

# **Results of the Galien River Watershed Survey**

## ***SIDMA Pilot Project***

**Galien River Implementation Project II**

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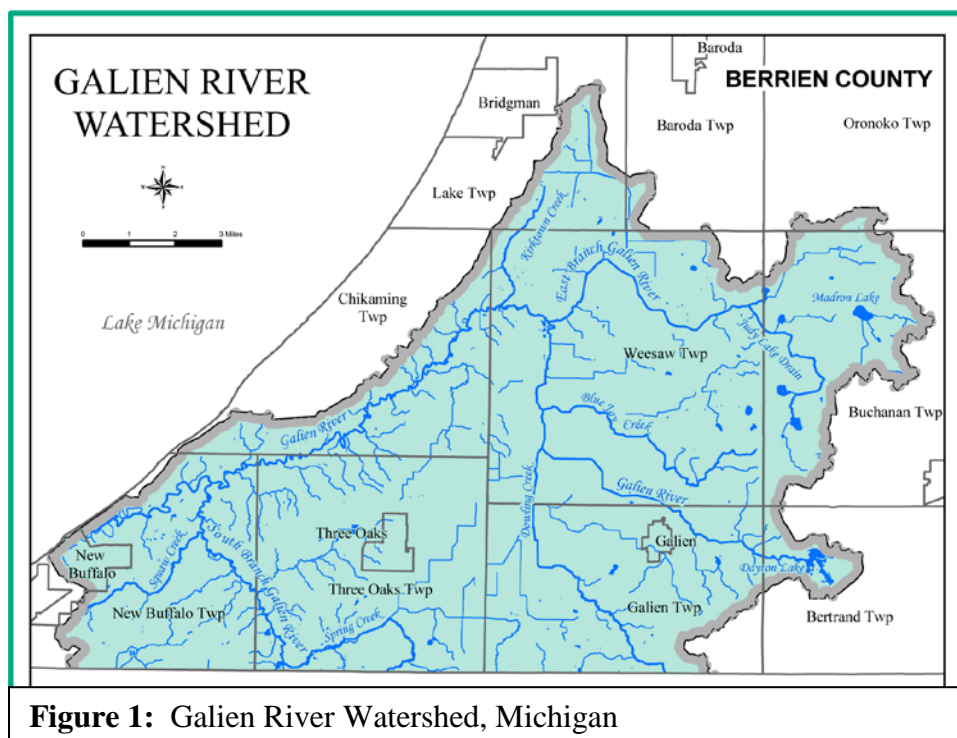
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## Watershed and Project Background

The Galien River winds through northwestern Indiana and southwestern Michigan in Berrien County before emptying into Lake Michigan at New Buffalo, Michigan. The entire basin contains 112,222 acres, the majority of which (82,665 acres) lies in Berrien County, Michigan. In Michigan, the watershed contains 62% rural land, 23% forest land, and 5% urban land, with the remainder being streams and lakes. The watershed has lost over 50% of its wetlands in the last 100 years. The Galien River Watershed encompasses acres of prime farmland and forested floodplains, Warren Woods Preserve, and a portion of the City of New Buffalo where the Galien River flows into Lake Michigan. The Galien River does not meet Michigan's water quality standards for *E. coli*. Polluted runoff containing sediment and excess nutrients also degrade the water quality of the Galien River and its tributaries.



**Figure 1:** Galien River Watershed, Michigan

The ***Galien River Watershed Project*** goal is to improve and protect water resources and protect the open, natural spaces that contribute to clean water and quality of life. This locally led project was started by the county drain commission in 2001 to study flooding problems in the watershed. With funding from the Michigan Department of Environmental Quality (MDEQ), a watershed inventory was completed in 2003 and a local steering committee of conservation groups, elected officials, citizens and landowners developed a Watershed Management Plan. Additional grant funds were obtained in 2005 to begin implementation of the plan. A second implementation grant was funded by MDEQ in 2009. The project partners strive to improve water quality by raising public awareness of water quality issues and addressing impairments to water quality with a specific focus on reducing *E. coli* pollution in the watershed. The ultimate project outcome is clean water and a healthy watershed.

## Project Description

As part of the second Galien River Watershed Implementation Project, the Southwest Michigan Planning Commission (SWMPC) conducted a survey of watershed residents. Funding for the survey was provided by the Michigan Department of Environmental Quality through The Conservation Fund. The survey was associated with a pilot program of the U.S. Environmental Protection Agency Region 5 and a team of researchers at Purdue, Wisconsin and Michigan State Universities.

Surveying and monitoring social indicators can provide valuable information about how well outreach and education strategies are working. The goal of conducting a survey was to gain a better understanding of the level of awareness about water quality issues so that outreach efforts could be tailored to local audiences.

Since watershed improvement efforts involve the interaction of humans with their natural environment, evaluating the effectiveness of programs to reduce water pollution needs to include an assessment of the human behavior contributing to the pollution. Water quality problems have built up over many decades and may take decades to amend. Even when appropriate practices are put into place, there will be a lag before water quality actually improves. Surveys can confirm the adoption of corrective practices and other beneficial attitudinal changes to provide more immediate indications of anticipated water quality change.

Evaluating the social component of water quality programs and projects involves more than identifying changes in behavior in critical areas of the watershed; it also requires consideration of the continuum of knowledge, awareness, attitudes, constraints, and capacity that eventually leads to behavioral change. Because decisions regarding individual behaviors are influenced by a complex interplay of factors, measuring the precursors or contributing factors leading to the change gives project managers additional information to help insure that current and future activities will accomplish water quality goals. If a project or program positively influences the precursors, it is advancing the goal of achieving the desired behavioral change.

Measuring change in behavioral precursors requires the use of a variety of *social indicators* that represent or reflect those precursors. *Social indicators are measures that describe the capacity, skills, knowledge, values, beliefs, and behaviors of individuals, households, organizations, and communities.* By measuring these indicators, water quality project managers can determine

whether policies, programs, and initiatives are likely to lead to the intended behavioral change in a watershed and, ultimately, to improvements in water quality.

**Purpose of the evaluation:**

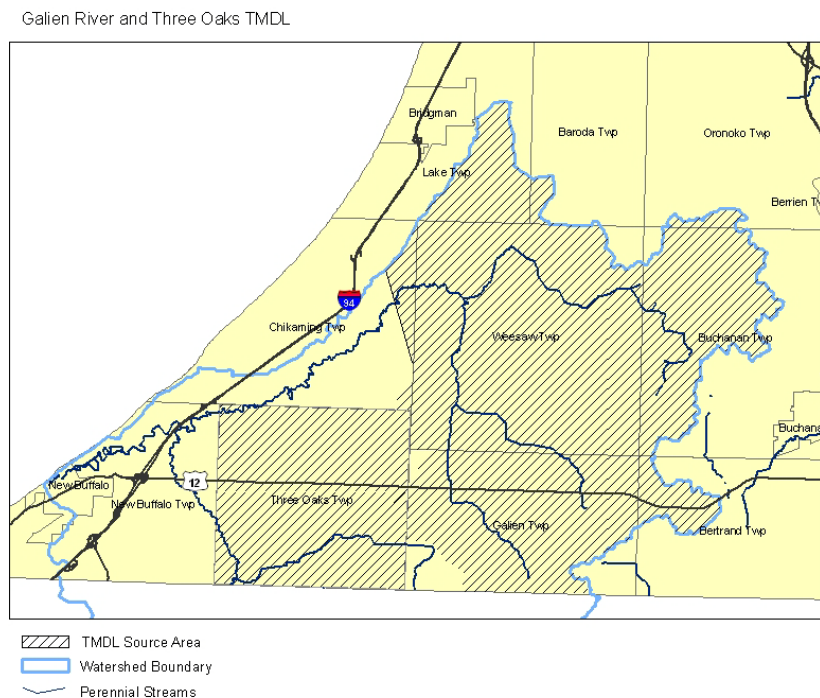
The social data collected during the survey was intended to develop indicators to serve both as an intermediate measure for the purpose of performance review, as well as provide information to inform the design of effective outreach and education efforts to reduce polluted runoff.

The data will help to answer a variety of questions regarding awareness, attitudes and behaviors related to polluted runoff. Questions in the survey will help to determine public awareness or misconceptions about topics such as:

- Connections between stormwater and pollution
- The community's level of concern about pollution
- Individual practices that contribute to polluted runoff
- Individual characteristics and barriers to behavior change

## Survey Methodology and Data Management

The same survey instrument (see Appendix A) was utilized in two different delivery mechanisms, a mailed survey and a door-to-door survey in the Galien River Watershed. The mailed survey was a random sample and covered the entire watershed area. The door-to-door survey targeted households in an area suspected for contributing to the *E. coli* impairment (specifically Three Oaks, Weesaw and Chikaming Townships) (see Figure 2). A door-to-door survey was used because of the perceived low literacy rates in the area. A postcard was mailed out one to two weeks prior to the door-to-door survey being conducted. Further a press release was issued to local newspapers and a letter was sent to municipalities in the watershed with information regarding the door-to-door and mail survey effort (see Appendix B). The mailed survey indicated that all respondents would be entered in to drawing to receive one of four \$25 Meijer gift cards, which were donated to the Southwest Michigan Planning Commission by Meijer for this effort. To increase the response rate, two weeks after the survey was mailed a reminder post card was sent to addresses if a survey had not yet been received. The mailed and door-to-door surveys were conducted once during this project. It is hoped that at least the mailed survey could be replicated in the future to determine changes in awareness, attitudes and behaviors.



**Figure 2:** Galien River Watershed, TMDL Study and Door-to-Door Target Area

The primary resource used for the survey was The Social Indicator Planning and Evaluation System (SIPES) for Nonpoint Source Management: A Handbook for Projects in the USEPA Region 5 and the Social Indicators Data Management and Analysis (SIDMA) on-line tool. The regional team that developed the SIPES also provided support for this and other pilot projects in the Great Lakes region. All data from the survey was entered into the web-based SIDMA system. The Social Indicator Data Management and Analysis (SIDMA) tool is a web-based project management aid that supports SIPES for watershed projects in USEPA Region 5. SIDMA is used by project coordinators to collect, organize, and use social indicators related to water quality improvements. For analysis of the data, SIDMA generates a report of results for each question and also the social indicator scores.

## **Survey Results**

The results section is presented in two separate sections. The first section will present various demographic related and then water quality related results from the mailed survey. The mailed survey had a 19% return rate, with 301 surveys returned from the 1,585 surveys that were mailed. The next section will present the demographic related and then the water quality related results from the door-to-door survey. Forty-three out of 200 targeted homes for the door-to-door survey were successfully administered in the summer of 2009.

As mentioned, the same survey instrument was used (Appendix A). The data reports from the SIDMA system for both surveys (mailed and door-to-door) can be found in Appendix C and D. Due to the large amount of data collected in the surveys, it is impractical to display charts and graphs for all of the questions. In the following sections, selected questions and results are highlighted from the surveys.

### ***Mailed Survey – Selected Demographic Results***

Three hundred and one surveys were returned, out of 1,585 that were mailed to residents (19% response rate). Respondents were not required to answer each question within the survey, therefore response rates varied slightly on each question. Most of the respondents (97.9%) stated that they made the home and lawn care decisions in their household. The average respondent was born around 1950, with a range of participants born from 1919 to 1983.

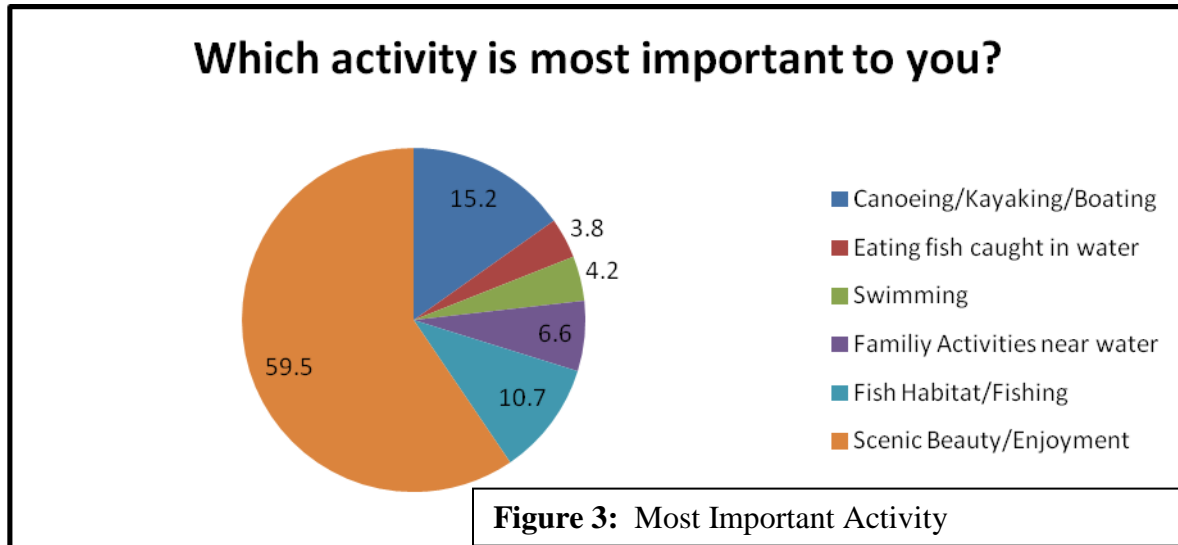
The population that completed the mailed survey was relatively well-educated, with the majority (54%) having completed at least 4 years of secondary education. The size of the respondents' residential lot varied uniformly from a quarter acre and smaller to five acres or more. Almost all of the respondents (99.6%) owned their home as opposed to renting, and had lived on their property for an average of 20 years. Most homeowners were not part of an agricultural operation (76.4 %), and most lived within city or village limits (59.2%).



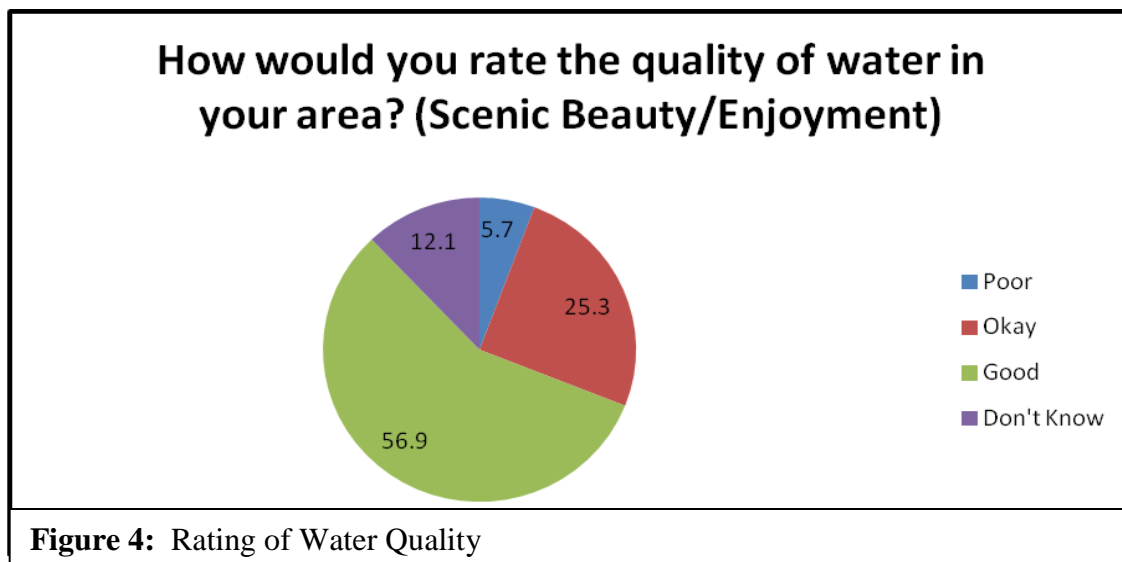
## ***Mailed Survey – Selected Results***

### **Water Usage/Quality**

The first sections of the survey questioned both the type and quality of water resources in the Galien River Watershed (GRW) area. The majority of participants (almost 60%) selected “scenic beauty/enjoyment” as their most important aspect of the GRW (see Figure 3).



Most of survey respondents (57%) indicated that the water quality for scenic beauty and enjoyment was good (see Figure 4).

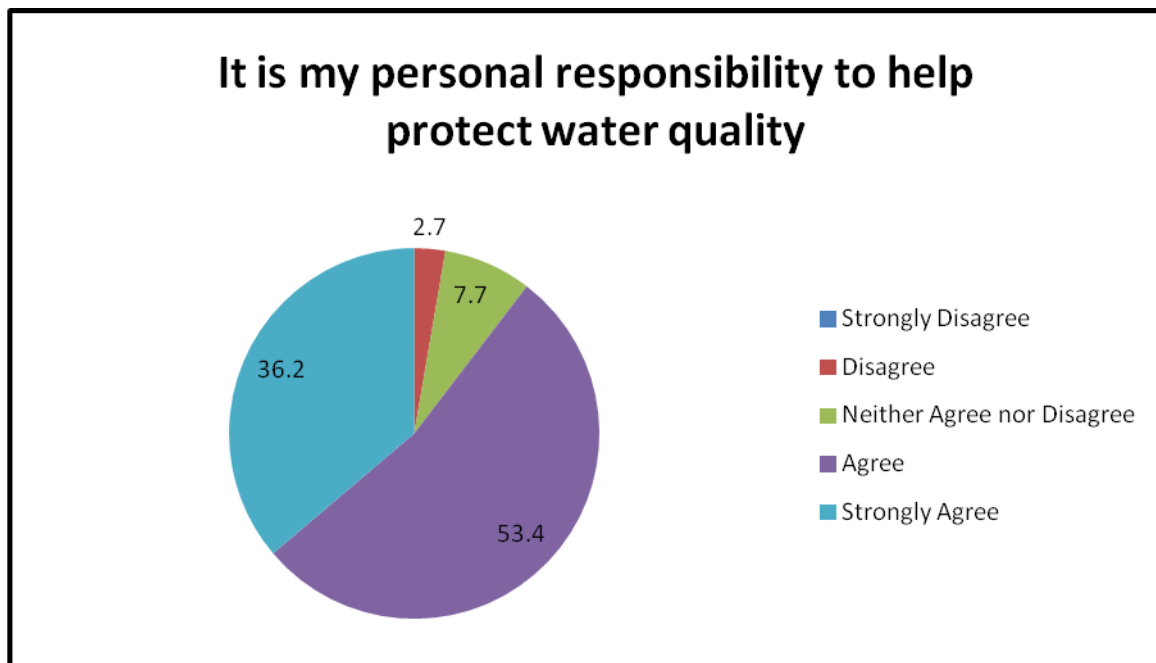


However, 42% of the respondents rated the water quality poor for swimming and 26% rated it poor for eating the fish caught in the water. A significant number of the respondents did not know whether the water quality was good or not for canoeing/kayaking (35%), fishing or fish

habitat (37%) and eating the fish caught in the water (45%). Only 40% of the respondents said that they knew where the water goes when it runs off their property. (See Appendix C).

