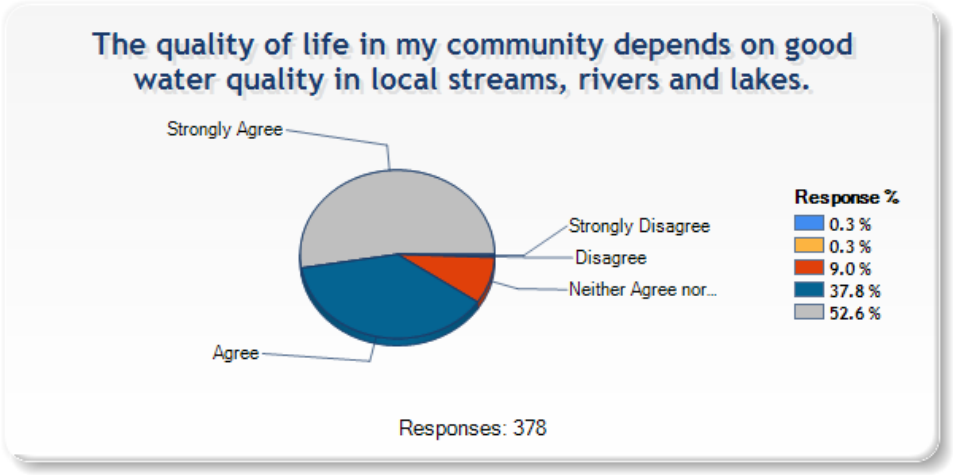
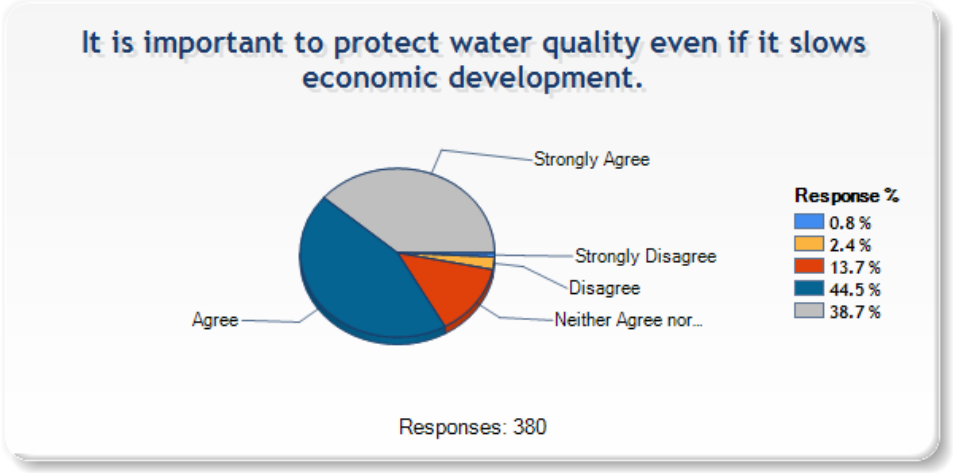
Social Indicators Survey for the Betsie River / Crystal Lake Watershed

The social indicators survey entitled “Preserving Water Quality in the Betsie-Crystal Watershed” was administered in 2014 to assess attitudes, knowledge and opinions of property owners in the watershed. Survey methods, outlined in a Quality Assurance Project Plan, were approved by the Michigan Department of Environmental Quality, which provided grant funds for the project.

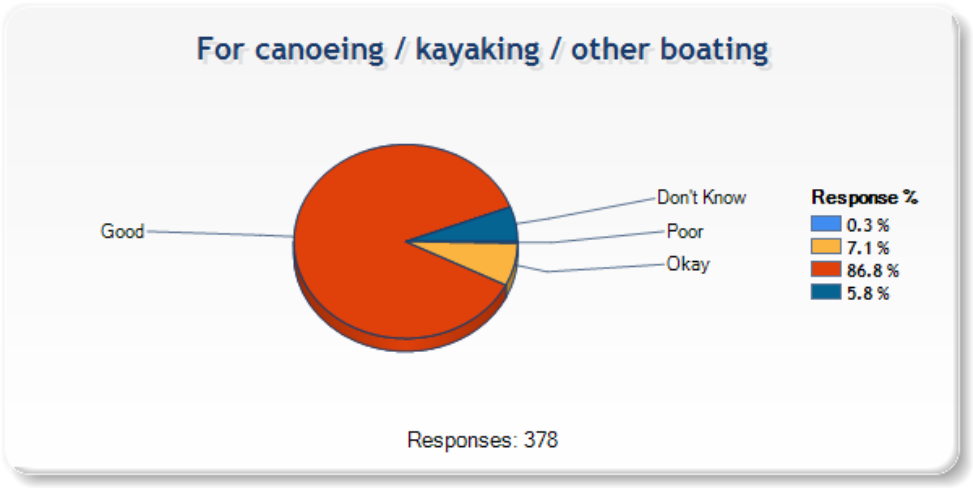
Approximately 12,000 property owners within the watershed were identified through tax records provided by Benzie, Grand Traverse and Manistee counties. From those lists, 1,000 property owners were selected at random to receive survey mailings. A total of 407 valid surveys were returned. Based on standard statistical measures, the results have a margin of error of 5 percent, at a 95 percent confidence level.

