

Maintaining What We Value

The Nippersink Creek Watershed Management Plan

A Report on the Community Survey



Photo Credit: Ray Mathis

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Introduction: Planning For The Future Of The Nippersink Creek Watershed

The Nippersink Creek Watershed is located in northeastern Illinois and southern Wisconsin and is the largest tributary to the Fox River, draining 137 square miles in Illinois and about 50 square miles in Wisconsin. The watershed is considered among the finest of Illinois streams. Surveys for the presence of pollution-sensitive fish found that the main stem rates as a 'B' quality stream and the North Branch received a 'Class A' ranking. The watershed is also home to at least 21 animals and 30 plants listed as endangered or threatened species in Illinois (Nippersink Creek Watershed Plan 2008).

Although the quality of the Nippersink Creek Watershed is relatively high compared to other Illinois EPA listed 303 (d) impaired waterways within the state, its relatively high water quality condition provides a critical and atypical opportunity to be proactive in the protection of the watershed for its ecological health and the quality of life for its residents. Most impaired watersheds within Illinois suffer from significant urban impacts, which require their watershed plans to focus on retrofitting of mediation tools to reduce the water quality impact from an urbanized environment. In contrast, the Nippersink Creek Watershed offers an incredible opportunity to be proactive in our approach to watershed health by implementing conservation efforts that will forever protect the water quality and quality of life from the negative impacts of future development efforts.

Current municipal comprehensive land use plans indicate that a potential exists for significant growth in development over the next twenty years. As a result of being situated on the edge of the Chicago metropolitan area, changes are rapidly occurring in the Nippersink Creek watershed. Many of the municipalities in the Nippersink Creek watershed have already begun significant residential and commercial development, or are anticipating it in the near future. The water resources within the Nippersink Creek Watershed necessitate a proactive approach to protect this valuable resource from the potential negative impacts from current and future development. Some of these impacts include wastewater treatment, pollutant loadings in the streams, groundwater contamination, and increasing amounts of impervious surfaces and associated storm water management (Nippersink Creek Watershed Plan 2008).

By taking a proactive approach to protecting the water quality and ecological health of the watershed, future development efforts may proceed with the assurance that the water quality and ecological integrity of the watershed have been provided for, which may attract residents and associated business for the high quality of life and environment in the Nippersink Creek Watershed. The completed social assessment of residents within the Nippersink Creek Watershed assists in the facilitation of effective and targeted implementation of various conservation efforts (as outlined in the Nippersink Creek Watershed Plan), through a more accurate understanding of current values and attitudes towards the natural resources within the watershed. This understanding, in turn, will be utilized to develop place-specific outreach and education efforts to improve stewardship of water quality and natural resources within the Nippersink Creek Watershed.

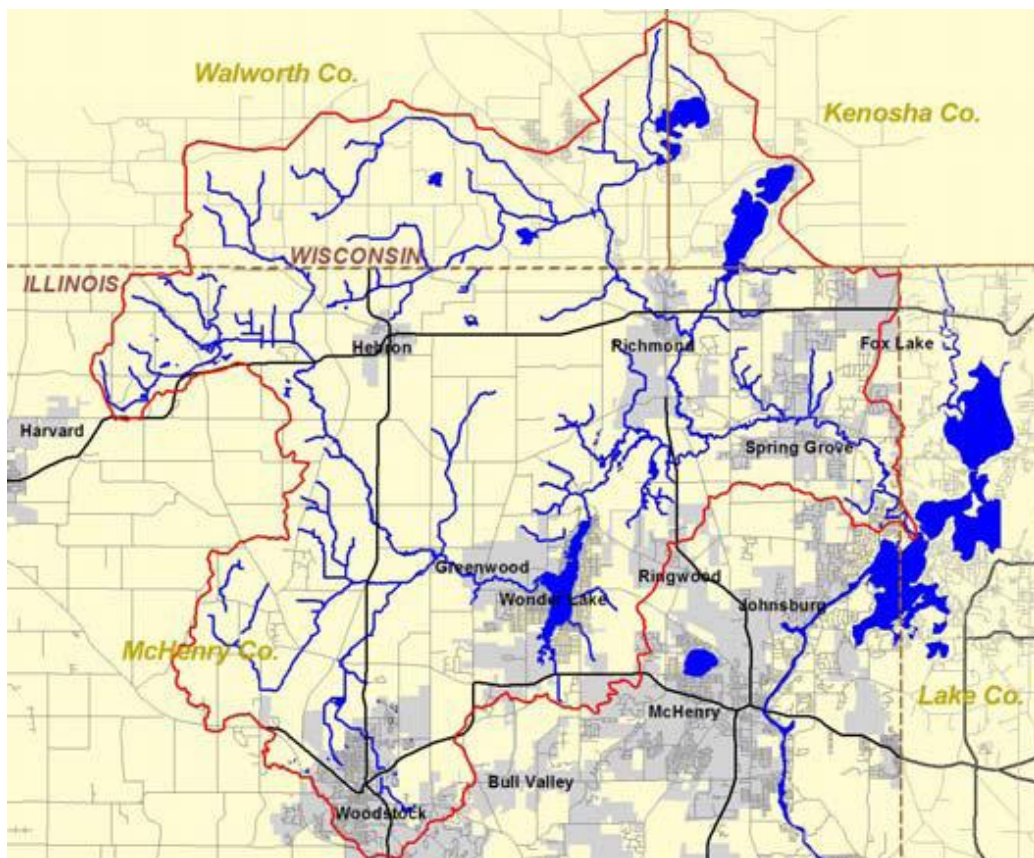
Implementing recommendations from a watershed plan is a complex process involving many areas of professional expertise and research, and many important tasks require an understanding of the social dynamics of issues within the watershed. Identifying residents' and property owners' desires for the future through a more thorough understanding of their concerns about management alternatives and documenting the current understanding of best management practices are just a few examples of the ways watershed management plans necessitate an understanding of social factors to be effective.

Finally, in an effort to improve non-point source (NPS) pollution management through the use of social indicators, this project is funded as part of a pilot program of the Region 5 Environmental Protection Agency's

(EPA) Social Indicators for Planning and Evaluation System (SIPES) program.¹ The use of social indicators for NPS management provides valuable insights into local residents' values, beliefs, awareness, constraints and behaviors that are related to water quality improvement and protection at a watershed scale. The inclusion of social indicators can assist water quality managers and practitioners to better target project activities and assess their impacts on water quality over time. In the case of the Nippersink Creek Watershed, an examination of these social indicators will provide valuable information to further guide and direct the recommendations that have been outlined in the Nippersink Creek Watershed Plan. It will also provide a more complete picture of current behaviors and practices that are already being implemented by local residents that support water quality health within the watershed, and areas where improvements of best management practices can be made.

To learn about the values and desires that need to be considered to guide the implementation of the Nippersink Creek Watershed Plan, a scientific, randomly sampled survey of property owners in four subwatersheds was conducted. The survey, which was conducted in summer of 2010, documented residents' and property owners' knowledge and concern for watershed pollutants, use of specific best management practices, values and beliefs about watershed protection, and sentiments and perceptions about recommendations made in the plan.

Figure 1. The Nippersink Creek Watershed.



Source: Nippersink Creek Watershed Association

¹ For more information on the EPA Region 5 SIPES Project, please visit: <http://www.uwex.edu/ces/regionalwaterquality/Flagships/Indicators.htm>

Through consultation with the Nippersink Creek Watershed planning committee and the Nippersink Creek Watershed Association, the project steering committee, and a review of relevant social science research, specific goals for the Maintaining What We Value: A Survey to Guide the Nippersink Creek Watershed Plan survey project were created. In addition, discussions with members of the project team identified specific uses for the information collected. The social science research was conducted to examine social factors relevant to efforts to maintain water quality, and the findings provide information for use in the implementation of the watershed plan and the design and delivery of education and outreach programs.

Research Methods Used To Conduct The Survey

The self-administered questionnaire survey was administered to property owners in four subwatersheds in the Nippersink Creek watershed (Silver Creek; Nippersink Headwaters; Lower Nippersink; and Wonder Lake). Nippersink Creek Watershed encompasses a total of fourteen subwatersheds covering approximately 94,800 acres. All samples in each subwatershed were drawn using a scientifically random selection based on residence within the subwatershed. Samples were purchased and drawn from Survey Sampling International (with the exception of Wonder Lake). Ultimately the randomly selected sample included 2,500 property owners within the four subwatersheds, but due to bad addresses and unoccupied households, the final sample size was 2,400 eligible households.

- The survey project was designed to:
- Evaluate property owners’ understanding and knowledge about water quality issues and threats within the Nippersink Creek Watershed.
 - Document property owners’ current behaviors and practices that may improve or protect water quality within the watershed.
 - Assess property owners’ level of support for recommendations in the Nippersink Creek Watershed Management Plan.
 - Assess property owners’ level of knowledge and concern about specific issues addressed in the watershed plan
 - Identify possible vectors for the delivery of information about the plan

Table 1. Watershed Land Area, Size Of Population By Subwatershed, And Samples Drawn From Each Subwatershed

Subwatershed	Acres in Watershed	% of Watershed Acres	Subwatershed Population	% of Watershed Population	Sampled Population	Response Rate
Silver Creek	12,010	9.3	17,527	42.3	1,000	25.8%
Nippersink Headwaters	6,600	5.1	472	1.1	400	17.8%
Lower Nippersink	12,432	9.6	6,620	16.0	500	30.8%
Wonder Lake	7,884	6.1	6,800	16.4	600	20.3%
Total	38,926	30.1	31,419	75.8	2,500	25.3%

Source: Nippersink Creek Watershed Association; US Census

To develop the sampling frame the research team identified all census block groups within three of the four subwatersheds (Silver Creek, Nippersink Headwaters, and Lower Nippersink). From these block groups, Survey Sampling International drew a scientifically random sample for each subwatershed. For the Wonder Lake subwatershed, a random sample was drawn from the Master Property Owners Association’s list of households.

The survey was administered using a modified version of the Tailored Design Method (Dillman 2009) that employed many techniques intended to enhance response rates including customizing letters, using multiple waves of contacts with carefully timed reminders, and providing clear information about the need for responses. The sampled population was sent a total of three contacts. First, respondents received a package which included a letter informing them about the project, the survey questionnaire, and a postage-paid response envelope. The second contact consisted of a postcard mailed within the next two weeks as a reminder to complete and mail in the questionnaire. A final contact, which contained a letter reiterating the importance of responses as well as a replacement questionnaire and return envelope, was sent two to three weeks after the reminder postcard. In addition, personal phone contact was made with a random sample of 600 non-respondents following the mailing of the third and final letter and survey. This personal contact was used to remind people of the importance of their response and to encourage participation.

A small proportion of the mailing addresses of potential respondents from the original sample frame were determined to be “undeliverable” due to inaccuracies in town records or other issues, and there were 24 of these cases. In order to maintain our original sample size, the undeliverable surveys were replaced and the same modified version of the Tailored Design Method was implemented to deliver these surveys. After the survey was administered, an addition 100 more of the mailings were returned as undeliverable throughout the process. Rather than repeating the process and holding up data collection, the original sample went from 2,500 to 2,400. Of the 2400 questionnaires mailed to valid addresses, 605 were completed and returned for an overall response rate of 25.3%.

Our overall response rate of 25% is lower than expected. Sometimes low response rates can indicate the data collected does not accurately represent the demographics of the surveyed population. In order to address this concern, we compared the demographics of our data with data from the American Community Survey 2006 – 2008 of McHenry County (See Table 2). Advanced statistical analysis shows no significant differences between the demographics of our data and the general population of McHenry County.

Table 2. McHenry County American Community Survey Demographics vs. Nippersink Survey Demographics.

	McHenry Co - ACS	Nippersink Survey Respondents
Male	50%	64%
Female	50%	33%
Education: High School Diploma or more	91%	97.90%
Education: BS or more	31%	40.30%
Median Income	77,681	50,000 - 74,999
Own Home	85%	91.40%
Rent Home	15%	5.50%
Age: 18 and up	73%	100%
Age: 65 and up	9.70%	25%

Source: <http://factfinder.census.gov/servlet>

Due to the lower response rate, the concern for non-response bias was also a factor that needed to be addressed. As a result, we drew a random sample of 300 households from non-respondents in the Silver Creek, Nippersink Headwaters, and Lower Nippersink watersheds. ² These households were asked to complete an abbreviated sample of survey questions via a phone survey. A total of 46 respondents completed the abbreviated questionnaire. Table 3 presents the results of the t-tests comparing mean responses between respondents and non-respondents. In general, the non-respondent data indicates that non-respondent bias is not likely to be a significant problem within our sample.