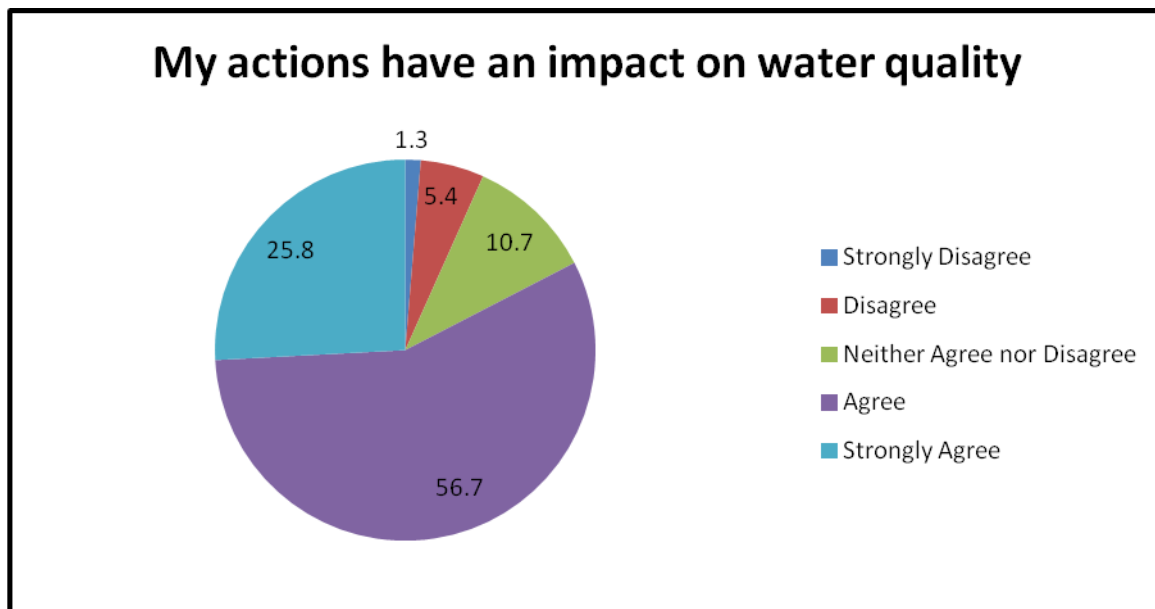
### **Your Opinions**

The following section of the survey asked participants to share their opinions on various factors relating to the GRW, ranging from economic relationship to water quality to defining responsibilities for water quality and cleanup. This section contained 13 questions. One relationship defined in this section examined the responsibilities of homeowners and their personal actions pertaining to water quality. Figure 5 shows that 89.6% of the participants strongly agreed or agreed that it is their personal responsibility to help protect water quality.



**Figure 5:** Personal Responsibility to Protect Water Quality

Figure 6 shows that 82.5% of the participants strongly agreed or agreed that their actions have an impact on water quality.

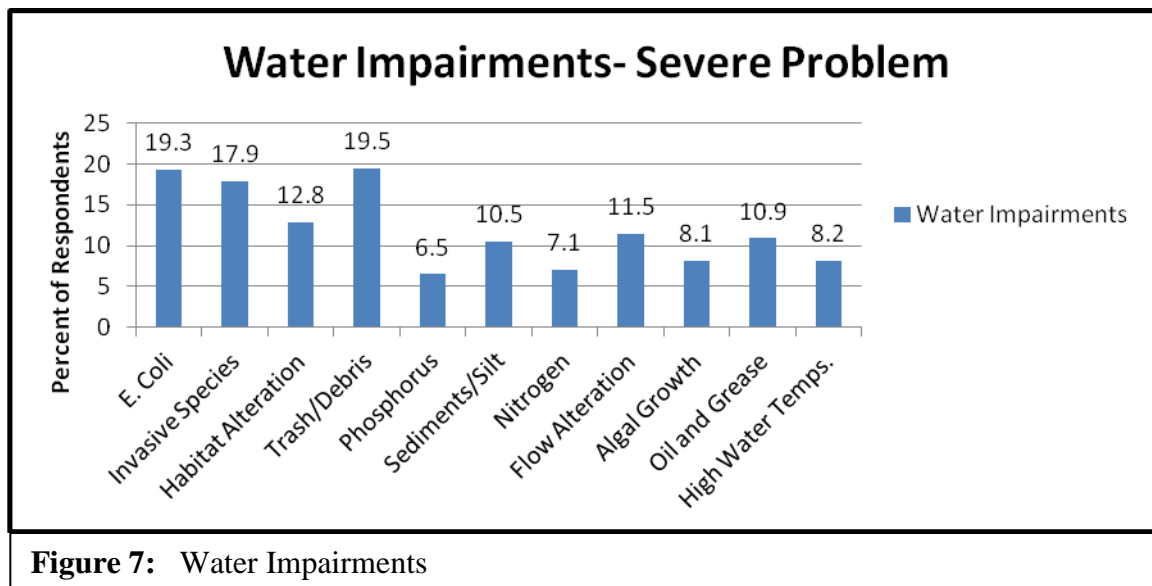


**Figure 6:** Actions and Impact on Water Quality

Results also showed that 80% of the respondents agreed or strongly agreed that the economic stability of their community depends upon good water quality and they also agreed or strongly agreed that it is important to protect water quality even if it slows economic development. Only 60% of the respondents agreed or strongly agreed that it is important to protect water quality even if it costs me more and 44% would be willing to pay more to improve water quality (for example through local taxes or fees. (See Appendix C.)

### **Water Impairments**

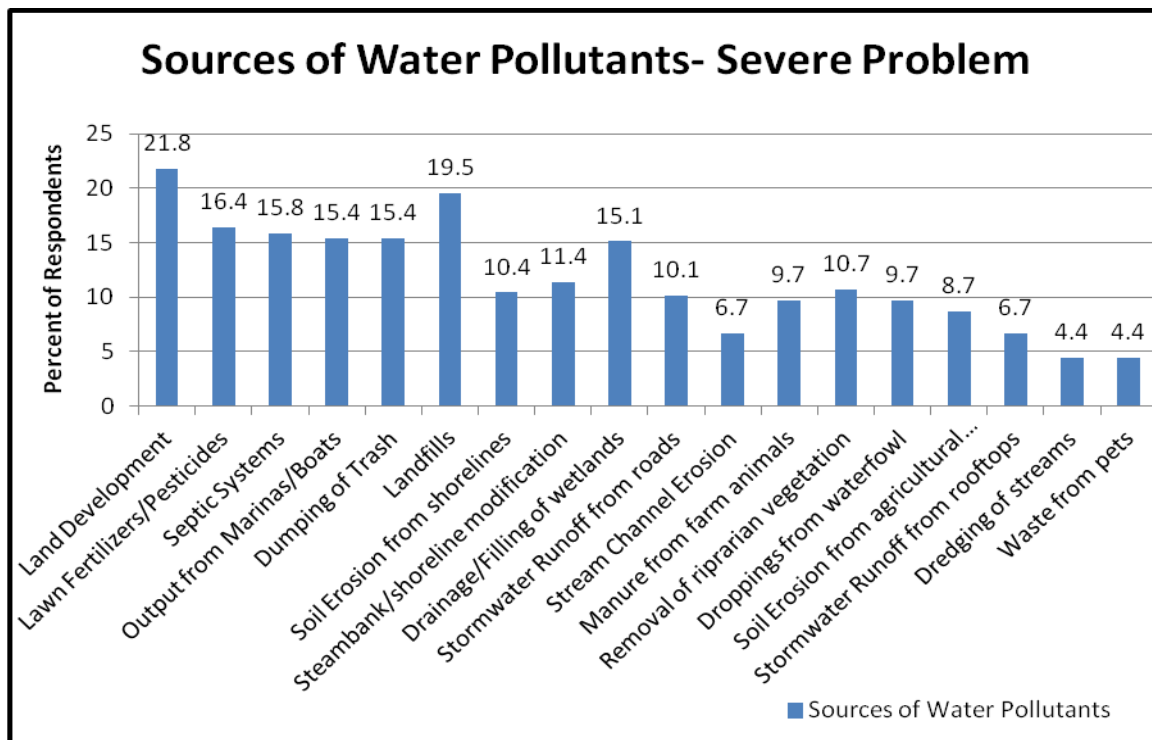
The following section of the survey asked participants to rate the importance of various pollutants and impairments to water quality and usage. The following chart displays the percentage of participants that rated a given pollutant as a “severe problem.” The section contained 11 questions. The top three water impairments selected as shown in Figure 7 are Trash/Debris, *E. coli* and Invasive Species.



The survey results also indicated that many respondents do not know if water pollutants were a problem or not. For *E. coli*, 50% did not know if it is a problem, for sediment 43% did not know and for phosphorus and nitrogen about 70% did not know if it was a problem or not. Other pollutants that most respondents did not know if they were a problem or not included habitat alteration (54%), flow alteration (57%), high water temperatures (60%) and oil and grease (53%)

### **Sources of Water Pollutants**

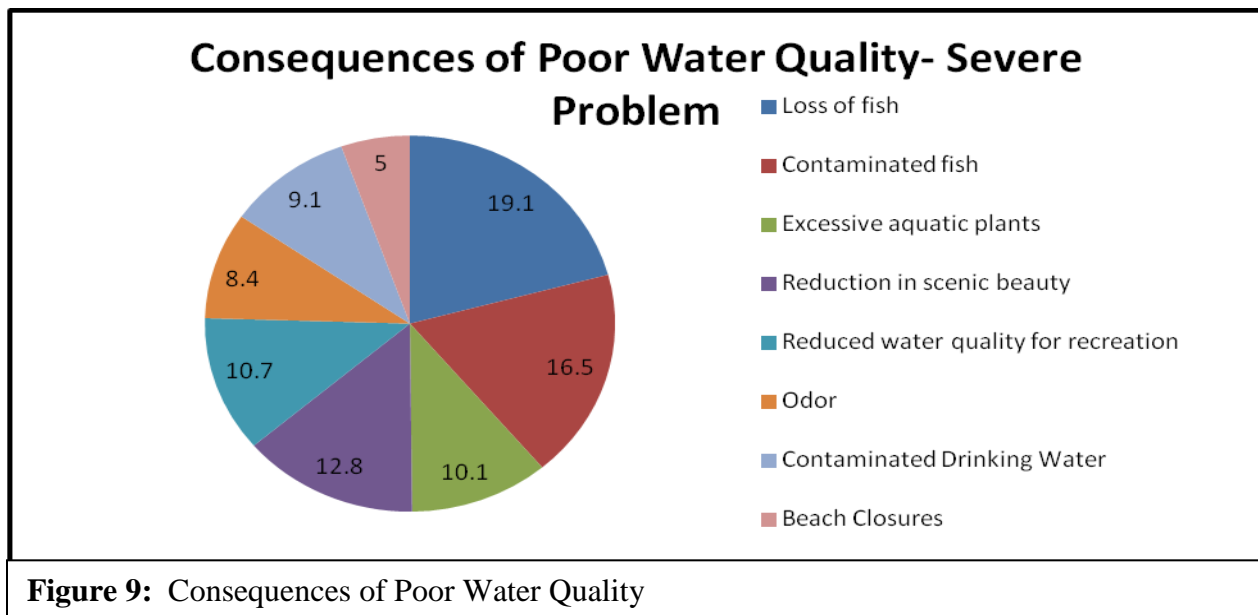
The following section examined the participants' views on where the sources of water pollution originate. Once again, the chart below displays those who answered "severe problem" to a given pollutant. The section contained 18 questions. The respondents perceived the top sources of water pollutants as shown in Figure 8 which are land development, landfills, lawn fertilizers/pesticides and septic systems.



**Figure 8:** Water Pollutant Sources

### **Consequences of Poor Water Quality**

In this section, participants were asked to rate the severity of a given scenario that could be caused by poor water quality. The chart below depicts the percentage of respondents who rated a given scenario as a “severe problem.” The section contained 8 questions. The top four consequences of poor water quality selected as a severe problem are shown in Figure 9 - loss of desirable fish species (19%), contaminated fish (16%), reduction in scenic beauty (13%) and reduced water quality for recreation (11%). It was also interesting to note that many people do not know what the consequences of poor water quality are. The consequences with the least amount of knowledge are loss of desirable fish species (42%), contaminated fish (37%) and excessive aquatic plant or algae growth (38%). While 23% didn’t know if beach closures were a problem, 34% said it was not a problem and 25% said it was a slight problem. For reduced water quality for water recreation 22% said it was not a problem, 20% slight problem and 25% did not know if it was a problem or not.

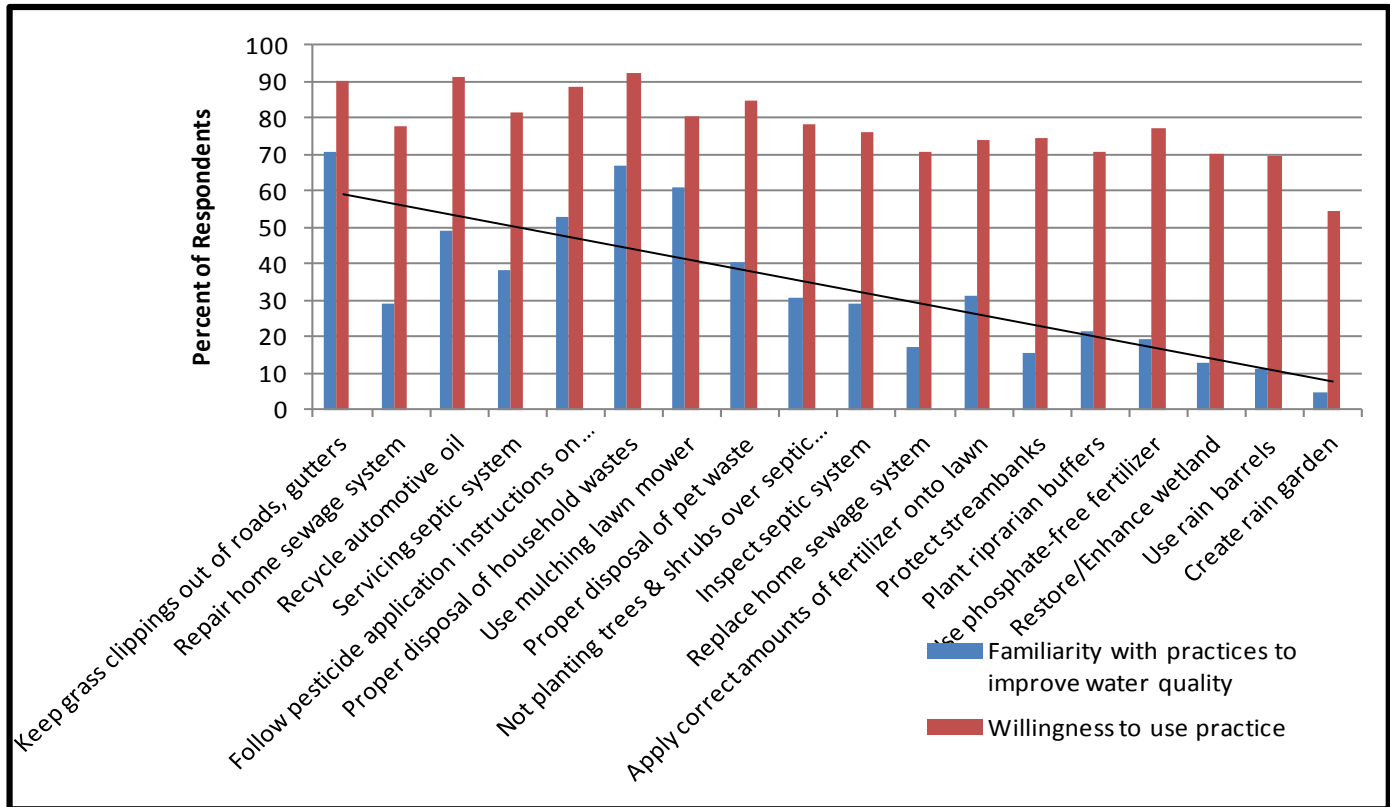


### **Practices to Improve Water Quality**

The following section examined the respondents' familiarity with common practices to improve local water quality, as well as their willingness to use the practice. For a given practice, participants were given six options to rate their experience with a practice and three options to rate their willingness to use that practice. The chart below depicts those currently using a given practice, and those willing to try or continue that practice. This section contained 18 questions.

The respondents were most familiar with the following practices: keeping their grass clippings out of roads, ditches and gutters, proper disposal of household wastes and using a mulching lawn mower. They were least familiar with these practices: creating a rain garden, using rain barrels, restoring/enhancing wetlands and protecting streambanks.

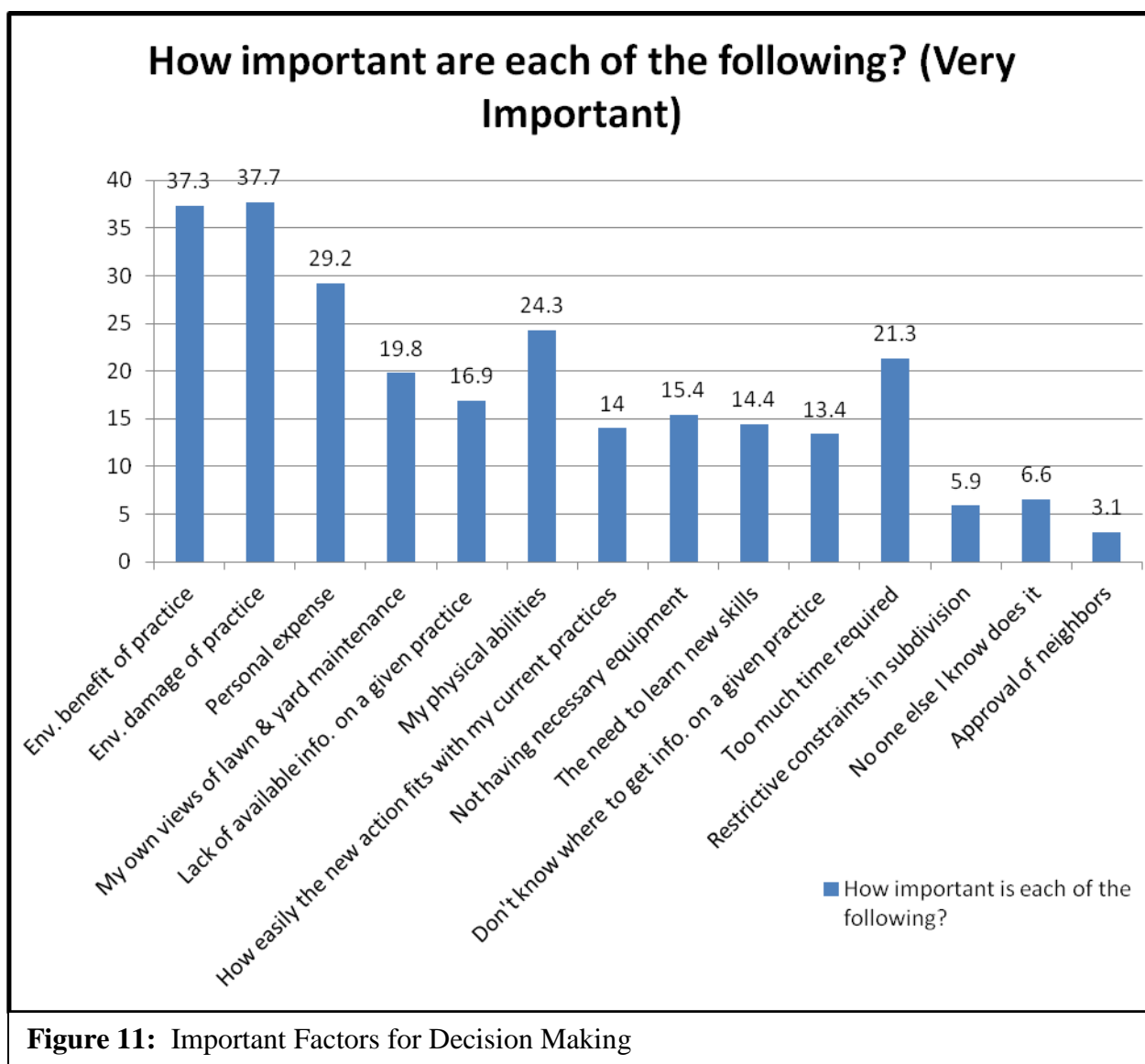
The respondents were most willing to use these practices: keep grass clippings out of roads, ditches and gutters, recycle automotive oil, follow pesticide application instructions, proper disposal of household wastes and proper disposal of pet waste. They were least likely to use these practices: create a rain garden, use a rain barrel, restore/enhance wetlands, plant riparian buffers and replace home sewage system.



**Figure 10:** Familiarity With and Willingness to Use Practices

### **Making Decisions for my Property**

This section of the survey specifically asked for input on the importance of certain factors when they pertained to changing their lawn care and/or storm water practices. The following chart shows the percentages of those who thought a particular factor was “very important.” This section included 14 questions. Almost 40% of the participants responded that for making decisions the environmental benefits and damages are very important factors. Between 21 and 29% of the respondents felt that personal factors such as personal expense, physical abilities and the time required are very important. Very few of the survey respondents said that approval of neighbors was very important (3%).



**Figure 11: Important Factors for Decision Making**

### Septic Systems

This section of the survey specifically covered information pertaining to homeowners' septic systems, a likely contributor to *E. coli* pollution in the watershed. Only 120 (40%) of the 301 survey respondents indicated that they had a septic system. This section included 8 questions.

