each row)

In the <u>past 12 months</u> how many times have you...	Number of times					
a. Heard about a CRWP initiative (e.g., rain barrel workshop, annual watershed cleanup, newspaper column)?	0	1	2-4	5-10	>10	
b. Participated in a CRWP initiative (e.g., rain barrel workshop, annual watershed cleanup)?	0	1	2-4	5-10	>10	
c. Worked with community members to protect water quality (unrelated to the CRWP)?	0	1	2-4	5-10	>10	
d. Talked to others about conservation practices?	0	1	2-4	5-10	>10	
e. Attended a meeting, public hearing or community discussion unrelated to the CRWP about a water resource issue?	0	1	2-4	5-10	>10	

Next, we would like to know your intentions to engage in the following actions.

14. Please rate your intentions to engage in the following actions in the next 12 months. (Please circle one number for each row)

In the <u>next 12 months</u> , I intend to...	Most certainly not	Probably not	Uncertain	Probably will	Most certainly will
a. Use conservation practices on my land/property.	-2	-1	0	1	2
b. Talk to others about conservation practices.	-2	-1	0	1	2
c. Learn more about water resource issues in my watershed.	-2	-1	0	1	2
d. Work with other community members to protect water quality.	-2	-1	0	1	2
e. Attend a meeting, public hearing or community discussion about a water resource issue.	-2	-1	0	1	2
f. Do whatever I can to prevent water pollution.	-2	-1	0	1	2
g. Contact the CRWP about water resource initiatives.	-2	-1	0	1	2

15. To what extent do you agree or disagree with the following statements? (Please circle one number for each row)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. People who are important to me expect me to use conservation practices on my land/property.	-2	-1	0	1	2
b. People who are important to me use conservation practices on their land/property.	-2	-1	0	1	2
c. People who are important to me expect me to do whatever I can to prevent water pollution.	-2	-1	0	1	2
d. People who are important to me do whatever they can to prevent water pollution.	-2	-1	0	1	2
e. People who are important to me expect me to attend meetings, public hearings, or community discussions about water resource issues.	-2	-1	0	1	2
f. People who are important to me attend meetings, public hearings, or community discussions about water resource issues.	-2	-1	0	1	2
g. In general, people who are important to me influence my decisions and behavior.	-2	-1	0	1	2
h. I generally want to do what people who are important to me want me to do.	-2	-1	0	1	2

Next, we would like to know to what extent you feel a *personal obligation* to engage in the following actions.

16. To what extent do you agree or disagree with the following statements? (Please circle one number for each row)

I feel a personal obligation to...	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. Use conservation practices on my land/property.	-2	-1	0	1	2
b. Talk to others about conservation practices.	-2	-1	0	1	2
c. Learn more about water resource issues in my watershed.	-2	-1	0	1	2
d. Work with other community members to protect water quality.	-2	-1	0	1	2
e. Attend a meeting, public hearing or community discussion about a water resource issue.	-2	-1	0	1	2
f. Do whatever I can to prevent water pollution.	-2	-1	0	1	2

17. To what extent do the following individuals or groups influence your decisions about conservation? (Please circle one number for each row)

	Not at all	Slightly	Moderately	A lot	Don't know/Not applicable
a. My family	1	2	3	4	DK/NA
b. My neighbors	1	2	3	4	DK/NA
c. Environmental advocacy organizations	1	2	3	4	DK/NA
d. My county's Soil and Water Conservation District	1	2	3	4	DK/NA
e. My financial institution (e.g., financial advisor, loan officer, mortgage lender, etc.)	1	2	3	4	DK/NA
f. The Cannon River Watershed Partnership	1	2	3	4	DK/NA
g. University researchers	1	2	3	4	DK/NA
h. The MN Department of Natural Resources	1	2	3	4	DK/NA
i. The MN Pollution Control Agency	1	2	3	4	DK/NA
j. My local MN extension agent	1	2	3	4	DK/NA
k. My county's Farm Bureau	1	2	3	4	DK/NA
l. Agricultural commodity associations	1	2	3	4	DK/NA
m. Farmer's Union	1	2	3	4	DK/NA
n. My local co-op	1	2	3	4	DK/NA
o. My agronomist	1	2	3	4	DK/NA
p. Other (please specify): _____	1	2	3	4	DK/NA

18. From the previous list (Question 17, a-p), what are your three most trusted sources of information regarding water quality issues and solutions? (Please list in order of first, second, and third most trusted)

1. _____ 2. _____ 3. _____

19. To what extent do you agree or disagree with the following statements? (Please circle one number for each row)

I would be more likely to adopt or continue to use conservation practices on my land/property if...	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	
a. I knew more about the benefits of conservation practices.	-2	-1	0	1	2	
b. I knew more about how to implement and maintain conservation practices.	-2	-1	0	1	2	
c. I had help with the physical labor of implementing and maintaining conservation practices.	-2	-1	0	1	2	
d. I had access to financial resources to help me implement and maintain conservation practices.	-2	-1	0	1	2	
e. I could talk to other property owners or farmers who are using conservation practices.	-2	-1	0	1	2	
f. I could attend a community workshop or field day on conservation practices.	-2	-1	0	1	2	
g. I could be enrolled in a registry program that recognizes local conservation stewards.	-2	-1	0	1	2	
h. My neighbors maintained conservation practices.	-2	-1	0	1	2	
i. There were regulations that mandated using a conservation practice.	-2	-1	0	1	2	
j. I could learn how to maintain conservation practices for wildlife benefits.	-2	-1	0	1	2	
k. I could learn how to maintain conservation practices for scenic quality.	-2	-1	0	1	2	
l. I could learn how to maintain conservation practices for soil conservation.	-2	-1	0	1	2	
m. I could learn how to maintain conservation practices for water quality.	-2	-1	0	1	2	
n. I was compensated for lost crop production because of conservation practices.	-2	-1	0	1	2	Not Applicable

V. Watershed Management in Minnesota

Next, please consider your attitudes toward potential water resource management actions in Minnesota.

20. To what extent do you support or oppose the following potential water resource management actions in Minnesota? (Please circle one number for each row)

	Strongly oppose	Somewhat oppose	Neither oppose nor support	Somewhat support	Strongly support
a. Conducting more water resource research and monitoring.	-2	-1	0	1	2
b. Enforcing existing land use laws and regulations.	-2	-1	0	1	2
c. Increasing regulations on businesses, corporations and industries to protect water resources.	-2	-1	0	1	2
d. Increasing regulations on private property owners to protect water resources.	-2	-1	0	1	2
e. Expanding programs that offer financial incentives to property owners/farmers for conservation practices.	-2	-1	0	1	2
f. Streamlining existing programs that offer financial incentives to property owners/farmers for conservation practices.	-2	-1	0	1	2
g. Promoting voluntary adoption of conservation practices through increased education and outreach programs.	-2	-1	0	1	2
h. Coordinating land use and water planning efforts across communities.	-2	-1	0	1	2
i. Engaging more citizens in local land use and water resource decision making.	-2	-1	0	1	2

VI. Information About You

Finally, we want to know a little bit about you in order to better understand who responded to this survey. Remember, your responses to all of the survey questions are confidential.

21. Approximately how many years have you lived in your community? _____

22. Please characterize the ownership arrangement and size of your land/property. (Please check all that apply and include acreage)

Ownership	Acres
<input type="checkbox"/> I own and manage my own land/property.	_____
<input type="checkbox"/> I rent my land/property <u>to</u> another party.	_____
<input type="checkbox"/> I rent my land/property <u>from</u> another party.	_____
<input type="checkbox"/> Other (please specify): _____	_____

23. What is your experience with programs that offer financial incentives to property owners for conservation practices?

Not relevant for my property Never heard of any Familiar but not enrolled Currently enrolled

24. Do you use your land/property or rent land/property for agricultural production? (Please check yes or no) Yes No

25. Approximately what percent of your income is dependent on your land/property? _____

26. Who makes the management decisions on your property? (Please check one box)

- I make my own decisions.
- I leave it up to my renter.
- I leave it up to the landowner/property owner.
- I work together with the renter/landowners to make decisions.