Table 3. T-test results comparing Non-respondents to Respondents

Variable	Mean Response of Respondents	Mean Response of Non-Respondents
Water Quality: Canoeing, Kayaking, Other Boating	2.45	2.50
Water Quality: Eating Fish	1.88	2.04
Water Quality: Swimming	1.85	2.00
Water Quality: Picnicking	2.54	2.54
Water Quality: Fishing	2.27	2.47
Water Quality: Scenic Beauty*	2.59*	2.85*
My lawn and yard care can influence water quality	4.17	4.07
It is my responsibility to protect water quality	4.24	4.11
My actions have an impact on water quality	4.13	4.24
Quality of life in community depends on good water quality*	3.99*	4.27*
Familiarity with the Nippersink Creek Watershed Plan	1.46	1.52
Expand water quality and biological monitoring*	4.08*	3.82*
Protect/enhance stream corridors	3.98	4.02
Change the way storm water is managed	3.82	3.69
Gender*	1.32*	1.25*
Year Born	2.84	2.89
Highest Education Level	4.00	3.87
Total Household Income	3.42	3.24

**Statistically significant difference at the .05 level*

- Only four of the eighteen variables were statistically significant in their differences between respondents and non-respondents.
- The variables that were the strongest predictors of differences in specific value orientations or support for watershed management recommendations (level of education, income) were not statistically significant.
- Gender was statistically significant – respondents to the survey were more likely to be male compared to non-respondents and compared to the census data for McHenry County. However, this was not a

² The Wonder Lake sampling frame did not have phone numbers associated with the mailing addresses; therefore we were unable to include non-respondents from Wonder Lake in our follow-up phone survey.

statistically significant predictor of differences in value orientations or level of support for the Watershed Plan recommendations.

- Overall, the non-respondent data analysis demonstrates that non-respondent bias is not likely to be a significant issue of concern in the sample data.

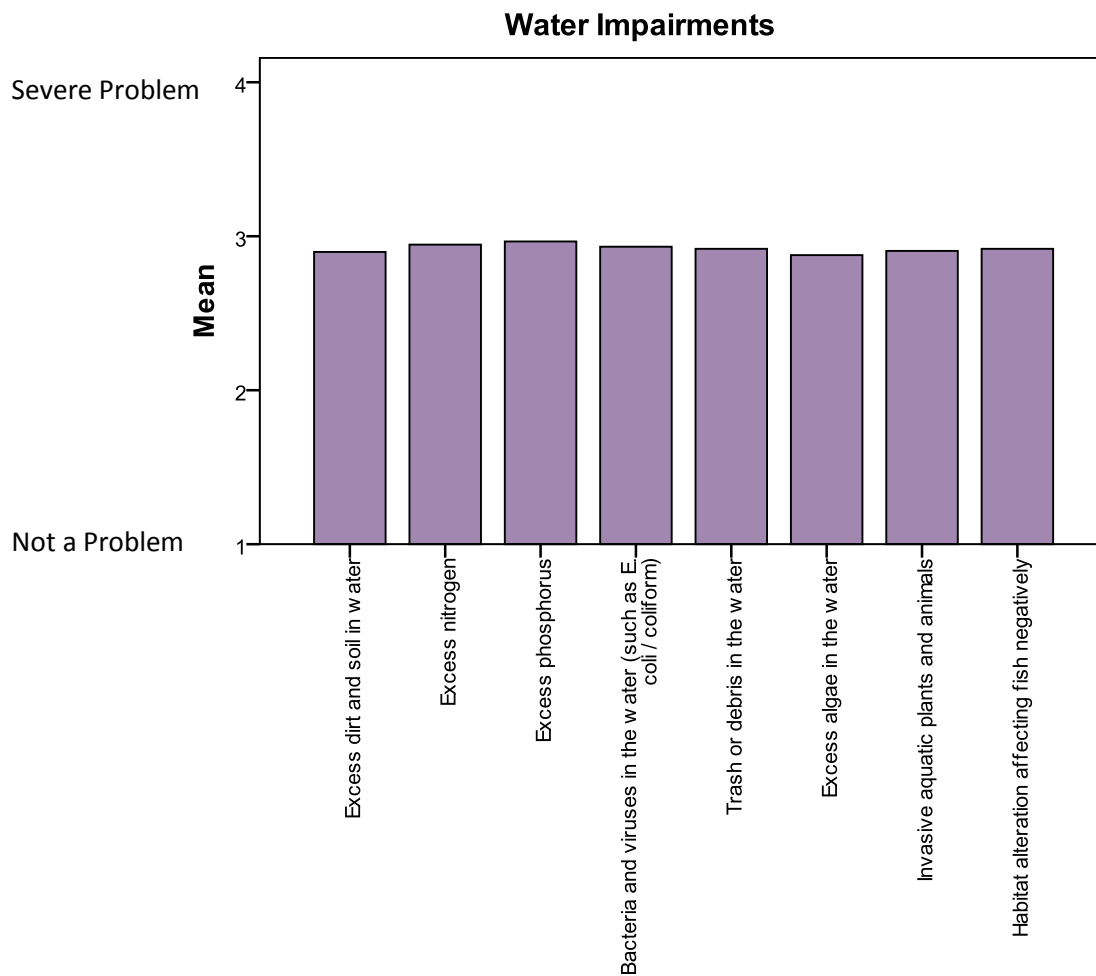
Analyses of the questionnaire data were conducted using Statistical Package for the Social Sciences (SPSS). Descriptive statistics, bivariate analyses, and multivariate procedures were used to examine the results and to identify important findings that can be applied to achieve the goals of the project.

This report presents key findings from the survey of particular importance for the implementation of the Nippersink Creek Watershed Plan through the use of tables, charts, and by highlighting the most important findings. Complete information about the responses to all questions in the survey is provided in the appendix to this document, which presents tables and charts giving the complete responses to each question in the questionnaire. A copy of the questionnaire used in the survey appears at the end of this report and as the last section of the appendix.

Respondents' Opinions on Water Impairments

As part of the objective to improve non-point source (NPS) pollution management through the use of social indicators, respondents were asked to rate how much of a problem common water pollutants and conditions were in their area. Using previous research conducted for the Watershed Management Plan, personal interviews with key stakeholders, and the SIPES variable database, a list of the 8 most common pollutants or conditions within the Nippersink Watershed was developed. The measurement of these variables provides valuable insights into local residents' awareness and perceptions about common pollutants that are related to water quality improvement and protection at a watershed scale.

Figure 1. Respondents' Views on Water Quality Impairments (1=Not a Problem, 4=Severe Problem)



Most respondents indicated that each contaminant was a “moderate” problem in their area. Due to variations in sub-watershed conditions, ANOVA statistical analysis was completed to test for differences in respondents' answers. Significant differences in answers were detected in five of the eight water contaminants.

- Responses differed significantly across subwatershed in regards to contaminants such as excess dirt and soil in the water, excess nitrogen, excess phosphorus, bacteria and viruses, and trash or debris in the water.
- Attitudes towards excess algae in the water, invasive aquatic plants and animals, and habitat alteration affecting fish negatively were reported in a consistent manner across subwatersheds.

To assess which subwatersheds rated different contaminants as more or less of a problem, multiple independent T-tests were conducted.

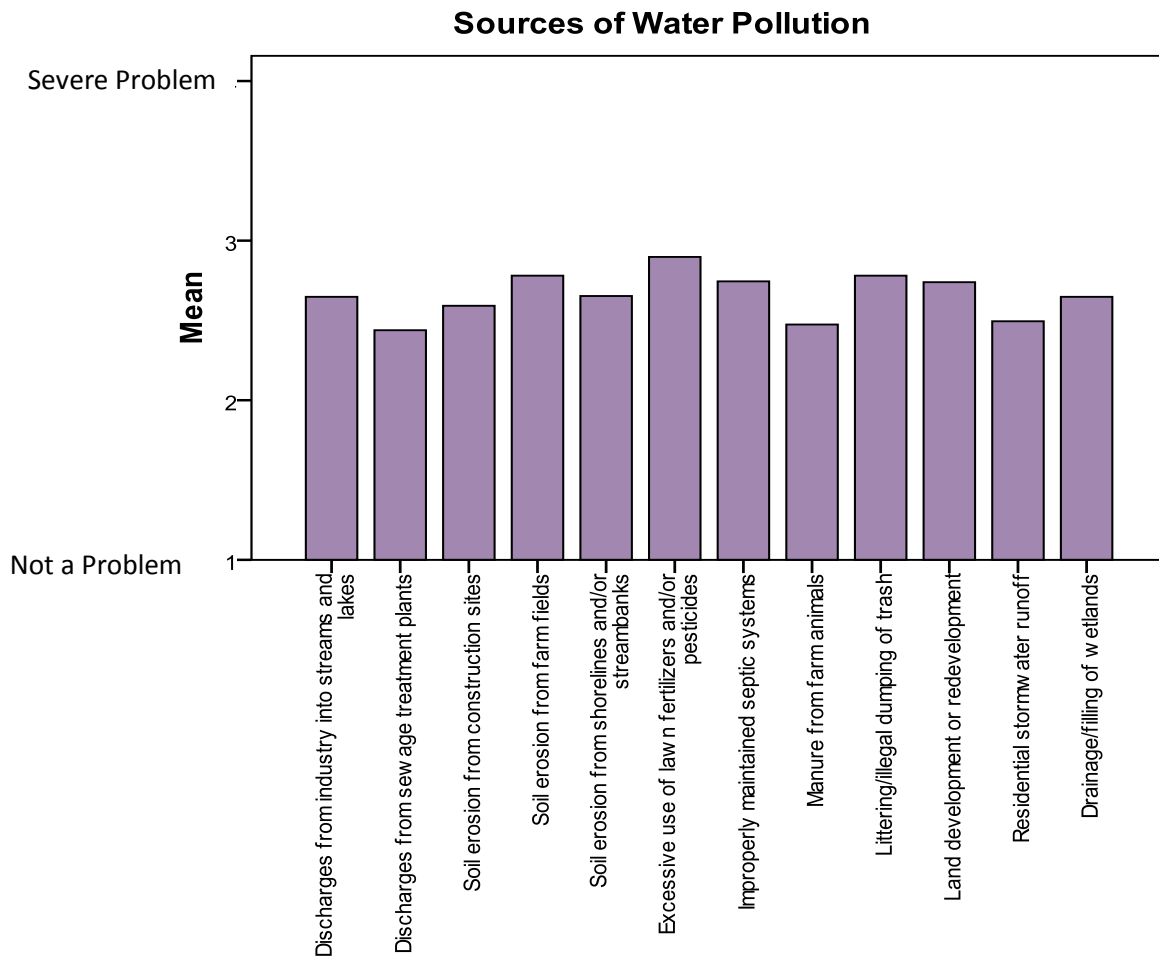
- Respondents in the subwatershed of Wonder Lake were more likely to report a problem with excess dirt and soil in the water, excess nitrogen, and bacteria and viruses in the water.
 - The average respondent from the Wonder Lake subwatershed rated these contaminants anywhere from 3.23 to 3.42 on the 4.0 scale, compared to an average rating of 2.33 to 2.89 from residents of the other three sub-watersheds.
- Overall, households in the Wonder Lake sub-watershed are more likely to be on a septic system, which may explain their higher level of concern for bacteria and viruses such as E coli.
- Respondents from the Silver Creek subwatershed were more likely to report problems with certain contaminants than those residents of the Nippersink Headwaters subwatershed.
 - These contaminants include bacteria and viruses in the water, trash or debris in the water, and excess algae in the water.
 - Residents of the Silver Creek subwatershed reported an average of 2.81 to 2.83 on a 4.0 scale, compared to the average rating of 2.39 to 2.45 from residents of the Nippersink sub-watershed.
- The Silver Creek sub-watershed is considerably more urbanized compared to the Nippersink Headwaters (the community of Woodstock comprises a large portion of the Silver Creek sub-watershed). This may explain respondents' greater concern for urban-related water contaminants such as trash and debris in the water, excess algae (which often results from high levels of phosphorous from urban lawn chemicals), and bacteria and viruses in the water.



Respondents’ Opinions on the Sources of Water Pollution

Directly related to residents’ awareness and perceptions of common pollutants and conditions that degrade water quality is their opinion on the sources of those pollutants. Respondents were asked to rate the level of problem for a total of 12 common sources of water quality pollution that are directly relevant to the social and ecological landscape within the Nippersink Creek Watershed.