As a general statement, respondents indicated a very high appreciation for the importance of water quality, but were somewhat less aware of actions to preserve that quality. For example, 90 percent either agreed or strongly agreed with the statement “The quality of life in my community depends on good water quality in local streams, rivers and lakes,” and more than 80 percent said water quality should be protected even if that slowed economic growth.

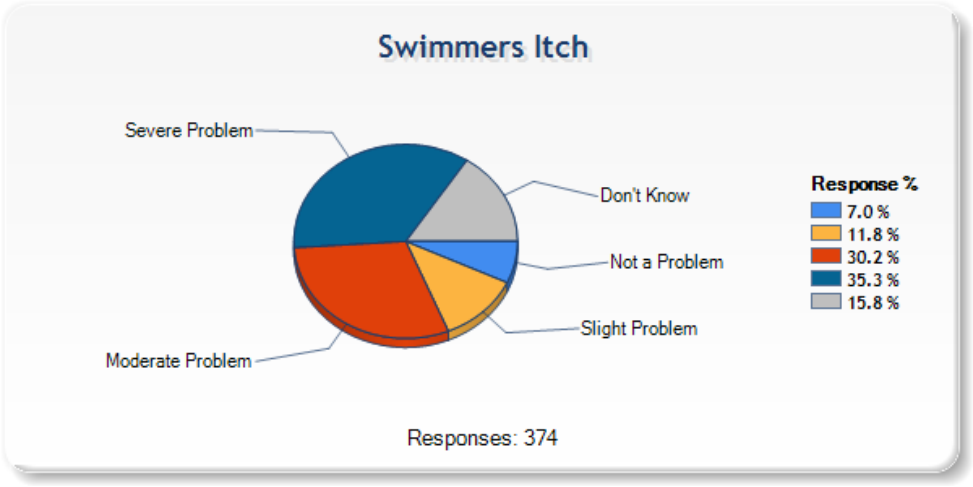




Asked to rate the quality of the local water for various activities, respondents gave the highest marks to "For Scenic Beauty" (94.7 percent "good") and "For Canoeing, Kayaking, other Boating" (86.8 percent "good"). A majority of respondents rated water quality as "good" for all listed conditions.



The most serious "water Impairment" was judged to be Swimmer's Itch, rated by 35.3 percent as a "severe" problem and by 30.2 percent as a moderate problem. Invasive species and pesticides were the second and third most serious impairments, according to the survey.



Asked to rate 15 potential sources of water pollution, respondents ranked "Droppings from geese, ducks and other waterfowl" as the most problematic, followed by "Improperly maintained septic systems" and "Excessive use of lawn fertilizers and/or pesticides." The phrasing of the question asked whether each potential source was: "Not a problem"; "A slight problem"; "A moderate problem"; or "A severe problem." On average, each of the potential sources was rated as less than a moderate problem, with most falling somewhere between slight and moderate.

A related query asked about the consequences of poor water quality (e.g. polluted swimming areas; contaminated fish, etc.). "Excessive aquatic plants and algae" was rated as the most problematic consequence. About a third of respondents considered this to be a moderate or severe problem, while 42 percent considered it a slight problem or not a problem.

It is noted that significant percentages of respondents answered “Don’t know,” to the questions about sources and consequences of pollution. This lack of knowledge is a challenge to be addressed in the Information/Education component of the Watershed Management Plan.