27. Does the land/property you own or rent touch a ditch, stream, lake, or river? (Please check yes or no) Yes No

28. How would you characterize the quality of water in the ditch, stream, lake, or river closest to you? (Please check one box)

Very poor Poor Fair Good Very good Don't know

29. How would you characterize the quality of water in the Cannon River? (Please check one box)

Very poor Poor Fair Good Very good Don't know

30. How do you use water resources in your watershed? (Check all that apply)

- Drinking water
- Canoeing/kayaking/other boating
- Fishing
- Swimming
- Irrigation
- Picnicking and family gatherings
- Observing wildlife
- Experiencing scenic beauty

31. In what year were you born? _____

32. What is your gender? Male Female

33. What is the highest level of formal education you have completed? (Please check one box)

- Did not finish high school
- Completed high school
- Some college but no degree
- Associate degree or vocational degree
- College bachelor's degree
- Some college graduate work
- Completed graduate degree (Masters or Ph. D.)

34. Are you of Hispanic, Latino, or Spanish origin? (Please check yes or no) Yes No

35. How would you describe your race? (Please check all that apply)

- | | | |
|---|---|--|
| <input type="checkbox"/> White | <input type="checkbox"/> Native Hawaiian | <input type="checkbox"/> Korean |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> Pacific Islander | <input type="checkbox"/> Vietnamese |
| <input type="checkbox"/> American Indian of Alaska Native | <input type="checkbox"/> Chinese | <input type="checkbox"/> Filipino |
| <input type="checkbox"/> Asian Indian | <input type="checkbox"/> Japanese | <input type="checkbox"/> Other race (Please specify) |
-

36. Which of the following best describes your total household income from all sources in 2012 before taxes? (Please check one box)

- | | |
|--|--|
| <input type="checkbox"/> Under \$10,000 | <input type="checkbox"/> \$50,000 - \$74,999 |
| <input type="checkbox"/> \$10,000 - \$24,999 | <input type="checkbox"/> \$75,000 - \$99,999 |
| <input type="checkbox"/> \$25,000 - \$34,999 | <input type="checkbox"/> \$100,000 - \$149,999 |
| <input type="checkbox"/> \$35,000 - \$49,999 | <input type="checkbox"/> \$150,000 or more |

37. Do you have any other comments about your community or water resource management?

Thank you for your help!

Please complete the survey, fold it in thirds, and mail it back in the enclosed self-addressed stamped envelope.

If you have questions about the survey or project, please contact Dr. Mae Davenport, Department of Forest Resources, 115 Green Hall, 1530 Cleveland Avenue N., St. Paul, MN 55108. Phone: (612) 624-2721 or Bjorn Olson by email at olso6198@umn.edu. Cover Photo: CRWP

APPENDIX B: COVER LETTER

Date

[First Name] [Last Name]

[Street Address]

[City] [State] [Zip code]

Cannon River Watershed Survey Information and Consent Form

Dear [First Name] [Last Name],

I am writing to ask for your help in a study about your community and its water resources. The study is being conducted by Mae Davenport, Department of Forest Resources, University of Minnesota and is being funded by grants from the Cannon River Watershed Partnership. I am contacting you because you are a landowner or property owner in the Cannon River watershed and we believe you have an important perspective to share on the future of your community and its water resources. The purpose of this survey is to learn more about how local landowners like you perceive and interact with their community, their environment, and specifically their water resources.

The findings from this study will be used to help resource managers and community leaders better understand landowners' views and to facilitate communication and outreach programs in the future. Your input will inform water and land management decisions in the Cannon River watersheds. We are only contacting a random sample of landowners in this area, so it is important that we hear from you! For your reference, a map is enclosed displaying the municipalities, counties and subwatersheds that are within the Cannon River watershed.

This survey is voluntary and completely confidential. The risks of participating in this study are minimal. There are no direct benefits to you for participating in this study. You are free to withdraw at any time. Completion of this survey indicates your voluntary consent to participate. Your decision to participate will not affect your current or future relationship with the University of Minnesota. The ID # on the front page of your survey is used to help us track mailings and will ensure that your name is never affiliated with your responses. Please answer the questions as completely as possible. It should take you only about 20 minutes to complete the questionnaire. Once you have **completed the questionnaire, fold it in thirds and mail it back in the enclosed self-addressed, postage-paid envelope.**

We would be happy to answer any questions or listen to any comments you may have about this study. Please feel free to contact me by phone at 612-624-2721, or by email at mdaven@umn.edu. If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Fairview Research Helpline at telephone number 612-672-7692 or toll free at 866-508-6961. You may also contact this office in writing or in person at University of Minnesota Medical Center, Fairview Riverside Campus, 2200 Riverside Avenue, Minneapolis, MN 55454.

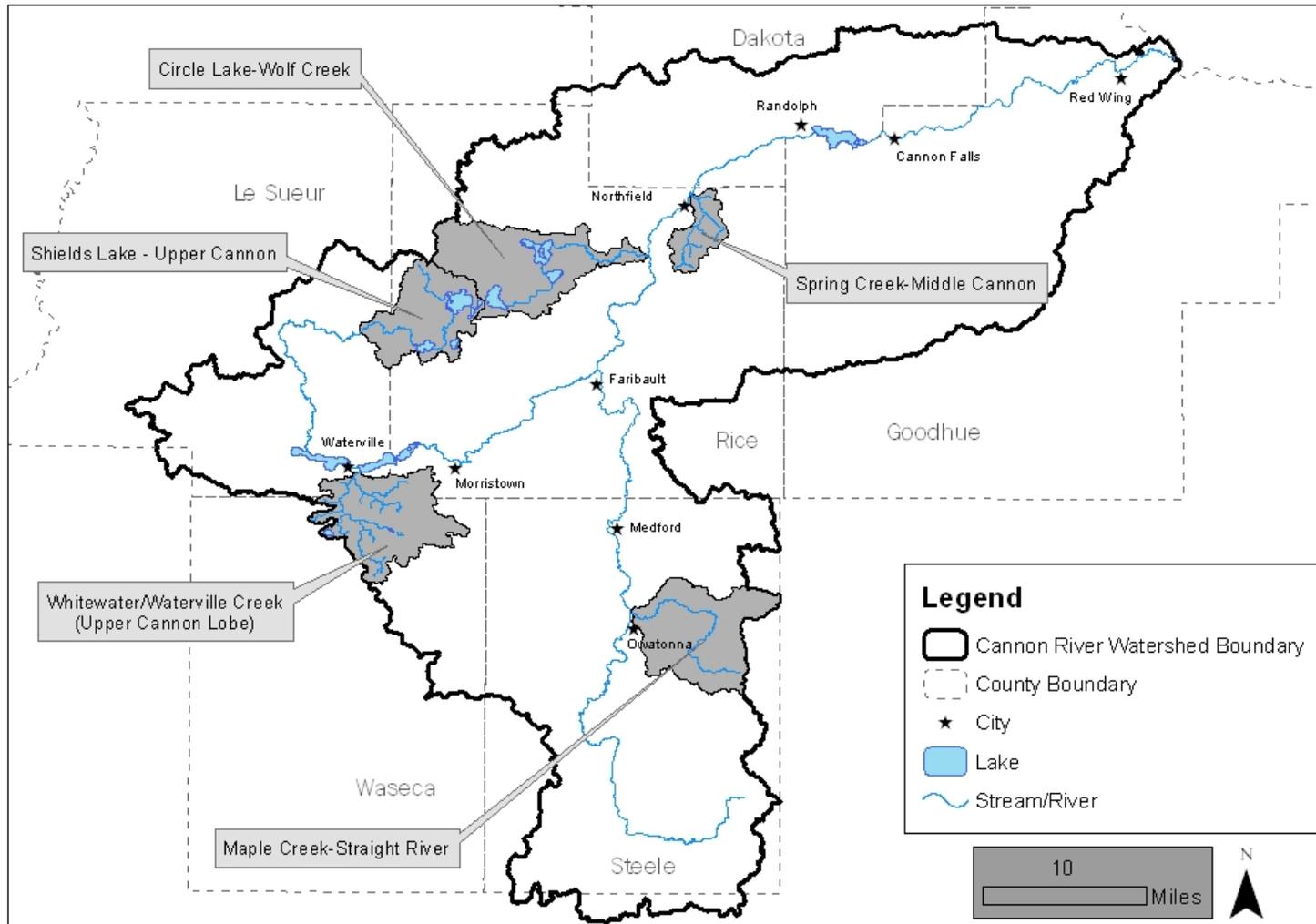
I hope you enjoy completing the questionnaire and I look forward to receiving your response.