Figure 2. Respondents’ opinions on the sources of water pollution. (1 = Not a Problem, 4 = Severe Problem)



The data indicate that respondents generally rate each source of water pollution as a moderate problem for their area. An ANOVA statistical analysis found that eleven out of the twelve sources of water pollution are rated significantly differently across subwatersheds. To assess if any particular subwatershed is experiencing higher ratings of pollutant sources, multiple T-tests were conducted. The independent samples T-tests indicate that:

- Respondents from the Nippersink Headwaters subwatershed were significantly less likely to report certain sources of water pollution as a problem, when compared to the other three subwatersheds.

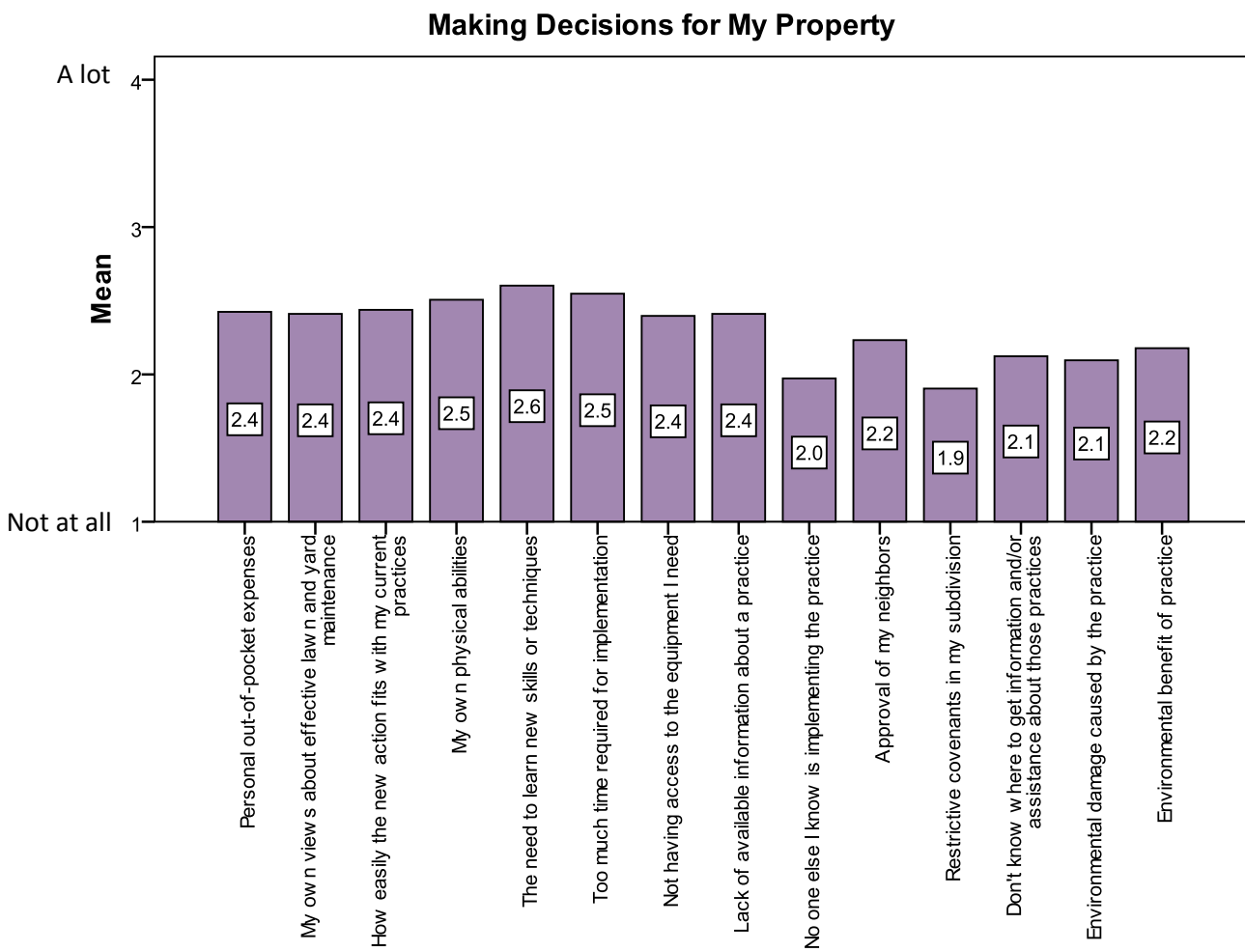
- Respondents from the Nippersink Headwaters sub-watershed indicated that they generally had less of a problem with discharges from industry and sewage treatment plants into streams and lakes, soil erosion from construction sites and from shorelines and/or stream banks, excessive use of lawn fertilizers and/or pesticides, improperly maintained septic systems, and residential storm water runoff when compared to the other sub-watersheds.
- Respondents from the Wonder Lake sub-watershed were significantly more likely to report soil erosion from farm fields and shorelines and/or stream banks, improperly maintained septic systems, manure from farm animals, and residential storm water runoff as the most common sources of pollution compared to the other three sub-watersheds.
- In general, the Nippersink Headwaters sub-watershed is the least developed land area of the four sub-watersheds in this study. Therefore it is not surprising to see that they reported less of a problem with sources of pollution that tend to be associated with urbanization and urban activities (i.e.: discharges from industry and sewage treatment plants, excessive use of lawn fertilizers and/or pesticides). In comparison, respondents from the more developed Wonder Lake sub-watershed expressed a significantly greater problem with sources that are representative of their specific social and environmental landscape. In particular, respondents indicated a greater problem related to improperly maintained septic systems, which reflects the higher percentage of residences that have septic in this sub-watershed.
- Overall, these findings indicate that respondents are aware of the unique pollutants and the specific associated sources for these contaminants that are relevant to their specific social and physical geography. They are able to properly identify the specific sources of pollutants that are most relevant in their specific area.

Overall, these findings indicate that respondents are aware of the unique pollutants and associated sources that are relevant to their special social and physical geography of their sub-watershed.

What Influences Residents' Decisions? Deciding to Change Lawn Care and/or Storm Water Practices for My Property

To achieve the goals in a watershed plan it is helpful to analyze the influences of various factors in residents' decisions on their own property regarding lawn care and/or storm water practices. A significant factor in NPS pollution is often related to residential lawn care or storm water management practices, particularly in more urbanizing areas. Influences on lawn care or storm water practices include social, economic, political, and environmental factors. The chart below presents the mean rating of the influences on changing lawn care and/or storm water for their property.

Figure 3. How Important Each Influence is on Residents' Decisions to Change the Lawn Care and/or Storm Water Practices for Their Property (1="Not at All"; 4="A Lot").



Considerable and consistent challenges are faced in initiating changes in lawn care and storm water practices. Respondents indicated that most of the factors presented influenced their lawn care and/or storm water practices at some level.

- Respondents' physical ability, the need to learn new skills or techniques, and the time involved for implementation are the factors most limiting respondents' ability to modify their lawn care and/or storm water management practices.
 - Approximately 35% of respondents answered "Don't Know" to these three factors. These answers indicate that respondents may be most affected by these three factors because they simply do not have the information on the skills, time, or physical ability required to implement changes.
 - A full 87.5% of respondents indicated that a lack of information about a practice influenced their ability to change their lawn care or storm water practices at least a little.
- Restrictive subdivision covenants and social stigma are the factors which least affect respondents' ability to change their lawn care or storm water practices.

Physical ability, the need to learn new skills or techniques, and the time involved for implementation are the factors most limiting respondents' ability to change their lawn care and/or storm water management practices.

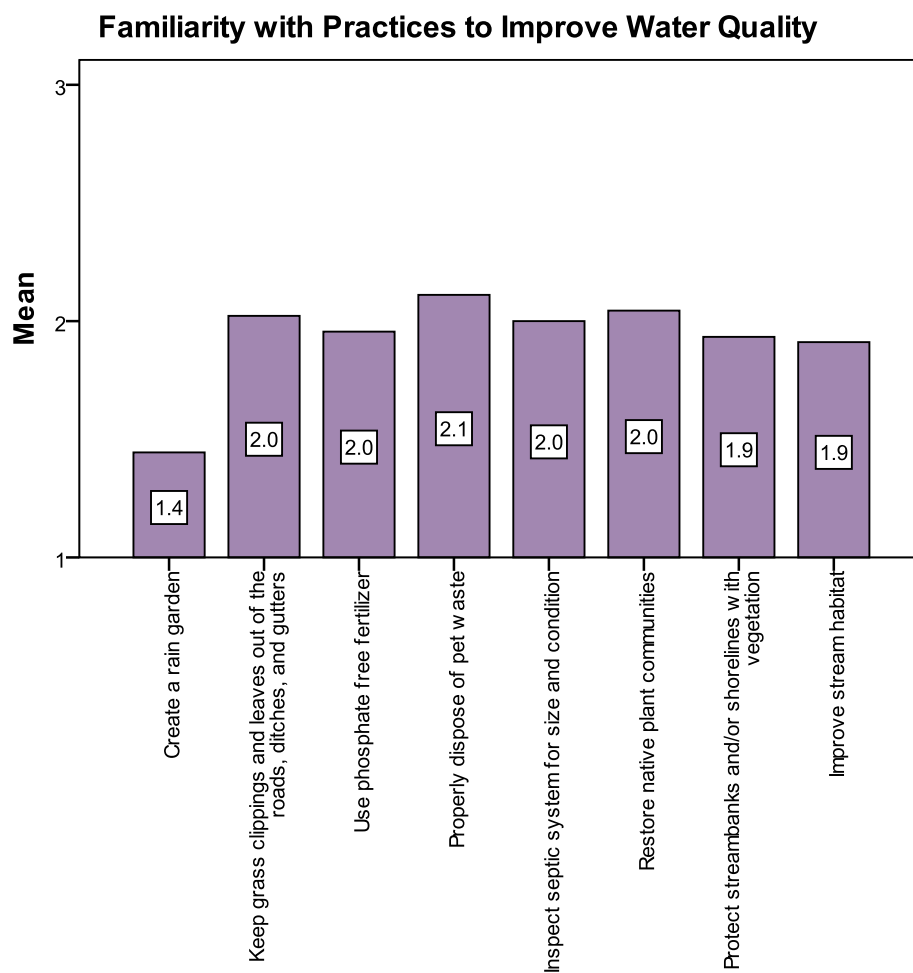
Overall, these responses are fairly consistent. Most respondents seem to feel that the factors presented are not major barriers to change. However, a large percentage (87.5%) indicated that a lack of information about a practice influenced their ability to change their practices. This indicates that there is considerable opportunity to further educate and empower residents with specific lawn care and storm water management practices for the future health and well-being of the watershed.



What do We Know and Practice? Practices to Improve Water Quality

Protecting water quality is an important objective in the Nippersink Creek Watershed Plan. Since the majority of water quality impairments are often the result of NPS pollution, it is critical to understand how familiar residents are with specific best management practices that can both maintain and improve overall water quality within the watershed. The following question asked respondents to indicate their level of familiarity with several best management practices that have been identified by the EPA to reduce NPS pollution and improve water quality. Figure 4 graphically illustrates the responses to this question below.

Figure 4. Familiarity with Practices to Improve Water Quality (1="Never Heard of It"; 3="Know How to Use It").



- Respondents were most familiar with the practices of properly disposing of pet waste, keeping grass clippings and leaves out of roads, ditches and gutters, inspecting their septic system for size and condition and using phosphate free fertilizer.
- Familiarity with the practices presented is similar between most of the variables.
- Respondents were least familiar with creating rain gardens; 52% of respondents indicated that they had never heard of rain gardens.

In addition to identifying familiarity with practices to improve water quality, this portion of the survey also asked respondents to indicate which practices they currently do, or do not, use. Answers to this question indicate that:

- The practices currently used by residents are the ones they are most familiar with: 50 to 60% of respondents indicated that they currently practice properly disposing of grass clippings, properly disposing of pet waste, and regularly inspecting their septic system.
- Even though respondents had about the same level of familiarity with most of the practices, some practices are more popular than others. The practices of restoring native plant communities, protecting stream banks, and improving stream habitats are only currently used by 10 to 20% of respondents. This is an interesting consideration since respondents have about the same level of knowledge regarding these practices as the ones practiced at a much higher rate. One explanation may be that fewer respondents – only 48% - actually have a shoreline or stream bank on their property. Another explanation for the lack of use of native plant communities may be due to difficulty in acquiring native plants at local nurseries.
- More than half of respondents had never heard of a rain garden, so it is not surprising that 95% of respondents did not currently use this practice.
 - Education about the benefits and use of rain gardens as a watershed health and water quality strategy is one area that could be specifically addressed in future outreach to the communities.



Photo credit: Wisconsin Department of Natural Resources

What Do Residents Practice? Constraints for Specific Practices

When considering the implementation of specific water quality conservation measures, it is important to think about potential barriers to the implementation of practices by residents. This portion of the survey seeks to identify respondents' current knowledge about, use of, and limitations to using certain practices. The first set of questions refers to the **use of pesticide application instructions**.