The average age of the respondents' septic systems was 20 years with answers ranging from one year to 100 years. Over 80% of the respondents claimed to have no problems with their septic systems within the last five years while almost 14% reported to have slow drains, 5.1% reported bad smells, 1.7% reported sewage on the surface and 0.8% had sewage flowing to a ditch. Slow drains, sewage/toilet backups in the house and bad smells were listed as the most common ways



to tell if their septic was not working properly (76.7%). Over 25% respondents reported having a garbage disposal with only 5% of the 25% do not use it (7.5% use it daily and 13% use it occasionally).

Figure 12 shows that only 24% would like to have a reminder from the local health department regarding septic maintenance; however, 65% thought local government agencies should handle inspection and maintenance of septic systems.

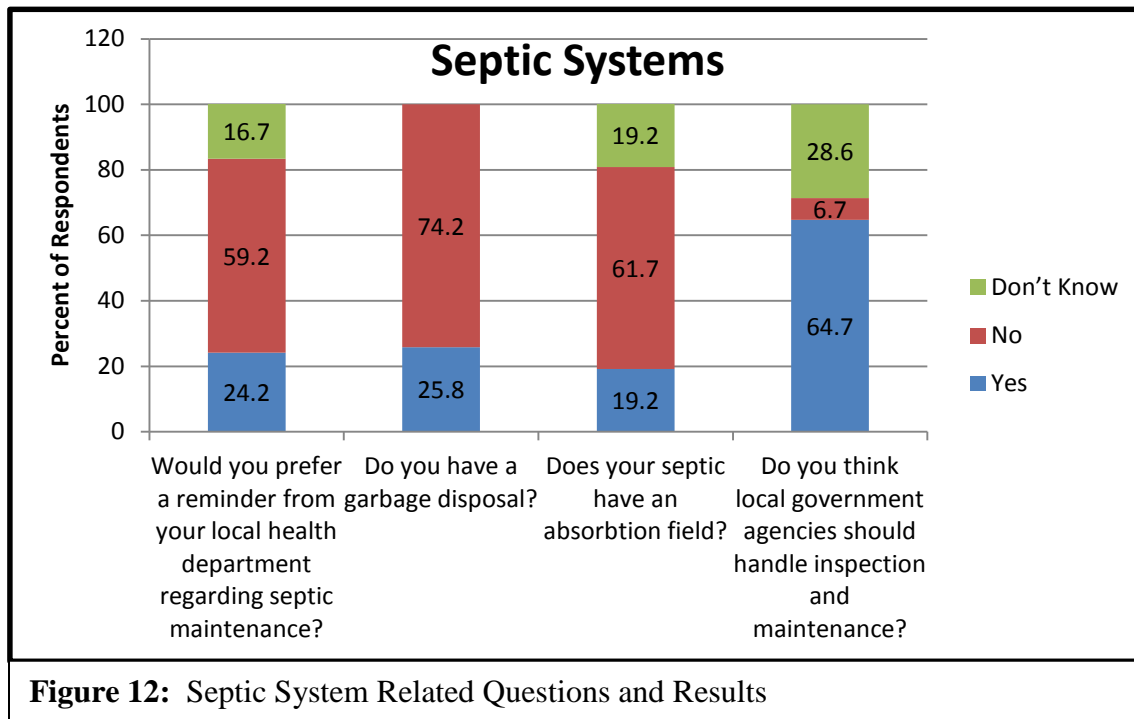
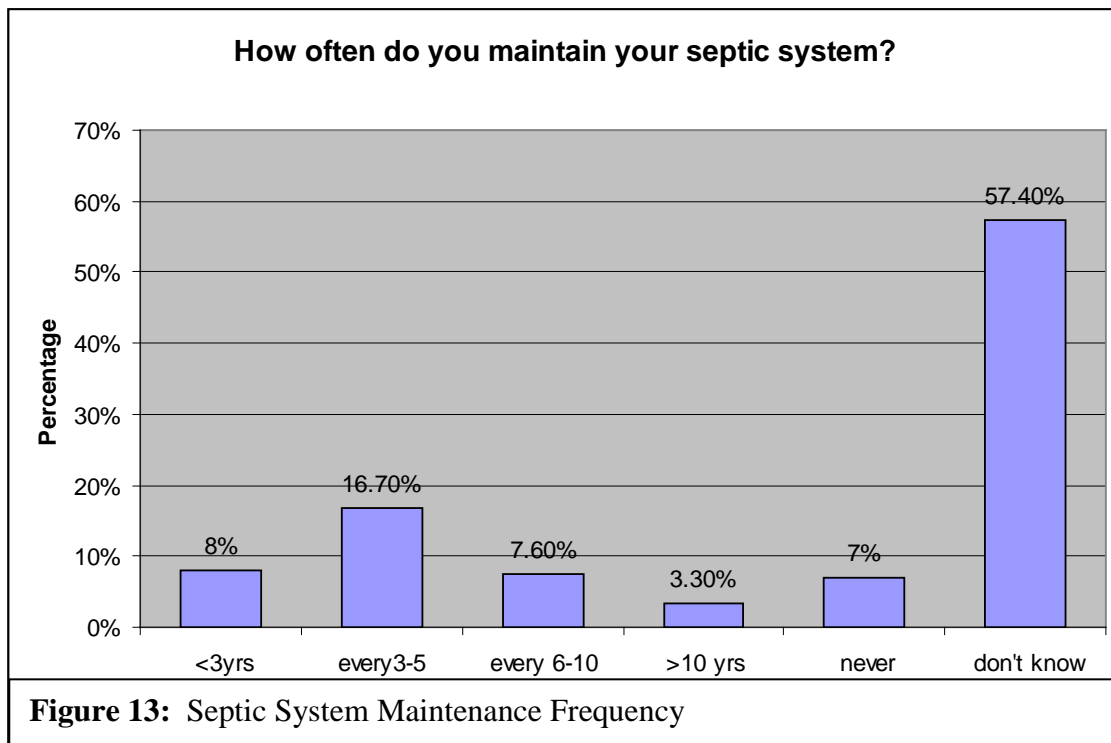
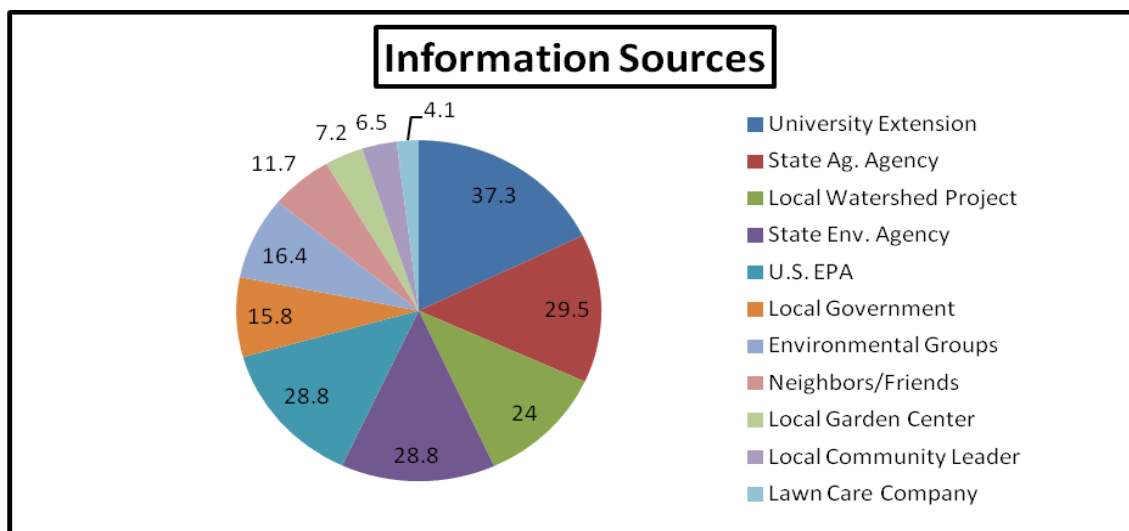


Figure 13 shows that 57% of the respondents don't know how often they maintain their septic systems and only 16.7% maintain their septic system every 3-5 years with 7.6% maintaining it every 6-10 years and 7% reported never maintaining their system. The recommended maintenance frequency for a septic system is every 3-5 years based on average household size and use.



### **Information Sources**

The final section of the survey examined what the public perceived as “trustworthy” sources to obtain their information on water quality. The following chart displays options that were selected as “very trustworthy.” The top five trustworthy information sources were the university extension (Michigan State University Extension), state agriculture agency (Michigan Department of Agriculture and Rural Development), state environmental agency (Michigan Department of Environmental Quality), the U.S. Environmental Protection Agency (U.S. EPA) and the local watershed project. The least trusted sources were lawn care companies, local community leaders, local garden centers and neighbors and friends.



**Figure 14:** Trusted Information Sources

### ***Door-to-Door Survey – Selected Demographic Results***

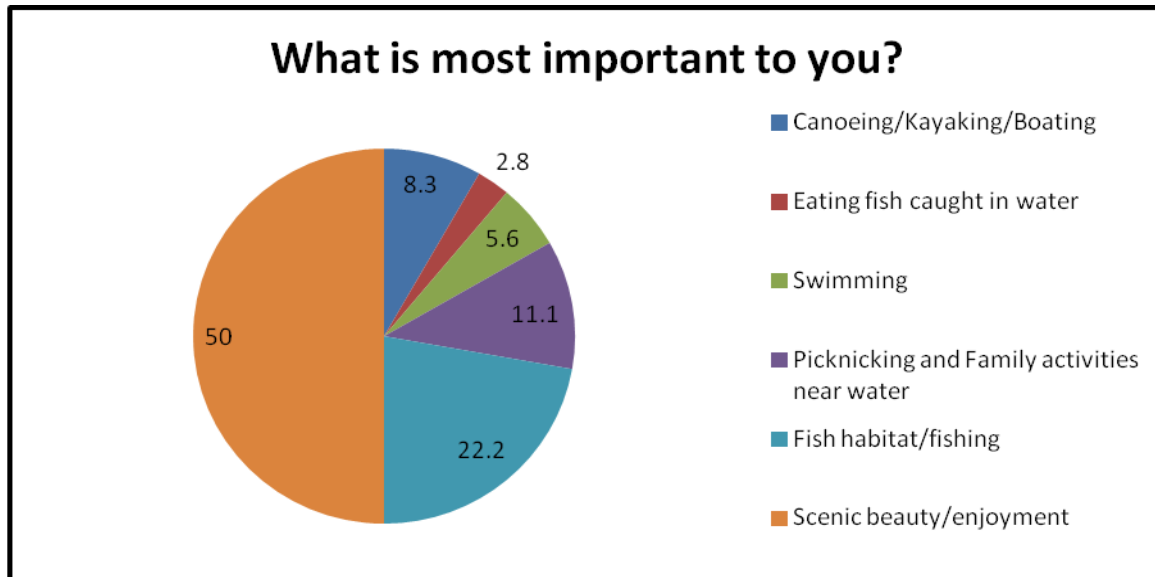
Two hundred homes were targeted for the door-to-door survey, but only 43 surveys were completed, each in-home with a Southwest Michigan Planning Commission staff member assisting. The low response rate was thought to be the result of several of the homes being vacant or seasonal residences. Respondents were not required to answer each question within the survey, therefore response rates varied slightly on each question. Of those that completed the survey, 95.3% stated that they made the home and lawn care decisions in their household. The average respondent was born around 1953, with a range from 1919 to 1989.

The population that completed the survey was educated to some extent, with 31% having completed a GED and 26.2% having completed at least some college education. (Compared to 54% of the mailed survey respondents had completed at least four years of secondary education.) Many respondents lived on larger tracts of land, with about 63% of the respondents' residential lots being five acres or greater. Almost 93% owned their home as opposed to renting, and had lived at the residence for an average of 24 years. Most homeowners were not part of an agricultural operation (60.5 %), yet most lived in a rural environment (70.8%). The area targeted for the door-to-door survey (mainly in Three Oaks and Weesaw Township) was mostly rural because it was focused on areas not served by a municipal sanitary sewer system and thought to be contributing to *E. coli* pollution.

## ***Door-to-Door Survey – Selected Results***

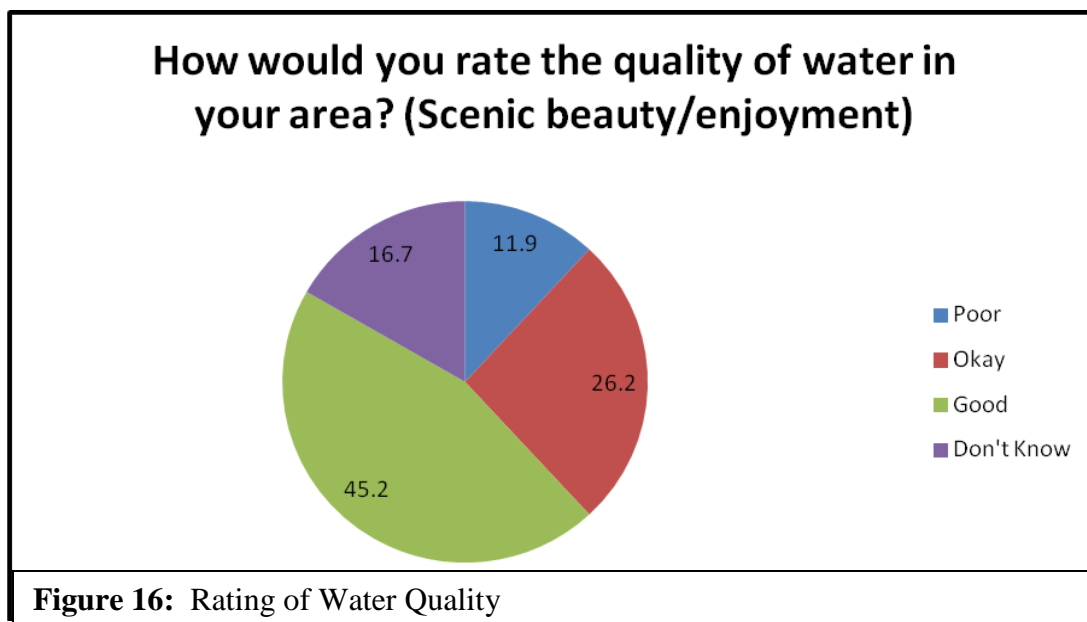
### **Water Usage/Quality**

The first sections of the survey questioned both the type and quality of water resources in the Galien River Watershed (GRW) area. Half of the respondents' (50%) selected scenic beauty/enjoyment as the most important aspect of the watershed and 22.2 % selected fish habitat/fishing as most important to them.



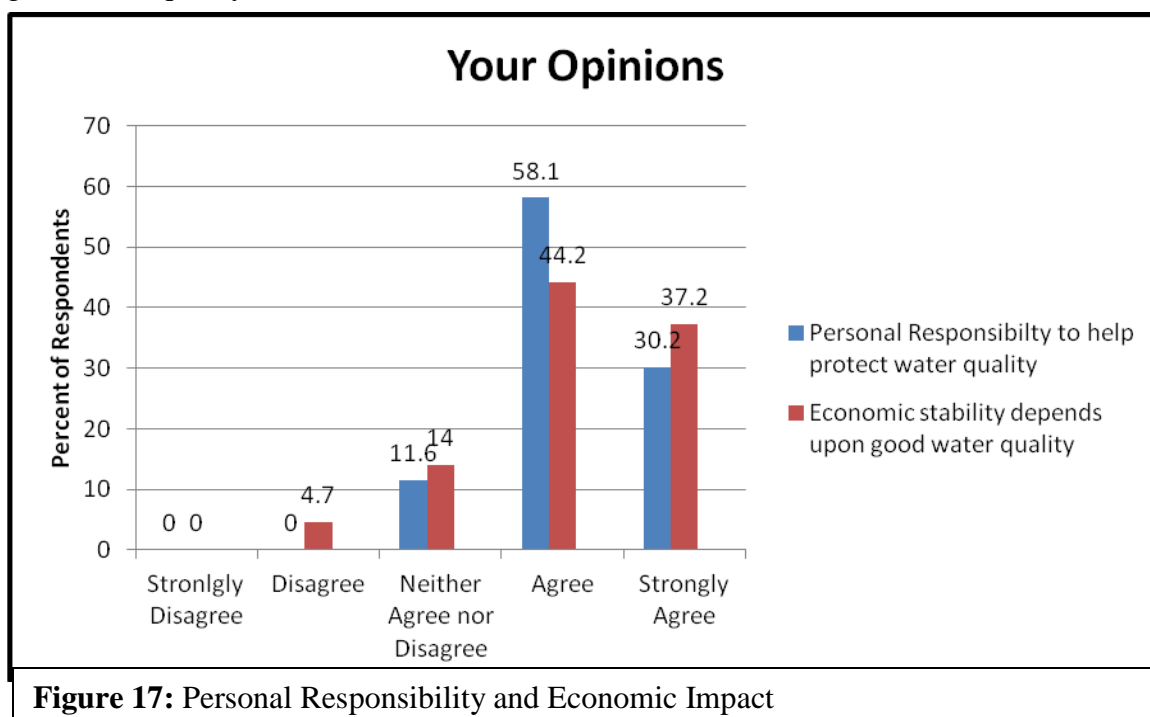
**Figure 15: Most Important Activity**

Many of the respondents did not know if the water quality was good for different activities in the watershed. Over 70% felt that the water quality was okay to good for scenic beauty/enjoyment. While about 30% of the respondents did not know if the water quality was good for other activities such as fishing/fish habitat, picnicking and other family activities near the water, canoeing/kayaking, eating fish caught in the water and for swimming. Almost 42% felt the water was of poor quality for swimming.



### **Your Opinions**

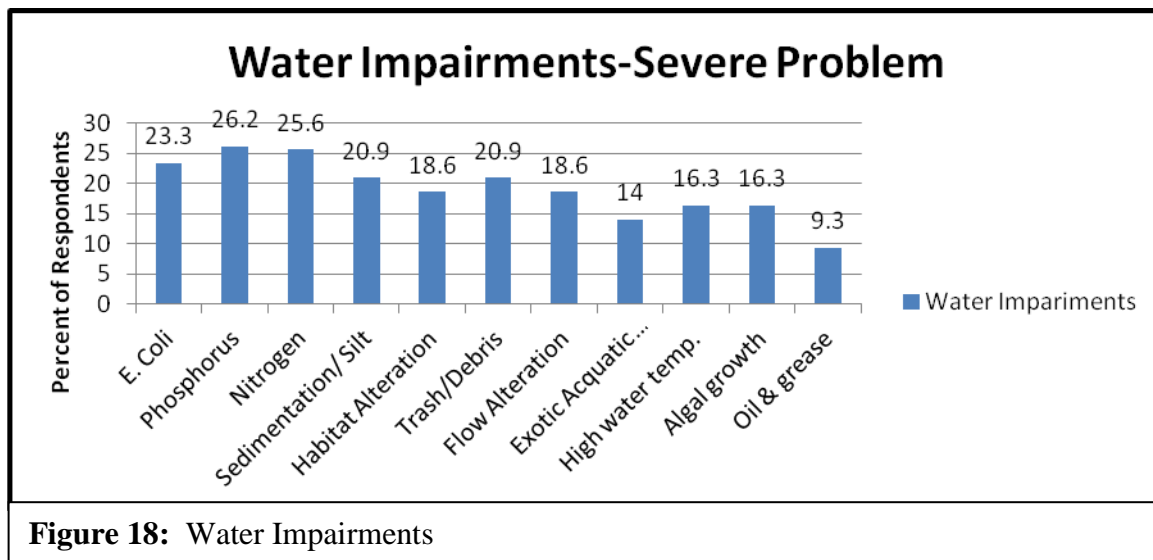
The following section of the survey asked participants to share their opinions on various factors relating to the GRW, ranging from economic relationship to water quality to defining their responsibility for water quality and cleanup. This section contained 13 questions. Figure 17 shows that there was agreement that there is a personal responsibility to protect water quality (88%). There was also agreement that the economic stability of their community depends upon good water quality (81.4%).