Sincerely,

Mae Davenport
Associate Professor

APPENDIX C: CANNON RIVER WATERSHED MAP

Cannon River Watershed



APPENDIX D: REMINDER LETTER

[Date]

[Full Address]

Dear [First name Last name],

A couple of weeks ago I sent you a questionnaire inquiring about your perspectives on your community and its water resources. We are surveying landowners in the Cannon River watershed to help guide communication, outreach and citizen engagement efforts in the area.

If you have already returned your completed questionnaire, please accept our sincere thank you. If not, please do so at your earliest convenience using the self-addressed stamped envelope provided. We are especially grateful for your assistance.

We have gotten a good response from landowners in the Cannon River watershed so far, but want to make sure that we document a wide range of perspectives! Thus, your input is invaluable. We're hoping every landowner in our sample responds!

If you have any questions about the study, please contact Mae Davenport at the University of Minnesota at (612) 624-2721 or mdaven@umn.edu.

Mae Davenport
Associate Professor

APPENDIX E: REPLACEMENT COVER LETTER

[Date]

[Full Address]

Dear [First name Last name],

A few weeks ago I sent you a questionnaire that asked about your perspectives on your community and its water resources. If you have already returned your questionnaire, thank you for your response. We sincerely appreciate your input!

If you have not yet responded, I am writing again because of the importance your participation is to the study and its intended outcomes. It should take you only about 20 minutes to complete the questionnaire. The responses we have already received from other landowners in your watershed show a range of beliefs about water resources and support for watershed management initiatives. We want to ensure that your opinions are represented, too! We are only contacting a sample of landowners in your area, so it's important that we hear from you.

The purpose of this survey is to learn more about how local landowners perceive and interact with their community, their environment, and specifically their water resources. Your opinions will inform management decisions in your community related to water resources and will guide outreach and education programs. The study is being conducted by the Department of Forest Resources, University of Minnesota and is being funded by grants from the Cannon River Watershed Partnership.

This survey is voluntary and completely confidential. The ID# on the front page of your survey is used to help us track mailings and will ensure that your name is never affiliated with your responses. Please answer the questions as completely as possible. Once you have **completed the questionnaire, fold it in thirds and mail it back in the enclosed self-addressed postage-paid envelope.**

We would be happy to answer any questions or listen to any comments you may have about this study. Please feel free to contact me by phone at (612) 624-2721, or by e-mail at mdaven@umn.edu.

I hope you enjoy completing the questionnaire and look forward to receiving your response.

Sincerely,

Mae Davenport
Associate Professor

APPENDIX F: SURVEY RESULTS

Table 1. Survey response rates by subwatershed

	N	Response Rate
Shields Creek	78	54.2
Circle Lake	60	38.5
Whitewater	60	42.0
Spring Creek	53	30.8
Maple Creek	38	27.3
Unknown	3	-
Total	292	38.3

Table 2. Respondents' socio-demographic characteristics

Socio-Demographic Characteristics	N	Percent	
Gender	Male	221	79
	Female	59	21
Ethnicity (Hispanic, Latino or Spanish origin)	Yes	4	1.5
	No	268	98.5
Race	White	278	97.2
	Other Race	8	2.8
Age	Median	61	-
	Minimum	27	-
	Maximum	96	-
Years lived in community	Median	30	-
	Maximum	90	-
	Minimum	<1	-
Formal education	Did not finish high school	5	1.8
	Completed high school	54	19.3
	Some college but no degree	55	19.6
	Associate or vocational degree	49	17.5
	College bachelor's degree	60	21.4
	Some college graduate work	15	5.4
	Completed graduate degree (MS or PhD)	42	15.0
Household income	Under \$10,000	4	1.6
	\$10,000-\$24,999	19	7.5
	\$25,000-\$34,999	18	7.1
	\$35,000-\$49,999	24	9.4
	\$50,000-\$74,999	62	24.3
	\$75,000-\$99,999	60	23.5
	\$100,000-\$149,999	43	16.9
	\$150,000 or more	25	9.8

Source: Questions 21, 31, 32, 33, 34, 35, and 36; Cannon River watershed survey

Table 3. Respondents' property characteristics

Property Characteristics		N	Percent
Land/property borders a ditch, stream, lake, or river	Yes	149	52.7
	No	134	47.3
Percent income dependent on land/property	0%	215	73.6
	1-25%	45	15.4
	26-50%	14	4.8
	More than 50%	18	6.2
Property used for agricultural production	Yes	82	29.0
	No	201	71.0
Ownership arrangement	I own and manage my own property	241	82.5
	I rent my land/property <u>to</u> another party	38	13.6
	I rent my land/property <u>from</u> another party	16	5.7
	Other	21	7.5
Management decisions on land/property	I make own decisions	238	85.6
	I leave it up to my renter	13	4.7
	I leave it up to the landowner/property owner	3	1.1
	I work together with renter/landowner to make decisions	24	8.6

Source: Questions 22, 24, 25, 26 and 27; Cannon River watershed survey

Table 4. Respondents' property size

	N	Percent	Median	SD	Under 1 acre ^b	1 – 5 acres	6 – 20 acres	21 – 50 acres	51 – 150 acres	151 acres or more
Size of property owned	241	82.5	1.5	138.77	36.3	27.9	9.9	8.0	8.1	9.4
Size of property rented out	38	13.6	64.0	96.53	3.1	0.0	9.4	31.3	34.3	21.9
Size of property rented	16	5.7	95.0	646.37	7.1	7.1	7.1	14.3	28.6	35.8
Other	21	7.5	1.0	40.55	11.8	58.8	23.6	0.0	0.0	5.9

Source: Question 22; Cannon River watershed survey

^bPercent

Survey Question: When you think of your community, what geographic area primarily comes to mind?

Table 5. Respondents' perception of their community

	N	Percent
City	114	41.5
Township	52	18.9
County	52	18.9
Neighborhood	51	18.5
Watershed	6	2.2
Total	275	100.0

Source: Question 1; Cannon River watershed survey

Survey question: How important are each of the following as guiding principles in your life?

Table 6. Respondents' cultural values

	N	Mean^a	SD	Not at all important^b	Slightly important	Moderately important	Very important	Extremely important
To cooperate with members of my community	286	3.65	0.84	1.4	7.7	27.6	51.4	11.9
To nurture or help other members of my community	285	3.52	0.91	2.5	9.8	32.6	43.2	11.9
To be self-reliant rather than depend on other community members	284	3.52	1.02	3.5	13.7	25.4	41.9	15.5
To identify myself as a member of my community	286	3.17	1.07	9.1	12.6	39.5	29.4	9.4
To pursue my personal goals even if they conflict with broader community goals	283	2.51	1.10	21.2	29.0	31.4	14.5	3.9
To be different from members of my community	283	2.00	1.04	42.4	25.4	23.7	7.1	1.4

Source: Question 2; Cannon River watershed survey

^aResponses based on a five-point scale from not at all important (1) to extremely important (5).

^bPercent

Survey question: How important are each of the following as guiding principles in your life?

Table 7. Respondents' environmental values

	N	Mean^a	SD	Not at all important^b	Slightly important	Moderately important	Very important	Extremely important
To respect the earth	284	4.37	0.73	0.7	1.1	7.7	41.2	49.3
To preserve nature for its own sake	285	4.10	0.77	0.4	2.5	15.1	51.2	30.9
To protect nature for human health and well-being	285	4.10	0.82	1.4	3.5	10.2	53.7	31.2
To conserve natural resources for human use	282	3.98	0.87	0.7	5.3	18.4	46.5	29.1
To protect private property rights	285	3.91	0.95	0.7	8.1	21.1	39.6	30.6
To share natural resource benefits among all people	285	3.87	0.90	1.4	4.9	24.2	43.9	25.6
To maintain unity with nature	282	3.81	1.00	3.2	6.4	22.7	41.2	26.6
To conserve natural resources for my use (e.g., recreation, production, etc.)	285	3.61	0.98	2.8	10.5	26.3	43.2	17.2
To use natural resources for personal income	284	1.93	1.05	45.8	25.0	21.9	4.9	2.5

Source: Question 3; Cannon River watershed survey

^aResponses based on a five-point scale from not at all important (1) to extremely important (5).

^bPercent

Survey question: To what extent do you agree or disagree with the following statements?