- In response to the question, “**Do you follow pesticide application instructions?**”
 - 56% said they “currently use” pesticide application instructions
 - 22% said they “don’t currently use” pesticide application instructions
 - 22% said that they have “never used” application instructions.
- In response to the question, “**How familiar are you with pesticide application?**”
 - The majority, 68%, responded that they are familiar with pesticide application instructions, and currently follow instructions.
 - 19% of respondents are “somewhat familiar” with application instructions
 - Only 9% of respondents had “never heard” of pesticide application instructions.
- In response to the next question, “**Are you willing to try to use pesticide application instructions?**”
 - 86% of respondents answered “yes or already do”
 - Only 5% of respondents refused to try pesticide application instructions.
- Respondents were then given a series of factors which may or may not limit their ability to follow pesticide application instructions, or had limited, if they currently use instructions.
 - Most respondents indicated that these factors did not limit their ability to use pesticide application instructions at all.
 - On average, two factors were indicated as limiting respondents “a little”: cost and desire to keep things the way they are.

Most respondents currently follow or are willing to follow pesticide application instructions. Those who do not follow, or previously did not follow, application instructions indicated cost and a desire to keep things the way they are as factors which limit, or limited, following instructions.

The next set of questions dealt with the practice of **regularly servicing septic systems**. For most single family home septic systems, it is recommended that tanks be thoroughly cleaned every 3 to 5 years. These questions explored the practices of resident regarding septic system maintenance, as well as the factors which limit regular maintenance. Those who indicated they did not have a septic system were not included in the following results.

- The first question asked, “**Do you follow the practice of regularly servicing your septic system?**”
 - The majority of respondents, 87%, currently service their septic system regularly.
 - 10% of respondents do not currently service their septic system.
 - Only 3% of respondents have never serviced their septic system.

- The next question asked respondents, “**How familiar are you with the practice of regularly servicing your septic system?**”
 - 80% of respondents indicated that they are very familiar with the servicing of septic systems, and currently practice maintenance.
 - 10% of respondents are “somewhat familiar” with the maintenance of septic systems.
 - 9% of respondents had “never heard of” septic system maintenance.
 - Only 2% of respondents were familiar with servicing their septic systems and not currently practicing maintenance.

- Respondents were then asked, “**Are you willing to follow the practice of regularly servicing your septic system?**”
 - The majority, 91%, of respondents answered “Yes or already do.”
 - This means that an additional 4% who indicated that they don’t currently use or have never serviced their septic system want to.
 - 8% of respondents said “maybe.”

- Finally, respondents were asked to rank how much specific factors limit, or limited, their ability to regularly service their septic system.
 - Most respondents indicated that most of the factors did not at all limit their ability to service their septic system.
 - The two factors which limited respondents’ ability to maintain their septic system were cost and the desire to keep things the way they are.
 - 33% of respondents indicated that maintenance costs limited their abilities to maintain their septic system at least “a little.”
 - 15% of respondents said that the desire to keep things the way they are limited their ability to regularly service their septic system.

The vast majority of respondents are very familiar with the maintenance of septic systems and regularly service of their systems. Those who do not, or previously did not, regularly service their septic systems indicated that cost and a desire to keep things the way they are as factors which limit, or limited, their abilities.

Respondents were then asked a series of questions regarding the practice of **protecting stream banks and/or shorelines with vegetation**. Diverse vegetation that grows along streams, rivers, or lakes act as a protective buffer between the land and the water, resulting in reduced runoff and sediment flowing into the water. The following questions were designed to extract respondents' level of knowledge, current practices, and limitations regarding the protection of stream banks using vegetation. These responses apply to the 48% of respondents who do have shoreline or stream banks on their property.

- The first question asked, “**Do you follow the practice of protecting stream banks and/or shorelines?**”
 - The majority of respondents, 42%, said they had never followed the practice of protecting stream banks or shorelines.
 - 37% of respondents currently protect shorelines and stream banks.
 - 22% of respondents don't currently practice protecting stream banks or shorelines.
- The next question asked respondents, “**How familiar are you with the practice of protecting stream banks and/or shorelines?**” Of the people who indicated they had shoreline or stream banks on their property,
 - 48% said they were “somewhat familiar” with the practice.
 - 23% of respondents had “never heard” of the practice.
 - 21% of respondents indicated that they were currently protecting stream banks and shorelines.
- Respondents were then asked, “**Are you willing to follow the practice of protecting stream banks and/or shorelines?**”
 - The majority of respondents, 66%, said “Yes or already do.”
 - This response indicates that an additional 30% of respondents, who have either never practiced or do not currently protect stream banks or shorelines, would like to start practicing.
 - 28% of respondents answered “maybe.”
 - Only 6% of respondents refused to practice protecting shorelines or stream banks.
- Finally, respondents were asked to rank how much specific factors limit, or limited, their ability to protect stream banks and/or shorelines.
 - Respondents felt that most of the factors presented limited their ability to protect shorelines and/or stream banks “a little.”
 - The three most limiting factors include cost, the features of their property, and the skills and information needed to practice.
 - These factors limited almost 40% of respondents from practicing stream bank and/or shoreline protection.

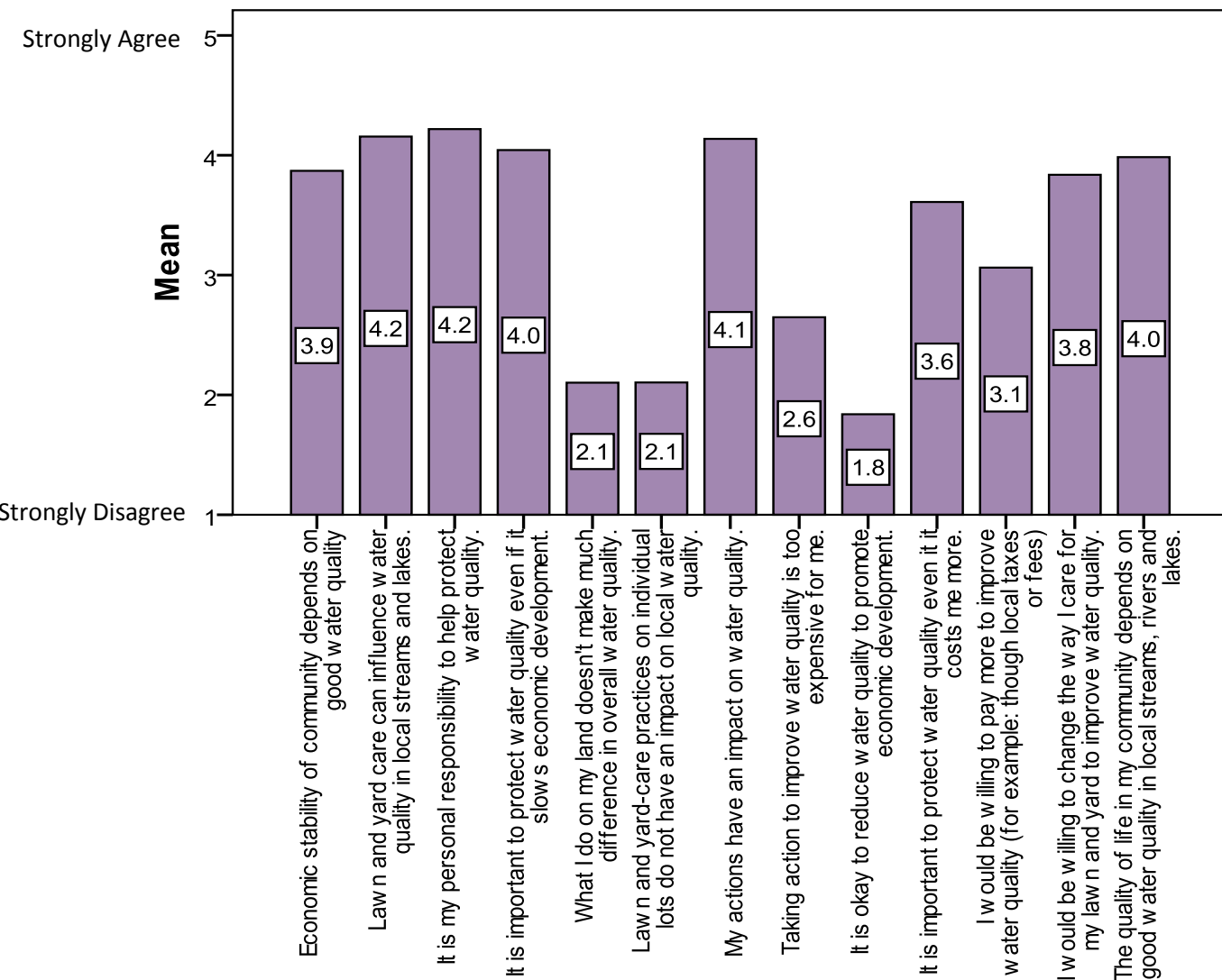
Most respondents either already protect stream banks and/or shorelines on their property, or would like to. Forty percent of respondents are prevented from practicing due to lack of skills, the features of their property, and cost. More outreach should focus on educating residents on the skills, information, and cost regarding the protection of shorelines or stream banks.

What Do Residents Value? Opinions and Beliefs Regarding Water Quality

Respondents' values and opinions regarding water quality are an important consideration when trying to determine support for specific recommendations in the Watershed Management Plan. The choices people make that impact the overall quality and health of their watershed are driven in large part by their value systems and beliefs. In order to influence people's awareness, attitudes, skills and capacity to act, a firm understanding of the values and beliefs that form the basis of those actions is necessary. The following questions ask respondents to indicate their level of agreement or disagreement with a series of statements that measure their values and opinions related to water quality and its relationship to their own actions and behaviors.

Figure 5. Residents' Opinions on Influences on Water Quality (1="Strongly Disagree"; 5="Strongly Agree").

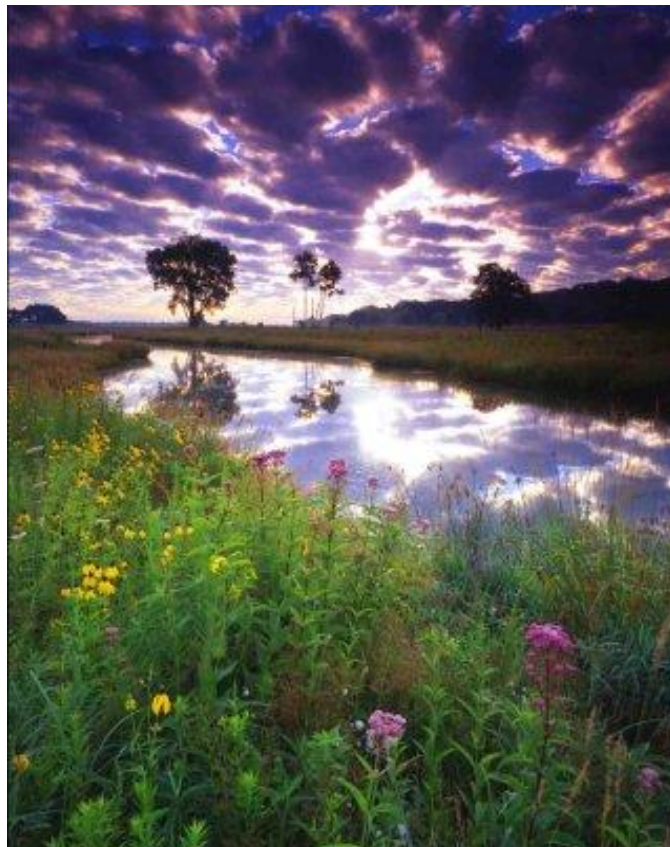
Residents' Opinions on Influences on Water Quality



Overall, responses to these opinions are fairly consistent. Respondents indicate a high level of personal responsibility for the quality of water. Responses also indicate that residents understand the connection between the stability and quality of life in their communities and water quality. The following results are especially important for the next steps in the process as implementation of the plan begins.

- Respondents most strongly agree with the assertions, “Lawn and yard care can influence water quality in local streams and lakes,” “It is my personal responsibility to help protect water quality,” and, “My actions have an impact on water quality.”
 - These responses illustrate respondents’ understanding of how their actions on their property affect local water quality.
- Respondents’ answers support improving water quality, even if such practices slow economic development. This assertion is likely connected to a strong support for the opinion, “Economic stability of community depends on good water quality.”
- The least amount of support appears for opinions such as, “It is okay to reduce water quality to promote economic development,” “What I do on my land doesn’t make much difference in overall water quality,” and “Lawn and yard-care practices on individual lots do not have an impact on local water quality.”
- Overall, residents show strong support for improving water quality despite potential downfalls. Residents also connect their actions to the welfare of the community and overall water quality.