Also, over 80% agreed or strongly agreed that it is important to protect water quality even if it slows economic development and over 75% disagreed or strongly disagreed that it is okay to reduce water quality to promote economic development. However, only 47% agreed or strongly agreed that it is important to protect water quality even if it costs me more and 40% agreed or strongly agreed to be willing to pay more to improve water quality (for example through local taxes or fees). (See Appendix D.)

### **Water Impairments**

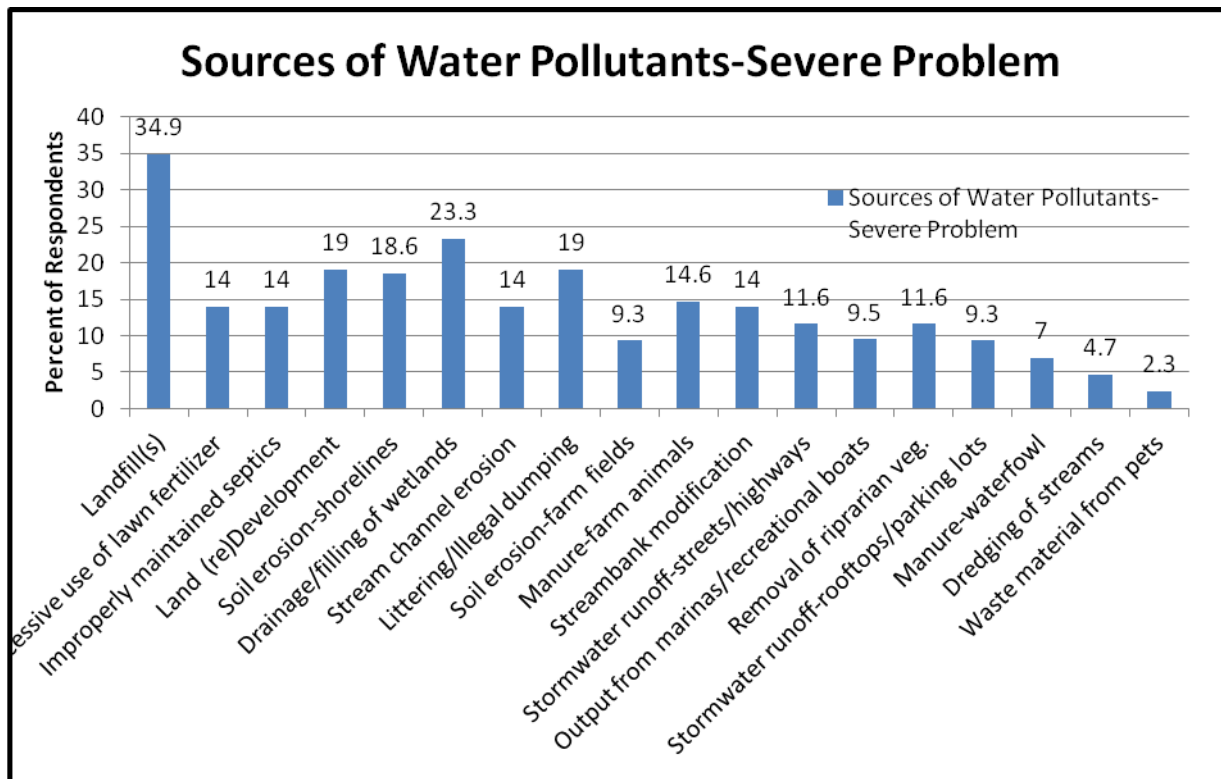
The following section of the survey asked participants to rate the importance of various pollutants and impairments to water quality and usage. The following chart displays the percentage of participants that rated a given pollutant as a “severe problem.” The section contained 11 questions. The top water impairments selected as a severe problem (shown in Figure 18) were Phosphorus (26.2%), Nitrogen (25.6%) and *E. coli* (23.3%).



The survey also indicated that many respondents did not know if several of the pollutants were a problem or not. The impairments that had the highest levels of unknown were flow alteration (46.5%), high water temperatures (44.2%), phosphorus (40.5%) and habitat alteration (39.5%).

### Sources of Water Pollutants

The following section examined the participants' views on where the sources of water pollution originate. Once again, the chart below displays those who answered "severe problem" to a given pollutant. The section contained 18 questions. The respondents perceived the top sources of water pollutants (shown in Figure 19) as landfills, draining/filling of wetlands, land development and littering/illegal dumping.

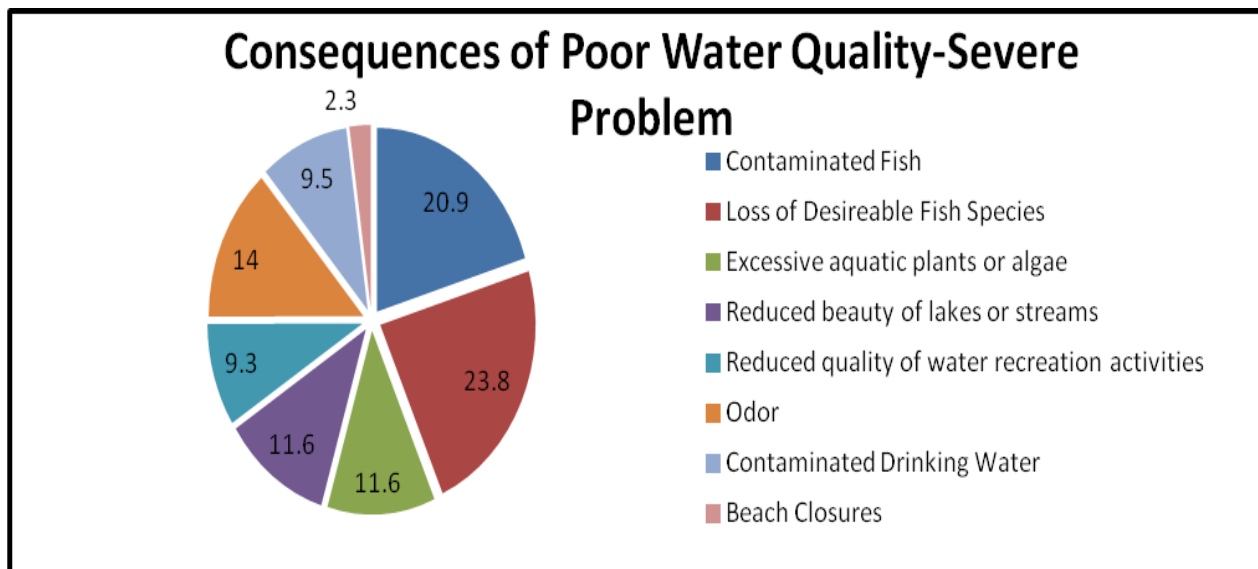


**Figure 19:** Water Pollutant Sources

### Consequences of Poor Water Quality

In this section, participants were asked to rate the severity of a given scenario that could be caused by poor water quality. The chart below depicts the percentage of respondents who rated a given scenario as a "severe problem." The section contained 8 questions. The top four consequences of poor water quality selected as shown in Figure 20 are loss of desirable fish species, contaminated fish, odor, reduction in scenic beauty and excessive aquatic plant or algae growth.





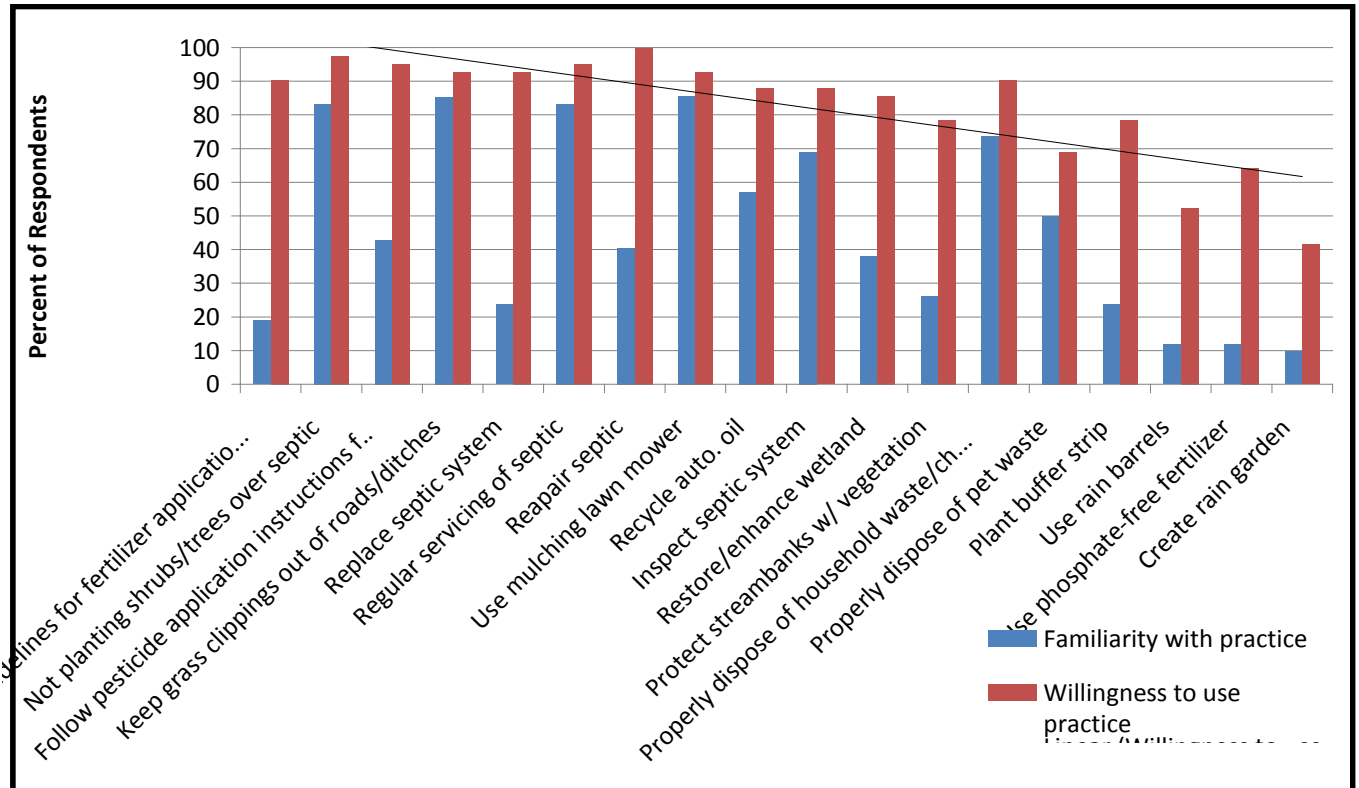
**Figure 20:** Consequences of Poor Water Quality

### **Practices to Improve Water Quality**

The following section examined the respondents' familiarity with common practices to improve local water quality, as well as their willingness to use the practice. For a given practice, participants were given six options to rate their experience with a given practice and three options to rate their willingness to use that practice. The chart below depicts those currently using a given practice, and those willing to try or continue that practice. This section contained 18 questions.

The respondents were most familiar with the following practices: keeping their grass clippings out of roads, ditches and gutters, not planting shrubs/trees over septic systems, regular servicing of septic systems, proper disposal of household wastes and using a mulching lawn mower. They were least familiar with these practices: creating a rain garden, using phosphate free fertilizer, using rain barrels, planting buffer strips, following guidelines for fertilizer application and protecting streambanks.

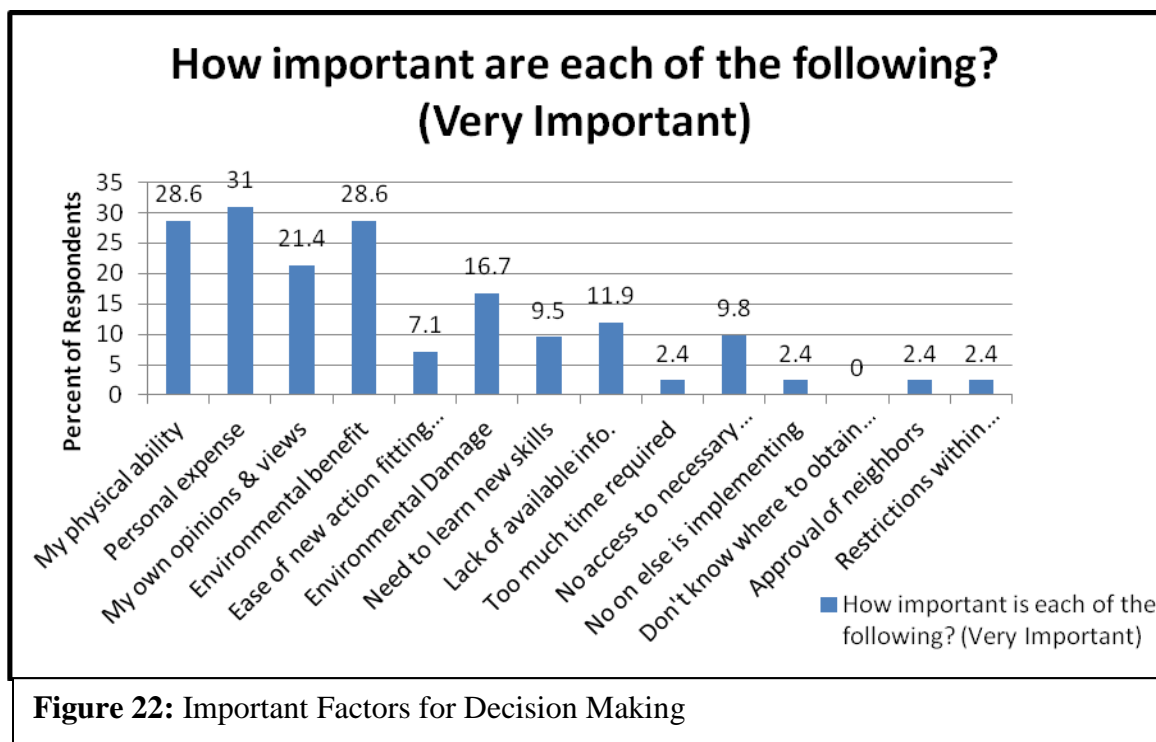
The respondents were most willing to use these practices: repair septic systems, not plant trees/shrubs over septic systems, follow pesticide application instructions, regular servicing of septic systems, use a mulching lawnmower, replace septic system, keep grass clippings out of roads, ditches and gutters, follow guidelines for fertilizer application and properly dispose of household wastes. They were least likely to use these practices: create a rain garden, use a rain barrel and use phosphate free fertilizer.



**Figure 21:** Familiarity With and Willingness to Use Practices

### **Making Decisions for my Property**

This section of the survey specifically asked for input on the importance of certain factors when they pertained to changing their lawn care and/or storm water practices. The following chart shows the percentages of those who thought a particular factor was “very important.” This section included 14 questions. The most respondents (31%) felt that personal expense was very important in making decisions. About 29% of the respondents felt it was very important to consider their physical ability and the environmental benefit of the practice for making decisions. Very few of the survey respondents said that the time required (2.4%) or the approval of neighbors (3%) were very important.



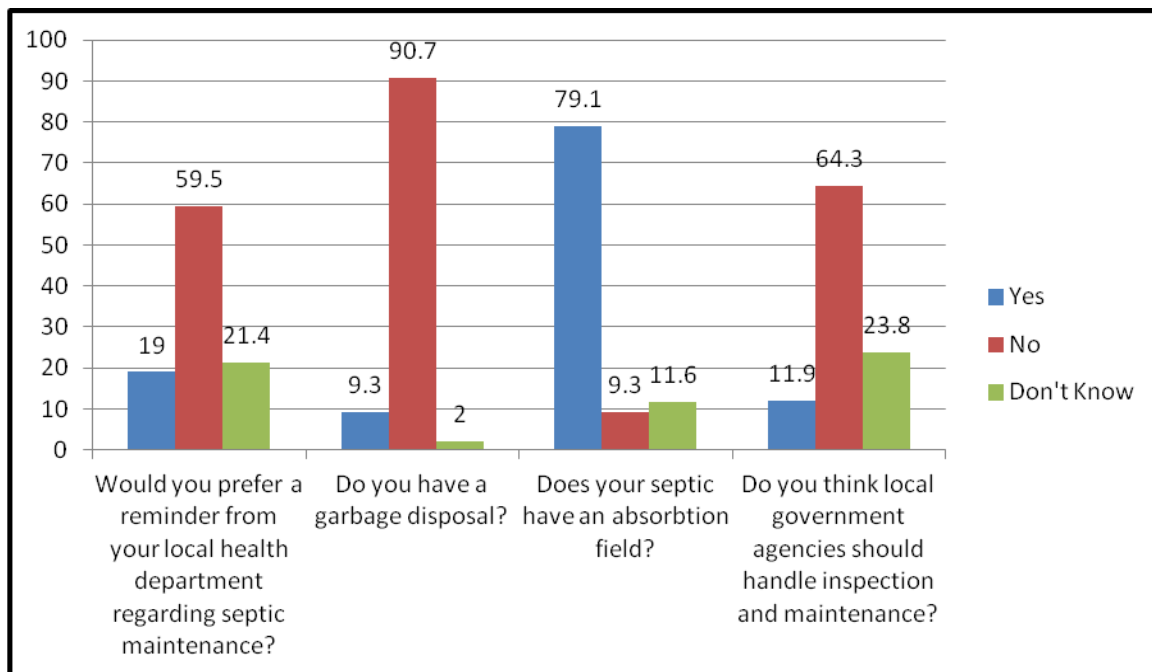
**Figure 22: Important Factors for Decision Making**

### **Septic Systems**

This section of the survey specifically covered information pertaining to homeowners' septic systems, a likely contributor to the *E. coli* pollution in the watershed. All of the 43 respondents (100%) had a septic system. This section included 8 questions.

The average age of the respondents' septic system was approximately 25 years with answers ranging from two to 61 years. About 54% of the respondents claimed to have had no problems with their septic systems in the last five years. While almost 35% of the homeowners reported slow drains, 18.6% reported sewage backups in the house, 14% bad smells near tank or drain field, 14% had either sewage on the surface or sewage flowing to a ditch within the last five years. Slow drains, sewage backup, and toilet backup were listed as the most common ways to tell if their septic was not working properly. Over 90% reported to not have a garbage disposal or not to use it, while only 7% had one (with 4.7% using it daily and 2.3% occasionally).

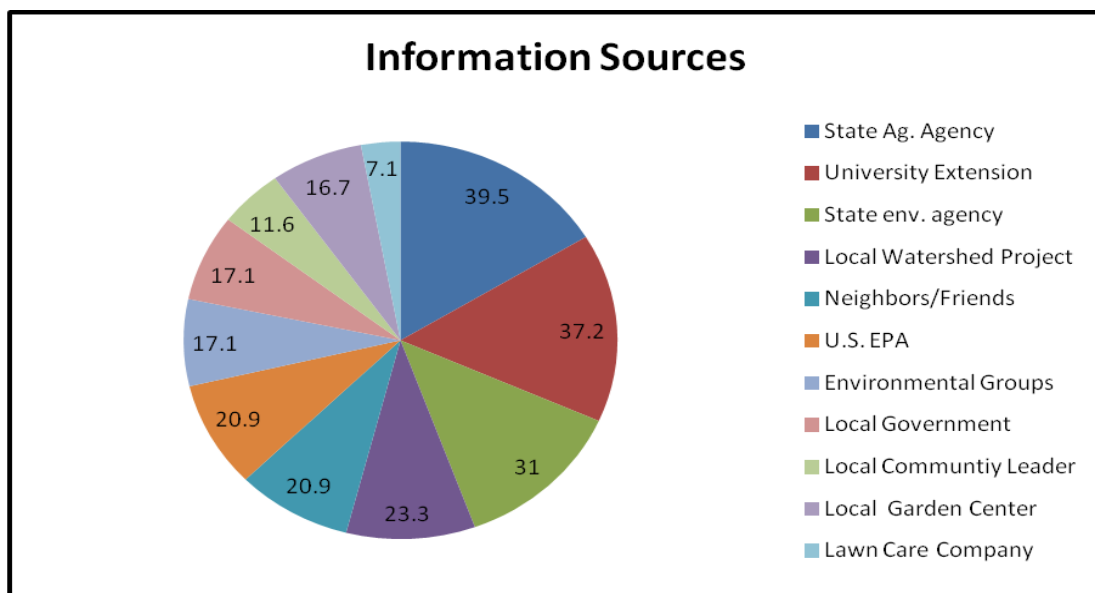
Figure 23 shows that only 19% would like to have a reminder from the local health department regarding septic maintenance and only 12% thought local government agencies should handle inspection and maintenance of septic systems (compared to 65% in the mailed survey).