Table 8. Respondents' beliefs about effects of water quality conservation practices

	N	Mean ^a	SD	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Water pollution can affect human health	286	1.83	0.48	0.3	0.3	1.4	11.5	86.4
Conservation practices protect aquatic life	283	1.61	0.67	0.4	0.7	6.0	23.0	70.0
Water pollution can affect my lifestyle	282	1.53	0.77	1.1	1.1	7.4	24.8	65.6
Conservation practices contribute to quality of life in my community	287	1.42	0.82	1.4	1.4	8.7	30.7	57.8
Water resources in Minnesota need better protection	286	1.19	0.88	1.4	2.1	16.4	36.0	44.1
Water resources in my community are adequately protected	285	0.01	1.18	10.9	25.6	24.9	28.4	10.2
Laws to protect the environment limit my choices and personal freedom.	286	-0.44	1.29	27.3	25.5	17.1	23.8	6.3
Protecting water resources will threaten jobs for people like me.	286	-1.07	1.13	52.1	15.4	23.8	5.2	3.5

Source: Question 4; Cannon River watershed survey

^aResponses based on a five-point scale from strongly disagree (-2) to strongly agree (+2).

^bPercent

Survey question: How familiar are you with water resource issues in your watershed?

Table 9. Respondents' familiarity with water resource issues in their watershed

	N	Percent
Not at all familiar	47	16.9
Slightly familiar	126	45.3
Moderately familiar	80	28.8
Very familiar	25	9.0
Total	278	100.0

Source: Question 5; Cannon River watershed survey

Survey question: Before this survey, did you know your property is in the Cannon River watershed?

Table 10. Respondents' knowledge of property ownership in Cannon River watershed

	N	Percent
Yes	199	72.1
No	70	25.4
Not in Cannon River watershed	7	2.5
Total	276	100.0

Source: Question 6; Cannon River watershed survey

Survey question: To what extent do you agree or disagree with the following statements?

Table 11. Respondents' concerns about the consequences of water pollution

I am concerned about the consequences of water pollution for...	N	Mean^a	SD	Strongly disagree^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Future generations	286	1.60	0.69	1.0	0.3	4.2	26.2	68.2
Wildlife	286	1.58	0.67	0.7	0.3	5.9	26.2	66.8
Aquatic life	284	1.51	0.72	0.7	1.1	6.0	30.6	61.9
My or my family's health	283	1.46	0.78	1.4	1.1	6.4	32.5	58.7
People in my community	286	1.29	0.86	1.7	1.7	10.8	37.4	48.3
My lifestyle	286	1.06	0.93	2.1	2.4	19.9	38.4	37.1

Source: Question 7; Cannon River watershed survey

^aResponses based on a five-point scale from strongly disagree (-2) to strongly agree (+2).

^bPercent

Survey question: To what extent do you agree or disagree with the following statements?

Table 12. Respondents' perceptions of who should take responsibility for addressing water quality issues

	N	Mean ^a	SD	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
It is my personal responsibility to make sure that what I do on my land doesn't contribute to water pollution	287	1.63	0.60	0.3	0.3	2.8	28.9	67.6
Lakeshore and streamside landowners should be responsible for protecting water quality	286	1.63	0.60	0.0	0.7	3.8	27.6	67.8
Landowners/property owners in my community should be responsible for protecting water quality	287	1.57	0.64	0.7	0.0	3.8	32.8	62.7
Landowners upstream should be responsible for impacts downstream	287	1.54	0.74	1.4	0.0	6.6	27.5	64.5
It is my personal responsibility to help protect water quality	287	1.41	0.70	0.7	0.3	6.6	41.8	50.5
Local government should be responsible for protecting water quality	286	1.21	0.91	1.4	4.9	9.4	39.5	44.8
The state government should be responsible for protecting water quality	287	1.01	1.09	4.2	8.0	9.4	39.0	39.3
The federal government should be responsible for protecting water quality	285	0.74	1.22	7.4	9.8	16.8	33.3	32.7

Source: Question 8; Cannon River watershed survey

^aResponses based on a five-point scale from strongly disagree (-2) to strongly agree (+2).

^bPercent

Survey question: In your opinion, how much of a problem are the following pollutants/issues in your watershed?

Table 13. Respondents' perceptions about pollutants/issues in their watershed

	N	Mean ^a	SD	Not a problem ^b	Slight problem	Moderate problem	Severe problem	Don't know
Phosphorus	280	3.16	0.87	2.9	9.3	21.1	23.9	42.9
Herbicides	282	3.11	0.87	2.5	13.1	21.6	25.2	37.6
Nitrogen in surface water	280	3.10	0.92	3.2	8.9	16.8	20.4	50.7
Pesticides	282	3.04	0.91	3.9	12.1	22.0	22.3	39.7
Non-native and invasive aquatic plants	280	2.99	0.96	6.1	13.9	23.6	25.4	31.1
Sediment (cloudiness)	277	2.96	0.90	6.5	13.0	33.9	23.1	23.5
Soil loss	281	2.90	0.86	4.6	17.1	33.1	18.9	26.3
Non-native and invasive aquatic animals	282	2.67	1.01	9.6	14.9	21.3	14.2	40.1
<i>E. coli</i> (bacteria)	282	2.49	1.02	9.2	16.0	13.8	9.6	51.4
Flooding	281	2.49	1.00	15.7	27.4	24.9	15.7	16.4
Nitrogen in drinking water	278	2.38	1.05	10.8	12.9	12.6	6.8	56.9
Drought	282	2.33	0.88	16.3	29.4	30.5	6.7	17.0

Source: Question 9; Cannon River watershed survey

^aResponses based on a four-point scale from not a problem (1) to severe problem (4)

^bPercent

Survey question: In your opinion, how much of a problem are the following sources of potential water pollutants/issues in your watershed?

Table 14. Respondents' perceptions about sources of pollutants/issues in their watershed

	N	Mean^a	SD	Not a problem^b	Slight problem	Moderate problem	Severe problem	Don't know
Use of fertilizers for crop production	284	3.07	0.97	7.0	15.1	26.1	35.2	16.5
Soil erosion from farm fields	281	2.88	0.90	5.0	24.6	30.6	24.2	15.7
Farm drainage (e.g., ditches, tiling)	283	2.88	1.04	10.2	16.3	23.7	27.2	22.6
Excessive use of lawn fertilizers	282	2.78	0.97	9.6	20.6	39.8	22.0	18.1
Urban/suburban stormwater runoff	283	2.70	0.98	9.9	22.3	26.5	18.7	22.6
Land development (e.g., residential, commercial)	281	2.68	0.91	9.6	23.8	35.2	16.0	15.3
Confined animal feedlot operations (CAFOs)	283	2.59	1.07	13.4	17.7	19.8	17.0	32.2
Improperly sized/maintained septic systems	282	2.57	0.95	10.3	23.4	24.5	13.1	28.7
Industrial discharge to streams, rivers, and lakes	282	2.36	0.99	16.3	23.0	21.6	9.9	29.1
Grass clippings and leaves entering storm drains	284	2.34	0.93	15.8	29.9	23.9	9.5	20.8
Natural causes (e.g., natural erosion, wildlife)	284	2.10	0.82	18.0	33.8	18.7	3.5	26.1

Source: Question 10; Cannon River watershed survey

^aResponses based on a four-point scale from not a problem (1) to severe problem (4)

^bPercent

Survey question: To what extent do you agree or disagree with the following statements?

Table 15. Respondents' perceptions about their and their community's ability to protect water resources.

	N	Mean ^a	SD	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
My use of a conservation practice contributes to healthy water resources	284	1.11	0.82	1.1	1.1	18.7	44.0	35.2
My community has the ability to change the way land will be developed in the future to protect water resources.	285	0.94	1.00	2.5	6.7	18.2	39.3	33.3
My community has the ability to change the way land is currently used to protect water resources.	285	0.60	1.11	4.2	13.3	23.9	35.8	22.8
If I wanted to, I have the ability to change the way I use my land/property to protect water resources.	284	0.58	1.05	3.9	10.6	29.9	34.9	20.8
I have the time to use conservation practices on my land/property	285	0.54	0.99	3.2	12.6	25.9	45.3	14.0
I have the knowledge and skills I need to use conservation practices on my land/property	284	0.40	1.08	6.3	14.1	25.4	41.2	13.0
My community has the financial resources it needs to protect water resources.	284	0.20	1.04	6.3	16.9	37.0	30.0	9.5
I have the financial resources I need to use conservation practices on my land/property	285	0.06	1.16	11.6	20.0	29.5	29.1	9.8
My community has the leadership it needs to protect water resources.	285	-0.23	1.03	14.4	20.7	42.1	19.3	3.5
What I do on my land does not make much difference in overall water quality	285	-0.64	1.31	31.6	33.7	10.2	15.8	8.8

Source: Question 11; Cannon River watershed survey

^aResponses based on a five-point scale from strongly disagree (-2) to strongly agree (+2).