Many residents feel a strong personal responsibility to help protect water quality, and connect their personal actions to impacts on local water quality.

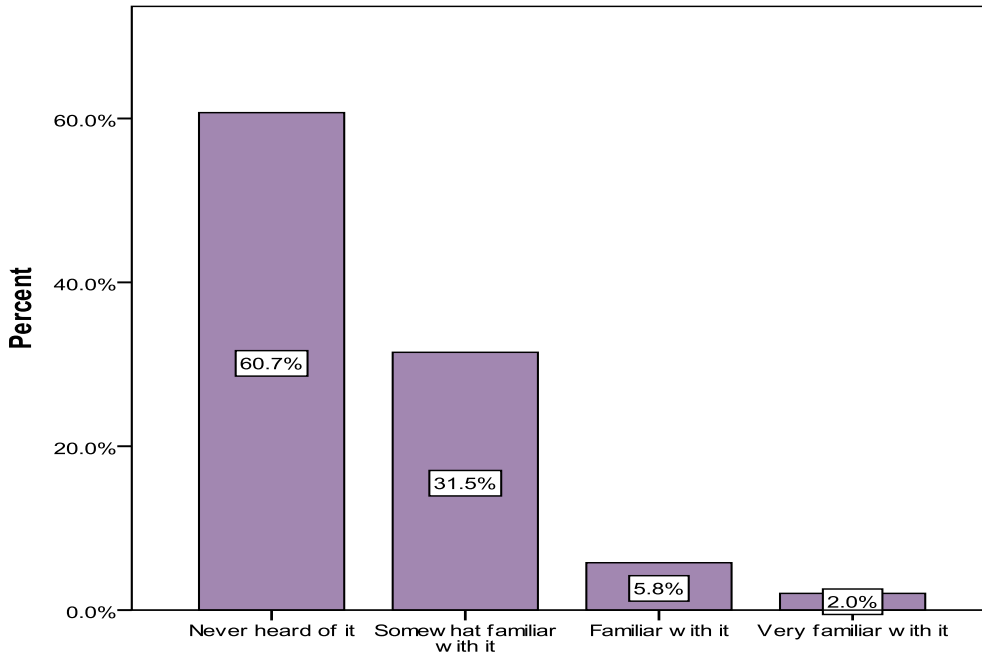


Familiarity with the Nippersink Creek Watershed Management Plan

One of the critical questions on the survey concerned knowledge of the Nippersink Creek Watershed Management Plan.

Figure 6. Familiarity with the *Nippersink Creek Watershed Management Plan*

Familiarity with the Nippersink Creek Watershed Management Plan



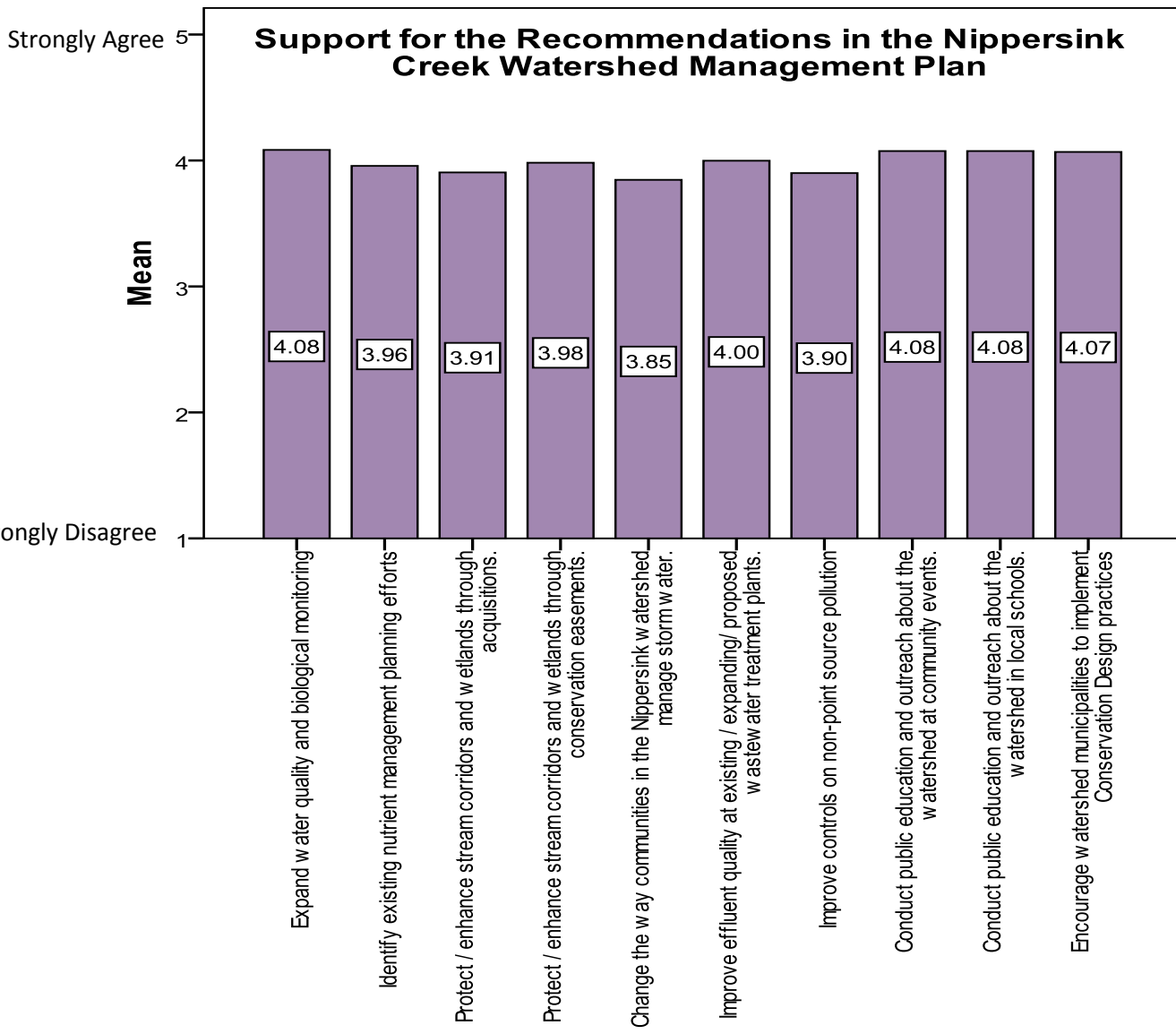
A large percentage, almost 61%, of respondents indicated that they had never heard of the Nippersink Creek Watershed Management Plan, while 39.3% of respondents indicated some level of familiarity with the Watershed Management Plan.



What Is Important? Support for Recommendations in The Nippersink Creek Watershed Management Plan

To be effective, a watershed plan must provide recommendations that represent the values and interests of local residents, property owners, and other stakeholders. These recommendations must have broad support if their implementation is to be successful. The next question asked respondents to rate their agreement with specific recommendations in the Nippersink Creek Watershed Plan. The chart below displays the mean level of agreement with each specific recommendation in the plan as rated by respondents.

Figure 7. Support for the Recommendations in the *Nippersink Creek Watershed Management Plan* (1="Strongly Disagree"; 5="Strongly Agree").



The data indicate that in general respondents exhibit high and consistent levels of agreement with the plan recommendations. These recommendations are essentially the vision statement for the Nippersink Creek Watershed Plan, so the high level of agreement placed upon achieving them reinforces the appropriateness of the vision statement. While the overall perceived agreement with the recommendations listed is high, several important findings are evident:

- The recommendation in the plan considered most important by respondents is expanding water quality and biological monitoring.
 - Support for public education both in local schools and at community events is a very close second in importance.
- Most of the recommendations present little disagreement among respondents, with very strong and consistent rankings of the importance of recommendations.
- The recommendation in the plan with the weakest agreement by respondents is changing the way communities in the Nippersink Creek watershed manage storm water. However, it is important to note that the agreement with this recommendation was still perceived to be high. This finding could indicate that respondents are satisfied with the management of storm water runoff, do not see a need to change the way storm water is managed, or that respondents do not understand the importance of changing the way storm water runoff is managed. Further statistical examination revealed that those respondents who see residential storm water runoff as ‘not a problem’ also tend to disagree with the recommendation to change the way storm water is managed. Those respondents who indicated that storm water runoff is a problem agree with the recommendation.

Expanding water quality and biological monitoring is the goal in the plan most strongly supported by residents.

To address the large percentage of respondents who had never heard of the Nippersink Creek Watershed Management Plan, we compared agreement with the Watershed Plan Recommendations between those who had heard of the Watershed Plan and those who had not hear of the Plan. Our analysis finds that:

- Nine out of the ten recommendations in the Nippersink Creek Watershed Management Plan had universal agreement, regardless of familiarity with the Plan.
 - This is important for future management activities because it shows that even if respondents were not aware of the plan, other educational and outreach information about management activities in the watershed appears to be reaching residents.
- A statistically significant difference was found regarding the recommendation to support the protection and enhancement of stream corridors and wetlands through conservation easements. Those who are familiar with the Watershed Management Plan agree with this particular recommendation significantly more than respondents who had not heard of the Plan.
- This indicates that the watershed plan as a working document was helpful in educating residents about the often complex and misunderstood tool of conservation easements as a means of protecting and enhancing stream corridors and wetlands. This also demonstrates that more work is needed in this area to better involve the public in understanding how this tool works and how it may benefit the future health and well-being of the Nippersink Creek Watershed.

Septic Systems

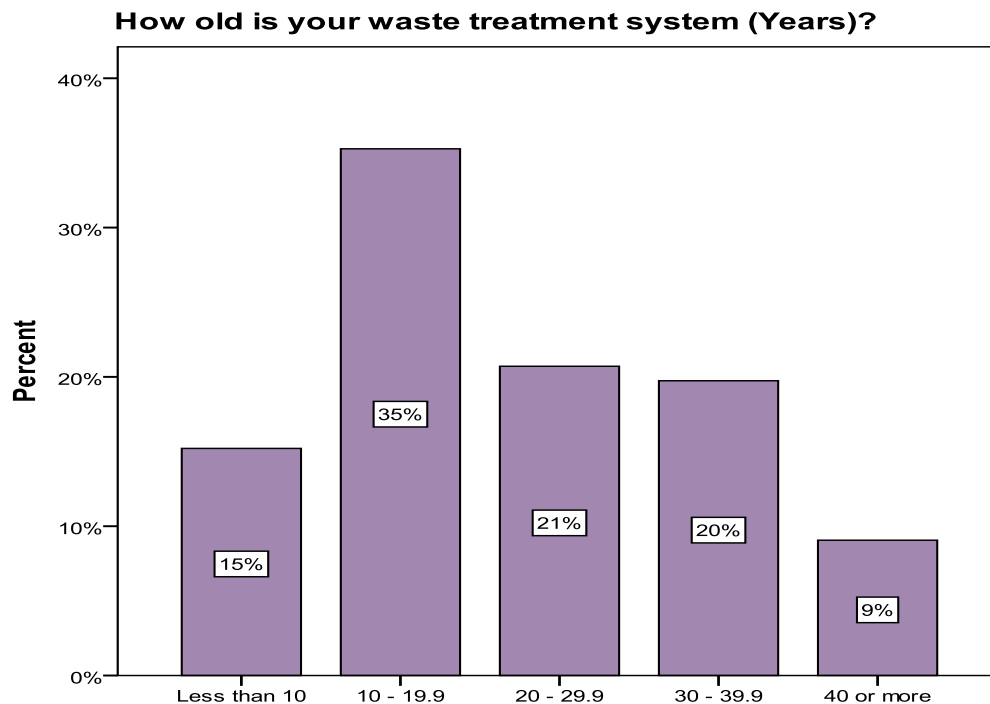
During the key informant interview phase of this project, a common theme of concern that emerged was concern for residential septic systems as a source of water contamination. In particular, the subwatershed of Wonder Lake has a considerable number of residences that are known to utilize septic systems. The Nippersink Creek Watershed Management Plan identified septic systems as one of their primary existing watershed protection challenges. In 2000, The Nippersink Creek was listed as non-support for a designated use of primary contact, due primarily to high levels of fecal coliform (Nippersink Creek Watershed Report 2008). Although the specific source of the fecal coliform is not known, a common source for these contaminants is failing septic systems. Therefore, a series of questions that focuses specifically on issues related to septic systems was employed in the survey.

The first question asked residents, “**Does your household have a septic system?**”

- 60% of respondents answered yes, while 40% of respondents indicated that their household did not have a septic system.