**Figure 23:** Septic System Related Questions and Results

### **Information Sources**

The final section of the survey examined what the public perceived as “trustworthy” sources to obtain their information on water quality. The following chart displays options that were selected as “very trustworthy.” The top five trustworthy information sources were the state agriculture agency (Michigan Department of Agriculture and Rural Development), university extension (Michigan State University Extension), state environmental agency (Michigan Department of Environmental Quality), the local watershed project, neighbors/friends and the U.S. Environmental Protection Agency (U.S. EPA). The least trusted sources were lawn care companies and local community leaders.



**Figure 24:** Trusted Information Sources

## Core Social Indicator Results

Social indicators for watershed management provide information about awareness, attitudes, constraints, capacity, and behaviors that are expected to lead to water quality improvement and protection. By measuring these indicators over time, water quality managers can target project activities and assess whether the projects are accomplishing changes expected to improve and protect water quality. Monitoring social indicators, like monitoring environmental indicators, gives us valuable information about how well our management strategies are working. Social indicators complement other environmental and administrative indicators to present a complete picture of project effectiveness. The core social indicators measured in this project are awareness, attitudes and constraints (see Figure 25). The social indicators will be useful to measure change across time or to be aggregated at the state or regional level. See Appendix E for raw data for social indicator results and the following section provides a summary of the results.



**Figure 25:** Goals, Intended Outcomes, Core Social Indicators

## Awareness

This set of indicators measures the awareness of the target audience regarding the relevant technical issues and/or recommended practices in the critical area. The indicators follow a logical progression of issues a target audience might be expected to become aware of during the course of a project—pollutants, consequences of pollutants, and, ultimately, the appropriate practices to mediate the impacts of these pollutants. In striving toward the ultimate goal of behavior change, awareness is the first step. If people are not aware of a problem or what can be done about it, we cannot expect them to change their behaviors. As awareness increases, the probability that attitudes and subsequent behavior change also increases. These indicators address the intended outcome of a *positive change in awareness* within the target audience regarding the relevant technical issues and/or recommended practices in the critical area. The goal is to increase target audience awareness.

### **Awareness Indicator #1 - Awareness of consequences of pollutants to water quality**

**Description:** This indicator measures the target audience's level of awareness about consequences of locally relevant pollutants.

**Use and Rationale:** Results obtained from a baseline survey can help diagnose pertinent areas of misinformation or lack of information so that education and outreach can be better focused. Knowing where the target audience has incorrect perceptions about the impact of different pollutants is critical to ultimately changing attitudes and behavior. Results from a survey conducted at the end of the project can help to demonstrate the degree of success of that education and outreach effort. At the state level, data received from projects around the state can provide a general idea of knowledge levels. Data may be used to determine what education and outreach approaches are most effective for increasing awareness.

**Measurement and Calculation:** Awareness Indicators 1-3 are calculated using the coding shown in Table 1 (not a problem (0) to severe problem (4)). The indicator value for an individual respondent is calculated and then the project value for the indicator would be the average of individual indicator scores.

### **Awareness Indicator #2 - Awareness of types of pollutants impairing waterways**

**Description:** This indicator measures the target audience's level of awareness about types of relevant pollutants.

**Use and Rationale:** Results obtained from a baseline survey can help diagnose pertinent areas of misinformation or lack of information so that education and outreach can be better focused. For example, from a pre-project survey, project staff may learn that a high percentage of the target

audience is aware of one locally relevant pollutant but not another. The project staff would then focus their education and outreach efforts on educating about the second pollutant. Results from a survey conducted at the end of the project can help to demonstrate the degree of success of that education and outreach effort. At the state level, data received from projects across the state can provide a general idea of knowledge levels. Data can be used to determine what education and outreach approaches are most effective.

***Measurement and Calculation:*** Same as Awareness Indicator 1.

### **Awareness Indicator #3 - Awareness of sources of pollutants impairing waterways**

***Description:*** This indicator measures the target audience's level of awareness about sources of relevant pollutants.

***Use and Rationale:*** Results obtained from a baseline survey can help diagnose pertinent areas of misinformation or lack of information so that education and outreach can be better focused. For example, from a pre-project survey, project staff may learn that a high percentage of the target audience is aware of one locally relevant pollutant but not another. The project staff would then focus their education and outreach efforts on educating about the second pollutant. Results from a survey conducted at the end of the project can help to demonstrate the degree of success of that education and outreach effort. At the state level, data received from projects across the state can provide a general idea of knowledge levels. Data can be used to determine what education and outreach approaches are most effective.

***Measurement and Calculation:*** Same as Awareness Indicator 1.



### Results for Awareness Indicators # 1 - 3

Table 1 shows that for Awareness Indicators 1, 2 and 3 (the awareness of consequences of pollutants to water quality, the awareness of types of water pollutants and the awareness of types of water pollution) respondents rated them all as a slight problem.

**Table 1:** Results for Awareness Indicators #1 - 3

	Not a problem 1	Slight problem 2	Moderate Problem 3	Severe Problem 4	Don't know 9
<b>Indicator #1</b> Awareness of consequences of pollutants to water quality		* (1.55) * (1.6)			
<b>Indicator #2</b> Awareness of pollutant types impairing water quality		*(1.71) *(1.69)			
<b>Indicator #3</b> Awareness of pollutant sources impairing water quality		*(1.64) *(1.62)			

Black\* – Mail survey mean

White\* – Door-to-Door survey mean

### Awareness Indicator 4: Awareness of appropriate practices to improve water quality

**Description:** This indicator measures the target audience's awareness about locally appropriate practices that are expected to improve water quality.

**Use and Rationale:** Results obtained from a baseline survey can help diagnose pertinent areas of misinformation or lack of information so that education and outreach can be better focused. This information can also be used to adjust the implementation approach of a given project. Results from a survey conducted at the end of the project can help demonstrate the degree of success of that education and outreach effort. At the state level, data received from projects around the state can provide a general idea of knowledge levels. Data can be used to determine what education and outreach approaches are most effective.

**Measurement and Calculation:** The indicator value for an individual respondent is calculated and the project value for the indicator would be the average of individual indicator scores.

## Results for Awareness Indicator #4

Table 2 shows that for Awareness Indicator 4, the awareness of appropriate practices to improve water quality respondents rated it as heard of it but not very familiar with it, but on the scale it was close to I am familiar with it, but have never done it.

**Table 2:** Results for Awareness Indicator #4

	Does not apply	Never heard of it	Heard of it, but not very familiar	Am familiar with it, but never done it	Tried it, but no longer do it	Currently use it
	N/A	1	2	3	4	5
<b>Indicator #4</b> Awareness of appropriate practices to improve water quality			(1.84) *  (1.91)*			

Black\* – Mail survey mean

White\* – Door-to-Door survey mean

## Attitudes

This set of indicators assesses progress towards a project goal of changing or reinforcing attitudes in a way that is expected to facilitate desired behavior change. First a target audience becomes aware that there are water quality problems in their area. Then, if constraints are alleviated, they need to *care* about the issues and be *willing* to adopt new behaviors in order to increase the probability that they will actually change their behavior. These indicators represent the intended outcome of *a positive attitude change* within the target audience as a measure of expectation of behavior change. The goal is to change target audience attitudes.

### Attitudes Indicator #1 – General water quality-related attitudes

**Description:** This indicator is assessed using a set of survey questions that are designed to elicit the respondent's strength of feeling about benefits, personal responsibility and norms associated with the protection of water quality at the *household* level.

**Use and Rationale:** Results obtained from the baseline survey can help diagnose general attitudes of the population about water quality so that appropriate activities can be designed for education and outreach. Results from a follow-up survey can help demonstrate the degree of success education and outreach efforts in raising the recognition and importance of water quality among the target audience in your watershed.

**Measurement and Calculation:** Table 3 shows how the attitudes indicator #1 about general water quality-related is broken down into five underlying concepts or “constructs.” Table 3 also shows the questions in the survey used as the basis for each construct and indicates which questions are reversed coded when the phrasing of the question is negative. Each construct is calculated in the same way as the overall indicator values. The indicator value for an individual respondent is calculated by averaging the values of their responses (based on the coding or reverse coding) and then the project value is the average of the individual scores.

**Table 3.** Questions and Coding for each Construct for Attitude Indicator #1

Construct	Question # in Survey	Reverse Coding (R)	Attitudinal Statement
Personal Impact	7		My actions have an impact on water quality.
	5	R	What I do on my land doesn't make much difference in overall water quality.
Value Importance of Water Quality	1		The economic stability of my community depends upon good water quality.
	13		The quality of life in my community depends on good water quality in local streams, rivers and lakes.
Lawn and Yard Management Impact	2		The way that I care for my lawn and yard can influence water quality in local streams and lakes.
	6	R	Lawn and yard-care practices (on individual lots) do not have an impact on local water quality.
Economics vs. Water Quality	9	R	It is okay to reduce water quality to promote economic development.
	4		It is important to protect water quality even if it slows economic development.
Personal Action / Responsibility	3		It is my personal responsibility to help protect water quality.
	11		I would be willing to pay more to improve water quality (for example: through local taxes or fees).
	12		I would be willing to change the way I care for my lawn and yard to improve water quality.
	10		It is important to protect water quality even if it costs me more.
	8	R	Taking action to improve water quality is too expensive for me.

### Results for Attitudes Indicator #1

Table 4 shows that respondents agree with the following general water quality-related attitude constructs: personal impact, lawn and yard management impact, economic versus water quality (door-to-door only) and personal action/responsibility. Respondents strongly agree with these general water quality-related attitudes constructs: value the importance of water quality and economics versus water quality (mail survey only).

**Table 4:** Results for Attitudes Indicator #1 – General Water Quality-Related Attitudes

	<b>Strongly Disagree 0</b>	<b>Disagree 1</b>	<b>Neither Agree nor Disagree 2</b>	<b>Agree 3</b>	<b>Strongly Agree 4</b>
<b>Personal Impact</b>				(3.93)* (3.65) *	
<b>Value importance of water quality</b>					*(4.12) *(4.13)
<b>Lawn &amp; yard management impact</b>				(3.94)* (3.77) *	
<b>Economics vs. water quality</b>				(3.99)*	*(4.21)
<b>Personal action / responsibility</b>				(3.60)* (3.52) *	
<b>Overall</b>				(3.88)* (3.74) *	

Black\* – Mail survey mean

White\* – Door-to-Door survey mean

**Attitudes Indicator 2: Willingness to take action to improve water quality**

**Description:** This indicator measures the respondent’s willingness to act on behalf of his or her *household* to protect or improve water quality. The survey questions measure the likelihood of respondents to adopt practices to improve water quality if they are not currently implementing the practice.

**Use and Rationale:** Results obtained from the baseline survey can help diagnose the willingness or likely responsiveness of the target audience so that the appropriate interventions can be designed for education and outreach. Results from a follow-up survey can help demonstrate the degree of success of the education and outreach effort in increasing the likelihood that a water quality practice will be implemented where one was not implemented before.

**Measurement and Calculation:** This indicator is based on responses to “Practices to Improve Water Quality.” The indicator value for an individual respondent is calculated. Because a mean response can result from several different response patterns, it is also beneficial to know the percentage of respondents who answered in each response category.

## Results for Attitudes Indicator #2

Table 5 shows that most respondents to the mail and door-to-door survey would maybe try or continue to use practices to improve water quality.

**Table 5:** Results of Attitude Indicator #2 – Those not using practice –their willingness to try

	%No 1	%Maybe 1.5	%Yes 2
<b>For those not currently using practice: Would you be willing to try or continue using this practice?</b>		(1.84)* (1.86)*	

Black\* – Mail survey mean

White\* – Door-to-Door survey mean

## Constraints

This set of indicators tries to capture a range of potential constraints to the adoption of desired practices. By collecting this information, programs will be able to design an implementation approach that may overcome these impediments to behavior change unrelated to attitudes and awareness. This information may help to identify the best areas to place emphasis in programs for this purpose. The goal is to reduce target audience constraints.

### Constraints Indicator 1: Constraints to behavior change

**Description:** This indicator elicits constraints that are preventing individuals in the target audience from adopting household practices beneficial to water quality.

**Use and Rationale:** Results obtained from the baseline survey can help diagnose locally relevant constraints that can be addressed through the implementation approach including the education and outreach component. Results from a follow-up survey can help demonstrate the degree of success of the education and outreach effort in reducing the recognized obstacles to behavior change.

**Measurement and Calculation:** Constraints are grouped by construct based on responses to the survey questions about “Making Management Decisions.” (See Table 6 for the questions used for each construct.) Individual values are average values of the responses to compute an average (mean) strength of constraints.

**Table 6:** Questions for each Construct for Constraint Indicator #1

Construct	Questions
Construct: Economics / Profitability	1. Personal out-of-pocket expense
Construct: Independence / own ideas	2. My own views about effective lawn and yard maintenance
Construct: Status Quo / Traditional	3. How easily a new practice fits with my current practices
	4. My own physical abilities
	5. The need to learn new skills or techniques
	6. Too much time required for implementation
	12. Don't know where to get information and/or assistance
Construct: Assistance Incentives	7. Not having access to the equipment that I need.
	8. Lack of available information about a practice
Construct: Peer/norms considerations	9. No one else I know is implementing the practice
	10. Approval of my neighbors
	11. Restrictive covenants in my subdivision
Construct: Environmental Considerations	13. Environmental benefit of practice
	14. Environmental damage caused by practice

**Results for Constraints Indicator #1**

Table 7 shows that the following constraints were considered important: economics/profitability, independence/own ideas, environmental considerations, status quo/traditional (mail only), assistance incentives (mail only). None of the constraints were considered very important. The peer/norms constraint was considered only somewhat important for the door to door respondents and for the mail survey the respondents were undecided.

**Table 7.** Results for Constraints Indicator #1 – Constraints to Behavior Change

Constructs	Not at all important 5	Somewhat important 4	Undecided 3	Important 2	Very Important 1
Economics/ Profitability				(2.23)* *(2.43)	
Independence / own ideas				(2.39)* *(2.48)	
Environmental considerations				(2.02)* *(2.80)	
Status Quo / Traditional			(3.24)*	*(2.80)	
Assistance Incentives			(3.45)*	*(2.62)	
Peer / norms considerations		(4.11)*	*(3.83)		
Overall			(3.28)*	*(2.82)	

Black\* – Mail survey mean

White\* – Door-to-Door survey mean

## **Conclusion**

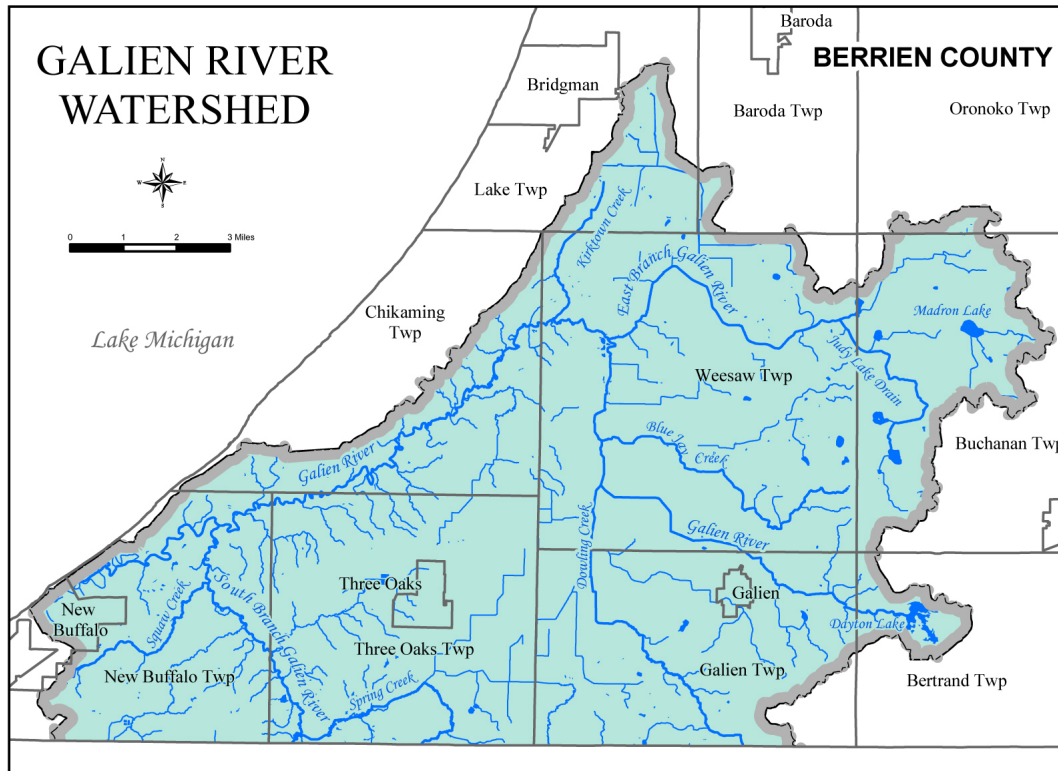
The information collected from the survey has been very helpful to better understand what the residents in the Galien River Watershed know, how they value water resources and what practices they may be willing to implement to improve water quality. SWMPC and The Conservation Fund have used the survey results to provide useful statistics to local community leaders who attend the Galien River Watershed Steering Committee meetings. The survey results have been presented to the Berrien County Health Board when discussing the need for a county-wide septic system inspection point of sale ordinance. Further, the survey results have been used to focus education and outreach efforts on topics such as rain gardens, rain barrels and septic system maintenance and to also craft the messages. For example, over the past year, SWMPC hosted several workshops focusing on these topics. The workshops were very well attended and participants provided positive comments in the workshop evaluations. Lastly, the survey results were used to inform the development of a media campaign that focused on septic system maintenance that utilized newspaper ads, billboards, social media and radio spots.

It will be important to continue to survey watershed residents' attitudes and behaviors regarding water resources and their protection to ensure that outreach and education efforts have made an impact and lead to water quality improvements.

## **Appendix A – Survey Instrument**



# Your Views on Galien River Water Resources



Your local Galien River watershed project is conducting this survey in coordination with the Southwest Michigan Planning Commission. The purpose of this survey is to identify the needs and concerns in your community regarding water quality.

We ask that this survey be completed by the person in your household that makes most of the lawn and garden decisions and is at least 18 years old. Your participation in this survey is completely 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 box that corresponds to the answer category that best describes you and your situation or opinion](#). The survey should take approximately 20-30 minutes to complete. Please read each question carefully.

# Galien River Watershed

PLEASE READ BEFORE BEGINNING THIS SURVEY:

The survey must be completed by an adult member of your household 18 years of age or older.  
Please mark all answers clearly, in pen or pencil, as indicated below.

Example "A" ☐ ☐ ☒ Example "B" ☐ ☐ ☒

Overall, how would you rate the quality of water in Galien River Watershed?

	Poor	Okay	Good	Don't Know
1. For canoeing / kayaking / other boating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. For eating fish caught in the water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. For swimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. For picnicking and family activities near water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. For fish habitat / fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. For scenic beauty / enjoyment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Of these activities, which is the most important to you? Check the box that corresponds to your answer.

☐ Canoeing / kayaking / other boating

☐ Eating fish caught in the water

☐ Swimming

☐ Picnicking and family activities near water

☐ Fish habitat / fishing

☐ Scenic beauty / enjoyment

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

☐ No, I don't know.