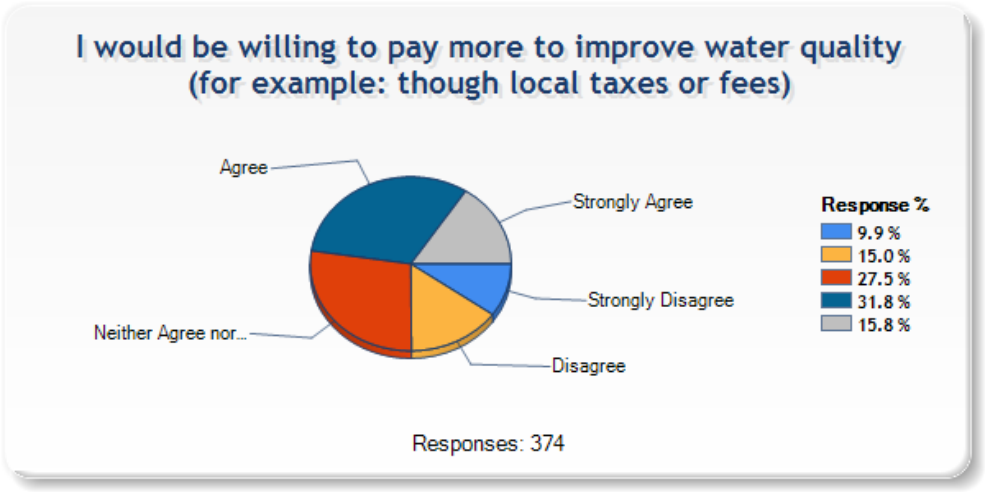
A series of survey questions asked property owners about their familiarity with two common practices to preserve water quality: Regular septic system maintenance, and restoration of native plant species.

More than half indicated they have their septic system serviced regularly, and 16.5 percent indicated the practice was not relevant for their property, presumably because those properties are served by municipal systems. The remaining 28 percent indicated they were unaware of the need for regular servicing or were not following the practice. Cost was the most commonly cited reason for failing to follow the best practice.

On the question of native plant restoration, only 15 percent indicated they currently use the practice, while more than 70 percent indicated they were unfamiliar or only somewhat familiar with it.

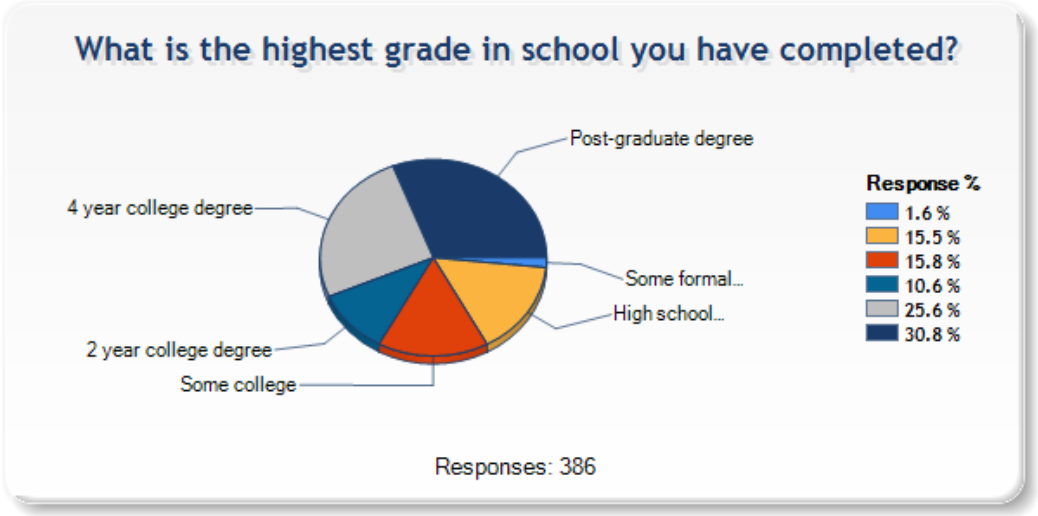
The information/Education section of the WMP should respond to these findings by providing practical guidance on how to achieve these best management practices, as well as the information to show the links between property management and high water quality.

Interestingly, the survey indicates that property owners are likely to adopt best management practices, if they understand the positive impact of those practices. More than 90 percent of respondents agreed or strongly agreed with the statement “It is my personal responsibility to help protect water quality.” Additionally, nearly 50 percent indicated they would accept higher taxes or fees to protect water quality.



In conveying Informational and Educational messages to the public, the survey indicates that the most trusted sources are the local Conservation Districts, the local watershed project, and University Extension. An effective Information/Education plan in the Betsie River /Crystal Lake Watershed should make use of the services of those three entities.

The Watershed Plan Steering Committee chose to administer the survey to owners of property throughout the watershed – including those who own recreational or vacation property locally but reside elsewhere for part or all of the year.
This decision was based on the understanding that property owners have the greatest impact on land use practices that affect water quality. It is noted that the region is a popular retirement and vacation destination. This tends to skew property ownership demographics toward higher age and income cohorts than if the survey had been administered only to full-time watershed residents.
The median age of respondents was 62.7 years (minimum: 28 years; maximum 96 years). In terms of education, 56 percent had at least a four-year college degree.