The following graph represents the age of residents’ septic systems.

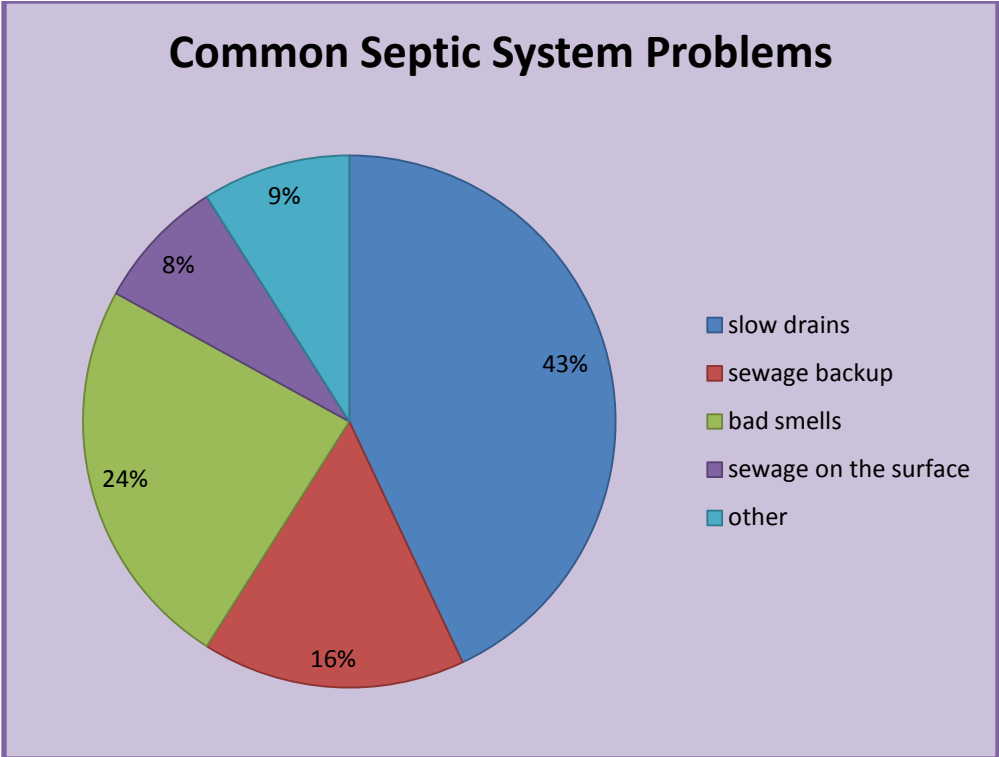
Figure 8. Age of Respondents’ Septic System, in Years.



Residents were asked about specific types of problems that they may have encountered with their septic system over the last five years. Responses included the most commonly reported problems and respondents were allowed to choose more than one issue.

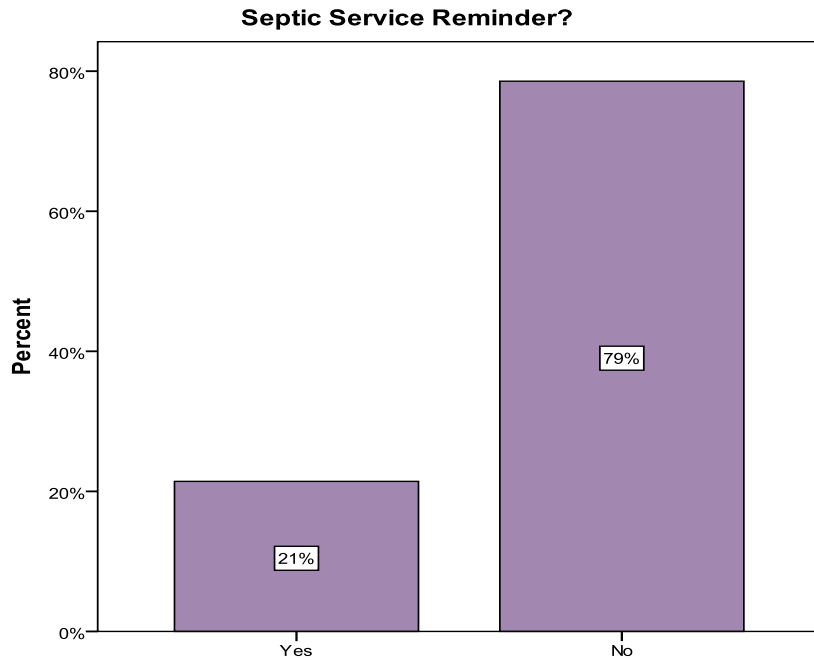
- Of the respondents who indicated their household has a septic system, 76 (or about 13% of total) respondents indicated they had experienced problems with their septic system. The following graph represents the most common septic system problems.
- The most commonly reported problem was slow drainage (43%) followed bad smells (24%).

Figure 9. Common Septic System Problems.



Respondents were then asked if they would be willing to receive a septic service reminder from their local health department.

Figure 10: In the future, would you like a septic service reminder from your local health department?



- A clear majority of respondents (79%) are not interested in receiving a septic service reminder from their local health department.
- Although only 13% of those with a septic system indicated they have experienced problems in the last five years, the majority of respondents (60%) did indicate that they do have a septic system.
- Given that failing septic systems are a potential source of high levels of fecal coliform in the watershed, focusing on efforts to improve the function and performance of septic systems is still an important activity.
- The level of disagreement with the suggestion for a service reminder from your local health department may be in part due to the fact that the question referenced a government agency as responsible for the reminder. An alternative approach may be to work with local septic service companies to encourage them to send annual service reminders to their clients, or even a broader listing of all homes within the watershed that have an existing septic system.

Who Responded To The Survey?

In order to best understand the uses and limitations of the survey data collected, a series of questions asked about the characteristics of the respondent and their household. Asking about background characteristics enables two important analyses: first, the data can be evaluated and compared with census data to identify any potential biases stemming from those who responded to the questionnaire. Second, responses to all questions can be analyzed using multivariate statistical analyses to identify how respondents' characteristics are related to patterns of responses. This information can be used to better understand responses to specific questions that may be affected by differences between those who responded to the survey and the demographic characteristics of all property owners in towns in the watershed.

The text below highlights some of the key demographic findings from the survey. Complete tables and charts representing responses to all questions in the survey including responses to open-ended questions are in the appendix to this document.

- The majority of respondents, 52%, have at least a two year college degree. 27% have some college experience, while 20% of respondents hold a high school diploma or equivalent.
- The median age of respondents is 57 years.
- The majority of the survey's respondents, 94.4%, own their property, and 5.6% rent their property.
- The median length of residence among respondents is 14 years.
- 62% of respondents live in a town, village, or city; 24% live in a rural subdivision or development; 12% live in a rural non-farm residence; and 1% of residents live on a farm.
- 26% of residents use some kind of professional lawn care service, while 74% of residents do not.

Multivariate Statistical Regression Analyses

In an effort to better understand the uses and limitations of the survey data, multivariate statistical analyses were performed to identify how respondent characteristics are related to patterns of responses. This information can be used to better understand responses to specific questions that may be affected by differences between who responded to the survey and the broader population of residents within the watershed.

Conducting these analyses is a very time consuming, complicated, and technical process and accordingly the complete procedures of data analyses and their results are not presented here. To present useful information for plan implementation the section below highlights important relationships between respondent's characteristics and responses to specific questions in the survey for consideration when working with the survey data.

In the analyses which follow, we focused on the following independent variables:

- Age
- Gender
- Level of Education
- Income
- Length of Residence
- Use of Professional Lawn care Service (Yes/No)
- Septic System (Yes/No)
- Familiarity with the Nippersink Creek Watershed Plan (Yes/No)

Sociodemographic variables (age, gender, education, income, length of residence) are frequently found to be the source of variations in belief systems and behaviors. The additional contextual variables (use of lawn care services, septic system, and familiarity with the watershed plan) are theorized to also be sources of potential differences based in part on the qualitative key informant interview data as well as the preliminary survey analyses.



Photo credit: City of Woodstock, Illinois

Your Opinions

Overall, responses to questions concerning respondents' values and beliefs were fairly similar (see pg. 18). Therefore, this analysis explores if there were any more subtle differences to responses based on the previously discussed characteristics. The following section reports on differences by sociodemographic characteristics to questions regarding respondents' opinions, values, and beliefs.

- Education is the most constant statistically significant predictor for questions concerning values, beliefs and opinions relative to water quality. Those with higher levels of education more strongly agree with sentiments such as
 - “The way that I care for my lawn and yard can influence water quality in local streams and lakes.”
 - “It is my personal responsibility to help protect water quality.”
 - “I would be willing to change the way I care for my lawn and yard to improve water quality.”
 - “The quality of life in my community depends on good water quality in local streams, rivers and lakes.”
 - “It is important to protect water quality even if it costs me more.”
 - “I would be willing to pay more to improve water quality (for example: through local taxes or fees).”
 - These last two statements indicate that respondents with higher levels of education are willing to pay more for good water.
- Age was an interesting variable in some models. Older residents more strongly agree with statements such as
 - “The economic stability of my community depends on good water quality.”
 - “It is important to protect water quality even if it costs me more.”
 - “I would be willing to pay more to improve water quality (for example: through local taxes or fees).”
 - Older residents disagreed with the following statement: “Taking action to improve water quality is too expensive for me.”
 - It is interesting to note that these sentiments correlate with older residents, regardless of how long they have lived at their current residence.

Older residents and those with higher levels of education are more strongly support improving water quality even if that means increasing costs. These same respondents also recognize their impact on water and are willing to take responsibility to protect water quality.

Practices to Improve Water Quality

From the previous analyses, we found that respondents were most familiar with the practices of properly disposing of pet waste, keeping grass clippings and leaves out of roads, ditches and gutters, inspecting their septic system for size and condition and using phosphate free fertilizer. Respondents were least familiar with creating rain gardens; 52% of respondents indicated that they had never heard of rain gardens (see pg. 13). Again, this analysis explores the possibility of more subtle difference based on the previously discussed sociodemographic characteristics. Differences in responses among those who know about or currently follow specific best management practices to improve water quality are highlighted below.

- The most constant predictor for those who follow practices to improve water quality is familiarity with the Nippersink Watershed Plan.
 - Those respondents who had some level of familiarity with the Watershed Plan were more likely to currently use practices to improve water quality.
- Education was also a recurring predictor.
 - Respondents with a higher level of education are more likely to follow practices to improve water quality.
- Respondents' use of a lawn care service is significant in some models.
 - Households with some kind of professional lawn care service are less likely to follow practices to improve water quality.
 - Those residents with a professional lawn care service may feel less control over what happens on their property.
 - Outreach on this subject may include educating lawn care companies on practices to improve water quality and encouraging the use of these practices.

Familiarity with the Nippersink Creek Watershed Plan was the most consistent predictor overall for respondents that followed practices to improve water quality. Since almost 61% of respondents have NOT heard of the watershed plan, this presents an important opportunity to improve knowledge about the plan, which will likely lead to an associated increase in the use of specific practices to improve water quality.

Making Decisions for my Property

Overall, previous analyses found that responses to these questions were fairly consistent. Most respondents seemed to feel that the factors presented are not major barriers to change. However, a large percentage (87.5%) indicated that a lack of information about a practice influenced their ability to change their practices (pg. 12). The following section highlights predictors for decisions regarding lawn care and/or storm water practices on respondents' property.

- Income is the most constant predictor influencing decisions regarding lawn care and/or storm water practices.
 - Respondents with higher incomes reported feeling more strongly affected by certain influences on decisions for their property.
 - Such influences included personal out-of-pocket expenses, too much time required for implementation, environmental damage caused by a practice, or environmental benefit of a practice.
 - Other influences involved access to information or equipment, such as not having access to needed equipment, lack of information about a practice, and not knowing where to get information or assistance about a practice.
 - Personal views about effective lawn and yard maintenance and how easily a new action fits with current practices were strong influences.
 - Social influences were also significant, such as the approval of neighbors and not knowing of anyone else implementing a practice.
- An interesting predictor that emerged from the data was the person making decisions regarding lawn and yard care in a household.
 - Those residents who make decisions about lawn and yard care are more likely to be concerned about personal out-of-pocket expenses, their physical abilities, and the time required for implementation.



Nippersink Creek Watershed Plan Recommendations

The initial analyses found a very uniform and high level of agreement with all recommendations in the Nippersink Creek Watershed Plan. In an effort to better understand how specific sociodemographic characteristics may influence subtle differences in that level of agreement we again ran multivariate analyses. The next section highlights predictors for agreement with the Nippersink Creek Watershed Plan recommendations.