☐ Yes, it goes to: \_\_\_\_\_

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

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. The economic stability of my community depends upon good water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The way that I care for my lawn and yard can influence water quality in local streams and lakes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. It is my personal responsibility to help protect water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. It is important to protect water quality even if it slows economic development.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. What I do on my land doesn't make much difference in overall water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Lawn and yard-care practices (on individual lots) do not have an impact on local water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. My actions have an impact on water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Taking action to improve water quality is too expensive for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. It is okay to reduce water quality to promote economic development.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. It is important to protect water quality even if it costs me more.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I would be willing to pay more to improve water quality (for example: through local taxes or fees).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I would be willing to change the way I care for my lawn and yard to improve water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. The quality of life in my community depends on good water quality in local streams, rivers and lakes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# Galien River Watershed

Below is a list of water pollutants that are generally present in water bodies to some extent. In your opinion, *how much of a problem are the following pollutants in your area?*

	Not a Problem	Slight Problem	Moderate Problem	Severe Problem	Don't know
1. Sedimentation/Silt/Soil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Nitrogen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Phosphorus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. E. coli / Bacteria	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Trash/Debris	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Oil and grease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Algae Growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Invasive Aquatic Plants and/or Animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Flow Alteration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Habitat Alteration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. High Water Temperatures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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
1. Contaminated drinking water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Beach closures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Contaminated fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Loss of desirable fish species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Reduced beauty of lakes or streams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Reduced quality of water recreation activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Excessive aquatic plants or algae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Odor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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
1. Soil erosion from farm fields	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Soil erosion from shorelines and/or streambanks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Excessive use of lawn fertilizers and/or pesticides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Improperly maintained septic systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Manure from farm animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Stormwater runoff from rooftops and/or parking lots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Stormwater runoff from streets and/or highways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Droppings from geese, ducks and other waterfowl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Pet waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Littering/Illegal dumping of trash	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Land development or redevelopment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Landfill(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Stream channel erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Dredging of streams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Removal of shoreline vegetation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Streambank or shoreline modification/destabilization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Draining/filling of wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Outputs from marinas and/or recreational boats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# Galien River Watershed

The practices below have the potential to improve water quality in your area. ***Please indicate which statement most accurately describes your level of experience with each practice. Be sure to answer part “A” and part “B” for this set of practices.***

[illegible]



# Galien River Watershed

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

	<i>Not at all important</i>	<i>Somewhat important</i>	<i>Undecided</i>	<i>Important</i>	<i>Very important</i>
1. Personal out-of-pocket expense	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. My own views about effective lawn and yard maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. How easily the new action fits with my current practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. My own physical abilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The need to learn new skills or techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Too much time required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Not having access to the equipment that I need	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Lack of available information about a practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. No one else I know is using the practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Approval of my neighbors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Restrictive covenants in my subdivision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Don't know where to get information and/or assistance about the practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Environmental damage caused by practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Environmental benefit of practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## The items listed below address issues from septic systems.

**1. Do you have a **septic system**?**

- ☐ Yes, it is \_\_\_\_\_ (years) old.  
(If Yes, please complete the rest of the survey.)
- ☐ No (If No, please move on to the next section of the survey.)

**2. Within the last five years, **have you had any or the following problems**? Please check all that apply.**

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

**3. **Would it be helpful to have a reminder** from your local health department regarding inspection/maintenance of your septic system?**

- ☐ Yes
- ☐ No
- ☐ Don't know

**4. Do you have a **garbage disposal**?**

- ☐ Yes, I use it daily
- ☐ Yes, I use it occasionally
- ☐ Yes, but I don't use it
- ☐ No

**5. Do you think a local government agency **should handle inspection and maintenance** of septic systems?**

- ☐ Yes
- ☐ No
- ☐ Don't know

**6. Does your septic **system** have **trenches** or a **drain bed** ("dry well")?**

- ☐ Yes
- ☐ No
- ☐ Don't know

**7. How would you know if your septic system was **NOT working properly**? Check all that apply**

- ☐ Slow drains
- ☐ Sewage backup in house
- ☐ Bad smells
- ☐ Toilet backs up
- ☐ Wet spots in lawn
- ☐ Pumping tank monthly or more
- ☐ Straight pipe to ditch
- ☐ Frozen septic
- ☐ Don't know
- ☐ Other \_\_\_\_\_

**8. Is your septic system designed to treat sewage or get rid of waste?**

- ☐ Treat sewage
- ☐ Get rid of waste
- ☐ Both
- ☐ Neither
- ☐ Don't know

**9. How often do you clean out your septic tank? Check one.?**

- ☐ Less than every 3 years
- ☐ Every 3-5 years
- ☐ Every 6-10 years
- ☐ Greater than 10 years
- ☐ Never
- ☐ Don't Know

# Galien River Watershed

People get information about water quality from a number of different sources. To what extent do you trust those listed below as a source of information about stewardship?

	Not at all	Slightly	Moderately	Very Much	Not Familiar
1. Local watershed project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Local government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. U.S. Environmental Protection Agency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Michigan State University Extension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Michigan Department of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Michigan Department of Environmental Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Environmental groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Local garden center	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Lawn care company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Local community leader	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Neighbors / friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The following “About You” questions are meant to gather information on the audience that received this survey. Please fill out as many of the questions as you are comfortable doing.

1. Do you make the **home and lawn care decisions** in your household?

☐ Yes

☐ No
2. What is your **gender**?

☐ Male

☐ Female
3. In what year were you born?

\_\_\_\_\_
4. What is the **highest grade in school** you have completed?

☐ Some high school

☐ High school diploma or GED

☐ Some college

☐ 2 year college degree

☐ 4 year college degree

☐ Graduate or professional degree

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**About You continued:**

5. 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

6. What is your occupation?

\_\_\_\_\_

7. What is the approximate size of your residential lot?

- ☐ ¼ acre or less  
☐ More than ¼ acre but less than 1 acre  
☐ 1 acre to less than 5 acres  
☐ 5 acres or more

8. Do you **own** or **rent** your home?

- ☐ Own  
☐ Rent

9. How long have you lived at your current residence?

\_\_\_\_\_ years

10. In addition to your residence, which of the following do you own or manage? (check all that apply)

- ☐ An agricultural operation  
☐ Forested land  
☐ Rural recreational property  
☐ None of these

11. Which of the following best describes where you live?

- ☐ In a town, village, or city  
☐ In an isolated, rural, non-farm residence  
☐ Rural subdivision or development  
☐ Farm

12. Do you use a professional lawn care service?

- ☐ Yes, just for mowing  
☐ Yes, for mowing and fertilizing  
☐ Yes, just for fertilizing and pest control  
☐ Yes, for mowing, fertilizing, and pest control  
☐ No

13. Where are you likely to seek information about water quality issues? (Check all that apply)

- ☐ Newsletters/brochure/factsheet  
☐ Internet  
☐ Radio  
☐ Newspapers/Magazines  
☐ Workshops/demonstrations/meetings  
☐ Talking with others  
☐ None of the above

# Galien River Watershed

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*Thank you* for your time and assistance!

Please return your completed questionnaire in the postage-paid envelope provided. Please use the space below for any additional comments about this survey or water resources in your community.



For more information about the Galien River Watershed Project, please visit:  
[http://www.swmpc.org/galien\\_river.asp](http://www.swmpc.org/galien_river.asp) or call 269-426-8825.

For more information about this survey, please contact Marcy Colclough at 269-925-1137 x25.

Thank You

## Appendix B – Press Releases, Letters and Reminder



### SOUTHWEST MICHIGAN PLANNING COMMISSION

185 East Main Street, Suite 701, Benton Harbor, MI 49022

Phone: 269-925-1137 • Website: [www.swmpc.org](http://www.swmpc.org)

July 14, 2009

#### For Immediate Release

#### Homeowner Survey Being Conducted in the Galien River Watershed

Over the next few months, the Southwest Michigan Planning Commission along with Michigan State University, Purdue University, Wisconsin University, Michigan Department of Environmental Quality, Environmental Protection Agency, and The Conservation Fund, will be conducting a survey of homeowners in the Galien River Watershed. About 200 homes will be visited by a SWMPC Water Quality Specialist Kris Martin. An additional 1,700 homes will receive a survey in the mail with a postage paid return envelope. The survey will assess homeowners' knowledge of and interest in water quality issues in the Galien River Watershed.

The Galien River Watershed is located in Berrien County (southwest Michigan) and is approximately 82,200 acres. The Galien River empties into Lake Michigan in New Buffalo. The water quality of the Galien River and its tributaries are impaired by several non-point source pollutants such as pathogens (E coli), sediment, and excess nutrients. The goal of the Galien River Watershed Project is to improve water quality by raising public awareness of water quality issues and addressing impairments to water quality.

One of the ways we can keep our watershed clean is to have a properly maintained septic system. Another way is to use water efficiently this includes using efficient dishwashers, washers, and using them only when they are full, maintaining plumbing to eliminate leaks, taking shorter showers. Don't flush or pour hazardous chemicals down the drain, or use your septic system as a trash can.

The desired project outcome is clean water and a healthy watershed. The Galien River watershed provides critical economic and quality of life benefits to our community. For more information please contact Kris Martin at (269) 925-1137 x13 or at [martink@swmpc.org](mailto:martink@swmpc.org) or check out the Galien Watershed Project Page ([http://www.swmpc.org/galien\\_river.asp](http://www.swmpc.org/galien_river.asp)).

## Sample letter to municipal officials



### SOUTHWEST MICHIGAN PLANNING COMMISSION

185 East Main Street, Suite 701, Benton Harbor, MI 49022

Phone: 269-925-1137 • Website: [www.swmpc.org](http://www.swmpc.org)

Dear Jeanne Dudek

Over the next few months, the Southwest Michigan Planning Commission along with Michigan State University, Purdue University, Wisconsin University, Michigan Department of Environmental Quality, Environmental Protection Agency, and The Conservation Fund, will be conducting a survey of homeowners in the Galien River Watershed. I am sending you this letter to inform you that we will be conducting this survey in your area. About 200 homes will be visited by SWMPC Water Quality Specialist Kris Martin. These 200 homes will receive a post card explaining that I'm coming to visit. I have attached that post card in this letter. An additional 1,700 homes will receive a survey in the mail with a postage paid return envelope. The survey will assess homeowners' knowledge of and interest in water quality issues in the Galien River Watershed.

The Galien River Watershed is located in Berrien County (southwest Michigan) and is approximately 82,200 acres. The Galien River empties into Lake Michigan in New Buffalo. The water quality of the Galien River and its tributaries are impaired by several non-point source pollutants such as pathogens (E coli), sediment, and excess nutrients. The goal of the Galien River Watershed Project is to improve water quality by raising public awareness of water quality issues and addressing impairments to water quality.

The desired project outcome is clean water and a healthy watershed. The Galien River watershed provides critical economic and quality of life benefits to our community. For more information please contact Kris Martin at (269) 925-1137 x13 or at [martink@swmpc.org](mailto:martink@swmpc.org) or check out the Galien Watershed Project Page ([http://www.swmpc.org/galien\\_river.asp](http://www.swmpc.org/galien_river.asp)).

Sincerely

Kris Martin

## Post Card – Sent to Door-to-Door Survey Residences



Hello, in the next few weeks I will be stopping by to conduct a survey to get your opinions about water quality issues in the Galien River Watershed. If you prefer to set up an appointment, please call me at 269-925-1137 x13 or email at [martink@swmpc.org](mailto:martink@swmpc.org). I look forward to speaking with you.



Kristopher Martin  
Water Quality Specialist,  
Southwest Michigan  
Planning Commission

For more information on water quality and the Galien River Watershed visit [www.swmpc.org/water.asp](http://www.swmpc.org/water.asp).



## Reminder post card for Mail Survey

# Galien River Watershed Survey

**WE NEED YOUR HELP!**

A couple weeks ago, you should have received a survey from the Galien River Watershed Project. We know that you are busy, but we hope that you will help us by completing and returning the survey. Your response is important to accurately represent the opinions about water quality issues in the Galien River Watershed. By participating in this survey, you will help shape outreach and education programs.



If you have not done so already, please complete the survey and return it in the pre-stamped / addressed envelope (enclosed with the survey you received). The survey will take about 20 minutes to complete. If you have already returned the survey, thank you, we appreciate your time in doing so.

Your responses will be confidential. Your answers will not be associated with your name in any way and your name will never be used in any report. Feel free to contact me at 269-925-1137 x25 if you have any questions, concerns or if you have misplaced your survey. I will gladly send another copy.

Thank you for your help!

Sincerely,

Marcy Colclough

**Southwest Michigan Planning Commission  
Galien River Watershed Project**

185 E. Main Street, Ste 701  
Benton Harbor, MI 49022

**Return your completed survey and you will be entered in a drawing to win a \$25 Meijer gift card!!!**



## Appendix C - Mailed Survey Data

### Rating of Water Quality

Overall, how would you rate the quality of water in your area?

		Poor (1)	Okay (2)	Good (3)	Don't Know (9)	N	V	Mean (SD)
6.	For scenic beauty / enjoyment	5.7	25.3	56.9	12.1	297	261	2.58 (0.61)
1.	For canoeing / kayaking / other boating	13.8	26.8	24.5	34.9	298	194	2.16 (0.75)
4.	For picnicking and family activities near water	13.4	37.6	25.5	23.5	298	228	2.16 (0.70)
5.	For fish habitat / fishing	13.8	30.6	18.2	37.4	297	186	2.07 (0.71)
2.	For eating fish caught in the water	25.5	20.8	8.7	45.0	298	164	1.70 (0.73)
3.	For swimming	42.1	17.5	7.1	33.3	297	198	1.47 (0.68)

### Your Water Resources

1. Of these activities, which is the most important to you? (N=289)

<input type="checkbox"/>	15.2	Canoeing / kayaking / other boating
<input type="checkbox"/>	3.8	Eating fish caught in the water
<input type="checkbox"/>	4.2	Swimming
<input type="checkbox"/>	6.6	Picnicking and family activities near water
<input type="checkbox"/>	10.7	Fish habitat / fishing
<input type="checkbox"/>	59.5	Scenic beauty / enjoyment

2. Do you know where the water goes when it runs off of your property? (N=295)

<input type="checkbox"/>	40.0	No, I don't know.
<input type="checkbox"/>	59.7	Yes, it goes to: (N=N/A Mean=N/A Median=N/A SD=N/A Min=N/A Max=N/A)

## Your Opinions

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

		<b>Strongly Disagree (1)</b>	<b>Disagree (2)</b>	<b>Neither Agree nor Disagree (3)</b>	<b>Agree (4)</b>	<b>Strongly Agree (5)</b>	<b>N</b>	<b>V</b>	<b>Mean (SD)</b>
3.	It is my personal responsibility to help protect water quality.	0.0	2.7	7.7	53.4	36.2	298	298	4.23 (0.70)
1.	The economic stability of my community depends upon good water quality.	1.0	3.0	16.4	41.6	37.9	298	298	4.12 (0.86)
13.	The quality of life in my community depends on good water quality in local streams, rivers and lakes.	1.3	5.0	10.4	47.0	36.2	298	298	4.12 (0.88)
4.	It is important to protect water quality even if it slows economic development.	0.0	5.0	14.1	45.3	35.6	298	298	4.11 (0.83)
2.	The way that I care for my lawn and yard can influence water quality in local streams and lakes.	2.3	4.7	11.0	46.8	35.1	299	299	4.08 (0.93)
7.	My actions have an impact on water quality.	1.3	5.4	10.7	56.7	25.8	298	298	4.00 (0.84)
12.	I would be willing to change the way I care for my lawn and yard to improve water	2.7	6.0	22.8	52.3	16.1	298	298	3.73 (0.90)

	quality.								
10.	It is important to protect water quality even if it costs me more.	3.0	11.4	25.2	47.0	13.4	298	298	3.56 (0.96)
11.	I would be willing to pay more to improve water quality (for example: through local taxes or fees).	10.1	20.8	25.2	36.6	7.4	298	298	3.10 (1.12)
8.	Taking action to improve water quality is too expensive for me.	11.8	32.8	41.2	10.8	3.4	296	296	2.61 (0.95)
6.	Lawn and yard-care practices (on individual lots) do not have an impact on local water quality.	28.9	45.3	7.0	14.1	4.7	298	298	2.20 (1.14)
5.	What I do on my land doesn't make much difference in overall water quality.	30.5	41.9	12.4	12.4	2.7	298	298	2.15 (1.07)
9.	It is okay to reduce water quality to promote economic development.	45.6	43.0	7.7	3.0	0.7	298	298	1.70 (0.79)

## Water Impairments

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 (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	N	V	Mean (SD)
4.	E. coli	4.1	9.2	17.3	19.3	50.2	295	147	3.04 (0.95)
8.	Exotic Aquatic Plants and/or Animals	8.1	9.5	19.3	17.9	45.3	296	162	2.86 (1.04)
10.	Habitat Alteration	6.8	8.4	17.6	12.8	54.4	296	135	2.80 (1.01)
5.	Trash/Debris	7.7	21.2	26.9	19.5	24.6	297	224	2.77 (0.95)
3.	Phosphorus	4.8	5.1	9.9	6.5	73.8	294	77	2.69 (1.04)
1.	Sedimentation/Silt	8.8	10.8	26.7	10.5	43.2	296	168	2.68 (0.95)
2.	Nitrogen	6.4	5.4	12.2	7.1	68.8	295	92	2.64 (1.05)
9.	Flow Alteration	9.1	8.8	13.2	11.5	57.4	296	126	2.63 (1.10)
7.	Algal Growth	11.1	14.5	18.9	8.1	47.3	296	156	2.46 (0.99)
6.	Oil and grease	13.3	10.9	11.2	10.9	53.7	294	136	2.43 (1.14)
11.	High Water Temperatures	15.0	7.2	8.9	8.2	60.8	293	115	2.26 (1.18)

## Sources of Water Pollutants

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 (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	N	V	Mean (SD)
11.	Land development or redevelopment	12.1	16.1	25.2	21.8	24.8	298	224	2.75 (1.04)
3.	Excessive use of lawn fertilizers and/or pesticides	9.7	14.8	24.2	16.4	34.9	298	194	2.73 (1.00)
4.	Improperly maintained septic systems	13.1	11.1	21.5	15.8	38.6	298	183	2.65 (1.08)
18.	Outputs from marinas and/or recreational boats	12.4	14.4	24.2	15.4	33.6	298	198	2.64 (1.04)

10.	Littering/Illegal dumping of trash	12.8	22.8	27.9	15.4	21.1	298	235	2.58 (0.98)
12.	Landfill(s)	18.2	12.5	17.2	19.5	32.7	297	200	2.57 (1.17)
2.	Soil erosion from shorelines and/or streambanks	9.4	25.5	28.2	10.4	26.5	298	219	2.54 (0.89)
16.	Streambank or shoreline modification/destabilization	12.1	13.1	17.1	11.4	46.3	298	160	2.52 (1.06)
17.	Drainage/filling of wetlands	15.4	12.8	15.4	15.1	41.3	298	175	2.51 (1.14)
7.	Stormwater runoff from streets and/or highways	11.7	23.8	24.5	10.1	29.9	298	209	2.47 (0.94)
13.	Stream channel erosion/incision	9.7	16.8	17.4	6.7	49.3	298	151	2.42 (0.95)
5.	Manure from farm animals	17.1	12.1	21.1	9.7	39.9	298	179	2.39 (1.07)
15.	Removal of riparian vegetation	16.4	12.1	16.8	10.7	44.0	298	167	2.39 (1.10)
8.	Droppings from geese, ducks and other waterfowl	12.8	28.9	18.8	9.7	29.9	298	209	2.36 (0.94)
1.	Soil erosion from farm fields	18.1	18.8	20.5	8.7	33.9	298	197	2.30 (1.01)
6.	Stormwater runoff from rooftops and/or parking lots	18.8	21.5	21.1	6.7	31.9	298	203	2.23 (0.97)
14.	Dredging of streams	18.5	13.1	12.8	4.4	51.3	298	145	2.06 (1.00)
9.	Waste material from pets	26.2	22.8	12.1	4.4	34.6	298	195	1.92 (0.92)

### Consequences of Poor Water Quality

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 (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	N	V	Mean (SD)
4.	Loss of desirable fish species	7.7	12.1	19.5	19.1	41.6	298	174	2.86 (1.02)
3.	Contaminated fish	9.8	16.8	20.2	16.5	36.7	297	188	2.69 (1.03)
7.	Excessive aquatic plants or algae	11.7	17.4	22.8	10.1	37.9	298	185	2.50 (0.98)
5.	Reduced beauty of lakes or streams	21.2	23.6	24.2	12.8	18.2	297	243	2.35 (1.03)
6.	Reduced quality of water recreation	21.8	19.5	23.2	10.7	24.8	298	224	2.30 (1.04)

	activities								
8.	Odor	32.8	17.9	12.5	8.4	28.4	296	212	1.95 (1.05)
1.	Contaminated drinking water	37.2	13.1	9.4	9.1	31.2	298	205	1.86 (1.09)
2.	Beach closures	33.9	25.8	12.1	5.0	23.2	298	229	1.85 (0.92)

### Practices to Improve Water Quality

The practices below have the potential to improve water quality in your area. Please indicate which statement most accurately describes your level of experience with each practice. Be sure to answer part "A" and part "B" for this set of practices.