^bPercent

Survey question: Please identify the extent to which you are currently engaged in the following conservation practices

Table 16. Respondents' current conservation practices

	N	Not at all ^b	In one to a few locations	In about half of the possible locations	In most possible locations	In all possible locations
I properly maintain my septic system	171	2.3	2.3	0.6	9.9	84.8
I follow manufacturer's instructions and do not over-apply when fertilizing lawn or garden	179	2.6	1.7	1.3	16.5	77.8
I use conservation tillage practices on my farm	71	9.9	7.0	7.0	22.5	53.5
I follow a comprehensive nutrient management plan on my farm	60	15.0	3.3	8.3	23.3	50.0
I maintain a conservation buffer along streams and ditches in my property/land	140	20.0	5.7	7.9	27.9	38.6
I plant cover crops on my farm	70	27.1	11.4	8.6	17.1	35.7
I have a controlled drainage management system (conservation drainage) on my farm	68	36.8	4.4	8.8	19.1	30.9
I use University of MN recommendations for the timing, method, and rate of fertilizer application on my farm	64	45.3	4.7	0	20.3	29.7
I plant native vegetation in my lawn or garden (e.g. rain garden)	244	35.7	18.4	9.0	18.4	18.4
I have porous (permeable) pavement to minimize runoff and allow infiltration	216	54.6	9.7	2.3	13.4	19.9
I use a rain barrel on my property	253	79.4	6.7	4.0	5.5	4.3

Source: question 12; Cannon River watershed survey

^aResponses based on a five-point scale from not at all (1) to In all possible locations (5); a not applicable response option was provided, those responses are excluded from this table.

^bPercent

Survey question: How often have you engaged in the following actions in the past 12 months?

Table 17. Respondents' civic engagement behavior

	N	0 ^b	1	2-4	5-10	>10
Heard about a CRWP initiative (e.g., rain barrel workshop, annual watershed cleanup, newspaper column)	284	37.3	14.1	33.8	12.7	2.1
Talked to others about conservation practices	284	45.8	22.9	26.1	3.9	1.4
Participated in a CRWP initiative (e.g., rain barrel workshop, annual watershed cleanup)	284	78.5	10.2	9.5	1.4	0.4
Worked with community members to protect water quality (unrelated to the CRWP)	284	79.6	9.9	8.5	1.8	0.4
Attended a meeting, public hearing or community discussion unrelated to the CRWP about a water resource issue	284	90.8	4.6	3.9	0.4	0.4

Source: Question 13; Cannon River watershed survey

^aResponses based on a five-point scale from 0 (1) to >10 (5)

^bPercent

Survey question: Please rate your intentions to engage in the following actions in the next 12 months.

Table 18. Participants' intentions to engage in conservation behavior

In the next 12 months, I intend to...	N	Mean ^a	SD	Most certainly not ^b	Probably not	Uncertain	Probably will	Most certainly will
Do whatever I can to prevent water pollution	284	1.14	0.87	1.4	2.8	14.8	42.6	38.4
Use conservation practices on my land/property	283	0.93	1.02	3.2	4.6	22.3	36.0	33.9
Learn more about water resource issues in my watershed	284	0.41	0.94	3.9	10.6	35.6	40.5	9.5
Talk to others about conservation practices	285	0.36	1.00	4.2	14.7	31.9	38.6	10.5
Work with other community members to protect water quality	285	0.10	0.94	4.6	19.3	43.9	26.0	6.3
Attend a meeting, public hearing or community discussion about a water resource issue	284	-0.03	0.97	6.3	22.5	46.5	17.3	7.4
Contact the CRWP about water resource initiatives	285	-0.28	0.91	8.8	29.1	47.4	10.9	3.9

Source: Question 14; Cannon River watershed survey

Responses based on a five-point scale from most certainly not (-2) to most certainly will (+2)

^bPercent

Survey question: To what extent do you agree or disagree with the following statements?

Table 19. Respondents' perceived social norms of conservation practices

	N	Mean ^a	SD	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
People who are important to me expect me to do whatever I can to prevent water pollution	285	0.85	0.83	1.1	3.2	26.7	47.7	21.4
People who are important to me expect me to use conservation practices on my land/property	284	0.72	0.89	1.4	4.6	35.2	38.0	20.8
People who are important to me do whatever they can to prevent water pollution	285	0.66	0.85	1.4	6.7	29.8	48.4	13.7
People who are important to me use conservation practices on their land/property	285	0.61	0.83	1.8	4.6	37.5	43.2	13.0
In general, people who are important to me influence my decisions and behavior	285	0.36	0.98	5.6	10.2	35.4	40.0	8.8
I generally want to do what people who are important to me want me to do	285	0.29	0.95	5.6	10.9	39.8	36.6	7.0
People who are important to me attend meetings, public hearings, or community discussions about water resource issues	285	-0.08	0.89	7.0	19.6	50.2	20.4	2.8
People who are important to me expect me to attend meetings, public hearings, or community discussions about water resource issues	285	-0.20	0.96	11.2	20.0	50.2	14.7	3.9

Source: Question 15; Cannon River watershed survey

^aResponses based on a five-point scale from strongly disagree (-2) to strongly agree (+2)

^bPercent

Survey question: To what extent do you agree or disagree with the following statements?

Table 20. Respondents' personal obligation to do something about water quality issues

I feel a personal obligation to...	N	Mean ^a	SD	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Do whatever I can to prevent water pollution	282	1.27	0.72	0.0	1.4	11.7	45.0	41.8
Use conservation practices on my land/property	283	1.25	0.75	0.7	1.1	11.3	46.3	40.6
Learn more about water resource issues in my watershed	283	0.69	0.80	1.8	2.8	32.9	49.8	12.7
Talk to others about conservation practices	282	0.49	0.84	1.4	8.2	40.8	39.7	9.9
Work with other community members to protect water quality	283	0.52	0.85	1.8	6.4	41.7	38.2	12.0
Attend a meeting, public hearing or community discussion about a water resource issue	282	0.20	0.92	4.6	12.4	49.3	25.9	7.8

Source: Question 16; Cannon River watershed survey

^aResponses based on a five-point scale from strongly disagree (-2) to strongly agree (+2)

^bPercent

Survey question: To what extent do the following individuals or groups would influence your decisions about conservation?

Table 21. Individuals or groups that influence landowners' decisions about conservation practices

	N	Mean^a	SD	Not at all^b	Slightly	Moderately	A lot	Don't know/Not applicable
My family	270	2.96	1.00	9.9	20.1	29.7	35.7	4.6
The MN Department of Natural Resources	261	2.50	0.95	14.8	31.8	30.4	15.2	7.8
My county's Soil and Water Conservation District	253	2.46	1.01	18.4	27.9	26.9	16.3	10.6
My neighbors	268	2.44	0.92	17.4	29.1	37.6	11.0	5.0
The MN Pollution Control Agency	251	2.35	0.99	20.5	30.0	25.1	13.1	11.3
Environmental advocacy organizations	264	2.21	0.92	27.7	29.4	25.9	10.6	6.4
The Cannon River Watershed Partnership	240	2.20	0.95	24.1	27.0	26.6	7.4	14.9
University researchers	247	2.15	0.99	26.9	30.7	19.4	10.2	12.7
My local MN extension agent	219	2.04	1.04	30.5	23.8	13.5	9.9	22.3
My county's Farm Bureau	192	1.60	0.90	42.4	14.5	6.7	4.2	32.2
My local co-op	180	1.58	0.88	38.9	16.6	3.9	4.2	36.4
Agricultural commodity associations	183	1.55	0.87	42.0	12.7	6.7	3.2	35.3
My agronomist	154	1.55	0.90	36.4	9.9	4.6	3.5	45.6
My financial institution (e.g., financial advisor, loan officer, mortgage lender, etc.)	236	1.51	0.85	56.9	13.4	9.9	3.2	16.6
Farmer's Union	169	1.33	0.70	46.3	9.5	1.8	2.1	40.3
Other	9	2.78	1.30	22.2	22.2	11.1	44.4	0.0

Source: Question 17; Cannon River watershed survey

^aResponses based on a four-point scale from not at all (1) to a lot (4)

^bPercent

Survey question: From the previous list, what are you three most trusted sources of information regarding water quality issues and solutions?