Respondents' properties were in a diversity of locations: 23.7 percent were in a town, village or city; 40.1 percent were isolated, non-farm properties; 33.8 percent were in rural subdivisions; and 2.4 percent were described as farms. About 70 percent of the properties were less than 5 acres in size, and respondents indicated they had owned the property an average of about 17 years.

Full survey results are presented below.

Preserving water quality in the Betsie-Crystal Watershed

Rating of Water Quality

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

Question #	Poor (1)	Okay (2)	Good (3)	Don't Know (9)	Mean (SD)	Valid Responses / Total Responses
1. For canoeing / kayaking / other boating	0.3	7.1	86.8	5.8	2.92 (0.28)	356 / 378
2. For eating locally caught fish	1.3	18.3	60.8	19.6	2.74 (0.48)	304 / 378
3. For swimming	5.6	28.2	59.9	6.2	2.58 (0.6)	349 / 372
4. For picnicking and family activities	0.8	10.1	85.4	3.7	2.88 (0.35)	363 / 377
5. For fish habitat	1.3	20.7	56.2	21.8	2.7 (0.49)	295 / 377
6. For scenic beauty	0.3	4	94.7	1.1	2.95 (0.22)	374 / 378

Your Water Resources

1. Of these activities, which is the most important to you? (Responses: 251)

15.1% For canoeing / kayaking / other boating

10.8% For eating locally caught fish

23.9% For swimming

5.6% For picnicking and family activities

13.1% For fish habitat

31.5% For scenic beauty

Your Opinions

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

Question #	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	Mean (SD)	Valid Responses / Total Responses
1. The way that I care for my lawn and yard can influence water quality in local streams and lakes.	2.6	5	11.3	42	39.1	4.1 (0.97)	379 / 379
2. Using recommended management practices on farms improves water quality.	0.3	2.1	11.2	44.4	42	4.26 (0.76)	376 / 376
3. It is my personal responsibility to help protect water quality.	0.5	0.8	7.4	47	44.3	4.34 (0.7)	379 / 379
4. It is important to protect water quality even if it slows economic development.	0.8	2.4	13.7	44.5	38.7	4.18 (0.81)	380 / 380
5. My actions have an impact on water quality.	0.5	2.4	7.4	51.5	38.2	4.24 (0.74)	377 / 377
6. I would be willing to pay more to improve water quality (for example: though local taxes or fees)	9.9	15	27.5	31.8	15.8	3.29 (1.19)	374 / 374
7. I would be willing to change the way I care for my lawn and yard to improve water quality.	1.9	6.2	23.2	42.3	26.4	3.85 (0.95)	371 / 371
8. I would be willing to change management practices to improve water quality.	0.8	2.7	28	43.1	25.3	3.89 (0.84)	371 / 371
9. The quality of life in my community depends on good water quality in local streams, rivers and lakes.	0.3	0.3	9	37.8	52.6	4.42 (0.69)	378 / 378

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?

Question #	Not a Problem (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	Mean (SD)	Valid Responses / Total Responses
1. Sedimentation (dirt and soil) in the water	20.3	26.2	25.4	5.3	22.7	2.2 (0.91)	289 / 374
2. Phosphorus	7.6	11.9	14.9	7.6	58	2.54 (0.99)	155 / 369
3. Bacteria and viruses in the water (such as E.coli / coliform)	18.9	16.5	17.3	9.7	37.6	2.29 (1.06)	231 / 370
4. Trash or debris in the water	23.9	34.3	22.8	8.6	10.5	2.18 (0.94)	334 / 373
5. Oil and grease.	30.6	22.6	11	7.5	28.2	1.94 (1)	267 / 372
6. Cloudiness of the water	38.5	28	12.7	2.4	18.3	1.74 (0.83)	303 / 371
7. Mercury	11.9	7.6	7.6	6.8	66.2	2.27 (1.15)	125 / 370
8. Algae in the water	17.7	30.3	22.3	4.8	24.9	2.19 (0.87)	280 / 373
9. Invasive aquatic plants and animals	8	12.1	28.2	26.8	24.9	2.98 (0.97)	280 / 373
10. Habitat alteration harming local fish	11.8	15.5	18.2	10.7	43.7	2.5 (1.03)	210 / 373
11. High water temperature	37.2	10.9	10.1	3.3	38.5	1.67 (0.94)	225 / 366
12. Pesticides	9.5	12.2	18.6	11.9	47.8	2.63 (1.03)	193 / 370
13. High water levels causing erosion	34	18.9	14.3	8.1	24.8	1.95 (1.04)	279 / 371
14. Low water levels harming fish habitat and-or access	25.9	17	17.3	8.4	31.5	2.12 (1.05)	254 / 371
15. Swimmers Itch	7	11.8	30.2	35.3	15.8	3.11 (0.94)	315 / 374

Sources of Water Pollution

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?