	A. Please indicate which statement most accurately describes your level of experience with each practice.						B. Would you be willing to try or continue using this practice?			Question A Stats			Question B Stats		
	Doe s not appl y (8)	I've neve r hear d of it. (1)	I've heard of it, but I'm not very famili ar with it. (2)	I am famili ar with it, but I've never done it. (3)	I have tried it, but I no long er do it. (4)	I current ly use it. (5)	Ye s (2)	No (0)	May be (1)	N	V	Mean (SD)	N	V	Mean (SD)
4. Keep grass clippings and leaves out of the roads, ditches, and gutters	13.8	3.4	2.0	9.1	1.0	70.7	90.2	3.4	6.4	297	256	4.55 (1.04)	296	296	1.87 (0.43)
8. Repair home sewage treatment system	65.1	1.0	1.7	3.1	0.3	28.8	77.9	13.1	9.0	292	102	4.55 (1.04)	289	289	1.65 (0.70)
10. Recycle automotive oil	39.5	1.7	3.7	4.7	1.0	49.3	91.2	5.1	3.7	296	179	4.53 (1.06)	296	296	1.86 (0.47)
7. Regular servicing of septic system	53.1	1.7	3.4	3.1	0.7	38.1	81.4	11.3	7.2	294	138	4.49 (1.12)	291	291	1.70 (0.66)
5. Follow pesticide application	28.1	1.4	3.4	10.5	3.7	52.9	88.8	6.1	5.1	295	212	4.44 (1.03)	295	295	1.83 (0.52)

instructions for lawn and garden															
12. Properly dispose of household waste (chemicals, batteries, florescent light bulbs, etc)	8.1	3.0	6.1	9.8	5.7	67.2	92.6	2.0	5.4	29.6	27.2	4.39 (1.12)	29.6	29.6	1.91 (0.36)
3. Use a mulching lawn mower	7.8	1.7	4.1	19.3	6.1	61.1	80.7	7.8	11.5	29.6	27.3	4.31 (1.06)	29.5	29.5	1.73 (0.60)
11. Properly dispose of pet waste	42.6	6.2	3.1	6.2	1.4	40.5	84.9	8.9	6.2	29.1	16.7	4.17 (1.41)	29.1	29.1	1.76 (0.60)
15. Not planting trees and shrubs over septic system	56.7	5.1	1.4	6.1	0.3	30.4	78.5	15.0	6.5	29.3	12.7	4.14 (1.42)	29.3	29.3	1.63 (0.73)
14. Inspect septic system for size and condition	55.5	3.8	3.8	6.8	1.4	28.8	76.0	14.0	9.9	29.2	13.0	4.07 (1.38)	29.2	29.2	1.62 (0.72)
9. Replace home sewage treatment system	71.2	1.4	3.4	6.8	0.0	17.1	70.6	16.3	13.1	29.2	8.4	3.98 (1.33)	28.9	28.9	1.54 (0.76)
1. At or below the manufacturer's guidelines for fertilizer application for my lawn	34.8	8.4	5.4	12.2	7.8	31.4	74.0	15.2	10.8	29.6	19.3	3.74 (1.45)	29.6	29.6	1.59 (0.74)
18. Protect streambanks and/or shorelines with vegetation	45.7	5.5	12.6	19.1	1.7	15.4	74.3	9.6	16.1	29.3	15.9	3.16 (1.34)	29.2	29.2	1.65 (0.65)
17. Plant vegetated riparian buffer	53.3	6.9	11.7	14.1	1.7	12.4	71.0	12.1	16.9	29.1	13.6	3.02 (1.40)	29.0	29.0	1.59 (0.70)
6. Use phosphate free fertilizer	36.9	11.5	15.7	15.3	1.4	19.2	77.4	8.4	14.3	28.7	18.1	3.02 (1.49)	28.7	28.7	1.69 (0.62)
16.	42.1	4.8	15.8	24.0	0.7	12.7	70.	12.	17.2	29	16	3.01	29	29	1.58

Restore/enhance wetland							4	4		2	9	(1.22)	1	1	(0.70)
13. Use rain barrels	27.4	8.2	10.3	38.7	4.1	11.3	69.5	13.4	17.1	29	21	3.00 (1.13)	29	29	1.56 (0.72)
2. Create a rain garden	18.3	39.7	15.6	21.7	0.3	4.4	54.4	18.7	26.9	29	24	1.95 (1.12)	29	29	1.36 (0.78)

### Making Decisions for my Property

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

		Not at all important (5)	Somewhat important (4)	Undecided (3)	Important (2)	Very Important (1)	N	V	Mean (SD)
14.	Environmental benefit of practice	3.1	6.2	14.4	39.0	37.3	292	292	1.99 (1.02)
13.	Environmental damage caused by practice	4.1	6.2	17.8	34.2	37.7	292	292	2.05 (1.08)
1.	Personal out-of-pocket expense	3.8	20.3	9.3	37.5	29.2	291	291	2.32 (1.20)
2.	My own views about effective lawn and yard maintenance	4.1	18.1	10.6	47.4	19.8	293	293	2.39 (1.12)
8.	Lack of available information about a practice	7.9	13.1	22.1	40.0	16.9	290	290	2.55 (1.15)
4.	My own physical abilities	14.0	15.4	9.2	37.0	24.3	292	292	2.58 (1.37)
3.	How easily the new action fits with my current practices	8.2	17.1	18.4	42.3	14.0	293	293	2.63 (1.16)
7.	Not having access to the equipment that I need	11.0	17.8	16.1	39.7	15.4	292	292	2.69 (1.24)
5.	The need to learn new skills or techniques	14.4	18.2	20.6	32.3	14.4	291	291	2.86 (1.28)
12.	Don't know where to get	18.2	15.8	21.0	31.6	13.4	291	291	2.94 (1.32)



	information and/or assistance about the practice								
6.	Too much time required for implementation	15.8	22.3	18.5	31.2	12.3	292	292	2.98 (1.29)
11.	Restrictive covenants in my subdivision	43.4	6.3	28.8	15.6	5.9	288	288	3.66 (1.33)
9.	No one else I know is implementing the practice	44.5	12.4	27.6	9.0	6.6	290	290	3.79 (1.28)
10.	Approval of my neighbors	53.6	15.5	14.8	13.1	3.1	291	291	4.03 (1.22)

## About You

**1. Do you make the home and lawn care decisions in your household? (N=289)**

- ☐ 97.9 Yes
- ☐ 2.1 No

**2. What is your gender? (N=289)**

- ☐ 65.1 Male
- ☐ 34.9 Female

**3. In what year were you born? (N=262)** (N=261 Mean=1,949.64 Median=1,950.00 SD=12.36 Min=1919 Max=1983)

**4. What is the highest grade in school you have completed? (N=289)**

- ☐ 3.1 Some formal schooling
- ☐ 21.1 High school diploma/GED
- ☐ 16.6 Some college
- ☐ 5.2 2 year college degree
- ☐ 23.2 4 year college degree
- ☐ 30.8 Post-graduate degree

**5. What was your total household income last year? (N=236)**

- ☐ 12.7 Less than \$24,999
- ☐ 25.4 \$25,000 to \$49,999
- ☐ 17.8 \$50,000 to \$74,999
- ☐ 9.7 \$75,000 to \$99,999
- ☐ 34.3 \$100,000 or more

**6. What is your occupation? (N=253)** (N=N/A Mean=N/A Median=N/A SD=N/A Min=N/A Max=N/A)

**7. What is the approximate size of your residential lot? (N=287)**

- ☐ 23.0 ¼ acre or less
- ☐ 26.5 More than ¼ acre but less than 1 acre
- ☐ 27.5 1 acre to less than 5 acres
- ☐ 23.0 5 acres or more

**8. Do you own or rent your home? (N=284)**

- ☐ 99.6 Own
- ☐ 0.4 Rent

**9. How long have you lived at your current residence? (N=277)** (N=275 Mean=20.49  
Median=16.00 SD=15.45 Min=1 Max=80) years

**10. In addition to your residence, which of the following do you own or manage? (check all that apply) (N=284)**

- ☐ 8.5 An agricultural operation
- ☐ 13.4 Forested land
- ☐ 8.8 Rural recreational property
- ☐ 76.4 None of these

**11. Which of the following best describes where you live? (N=255)**

- ☐ 59.2 In a town, village, or city
- ☐ 27.5 In an isolated, rural, non-farm residence
- ☐ 13.3 Rural subdivision or development

**12. Do you use a professional lawn care service? (N=289)**

- ☐ 14.5 Yes, just for mowing
- ☐ 4.8 Yes, for mowing and fertilizing
- ☐ 2.1 Yes, just for fertilizing and pest control
- ☐ 4.2 Yes, for mowing, fertilizing, and pest control
- ☐ 74.4 No

**13. Where are you likely to seek information about water quality issues? (Check all that apply) (N=288)**

- ☐ 57.6 Newsletters/brochure/factsheet
- ☐ 36.8 Internet
- ☐ 11.1 Radio
- ☐ 50.7 Newspapers/Magazines
- ☐ 19.8 Workshops/demonstrations/meetings
- ☐ 48.3 Conversations with others
- ☐ 10.4 None of the above

## Septic Systems

**1. How old is your waste treatment system? (N=120)** (N=120 Mean=20.09 Median=15.00 SD=16.93 Min=1 Max=100) years

**2. Within the last five years, have you had any of the following problems? Check all that apply. (N=118)**

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

**3. In the future, would you like a reminder from your local health department regarding inspection/maintenance of your septic system? (N=120)**

- ☐ 24.2 Yes
- ☐ 59.2 No
- ☐ 16.7 Don't know

**4. Do you have a garbage disposal? (N=120)**

- ☐ 7.5 Yes, I use it daily
- ☐ 13.3 Yes, I use it occasionally
- ☐ 5.0 Yes, but I don't use it
- ☐ 74.2 No

**5. Does your septic system have an absorption field ("finger system")? (N=120)**

- ☐ 19.2 Yes
- ☐ 61.7 No
- ☐ 19.2 Don't know

**6. How would you know if your septic system was NOT working properly? Check all that apply. (N=120)**

- ☐ 76.7 Slow drains
- ☐ 75.8 Sewage backup in house
- ☐ 70.8 Bad smells
- ☐ 75.8 Toilet backs up
- ☐ 60.0 Wet spots in lawn
- ☐ 36.7 Pumping tank monthly or more
- ☐ 16.7 Straight pipe to ditch
- ☐ 19.2 Frozen septic
- ☐ 7.5 Don't know
- ☐ 2.5 Other

**7. Is your septic system designed to treat sewage or get rid of waste? (N=118)**

- ☐ 16.1 Treat sewage
- ☐ 13.6 Get rid of waste
- ☐ 37.3 Both
- ☐ 3.4 Neither
- ☐ 29.7 Don't know

**8. Do you think a local government agency should handle inspection and maintenance of septic systems? (N=119)**

- ☐ 64.7 Yes
- ☐ 6.7 No
- ☐ 28.6 Don't know

## Information Sources

*People get information about water quality from a number of different sources. To what extent do you trust those listed below as a source of information about stewardship?*

		Not at all (1)	Slightly (2)	Moderately (3)	Very Much (4)	Am Not Familiar (9)	N	V	Mean (SD)
4.	University Extension	5.1	6.8	23.3	37.3	27.4	292	212	3.28 (0.90)
5.	State agricultural agency	6.2	10.3	28.8	29.5	25.3	292	218	3.09 (0.93)
1.	Local watershed project	6.5	10.3	25.7	24.0	33.6	292	194	3.01 (0.95)
6.	State environmental agency	7.5	15.1	25.0	28.8	23.6	292	223	2.98 (0.99)
3.	U.S. Environmental Protection Agency	11.6	15.4	26.7	28.8	17.5	292	241	2.88 (1.04)
2.	Local government	14.4	25.0	30.1	15.8	14.7	292	249	2.55 (0.98)
7.	Environmental groups	16.4	20.2	28.8	16.4	18.2	292	239	2.55 (1.03)
11.	Neighbors / friends	11.0	29.2	33.7	11.7	14.4	291	249	2.54 (0.88)
8.	Local garden center	21.0	27.5	26.1	7.2	18.2	291	238	2.24 (0.94)
10.	Local community leader	20.6	26.5	26.1	6.5	20.3	291	232	2.23 (0.93)
9.	Lawn care company	33.2	29.1	13.4	4.1	20.2	292	233	1.85 (0.88)

### **Extra Questions not included in SIDMA On-Line System**

<b>Septic Systems</b>							
	<b>Less than every 3 years</b>	<b>Every 3-5 years</b>	<b>Every 6-10 years</b>	<b>Greater than 10 years</b>	<b>Never</b>	<b>Don't Know</b>	<b>N</b>
Question 9. How often do you clean out your septic tank? Check one.	24 (8%)	50 (16.7%)	23 (7.7%)	10 (3.3%)	21 (7%)	171 (57.2%)	299

<b>About You</b>					
	<b>In a town, village, or city</b>	<b>In an isolated, rural, non-farm residence</b>	<b>Rural subdivision or development</b>	<b>Farm</b>	<b>N</b>
Question 11. Which of the following best describes where you live?	152 (50.1%)	67 (22.4%)	46 (15.4%)	34 (11.4%)	299

## Appendix D - Door-to-Door Survey Data

### Rating of Water Quality

Overall, how would you rate the quality of water in your area?

		Poor (1)	Okay (2)	Good (3)	Don't Know (9)	N	V	Mean (SD)
6.	For scenic beauty / enjoyment	11.9	26.2	45.2	16.7	42	35	2.40 (0.74)
5.	For fish habitat / fishing	23.8	31.0	16.7	28.6	42	30	1.90 (0.76)
4.	For picnicking and family activities near water	20.9	39.5	9.3	30.2	43	30	1.83 (0.65)
1.	For canoeing / kayaking / other boating	30.2	25.6	11.6	32.6	43	29	1.72 (0.75)
2.	For eating fish caught in the water	34.9	30.2	2.3	32.6	43	29	1.52 (0.57)
3.	For swimming	41.9	20.9	7.0	30.2	43	30	1.50 (0.68)

### Your Water Resources

1. Of these activities, which is the most important to you? (N=36)

<input type="checkbox"/>	8.3	Canoeing / kayaking / other boating
<input type="checkbox"/>	2.8	Eating fish caught in the water
<input type="checkbox"/>	5.6	Swimming
<input type="checkbox"/>	11.1	Picnicking and family activities near water
<input type="checkbox"/>	22.2	Fish habitat / fishing
<input type="checkbox"/>	50.0	Scenic beauty / enjoyment

2. Do you know where the water goes when it runs off of your property? (N=42)

<input type="checkbox"/>	19.0	No, I don't know.
<input type="checkbox"/>	78.6	Yes, it goes to: (N=N/A Mean=N/A Median=N/A SD=N/A Min=N/A Max=N/A)



## Your Opinions

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

		Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	N	V	Mean (SD)
3.	It is my personal responsibility to help protect water quality.	0.0	0.0	11.6	58.1	30.2	43	43	4.19 (0.63)
1.	The economic stability of my community depends upon good water quality.	0.0	4.7	14.0	44.2	37.2	43	43	4.14 (0.83)
13.	The quality of life in my community depends on good water quality in local streams, rivers and lakes.	0.0	0.0	14.3	59.5	26.2	42	42	4.12 (0.63)
4.	It is important to protect water quality even if it slows economic development.	0.0	2.3	14.0	60.5	23.3	43	43	4.05 (0.69)
2.	The way that I care for my lawn and yard can influence water quality in local streams and lakes.	0.0	14.0	14.0	46.5	25.6	43	43	3.84 (0.97)
7.	My actions have an impact on water quality.	2.3	9.3	11.6	62.8	14.0	43	43	3.77 (0.90)
10.	It is important to protect water quality even if it costs me more.	0.0	4.7	46.5	37.2	11.6	43	43	3.56 (0.77)
12.	I would be willing to change the way I care for my lawn and yard to improve water quality.	4.7	16.3	18.6	51.2	9.3	43	43	3.44 (1.03)
11.	I would be willing to pay more to improve water quality (for example: through local taxes or fees).	7.0	23.3	30.2	30.2	9.3	43	43	3.12 (1.10)
8.	Taking action to improve water	11.6	27.9	37.2	23.3	0.0	43	43	2.72 (0.96)

	quality is too expensive for me.								
5.	What I do on my land doesn't make much difference in overall water quality.	14.0	51.2	14.0	16.3	4.7	43	43	2.47 (1.08)
6.	Lawn and yard-care practices (on individual lots) do not have an impact on local water quality.	16.3	53.5	16.3	11.6	2.3	43	43	2.30 (0.96)
9.	It is okay to reduce water quality to promote economic development.	30.2	46.5	11.6	9.3	2.3	43	43	2.07 (1.01)

### Water Impairments

*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 (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	N	V	Mean (SD)
4.	E. coli	2.3	9.3	32.6	23.3	32.6	43	29	3.14 (0.79)
3.	Phosphorus	7.1	14.3	11.9	26.2	40.5	42	25	2.96 (1.10)
2.	Nitrogen	7.0	18.6	14.0	25.6	34.9	43	28	2.89 (1.07)
1.	Sedimentation/Silt	4.7	20.9	25.6	20.9	27.9	43	31	2.87 (0.92)
10.	Habitat Alteration	9.3	9.3	23.3	18.6	39.5	43	26	2.85 (1.05)
5.	Trash/Debris	9.3	32.6	18.6	20.9	18.6	43	35	2.63 (1.00)
9.	Flow Alteration	14.0	14.0	7.0	18.6	46.5	43	23	2.57 (1.24)
8.	Exotic Aquatic Plants and/or Animals	14.0	16.3	16.3	14.0	39.5	43	26	2.50 (1.10)
11.	High Water Temperatures	18.6	11.6	9.3	16.3	44.2	43	24	2.42 (1.25)
7.	Algal Growth	16.3	34.9	11.6	16.3	20.9	43	34	2.35 (1.04)
6.	Oil and grease	16.3	25.6	18.6	9.3	30.2	43	30	2.30 (0.99)

## Sources of Water Pollutants

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 (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	N	V	Mean (SD)
12.	Landfill(s)	18.6	14.0	7.0	34.9	25.6	43	32	2.78 (1.29)
3.	Excessive use of lawn fertilizers and/or pesticides	11.6	14.0	32.6	14.0	27.9	43	31	2.68 (0.98)
4.	Improperly maintained septic systems	11.6	16.3	34.9	14.0	23.3	43	33	2.67 (0.96)
11.	Land development or redevelopment	14.3	14.3	21.4	19.0	31.0	42	29	2.66 (1.11)
2.	Soil erosion from shorelines and/or streambanks	9.3	25.6	18.6	18.6	27.9	43	31	2.65 (1.02)
17.	Drainage/filling of wetlands	18.6	11.6	11.6	23.3	34.9	43	28	2.61 (1.26)
13.	Stream channel erosion/incision	11.6	18.6	18.6	14.0	37.2	43	27	2.56 (1.05)
10.	Littering/Illegal dumping of trash	16.7	28.6	19.0	19.0	16.7	42	35	2.49 (1.07)
1.	Soil erosion from farm fields	4.7	41.9	23.3	9.3	20.9	43	34	2.47 (0.79)
5.	Manure from farm animals	14.6	29.3	24.4	14.6	17.1	41	34	2.47 (0.99)
16.	Streambank or shoreline modification/destabilization	16.3	14.0	14.0	14.0	41.9	43	25	2.44 (1.16)
7.	Stormwater runoff from streets and/or highways	16.3	18.6	23.3	11.6	30.2	43	30	2.43 (1.04)
18.	Outputs from marinas and/or recreational boats	14.3	23.8	26.2	9.5	26.2	42	31	2.42 (0.96)
15.	Removal of riparian vegetation	20.9	11.6	16.3	11.6	39.5	43	26	2.31 (1.16)
6.	Stormwater runoff from rooftops and/or parking lots	30.2	7.0	20.9	9.3	32.6	43	29	2.14 (1.16)
8.	Droppings from geese, ducks and other waterfowl	25.6	16.3	20.9	7.0	30.2	43	30	2.13 (1.04)
14.	Dredging of streams	16.3	20.9	9.3	4.7	48.8	43	22	2.05 (0.95)
9.	Waste material from pets	37.2	20.9	14.0	2.3	25.6	43	32	1.75 (0.88)

## Consequences of Poor Water Quality

*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 (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	N	V	Mean (SD)
3.	Contaminated fish	9.3	9.3	27.9	20.9	32.6	43	29	2.90 (1.01)
4.	Loss of desirable fish species	11.9	9.5	16.7	23.8	38.1	42	26	2.85 (1.16)
7.	Excessive aquatic plants or algae	11.6	25.6	20.9	11.6	30.2	43	30	2.47 (0.97)
5.	Reduced beauty of lakes or streams	18.6	16.3	30.2	11.6	23.3	43	33	2.45 (1.03)
6.	Reduced quality of water recreation activities	18.6	20.9	23.3	9.3	27.9	43	31	2.32 (1.01)
8.	Odor	23.3	27.9	11.6	14.0	23.3	43	33	2.21 (1.08)
1.	Contaminated drinking water	26.2	23.8	21.4	9.5	19.0	42	34	2.18 (1.03)
2.	Beach closures	30.2	30.2	14.0	2.3	23.3	43	33	1.85 (0.83)

## Practices to Improve Water Quality

The practices below have the potential to improve water quality in your area. Please indicate which statement most accurately describes your level of experience with each practice. Be sure to answer part "A" and part "B" for this set of practices.