Table 22. Respondents' most trusted sources of information regarding water quality

	N	Most trusted ^a	Second most trusted	Third most trusted
The MN Department of Natural Resources	124	48	42	34
My county's Soil and Water Conservation District	95	43	20	32
The MN Pollution Control Agency	84	14	40	30
The Cannon River Watershed Partnership	78	21	32	25
University researchers	70	27	23	20
My family	54	27	15	12
My neighbors	37	6	17	14
Environmental advocacy organizations	32	10	5	17
My local MN extension agent	26	11	5	10
My agronomist	8	3	4	1
My local co-op	8	1	3	4
My county's Farm Bureau	6	0	3	3
Other	4	2	0	2
My financial institution (e.g., financial advisor, loan officer, mortgage lender, etc.)	2	0	1	1
Agricultural commodity associations	1	0	0	1
Farmer's Union	0	0	0	0

Source: Question 18; Cannon River watershed survey

^bN

Survey question: To what extent do you agree or disagree with the following statements?

Table 23. Respondents' views about factors that would enhance their conservation practices

I would be more likely to adopt or continue to use conservation practices on my land/property if...	N	Mean ^a	SD	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Not applicable
I could learn how to maintain conservation practices for water quality	277	0.82	0.89	1.8	3.6	27.8	44.0	22.7	
I knew more about how to implement and maintain conservation practices	279	0.72	0.88	1.8	5.0	30.8	44.4	17.9	
I could learn how to maintain conservation practices for wildlife benefits	278	0.71	0.89	2.2	4.7	31.3	43.9	18.0	
I could learn how to maintain conservation practices for soil conservation	278	0.65	0.89	2.2	4.7	36.0	39.9	17.3	
I knew more about the benefits of conservation practices	280	0.61	0.85	1.8	6.8	32.5	46.8	12.1	
I had access to financial resources to help me implement and maintain conservation practices	279	0.61	1.04	3.6	7.9	36.2	29.0	23.3	
I could learn how to maintain conservation practices for scenic quality	277	0.59	0.94	4.0	4.7	34.7	41.5	15.2	
I have help with the physical labor of implementing and maintaining conservation practices	279	0.41	0.98	4.3	8.2	43.7	29.4	14.3	
My neighbors maintained conservation practices	279	0.31	0.93	5.4	9.0	42.7	35.5	7.5	
I could talk to other property owners or farmers who are using conservation practices	278	0.27	0.82	3.2	7.6	54.3	28.8	6.1	
I could attend a community workshop or field day on conservation practices	279	0.20	0.93	5.4	11.8	47.3	28.7	6.8	
I was compensated for lost crop production because of conservation practices	166	0.13	1.16	7.1	5.7	28.2	8.9	9.3	40.7
There were regulations that mandated using a conservation practice	277	0.12	1.24	15.5	10.8	33.6	26.0	14.1	
I could be enrolled in a registry program that recognizes local conservation stewards	278	-0.18	0.92	10.8	16.5	55.8	13.3	3.6	

Source: Question 19; Cannon River watershed survey

^aResponses based on a five-point scale from strongly disagree (-2) to strongly agree (+2)

^bPercent

Survey question: To what extent do you support or oppose the following potential water resource management actions in Minnesota?

Table 24. Respondents' perceptions about management actions to protect water resources

	N	Mean ^a	SD	Strongly oppose ^b	Somewhat oppose	Neither oppose nor support	Somewhat support	Strongly support
Promoting voluntary adoption of conservation practices through increased education and outreach programs	280	1.14	0.82	0.7	2.1	17.1	42.9	37.1
Enforcing existing land use laws and regulations	278	1.08	0.96	1.8	3.6	20.5	33.1	41.0
Coordinating land use and water planning efforts across communities	280	1.02	0.85	1.4	1.1	22.9	43.2	31.4
Conducting more water resource research and monitoring	279	0.99	0.93	1.4	5.0	19.7	40.5	33.3
Engaging more citizens in local land use and water resource decision making	280	0.90	0.88	1.8	1.8	27.9	41.8	26.8
Increasing regulations on businesses, corporations and industries to protect water resources	280	0.86	1.19	7.1	5.7	18.6	31.1	37.5
Streamlining existing programs that offer financial incentives to property owners/farmers for conservation practices	280	0.82	1.04	4.3	5.7	22.1	39.6	28.2
Expanding programs that offer financial incentives to property owners/farmers for conservation practices	280	0.80	1.07	5.4	6.1	17.9	44.3	26.4
Increasing regulations on private property owners to protect water resources	280	0.48	1.29	10.7	12.9	18.9	32.5	25.0

Source: Question 20; Cannon River watershed survey

^aResponses based on a five-point scale from strongly oppose (-2) to strongly support (+2)

^bPercent

Survey question: What is your experience with programs that offer financial incentives to property owners for conservation practices?

Table 25. Respondents' experience with financial conservation incentives

	N	Percent
Not relevant for my property	97	34.6
Never heard of any	104	37.1
Familiar but not enrolled	44	15.7
Currently enrolled	35	12.5
Total	280	100.0

Source: Question 23; Cannon River watershed survey

Survey question: How would you characterize the quality of water in the ditch, stream, lake, or river closest to you?

Table 26. Respondents' perceptions of the quality of water in the ditch, stream, lake, or river closest to them

	N	Percent
Very poor	18	6.6
Poor	42	15.3
Fair	87	31.8
Good	62	22.6
Very good	19	6.9
Don't know	46	16.8
Total	274	100.0

Source: Question 28; Cannon River watershed survey

Survey question: How would you characterize the quality of water in the Cannon River?

Table 27. Respondents' perceptions of the quality of water in the Cannon River

	N	Percent
Very poor	12	4.2
Poor	45	15.9
Fair	112	39.6
Good	38	13.4
Very good	6	2.1
Don't know	70	24.7
Total	283	100.0

Source: Question 29; Cannon River watershed survey

Survey question: How do you use water resources in your watershed?

Table 28. Respondents' use of water resources

	N	Percent
Experiencing scenic beauty	282	65.2
Observing wildlife	282	63.8
Drinking water	282	61.3
Fishing	282	51.8
Canoeing/kayaking/other boating	282	43.6
Picnicking and family gatherings	282	34.0
Swimming	282	28.0
Irrigation	282	7.1

Source: Question 30; Cannon River watershed survey

Table 29. Number of respondents by subwatershed type

Subwatershed Type^a	N	Percent
Rural/ag	180	62.3
Urban/ag	109	37.3
Total	289	100.0

^aRural/ag subwatersheds = Circle Lake, Shields and Whitewater
 Urban/ag subwatersheds = Maple Creek and Spring Creek

Table 30. Difference between rural/ag and urban/ag respondents in use of their land for agricultural production

Subwatershed Type^a	Use land for agricultural production (%)	χ^2
Rural/ag	93.9	49.294
Urban/ag	6.1	
Total	100	

^aRural/ag subwatersheds = Circle Lake, Shields and Whitewater
 Urban/ag subwatersheds = Maple Creek and Spring Creek
 χ^2 Chi-square statistic for testing differences in proportions; $p \leq .01$.