- Education is the most consistent predictor of agreement with the Plan objectives. Those residents with a higher level of education are more likely to agree with the Nippersink Creek Watershed Plan recommendations. Residents with a high level of education agree with the majority of the Plan recommendations, including:
 - Expand water quality and biological monitoring
 - Identify existing nutrient management planning efforts
 - Protect/enhance stream corridors and wetlands through acquisitions
 - Protect/enhance stream corridors and wetlands through conservation
 - Change the way communities in the Nippersink watershed manage storm water
 - Improve effluent quality at existing/expanding/proposed wastewater treatment
 - Improve controls on non-point source pollution
 - Conduct public education and outreach about the watershed at community events
 - Encourage watershed municipalities to implement Conservation Design practices.

Those with a higher level of education are more likely to support the Nippersink Creek Watershed Plan recommendations. Interestingly, knowledge about the plan was NOT a statistically significant predictor, which was expected based on previous analyses. This implies that support for the plan recommendations is truly strong and consistent, regardless of the majority of individual characteristics that were examined as part of this analysis.

Conclusions

The social assessment of residents within the Nippersink Creek Watershed was developed to assist in the facilitation of effective and targeted implementation of various conservation efforts (as outlined in the Nippersink Creek Watershed Plan) through a more accurate understanding of current values and attitudes towards the natural resources within the watershed. The findings from this study will be utilized to develop place-specific outreach and education efforts to improve stewardship of water quality and natural resources within the Nippersink Creek Watershed.

More specifically, the social assessment survey project was designed to:

- Evaluate property owners' understanding and knowledge about water quality issues and threats within the Nippersink Creek Watershed.
- Document property owners' current behaviors and practices that may improve or protect water quality within the watershed.
- Assess property owners' level of support for recommendations in the Nippersink Creek Watershed Management Plan.
- Assess property owners' level of knowledge and concern about specific issues addressed in the watershed plan
- Identify possible vectors for the delivery of information about the plan

The survey results overall were very encouraging, demonstrating a respectable level of knowledge about water quality issues and threats within the watershed and a collective level of strong support for recommendations in the watershed plan among respondents. Respondents with a higher level of education were more likely to support the Watershed Plan recommendations. Respondents also clearly see a connection between their actions, water quality, and quality of life in their community. Those with a higher level of education, and particularly older respondents, are more likely to see the connection between personal action and water quality. They are also more willing to pay more to protect water quality. Additional analysis of non-respondents and U.S. Census data for McHenry County indicate that respondents are not likely to be significantly different from the broader population within the watershed, again offering encouragement for the interpretation of these findings, especially in regards to representativeness.

In regards to knowledge and understanding about water quality issues and threats within the Nippersink Watershed, respondents generally viewed the most common water pollutants and conditions as a moderate to severe problem. Excess nitrogen was the most severely rated problem, in comparison to invasive aquatic plants and animals, which was rated as the least severe problem. When asked to rate the most common sources of water pollution as "not a problem" to "severe problem" respondents seemed to make a connection between their above noted concern for excess nitrogen and a likely source of that pollutant, lawn fertilizers.

Overall, respondents appear to have a significant level of knowledge about both pollutants and conditions that impair water quality within the Nippersink Creek Watershed and can make logical links to appropriate sources for those pollutants. The identification of excess nitrogen and the linkage to lawn fertilizers as a possible source of this pollutant is important because it indicates that residents are knowledgeable about specific sources of pollution in their watershed and can link them to the urbanization within their watershed. These findings have some important implications for future watershed health efforts:

- Given that respondents seem to already understand this connection, efforts to target residential homeowners regarding the proper use, application, and purchase of various environmentally friendly lawn fertilizer products may have a positive impact on further reducing excess nitrogen in the watershed, particularly as it relates to the excess use of lawn fertilizers and/or pesticides.

- Local merchants can be further encouraged to carry lawn care products that minimize the use of harmful chemicals. Since respondents view excess nitrogen as a severe problem and make a link to lawn care practices, they may be more willing to purchase ecologically friendly lawn care products to further reduce such an impact on water quality, if those products were more widely and easily accessible.

In regards to barriers to making changes to lawn care practices to protect water quality, respondents cited physical ability, a need to learn new skills, time involved, and the need for information as limiting their ability to change lawn care practices. The least restrictive were subdivision covenants and social stigma. Respondents that were familiar with the Watershed Plan and with a higher level of education were more likely to employ the practices we measured to improve water quality. The significance of these findings is twofold:

- A full 87.5% of respondents indicated that a lack of information about a practice influenced their ability to change their lawn care or storm water practices at least a little.
- It appears that structural issues are not limiting lawn care and storm water practices. Rather, individuals are mainly responsible for changing their practices and respondents view their own individual attributes as the most limiting.
- This makes it a bit more difficult to target efforts to minimize these barriers to changing lawn care practices, as it is challenging to address an individuals' perceived lack of time or their physical abilities. However, the identification of the need to learn new skills and the need for information may be addressed through local outreach efforts and educational events that provide the necessary information on specific best management practices such as rain gardens.
- The majority of respondents indicated that they already follow pesticide application instructions and regularly service their septic system, two important best management practices for controlling non-point source (NPS) pollution in the watershed.
- However, 30% of those who have never protected shorelines or stream banks would like to protect it. This finding indicates that the desire to make this behavioral change is there, but people are not acting on that desire, due to cost, property features, and lack of information. This presents another opportunity for outreach and education that could be targeted specifically to property owners who have stream bank or shore line access on their property.
- Residential storm water management via the use of rain gardens is another area for potential improvement in regards to their use as a best management practice to improve water quality. A significant finding from the data indicated that 52% of respondents had never heard of rain gardens. This shows that there is a considerable lack of knowledge about this practice and provides an opportunity to capitalize on this relatively easy and underutilized practice.

A majority of respondents reported having a septic system. Of those with a septic system, 13% reported having had at least one problem with their septic system in the past year.

- Due to the significant presence of septic systems within the four sub-watersheds in this study and the high levels of concern for bacteria and viruses in the water (such as E coli), it is important to develop approaches to ensure that systems are regularly serviced.
- However, respondents were overwhelmingly opposed to receiving a service reminder from the public health department. This may be due in part to an aversion to more government intervention in what respondents consider to be a 'private' matter. Instead, it may be beneficial to partner with local, private septic system providers within the watershed to develop a social marketing plan to provide routine reminders to residents about servicing their systems. Combining current water quality data with the reminder may also increase the likelihood that respondents will alter their behaviors to more actively service their septic system on an annual basis.
- One example of a social marketing tool that involves collaboration with private septic system providers

as well as local government agencies is the “septic social” event. “Septic socials” are workshops that invite local residents to learn about easy and inexpensive practices they may adopt to keep their system running efficiently. These workshops also provide educational information to help residents identify when their system has a problem sooner rather than later, which will save the homeowner money and protect the watershed from harmful contaminants. This social marketing tool has been used with considerable success in Southern Maine and may be one consideration to address the issue of septic system maintenance, particularly within the sub-watersheds with a higher proportion of septic systems, such as Wonder Lake.

The majority of respondents were unfamiliar with the Nippersink Creek Watershed Plan. However, respondents generally agreed with all of the Watershed Plan recommendations evenly.

- The most strongly supported recommendation was expanding water quality and biological monitoring.
- However, respondents with a higher level of education are more likely to support the Watershed Plan recommendations.
- These findings indicate that the plan has even greater potential for support, and perhaps participation in actual implementation of the recommendations, if more residents in the watershed were aware of the plan.
- The strong support for expanding water quality and biological monitoring and education and outreach in local schools indicates that there may be considerable opportunity to collaborate with local schools to involve students in the monitoring and education process.
- There is considerable room for further dissemination of the Watershed Management Plan and its recommendations. Due to the depth of information provided in the Watershed Management Plan, it is feasible to expect that this effort to increase awareness and knowledge about the plan may also help to reduce some of the previously noted barriers to making changes in lawn care practices.

Community based social marketing techniques are a valuable tool that can be utilized to address many of the issues previously identified. These techniques may help to facilitate both awareness and, more importantly, behavior change, to further protect water quality and watershed health in the Nippersink Creek Watershed. Research has shown that education alone often has little or no effect on changing people’s behaviors, in particular as it relates to sustainability issues such as water quality or watershed health (Geller 1981; Geller, Erickson, and Buttram 1983; Jordan, Hungerford, and Tomera 1986). Community-based social marketing addresses this shortcoming by first identifying barriers to a sustainable behavior and then designing a strategy that utilizes behavior change tools (McKenzie-Mohr 2010).

This study has provided critical baseline information on barriers to specific actions such as making changes to lawn care and/or storm water practices, following pesticide application instructions for lawn and garden, protecting stream banks and/or shorelines with vegetation, and the regular servicing of septic systems. With this information, it is now possible to develop and employ specific tools that are effective in changing behavior. Examples of the most proven tools include gaining a commitment from an individual to try a new activity or developing community norms that encourage people to behave in a way that is more supportive of sustainability objectives (McKenzie-Mohr). To be most effective, it is important that these tools be carried out at the local and community level and work to incorporate direct personal contact. In the case of the Nippersink Creek Watershed, the findings indicate that some objectives could be carried out watershed-wide (such as increasing awareness about the watershed plan or residential storm water management via the use of rain gardens) while others may be more effective if targeted to the specific conditions and environments of the sub-watershed itself (such as focusing on septic system maintenance in the Wonder Lake sub-watershed or storm water management in the Silver Creek sub-watershed).

References:

Dillman, D. A. 2006. *Mail and Internet Surveys: The Tailored Design Method*. Wiley Publishing.

Geller, E.S. 1981. "Evaluating energy conservation programs: Is verbal report enough? *Journal of Consumer Research*." 8:331-335.

Geller, E.S., Erickson, J.B., and Buttram, B.A. 1983. "Attempts to promote residential water conservation with educational, behavioral and engineering strategies." *Population and Environment*, 6:96-112.

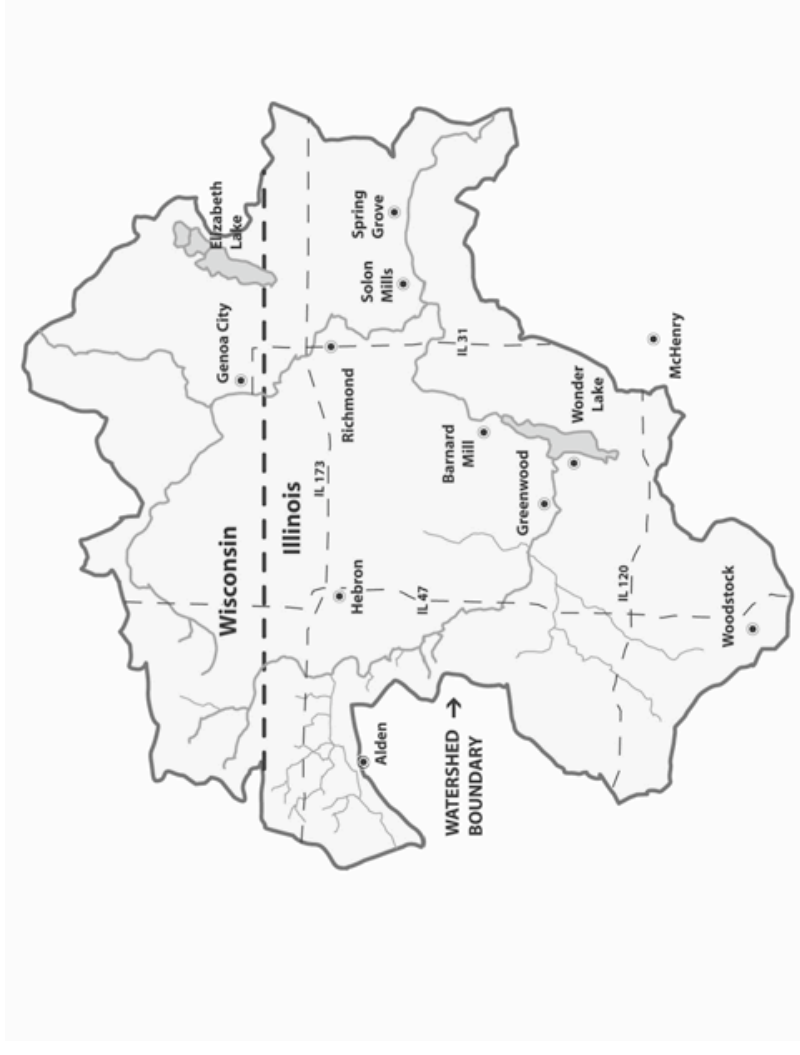
Jordan, J.R., Hungerford, H.R., and Tomera, A.N. 1986. "Effects of two residential environmental workshops on high school students." *Journal of Environmental Education*, 18:15-22.