	A. Please indicate which statement most accurately describes your level of experience with each practice.						B. Would you be willing to try or continue using this practice?			Question A Stats			Question B Stats		
	Does not apply (8)	I've never heard of it. (1)	I've heard of it, but I'm not very familiar with it. (2)	I am familiar with it, but I've never done it. (3)	I have tried it, but I no longer do it. (4)	I currently use it. (5)	Yes (2)	No (0)	Maybe (1)	N	V	Mean (SD)	N	V	Mean (SD)
1. At or below the manufacturer's guidelines for fertilizer application for my lawn	81.0	0.0	0.0	0.0	0.0	19.0	90.5	2.4	7.1	42	8	5.00 (0.00)	42	42	1.88 (0.40)
15. Not planting trees and shrubs over septic system	16.7	0.0	0.0	0.0	0.0	83.3	97.6	0.0	2.4	42	35	5.00 (0.00)	41	41	1.98 (0.16)
5. Follow pesticide application instructions for lawn and garden	54.8	0.0	0.0	2.4	0.0	42.9	95.2	2.4	2.4	42	19	4.89 (0.46)	42	42	1.93 (0.34)
4. Keep grass clippings and leaves out of the roads, ditches, and gutters	9.8	2.4	0.0	0.0	2.4	85.4	92.9	7.1	0.0	41	37	4.86 (0.67)	42	42	1.86 (0.52)
9. Replace home sewage treatment system	73.8	0.0	0.0	2.4	0.0	23.8	92.9	2.4	4.8	42	11	4.82 (0.60)	42	42	1.90 (0.37)
7. Regular	4.8	0.0	0.0	7.1	4.8	83.3	95.2	2.4	2.4	42	40	4.80	42	42	1.93

servicing of septic system												(0.56)			(0.34)
8. Repair home sewage treatment system	52.4	0.0	0.0	2.4	4.8	40.5	100.0	0.0	0.0	42	20	4.80 (0.52)	42	42	2.00 (0.00)
3. Use a mulching lawn mower	4.8	0.0	2.4	4.8	2.4	85.7	92.9	4.8	2.4	42	40	4.80 (0.65)	42	42	1.88 (0.45)
10. Recycle automotive oil	35.7	0.0	0.0	7.1	0.0	57.1	88.1	9.5	2.4	42	27	4.78 (0.64)	42	42	1.79 (0.61)
14. Inspect septic system for size and condition	21.4	2.4	2.4	2.4	2.4	69.0	87.8	7.3	4.9	42	33	4.70 (0.92)	41	41	1.80 (0.56)
16. Restore/enhance wetland	57.1	2.4	2.4	0.0	0.0	38.1	85.7	4.8	9.5	42	18	4.61 (1.14)	42	42	1.81 (0.51)
18. Protect streambanks and/or shorelines with vegetation	69.0	2.4	0.0	2.4	0.0	26.2	78.6	7.1	14.3	42	13	4.54 (1.20)	42	42	1.71 (0.60)
12. Properly dispose of household waste (chemicals, batteries, florescent light bulbs, etc)	7.1	7.1	4.8	4.8	2.4	73.8	90.5	9.5	0.0	42	39	4.41 (1.27)	42	42	1.81 (0.59)
11. Properly dispose of pet waste	28.6	0.0	4.8	16.7	0.0	50.0	69.0	26.2	4.8	42	30	4.33 (1.06)	42	42	1.43 (0.89)
17. Plant vegetated riparian buffer	66.7	4.8	0.0	4.8	0.0	23.8	78.6	9.5	11.9	42	14	4.14 (1.51)	42	42	1.69 (0.64)
13. Use rain barrels	59.5	4.8	2.4	19.0	2.4	11.9	52.4	38.1	9.5	42	17	3.35 (1.32)	42	42	1.14 (0.95)
6. Use phosphate free fertilizer	52.4	9.5	9.5	14.3	2.4	11.9	64.3	21.4	14.3	42	20	2.95 (1.47)	42	42	1.43 (0.83)
2. Create a rain garden	12.2	51.2	4.9	22.0	0.0	9.8	41.5	26.8	31.7	41	36	2.00 (1.37)	41	41	1.15 (0.82)

## Making Decisions for my Property

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

		Not at all important (5)	Somewhat important (4)	Undecided (3)	Important (2)	Very Important (1)	N	V	Mean (SD)
4.	My own physical abilities	9.5	14.3	4.8	42.9	28.6	42	42	2.33 (1.30)
1.	Personal out-of-pocket expense	7.1	23.8	4.8	33.3	31.0	42	42	2.43 (1.35)
2.	My own views about effective lawn and yard maintenance	4.8	19.0	16.7	38.1	21.4	42	42	2.48 (1.17)
14.	Environmental benefit of practice	21.4	4.8	7.1	38.1	28.6	42	42	2.52 (1.50)
3.	How easily the new action fits with my current practices	19.0	4.8	45.2	23.8	7.1	42	42	3.05 (1.17)
13.	Environmental damage caused by practice	31.0	7.1	16.7	28.6	16.7	42	42	3.07 (1.52)
5.	The need to learn new skills or techniques	28.6	16.7	21.4	23.8	9.5	42	42	3.31 (1.37)
8.	Lack of available information about a practice	26.2	23.8	23.8	14.3	11.9	42	42	3.38 (1.34)
6.	Too much time required for implementation	24.4	24.4	22.0	26.8	2.4	41	41	3.41 (1.20)
7.	Not having access to the equipment that I need	31.7	29.3	7.3	22.0	9.8	41	41	3.51 (1.40)
9.	No one else I know is implementing the practice	42.9	9.5	38.1	7.1	2.4	42	42	3.83 (1.15)
12.	Don't know where to get information and/or	48.8	22.0	19.5	9.8	0.0	41	41	4.10 (1.04)

	assistance about the practice								
10.	Approval of my neighbors	54.8	19.0	14.3	9.5	2.4	42	42	4.14 (1.14)
11.	Restrictive covenants in my subdivision	69.0	4.8	21.4	2.4	2.4	42	42	4.36 (1.06)

## About You

### 1. Do you make the home and lawn care decisions in your household? (N=43)

- ☐ 95.3 Yes
- ☐ 4.7 No

### 2. What is your gender? (N=43)

- ☐ 58.1 Male
- ☐ 41.9 Female

### 3. In what year were you born? (N=42) (N=42 Mean=1,907.40 Median=1,953.50 SD=294.97 Min=44 Max=1989)

### 4. What is the highest grade in school you have completed? (N=42)

- ☐ 14.3 Some formal schooling
- ☐ 31.0 High school diploma/GED
- ☐ 26.2 Some college
- ☐ 9.5 2 year college degree
- ☐ 11.9 4 year college degree
- ☐ 7.1 Post-graduate degree

### 5. What was your total household income last year? (N=32)

- ☐ 12.5 Less than \$24,999
- ☐ 34.4 \$25,000 to \$49,999
- ☐ 21.9 \$50,000 to \$74,999
- ☐ 18.8 \$75,000 to \$99,999
- ☐ 12.5 \$100,000 or more

### 6. What is your occupation? (N=40) (N=N/A Mean=N/A Median=N/A SD=N/A Min=N/A Max=N/A)



**7. What is the approximate size of your residential lot? (N=43)**

- ☐ **0.0** ¼ acre or less
- ☐ **2.3** More than ¼ acre but less than 1 acre
- ☐ **34.9** 1 acre to less than 5 acres
- ☐ **62.8** 5 acres or more

**8. Do you own or rent your home? (N=42)**

- ☐ **92.9** Own
- ☐ **7.1** Rent

**9. How long have you lived at your current residence? (N=43)** (N=43 Mean=24.15 Median=23.00 SD=16.08 Min=1 Max=61) years

**10. In addition to your residence, which of the following do you own or manage? (check all that apply) (N=43)**

- ☐ **30.2** An agricultural operation
- ☐ **11.6** Forested land
- ☐ **4.7** Rural recreational property
- ☐ **60.5** None of these

**11. Which of the following best describes where you live? (N=24)**

- ☐ **20.8** In a town, village, or city
- ☐ **70.8** In an isolated, rural, non-farm residence
- ☐ **8.3** Rural subdivision or development

**12. Do you use a professional lawn care service? (N=42)**

- ☐ **0.0** Yes, just for mowing
- ☐ **0.0** Yes, for mowing and fertilizing
- ☐ **0.0** Yes, just for fertilizing and pest control
- ☐ **0.0** Yes, for mowing, fertilizing, and pest control
- ☐ **100.0** No

**13. Where are you likely to seek information about water quality issues? (Check all that apply)**  
(N=42)

- ☐ 50.0 Newsletters/brochure/factsheet
- ☐ 35.7 Internet
- ☐ 11.9 Radio
- ☐ 50.0 Newspapers/Magazines
- ☐ 21.4 Workshops/demonstrations/meetings
- ☐ 52.4 Conversations with others
- ☐ 11.9 None of the above

**Septic Systems**

**1. How old is your waste treatment system? (N=39)** (N=39 Mean=25.15 Median=20.00 SD=17.43 Min=2 Max=61) years

**2. Within the last five years, have you had any of the following problems? Check all that apply.**  
(N=43)

- ☐ 34.9 Slow drains
- ☐ 18.6 Sewage backup in house
- ☐ 14.0 Bad smells near tank or drain field
- ☐ 7.0 Sewage on the surface
- ☐ 7.0 Sewage flowing to ditch
- ☐ 2.3 Frozen septic
- ☐ 9.3 Other
- ☐ 53.5 None
- ☐ 2.3 Don't know

**3. In the future, would you like a reminder from your local health department regarding inspection/maintenance of your septic system? (N=42)**

- ☒ 19.0 Yes
- ☒ 59.5 No
- ☒ 21.4 Don't know

**4. Do you have a garbage disposal? (N=43)**

- ☐ 4.7 Yes, I use it daily
- ☐ 2.3 Yes, I use it occasionally
- ☐ 2.3 Yes, but I don't use it
- ☐ 90.7 No

**5. Does your septic system have an absorption field ("finger system")? (N=43)**

- ☐ 79.1 Yes
- ☐ 9.3 No
- ☐ 11.6 Don't know

**6. How would you know if your septic system was NOT working properly? Check all that apply. (N=43)**

- ☐ 86.0 Slow drains
- ☐ 86.0 Sewage backup in house
- ☐ 79.1 Bad smells
- ☐ 86.0 Toilet backs up
- ☐ 76.7 Wet spots in lawn
- ☐ 53.5 Pumping tank monthly or more
- ☐ 32.6 Straight pipe to ditch
- ☐ 25.6 Frozen septic
- ☐ 7.0 Don't know
- ☐ NA Other

**7. Is your septic system designed to treat sewage or get rid of waste? (N=43)**

- ☐ 16.3 Treat sewage
- ☐ 23.3 Get rid of waste
- ☐ 30.2 Both
- ☐ 14.0 Neither
- ☐ 16.3 Don't know

**8. Do you think a local government agency should handle inspection and maintenance of septic systems? (N=42)**

- ☐ 11.9 Yes
- ☐ 64.3 No
- ☐ 23.8 Don't know

## Information Sources

*People get information about water quality from a number of different sources. To what extent do you trust those listed below as a source of information about stewardship?*

		Not at all (1)	Slightly (2)	Moderately (3)	Very Much (4)	Am Not Familiar (9)	N	V	Mean (SD)
5.	State agricultural agency	2.3	11.6	41.9	39.5	4.7	43	41	3.24 (0.77)
4.	University Extension	2.3	14.0	30.2	37.2	16.3	43	36	3.22 (0.83)
6.	State environmental agency	2.4	26.2	33.3	31.0	7.1	42	39	3.00 (0.86)
1.	Local watershed project	11.6	11.6	37.2	23.3	16.3	43	36	2.86 (0.99)
11.	Neighbors / friends	9.3	25.6	39.5	20.9	4.7	43	41	2.76 (0.92)
3.	U.S. Environmental Protection Agency	11.6	27.9	30.2	20.9	9.3	43	39	2.67 (0.98)
7.	Environmental groups	12.2	26.8	22.0	17.1	22.0	41	32	2.56 (1.01)
2.	Local government	19.5	29.3	24.4	17.1	9.8	41	37	2.43 (1.04)
10.	Local community leader	18.6	41.9	18.6	11.6	9.3	43	39	2.26 (0.94)
8.	Local garden center	28.6	31.0	19.0	16.7	4.8	42	40	2.25 (1.08)
9.	Lawn care company	35.7	33.3	9.5	7.1	14.3	42	36	1.86 (0.93)

### Extra Questions not included in SIDMA On-Line System

<b>Septic Systems</b>							
	<b>Less than every 3 years</b>	<b>Every 3-5 years</b>	<b>Every 6-10 years</b>	<b>Greater than 10 years</b>	<b>Never</b>	<b>Don't Know</b>	<b>N</b>
Question 9. How often do you clean out your septic tank? Check one.	9 (22%)	17 (41.5%)	6 (14.6%)	4 (9.8%)	4 (9.8%)	1 (2.4%)	41

<b>About You</b>					
	<b>In a town, village, or city</b>	<b>In an isolated, rural, non-farm residence</b>	<b>Rural subdivision or development</b>	<b>Farm</b>	<b>N</b>
Question 11. Which of the following best describes where you live?	4 (9.5%)	15 (35.7%)	2 (4.8%)	21 (50%)	42

## **Appendix E. Social Indicator Results**

1. Mail Survey
2. Door-To-Door Survey

## Summary of Scores for Mail Survey - GRW - 11/12/2009 1:35:59 PM

[Print Report](#)[Download Raw Data](#)**N = 301 responses**

Category	Indicator	Mean (SD)	Valid Answers
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**Awareness**

<b>Awareness 1</b>	<b>Awareness of consequences of pollutants to water quality.</b>	<b>0.55(0.43)</b>	<b>1660</b>
	<i>Key Indicator Scores:</i>	<i>0.56(0.42)</i>	<i>627</i>
<b>Awareness 2</b>	<b>Awareness of types of water pollutants.</b>	<b>0.71(0.39)</b>	<b>1538</b>
	<i>Key Indicator Scores:</i>	<i>0.76(0.37)</i>	<i>484</i>
<b>Awareness 3</b>	<b>Awareness of sources of water pollution.</b>	<b>0.64(0.40)</b>	<b>3443</b>
	<i>Key Indicator Scores:</i>	<i>0.65(0.41)</i>	<i>946</i>
<b>Awareness 4</b>	<b>Awareness of appropriate practices to improve water quality.</b>	<b>0.84(0.33)</b>	<b>3155</b>

**Attitude**

<b>Attitude 1</b>	<b>General water-quality-related attitudes.</b>		
	Construct: Personal impact	3.93(0.96)	596
	Construct: Value importance of water quality	4.12(0.87)	596
	Construct: Lawn & yard management impact	3.94(1.05)	597
	Construct: Economics vs. water quality	4.21(0.82)	596
	Construct: Personal action / responsibility	3.60(1.01)	1488
	<b>OVERALL</b>	<b>3.88(0.99)</b>	<b>3873</b>
<b>Attitude 2</b>	<b>Willingness to take action to improve water quality.</b>	<b>0.84(0.33)</b>	<b>4087</b>

**Constraints**

<b>Constraints 1</b>	<b>Constraints to behavior change.</b>		
	Construct: Economics / Profitability	2.32(1.20)	291
	Construct: Financial incentives	N/A(N/A)	0
	Construct: Independence / own ideas	2.39(1.12)	293
	Construct: Environmental considerations	2.02(1.05)	584
	Construct: Status Quo / Traditional	2.80(1.30)	1459
	Construct: Assistance Incentives	2.62(1.20)	582
	Construct: Caution about government programs	N/A(N/A)	0
	Construct: Peer/norms considerations	3.83(1.28)	869
	<b>OVERALL</b>	<b>2.82(1.36)</b>	<b>4078</b>

**Behavior**

<b>Behavior 2</b>	<b>Percentage of target audience implementing practices in critical areas.</b>	<b>0.54(0.50)</b>	<b>3155</b>
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## Summary of Scores for Galien River Septic Survey - 11/12/2009 1:35:21 PM

[Print Report](#)[Download Raw Data](#)

N = 43 responses

Category	Indicator	Mean (SD)	Valid Answers
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**Awareness**

<b>Awareness 1</b>	<b>Awareness of consequences of pollutants to water quality.</b>	<b>0.60(0.41)</b>	<b>249</b>
	<i>Key Indicator Scores:</i>	<i>0.57(0.42)</i>	<i>90</i>
<b>Awareness 2</b>	<b>Awareness of types of water pollutants.</b>	<b>0.69(0.38)</b>	<b>311</b>
	<i>Key Indicator Scores:</i>	<i>0.80(0.32)</i>	<i>113</i>
<b>Awareness 3</b>	<b>Awareness of sources of water pollution.</b>	<b>0.62(0.41)</b>	<b>539</b>
	<i>Key Indicator Scores:</i>	<i>0.66(0.40)</i>	<i>150</i>
<b>Awareness 4</b>	<b>Awareness of appropriate practices to improve water quality.</b>	<b>0.91(0.28)</b>	<b>453</b>

**Attitude**

<b>Attitude 1</b>	<b>General water-quality-related attitudes.</b>		
	Construct: Personal impact	3.65(0.99)	86
	Construct: Value importance of water quality	4.13(0.74)	85
	Construct: Lawn & yard management impact	3.77(0.97)	86
	Construct: Economics vs. water quality	3.99(0.86)	86
	Construct: Personal action / responsibility	3.52(0.98)	215
	<b>OVERALL</b>	<b>3.74(0.95)</b>	<b>558</b>
<b>Attitude 2</b>	<b>Willingness to take action to improve water quality.</b>	<b>0.86(0.32)</b>	<b>723</b>

**Constraints**

<b>Constraints 1</b>	<b>Constraints to behavior change.</b>		
	Construct: Economics / Profitability	2.43(1.35)	42
	Construct: Financial incentives	N/A(N/A)	0
	Construct: Independence / own ideas	2.48(1.17)	42
	Construct: Environmental considerations	2.80(1.53)	84
	Construct: Status Quo / Traditional	3.24(1.34)	208
	Construct: Assistance Incentives	3.45(1.36)	83
	Construct: Caution about government programs	N/A(N/A)	0
	Construct: Peer/norms considerations	4.11(1.13)	126
	<b>OVERALL</b>	<b>3.28(1.42)</b>	<b>585</b>

**Behavior**

<b>Behavior 2</b>	<b>Percentage of target audience implementing practices in critical areas.</b>	<b>0.77(0.42)</b>	<b>453</b>
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