Table 31. Differences between rural/ag and urban/ag respondents in their beliefs, responsibility, perceived ability and barriers to adoption or continued use of conservation practices

Survey item ^a	Subwatershed Type ^b	N	Mean	SD	t ^c	Cohen's d ^d
Beliefs about consequences						
Laws to protect the environment limit my choices and personal freedom.	Rural/ag	177	-0.19	1.30	4.309	0.53
	Urban/ag	106	-0.85	1.16		
Responsibility						
The state government should be responsible for protecting water quality.	Urban/ag	107	1.29	0.86	-3.450	-0.42
	Rural/ag	177	0.84	1.18		
Perceived ability						
My community has the ability to change the way land is currently used to protect water resources.	Urban/ag	106	0.83	0.93	-2.828	-0.35
	Rural/ag	176	0.45	1.18		
My community has the financial resources it needs to protect water resources.	Urban/ag	106	0.42	0.99	-2.799	-0.35
	Rural/ag	176	0.06	1.04		
Barriers to conservation						
<i>I would be more likely to adopt or continue to use conservation practices on my land/property if:</i>						
I was compensated for lost crop production because of conservation practices.	Rural/ag	110	0.35	1.19	3.679	0.61
	Urban/ag	55	-0.33	0.98		
I had access to financial resources to help me implement and maintain conservation practices.	Rural/ag	170	0.75	1.07	2.913	0.36
	Urban/ag	107	0.38	0.96		

^aItems measured on a five point scale from -2 (strongly disagree) to 2 (strongly agree)

^bRural/ag subwatersheds = Circle Lake, Shields and Whitewater

Urban/ag subwatersheds = Maple Creek and Spring Creek

^cT-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq .01$ reported here.

^dEffect size statistic for measuring the magnitude of the difference between subgroups.

SD = Standard Deviation

Table 32. Differences between rural/ag and urban/ag respondents in their perceptions of water pollutants/issues and sources of water pollutants/issues as problems.

Survey item*	Subwatershed Type ^a	N	Mean	SD	t ^c	Cohen's d ^d
Water pollutant/issue						
Flooding	Urban/ag	87	2.93	0.86	-5.582	-0.76
	Rural/ag	145	2.22	0.98		
Sources of water pollutants/issues						
Confined animal feedlot operations (CAFOs)	Urban/ag	63	2.90	0.96	-2.970	-0.45
	Rural/ag	127	2.43	1.09		
Grass clippings and leaves entering storm drains	Urban/ag	83	2.58	0.81	-3.089	-0.43
	Rural/ag	139	2.19	0.97		
Urban/ag/suburban/ag stormwater runoff	Urban/ag	83	2.99	0.83	-3.633	-0.51
	Rural/ag	133	2.50	1.02		

^aItems measured on a 4-point scale from 1 (not a problem) to 4 (severe problem)

^bRural/ag subwatersheds = Circle Lake, Shields and Whitewater

Urban/ag subwatersheds = Maple Creek and Spring Creek

^cT-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq .01$ reported here.

^dEffect size statistic for measuring the magnitude of the difference between subgroups.

SD = Standard Deviation

Table 33. Difference between rural/ag and urban/ag respondents in their reporting of whether their property touches a ditch, stream, lake or river

		Subwatershed Type			χ^2
		Rural/ag	Urban/ag	Total	
Property touches a ditch, stream, lake or river	Yes	85.8%	14.2%	100%	71.772
	No	36.8%	63.2%	100%	

χ^2 Chi-square statistic for testing differences in proportions; $p \leq .01$.

Table 34. Number of respondents by levels of intended civic engagement

Levels of intended civic engagement [#]	N	Percent
High	78	27.6
Moderate	118	41.7
Low	87	30.7
Total	283	100.0

[#]Based on an index of survey questions 14b, 14c, 14d, 14e and 14g measured on a 5-point scale from most certainly not (-2) to most certainly will (+2). High = index score greater than 0.5-2.0, medium= index score of 0-0.5 and low = index score of -2 to less than 0.

Table 35. Differences among respondents with varying levels of intended civic engagement in the use of their land for agricultural production

Levels of intended civic engagement[#]	Use land for agricultural production (%)	χ^2
High	21.2	11.227
Moderate	37.5	
Low	41.3	
Total	100	

[#]Based on an index of survey questions 14b, 14c, 14d, 14e and 14g measured on a 5-point scale from most certainly not (-2) to most certainly will (+2). High = index score greater than 0.5-2.0, medium= index score of 0-0.5 and low = index score of -2 to less than 0.

χ^2 Chi-square statistic for testing differences in proportions; $p \leq .01$

Table 36. Differences among respondents with varying levels of intended civic engagement in their awareness, responsibility and perceived ability

Survey item	Levels of intended civic engagement [#]	N	Mean	SD	F*
Beliefs about consequences (5-point scale from strongly disagree (-2) to strongly agree (+2))					
Water pollution can affect my lifestyle.	High ^b	77	1.78	0.48	10.112
	Moderate ^b	118	1.57	0.70	
	Low ^a	83	1.25	0.99	
Water resources in Minnesota need better protection.	High ^b	77	1.43	0.91	8.726
	Moderate ^b	118	1.25	0.82	
	Low ^a	86	0.88	0.87	
Conservation practices contribute to quality of life in my community.	High ^b	77	1.65	0.68	4.893
	Moderate ^a	118	1.39	0.84	
	Low ^a	86	1.26	0.88	
My use of a conservation practice contributes to healthy water resources.	High ^b	77	1.35	0.85	4.858
	Moderate ^a	118	1.03	0.83	
	Low ^a	85	1.00	0.72	
Responsibility (5-point scale from strongly disagree (-2) to strongly agree (+2))					
It is my personal responsibility to help protect water quality.	High ^b	77	1.62	0.51	11.404
	Moderate ^b	118	1.48	0.58	
	Low ^a	87	1.15	0.86	
It is my personal responsibility to make sure that what I do on my land doesn't contribute to water pollution.	High ^b	77	1.81	0.40	8.393
	Moderate ^b	118	1.65	0.55	
	Low ^a	87	1.44	0.74	
Landowners/property owners in my community should be responsible for protecting water quality.	High ^b	77	1.77	0.43	7.841
	Moderate ^a	118	1.58	0.60	
	Low ^a	87	1.38	0.78	
Perceived ability (5-point scale from strongly disagree (-2) to strongly agree (+2))					
My community has the ability to change the way land will be developed in the future to protect water resources.	High ^b	77	1.18	0.85	4.975
	Moderate ^{ab}	118	0.97	1.05	
	Low ^a	86	0.70	1.01	

[#]Based on an index of survey questions 14b, 14c, 14d, 14e and 14g measured on a 5-point scale from most certainly not (-2) to most certainly will (+2). High = index score greater than 0.5-2.0, medium= index score of 0-0.5 and low = index score of -2 to less than 0.

*F-statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq .01$ reported here. Items are listed in descending order by F-statistic.

^{a, b, c} Each superscript letter denotes no significant difference between levels of civic engagement at a significance level of $p \leq .01$ based on least significant difference (LSD) post-hoc test.

SD = Standard deviation

Table 37. Differences among respondents with varying levels of intended civic engagement in their past civic behaviors

Survey item	Levels of intended civic engagement [#]	N	Mean	SD	F*
In the past 12 months, how many times have you... (5-point scale: 0 (1), 1 (2), 2-4 (3), 5-10 (4) and >10 (5))					
Attended a meeting, public hearing or community discussion about a water resource issue	High ^b	78	1.87	1.02	33.261
	Moderate ^a	117	1.15	0.42	
	Low ^a	87	1.15	0.52	
Talked to others about conservation practices	High ^c	77	2.99	0.99	30.991
	Moderate ^b	118	2.25	1.06	
	Low ^a	87	1.70	1.07	
Worked with community members to protect water quality	High ^b	78	1.81	1.05	27.626
	Moderate ^a	117	1.20	0.53	
	Low ^a	87	1.08	0.35	
Participated in a Cannon River Watershed Partnership initiative (e.g., rain barrel workshop, annual watershed cleanup)	High ^b	78	1.42	0.85	16.713
	Moderate ^a	117	1.04	0.24	
	Low ^a	87	1.05	0.26	
Heard about a Cannon River Watershed Partnership initiative (e.g., rain barrel workshop, annual watershed cleanup, newspaper column)	High ^b	78	2.27	1.11	9.489
	Moderate ^{ab}	117	1.93	0.94	
	Low ^a	87	1.61	0.88	

[#]Based on an index of survey questions 14b, 14c, 14d, 14e and 14g measured on a 5-point scale from most certainly not (-2) to most certainly will (+2). High = index score greater than 0.5-2.0, medium= index score of 0-0.5 and low = index score of -2 to less than 0.

*F-statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq .01$ reported here. Items are listed in descending order by F-statistic.

^{a, b, c} Each superscript letter denotes no significant difference between levels of civic engagement at a significance level of $p \leq .01$ based on least significant difference (LSD) post-hoc test.