McKenzie-Mohr, D. 2010. *Fostering Sustainable Behavior: Community-Based Social Marketing*. Retrieved November 12, 2010 (<http://www.cbsm.com/pages/guide/preface>)

Nippersink Creek Watershed Association. 2008. Nippersink Creek Watershed Management Plan.



Maintaining What We Value: A Survey to Guide the Nippersink Creek Watershed Plan



Nippersink Creek Watershed Planning Committee



Illinois Environmental Protection Agency



ILLINOIS STATE UNIVERSITY
Illinois' first public university

The Nippersink Watershed Association

Your Views of the Nippersink Creek Watershed

May, 2010

The Nippersink Watershed Association is conducting this survey in coordination with local watershed partners and Illinois State University in order to identify the needs and concerns in your community regarding water quality in the Nippersink Creek watershed. This project is funded by the Illinois Environmental Protection Agency.

In an effort to learn about your perceptions and concerns, such as how residents view issues like water quality and what they consider to be the biggest threats to the future well-being of the natural environment within the watershed, we are contacting a random sample of citizens in the Nippersink Creek watershed.

The questions in this survey were developed from conversations that we have had with leaders and members of your community. This study will inform public officials about citizens' needs and concerns, as well as your community's ability and desires to engage in activities that will help to maintain and improve the quality of the natural environment within the Nippersink Creek watershed.

We ask that this survey be completed by the person in your home that makes most of the lawn and yard care decisions and is at least 18 years old. Your participation in this survey is voluntary. Your answers will be kept confidential and will be released only as summaries where individual answers cannot be identified.

Unless otherwise instructed, please check the circle that corresponds to the answer category that best describes you and your situation or opinion. Your opinions and perspectives are extremely valuable to us and we hope that you will take about 15-20 minutes of your time to complete the survey. Please read each question carefully. **Thank you for your time and consideration in completing this survey.**

*A watershed is the land area that drains to a specific body of water.
(Please see the cover for a map of the Nippersink Creek Watershed)*

This project has been reviewed and approved by the Illinois State University Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Research Ethics & Compliance Office at Illinois State University at (309) 438-2529

Your Views of the Nippersink Creek Watershed

Your Views of the Nippersink Creek Watershed

Your Views of the Nippersink Creek Watershed

Thank you for your time and assistance!

Please return your completed survey in the postage-paid envelope provided. Please use the space below for any additional comments about this survey or water resource issues in your community. To learn more about the Nippersink Creek Watershed Plan and other related activities please visit www.nippersink.org.

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I. Rating of Water Quality

1. Overall, how would you rate the quality of the water in your local rivers, streams, and lakes?

	Poor	Okay	Good	Don't Know
a. For canoeing / kayaking / other boating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. For eating fish caught in the water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. For swimming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. For picnicking and family activities near water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. For fish habitat / fishing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. For scenic beauty / enjoyment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

II. Your Water Resources

2. Of these activities, which is the most important to you?

- Canoeing / kayaking / other boating
- Eating fish caught in the water
- Swimming
- Picnicking and family activities near water
- Fish habitat / fishing
- Scenic beauty / enjoyment

3. Do you know where the water goes when it runs off of your property?

- No, I don't know.
- Yes, it goes to _____

Your Views of the Nippersink Creek Watershed

III. Your Opinions

4. Please indicate your level of agreement or disagreement with the statements below.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
a) The economic stability of my community depends upon good water quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) The way that I care for my lawn and yard can influence water quality in local streams and lakes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) It is my personal responsibility to help protect water quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) It is important to protect water quality even if it slows economic development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) What I do on my land doesn't make much difference in overall water quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Lawn and yard-care practices (on individual lots) do not have an impact on local water quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) My actions can have an impact on water quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Taking action to improve water quality is too expensive for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) It is okay to reduce water quality to promote economic development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) It is important to protect water quality even if it costs me more.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k) I would be willing to pay more to improve water quality (for example: through local taxes or fees).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l) I would be willing to change the way I care for my lawn and yard to improve water quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m) The quality of life in my community depends on good water quality in local streams, rivers and lakes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your Views of the Nippersink Creek Watershed

XII. Septic Systems

34. Does your household have a septic system?
 No (Thank you for your time, you are done with the survey)
 Yes (Continue to Question 35)

35. How old is your waste treatment system? _____ (years)

36. Within the last five years, have you had any of the following problems? Check all that apply.

- Slow drains
- Sewage backup in the house
- Bad smells near tank or drain field
- Sewage on the surface
- Sewage flowing to ditch
- Frozen septic
- Other
- None
- Don't know

37. In the future, would you like a reminder from your local health department regarding inspection/maintenance of your septic system?

- Yes
- No
- Don't know



XI. About You

24. Do you make the home or lawn care decisions in your household?
 Yes
 No
25. What is your gender?
 Male
 Female
26. In what year were you born? _____
27. What is the highest grade in school you have completed?
 Some formal schooling
 High school diploma / GED
 Some college
 2 year college degree
 4 year college degree
 Graduate degree
28. What was your total household income last year?
 Less than \$24,999
 \$25,000 to \$49,999
 \$50,000 to \$74,999
 \$75,000 to \$99,999
 \$100,000 or more
29. What is the approximate size of your residential lot?
 ¼ acre or less
 More than a ¼ acre but less than 1 acre
 1 acre to less than 5 acres
 5 acres or more
30. Do you own or rent your home?
 Own
 Rent
31. How long have you lived at your current residence? _____ years
32. Which of the following best describes where you live?
 a. In a town, village, or city
 b. In an isolated, rural, non-farm residence
 c. Rural subdivision or development
33. Do you use a professional lawn care service?
 Yes, just for mowing
 Yes, just for fertilizing
 Yes, just for pest control (including herbicide)
 Yes, some combination of mowing, fertilizing and pest control
 No

IV. Water Impairments

5. Below is a list of water pollutants and conditions that are generally present in water bodies to some extent. The pollutants and conditions become a problem when present in excessive amounts. In your opinion, how much of a problem are the following water impairments in your area?

	Not a Problem	Slight Problem	Moderate Problem	Severe Problem	Don't Know
a) Excess dirt and soil in the water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Excess nitrogen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Excess phosphorus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Bacteria and viruses in the water (such as E. coli / coliform)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Trash or debris in the water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Excess algae in the water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Invasive aquatic plants and animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Habitat alteration affecting fish negatively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your Views of the Nippersink Creek Watershed

V. Sources of Water Pollution

6. The items listed below are sources of water quality pollution across the country. In your opinion, how much of a problem are the following sources in your area?

	Not a Problem	Slight Problem	Moderate Problem	Severe Problem	Don't Know
a) Discharges from industry into streams and lakes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Discharges from sewage treatment plants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Soil erosion from construction sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Soil erosion from farm fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Soil erosion from shorelines and/or streambanks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Excessive use of lawn fertilizers and/or pesticides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Improperly maintained septic systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Manure from farm animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Littering/illegal dumping of trash	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Land development or redevelopment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k) Residential stormwater runoff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l) Drainage/filling of wetlands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your Views of the Nippersink Creek Watershed

X. Nippersink Creek Watershed Plan

22. How familiar are you with the Nippersink Creek Watershed Plan completed by Nippersink Watershed Planning Committee in 2008?

Never Heard of It	Somewhat Familiar With It	Familiar With It	Very Familiar With It
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. Below are general Watershed Plan recommendations that are applicable to the entire watershed. Please indicate your level of agreement with the following recommendations:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
a) Expand water quality and biological monitoring to better understand the conditions in the watershed and identify trends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Identify existing nutrient management planning efforts such as managing the amount, source, and timing of the application of plant nutrients and soil amendments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Protect/enhance stream corridors and wetlands through acquisitions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Protect/enhance stream corridors and wetlands through conservation easements.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Change the way communities in the Nippersink watershed manage storm water.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Improve effluent quality at existing/expanding/proposed wastewater treatment plants.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Improve controls on non-point source pollution such as runoff from impervious surfaces or lawn chemicals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Conduct public education and outreach about the watershed at community events.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Conduct public education and outreach about the watershed in local schools.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Encourage watershed municipalities to implement Conservation Design Practices that facilitate development while maintaining and preserving the most valuable features and functions of a site.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your Views of the Nippersink Creek Watershed

IX. Making Decisions for my Property

21. When you make decisions about changing your lawn care and/or stormwater practices, how important is each of the following?

	Not at All	A little	Some	A lot	Don't Know
a) Personal out-of-pocket expense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) My own views about effective lawn and yard maintenance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) How easily the new action fits with my current practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) My own physical abilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) The need to learn new skills or techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Too much time required for implementation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Not having access to the equipment that I need	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Lack of available information about a practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) No one else I know is implementing the practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Approval of my neighbors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k) Restrictive covenants in my subdivision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l) Don't know where to get information and/or assistance about the practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m) Environmental damage caused by practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n) Environmental benefit of practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your Views of the Nippersink Creek Watershed

VI. Consequences of Poor Water Quality

7. Poor water quality can lead to a variety of consequences for communities. In your opinion, how much of a problem are the following issues in your area?

	Not a Problem	Slight Problem	Moderate Problem	Severe Problem	Don't Know
a) Contaminated drinking water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Polluted / closed swimming areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Contaminated fish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Increase in water / sewage bill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Loss of desirable fish and wildlife species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Reduced beauty of lakes or streams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Reduced opportunities for water activities such as boating, canoeing, and fishing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Reduced quality of water activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Excessive aquatic plants or algae	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Lower property values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

VII. Practices to Improve Water Quality

8. Please indicate which statement most accurately describes your level of experience with each practice listed below.

	Never Heard Of it	Somewhat familiar with it	Know how to use it; not using it	Currently Use It
a) Create a rain garden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Keep grass clippings and leaves out of the roads, ditches, and gutters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Use phosphate free fertilizer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Properly dispose of pet waste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Inspect septic system for size and condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Restore native plant communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Protect stream banks and/or shorelines with structures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Improve stream habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your Views of the Nippersink Creek Watershed

VIII. Constraints for Specific Practices

Follow pesticide application instructions for lawn and garden. Lawn and garden pesticides should be applied according to the guidelines from the manufacturer.

9. Do you follow pesticide application instructions?
 Currently use.
 Don't currently use.
 Never used.

10. How familiar are you with pesticide application instructions?
 Never heard of it.
 Somewhat familiar with it.
 Know how to follow, not following them.
 Currently follow instructions.

11. Are you willing to try to use pesticide application instructions?
 Yes or already do.
 Maybe.
 No.

12. How much do the following factors limit your ability to follow pesticide application instructions (or limited, if you already do)?

	Not at All	A little	Some	A lot	Don't Know
a. Lack of skills / information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Physical limitations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The features of my property.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Time required	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Desire to keep things the way they are	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Regular servicing of septic system. For most single family home septic systems, tanks should be cleaned every 3-5 years. Make sure the cleaner thoroughly removes all the sludge, effluent and scum from the tank.

13. Do you follow the practice of regularly servicing your septic system?
 Currently use.
 Don't currently use.
 Never used.

14. How familiar are you with the practice of regularly servicing your septic system?
 Never heard of it.
 Somewhat familiar with it.
 Know about servicing septic, not doing it.
 Regularly service septic system.

15. Are you willing to follow the practice of regularly servicing your septic system?
 Yes or already do.
 Maybe.
 No.

16. How much do the following factors limit your ability to regularly service your septic system (or limited, if you already do)?

	Not at All	A little	Some	A lot	Don't Know
a. Lack of skills / information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Physical limitations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The features of my property.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Time required	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Desire to keep things the way they are	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your Views of the Nippersink Creek Watershed

Protect streambanks and/or shorelines with vegetation. Diverse vegetation that grows along streams, rivers or lakes acts as a protective buffer between the land and the water to reduce runoff and sediments flowing into the water.

17. Do you follow the practice of protecting streambanks and/or shorelines?
 Currently use.
 Don't currently use.
 Never used.

18. How familiar are you with the practice of protecting streambanks and/or shorelines?
 Never heard of it.
 Somewhat familiar with it.
 Know how to protect, not doing it.
 Currently protecting.
 Do not have streambank or shoreline on my property.

19. Are you willing to follow the practice of protecting streambanks and/or shorelines?
 Yes or already do.
 Maybe.
 No.

20. How much do the following factors limit your ability to protect streambanks and/or shorelines with vegetation (or limited, if you already do)?

	Not at All	A little	Some	A lot	Don't Know
a. Lack of skills / information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Physical limitations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The features of my property.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Time required	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Desire to keep things the way they are	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>