SD = Standard Deviation

Table 38. Differences among respondents with varying levels of intended civic engagement in the extent to which their conservation decisions are influenced by individuals or groups

Survey item ^f	Levels of intended civic engagement [#]	N	Mean	SD	F*
University researchers	High ^c	70	2.86	0.87	34.778
	Moderate ^b	97	2.04	0.95	
	Low ^a	77	1.68	0.79	
The Cannon River Watershed Partnership	High ^c	66	2.79	0.85	25.912
	Moderate ^b	98	2.15	0.83	
	Low ^a	73	1.74	0.91	
County Soil and Water Conservation District	High ^c	71	3.04	0.92	23.597
	Moderate ^b	104	2.41	0.89	
	Low ^a	75	1.99	1.01	
Local MN extension agent	High ^b	66	2.68	1.10	22.306
	Moderate ^a	81	1.83	0.88	
	Low ^a	69	1.67	0.89	
Environmental advocacy organizations	High ^c	75	2.68	0.92	18.142
	Moderate ^b	109	2.20	0.95	
	Low ^a	77	1.77	0.93	
Agricultural commodity associations	High ^b	53	2.09	1.04	18.026
	Moderate ^a	71	1.41	0.71	
	Low ^a	57	1.23	0.63	
Farmer's Union	High ^b	46	1.76	1.02	14.181
	Moderate ^a	70	1.21	0.54	
	Low ^a	51	1.10	0.30	
Local co-op	High ^b	52	2.08	1.01	13.074
	Moderate ^a	72	1.39	0.72	
	Low ^a	54	1.37	0.76	
The MN Department of Natural Resources	High ^b	73	2.93	0.87	12.461
	Moderate ^a	108	2.41	0.88	
	Low ^a	77	2.22	0.98	
Neighbors	High ^b	73	2.81	0.88	11.808
	Moderate ^a	113	2.43	0.90	
	Low ^a	79	2.11	0.86	
The MN Pollution Control Agency	High ^b	71	2.73	0.98	10.642
	Moderate ^{ab}	102	2.35	0.95	
	Low ^a	75	2.00	0.94	
Agronomist	High ^b	43	2.02	1.06	10.119
	Moderate ^a	60	1.45	0.81	
	Low ^a	49	1.24	0.69	
Family	High ^b	74	3.31	0.87	8.274
	Moderate ^{ab}	113	2.95	0.98	
	Low ^a	80	2.68	1.04	
Financial institution (e.g., financial advisor, loan officer, mortgage lender, etc.)	High ^b	67	1.84	0.99	7.288
	Moderate ^a	94	1.43	0.78	
	Low ^a	72	1.33	0.71	

Survey item ^r	Levels of intended civic engagement [#]	N	Mean	SD	F*
County Farm Bureau	High ^b	55	1.96	1.09	7.031
	Moderate ^a	75	1.53	0.79	
	Low ^a	60	1.37	0.76	

^rResponse on a 4-point scale from not at all (1) to a lot (4)

[#]Based on an index of survey questions 14b, 14c, 14d, 14e and 14g measured on a 5-point scale from most certainly not (-2) to most certainly will (+2). High = index score greater than 0.5-2.0, medium= index score of 0-0.5 and low = index score of -2 to less than 0.

*F-statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq .01$ reported here. Items are listed in descending order by F-statistic.

^{a, b, c} Each superscript letter denotes no significant difference between levels of civic engagement at a significance level of $p \leq .01$ based on least significant difference (LSD) post-hoc test.

SD = Standard Deviation

Table 39. Differences among respondents with varying levels of intended civic engagement in factors that would enhance their use of conservation practices

Survey item ^f	Levels of intended civic engagement [#]	N	Mean	SD	F*
I could attend a community workshop or field day on conservation practices.	High ^b	76	0.75	0.83	24.947
	Moderate ^a	116	0.11	0.85	
	Low ^a	84	-0.19	0.88	
I could learn how to maintain conservation practices for soil conservation.	High ^c	76	1.09	0.77	22.839
	Moderate ^b	116	0.68	0.80	
	Low ^a	83	0.20	0.92	
I could learn how to maintain conservation practices for water quality.	High ^c	75	1.23	0.75	19.886
	Moderate ^b	116	0.86	0.79	
	Low ^a	83	0.40	0.95	
I could be enrolled in a registry program that recognizes local conservation stewards.	High ^b	76	0.32	0.88	19.003
	Moderate ^a	115	-0.23	0.86	
	Low ^a	84	-0.51	0.84	
I knew more about how to implement and maintain conservation practices.	High ^c	76	1.12	0.82	17.189
	Moderate ^b	116	0.73	0.81	
	Low ^a	84	0.35	0.88	
I had help with the physical labor of implementing and maintaining conservation practices.	High ^c	76	0.84	0.94	16.937
	Moderate ^b	116	0.44	0.89	
	Low ^a	84	-0.01	0.98	
I could learn how to maintain conservation practices for wildlife benefits.	High ^c	76	1.11	0.76	15.964
	Moderate ^b	116	0.72	0.86	
	Low ^a	83	0.35	0.89	
I could talk to other property owners or farmers who are using conservation practices.	High ^c	75	0.63	0.78	14.753
	Moderate ^b	116	0.27	0.76	
	Low ^a	84	-0.05	0.81	
I could learn how to maintain conservation practices for scenic quality.	High ^b	75	1.03	0.82	13.913
	Moderate ^a	116	0.55	0.86	
	Low ^a	83	0.29	0.98	
I knew more about the benefits of conservation practices.	High ^b	76	0.99	0.81	12.271
	Moderate ^a	117	0.56	0.82	
	Low ^a	84	0.36	0.82	
My neighbors maintained conservation practices.	High ^b	76	0.67	0.91	11.437
	Moderate ^a	116	0.30	0.88	
	Low ^a	84	-0.01	0.92	
I was compensated for lost crop production because of conservation practices.	High ^b	53	0.55	1.10	9.279
	Moderate ^{ab}	64	0.14	1.14	
	Low ^a	47	-0.40	1.06	

Survey item ^f	Levels of intended civic engagement [#]	N	Mean	SD	F*
I had access to financial resources to help me implement and maintain conservation practices.	High ^b	76	0.96	0.97	9.158
	Moderate ^{ab}	116	0.62	0.99	
	Low ^a	84	0.27	1.08	

^fResponse on a 5-point scale from strongly disagree (-2) to strongly agree (+2)

[#]Based on an index of survey questions 14b, 14c, 14d, 14e and 14g measured on a 5-point scale from most certainly not (-2) to most certainly will (+2). High = index score greater than 0.5-2.0, medium= index score of 0-0.5 and low = index score of -2 to less than 0.

*F-statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq .01$ reported here. Items are listed in descending order by F-statistic.

^{a, b, c} Each superscript letter denotes no significant difference between levels of civic engagement at a significance level of $p \leq .01$ based on least significant difference (LSD) post-hoc test.

SD = Standard Deviation

Table 40. Differences among respondents with varying levels of intended civic engagement in their perceptions of water pollutants/issues and sources of water pollutants/issues

Survey item	Levels of intended civic engagement [#]	N	Mean	SD	F*
Water pollutant/issue (4-point scale from not a problem (1) to severe problem (4))					
Flooding	High ^b	65	2.80	1.00	5.001
	Moderate ^{ab}	102	2.41	0.98	
	Low ^a	64	2.28	0.97	
Sources of water pollutants/issues (4-point scale from not a problem (1) to severe problem (4))					
Land development (e.g., residential, commercial)	High ^b	68	2.84	1.00	5.131
	Moderate ^b	102	2.75	0.83	
	Low ^a	64	2.38	0.88	
Soil erosion from farm fields	High ^b	66	3.08	0.83	5.390
	Moderate ^{ab}	101	2.93	0.85	
	Low ^a	66	2.59	0.96	
Excessive use of lawn fertilizers	High ^b	67	2.92	1.03	5.733
	Moderate ^b	94	2.91	0.88	
	Low ^a	67	2.45	0.97	

[#]Based on an index of survey questions 14b, 14c, 14d, 14e and 14g measured on a 5-point scale from most certainly not (-2) to most certainly will (+2). High = index score greater than 0.5-2.0, medium= index score of 0-0.5 and low = index score of -2 to less than 0.

*F-statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq .01$ reported here.

^{a, b, c} Each superscript letter denotes no significant difference between levels of civic engagement at a significance level of $p \leq .01$ based on least significant difference (LSD) post-hoc test.

SD = Standard Deviation