Question #	Not a Problem (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	Mean (SD)	Valid Responses / Total Responses
1. Discharges from industry into streams and lakes	27.6	17.2	14.9	7.2	33.2	2.02 (1.03)	252 / 377
2. Discharges from sewage treatment plants	24.8	15.2	12.5	9.1	38.4	2.1 (1.09)	231 / 375
3. Soil erosion from construction sites	24.2	26.1	10.5	4.6	34.7	1.93 (0.9)	243 / 372
4. Soil erosion from farm fields	20.5	20.8	15.5	3.7	39.5	2.04 (0.92)	227 / 375
5. Soil erosion from shorelines and/or streambanks	17.3	27.1	20.6	6.8	28.2	2.23 (0.92)	265 / 369
6. Excessive use of lawn fertilizers and/or pesticides	8	20.8	22.9	14.1	34.1	2.66 (0.95)	247 / 375
7. Improperly maintained septic systems	8	17.4	20.6	13.9	40.1	2.67 (0.98)	224 / 374
8. Stormwater runoff from streets and/or highways	15.2	23.1	22.6	7.7	31.4	2.33 (0.94)	258 / 376
9. Street salt and sand	12.8	24.5	23.7	8.2	30.9	2.4 (0.92)	260 / 376
10. Droppings from geese, ducks and other waterfowl	9.9	20.6	33.2	19.8	16.4	2.75 (0.95)	312 / 373
11. Specialty crop production (horticulture, citrus, nuts, fruits)	22.9	12.8	7.5	1.9	54.9	1.74 (0.88)	169 / 375
12. Highway/road/bridge runoff	15.2	25.3	16.8	5.1	37.6	2.19 (0.9)	234 / 375
13. Removal of riparian vegetation	13.5	15.9	14.1	4.3	52.2	2.19 (0.95)	177 / 370
14. Fueling of boats	17.9	28	19.5	6.7	28	2.21 (0.92)	270 / 375
15. Turf management (golf courses, sports fields)	20.1	21.2	15.5	7	36.2	2.15 (0.99)	238 / 373

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?

Question #	Not a Problem (1)	Slight Problem (2)	Moderate Problem (3)	Severe Problem (4)	Don't Know (9)	Mean (SD)	Valid Responses / Total Responses
1. Polluted swimming areas	33	26.3	14.4	8.2	18.1	1.97 (0.99)	308 / 376
2. Contaminated fish	25.9	23	11.5	6.1	33.4	1.97 (0.97)	249 / 374
3. Loss of desirable fish species	18.1	18.1	18.1	9.3	36.4	2.29 (1.04)	239 / 376
4. Reduced beauty of lakes or streams	41.6	25.7	13.1	8	11.5	1.86 (0.98)	330 / 373
5. Reduced quality of water recreation activities	33.3	27.7	14	9.4	15.6	1.99 (1)	314 / 372
6. Excessive aquatic plants or algae	15.5	26.7	24.6	10.4	22.7	2.39 (0.95)	289 / 374

Practices to Improve Water Quality

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

Question #	Not relevant for my property (9)	Never heard of it (1)	Somewhat familiar with it (2)	Know how to use it; not using it (3)	Currently use it (4)	Mean (SD)	Valid Responses / Total Responses
1. Following the manufacturer's instructions when fertilizing lawn or garden	33.3	0	7.6	23.4	35.7	3.42 (0.69)	256 / 384
2. Create a rain garden	30.5	38.3	15.1	13.8	2.3	1.72 (0.9)	267 / 384
3. Keep grass clippings and leaves out of the roads, ditches, and gutters	36	3.9	11	7.8	41.3	3.35 (0.97)	245 / 383
4. Follow pesticide application instructions for lawn and garden	33.5	0.8	7	22.9	35.8	3.41 (0.72)	256 / 385
5. Use phosphate free fertilizer	38.7	5.3	9.1	24.5	22.4	3.04 (0.93)	230 / 375
6. Properly dispose of household waste (chemicals, batteries, florescent light bulbs, etc.)	10.4	0.5	8.6	7.6	72.8	3.71 (0.66)	343 / 383
7. Stabilize and protect streambanks and/or shorelines	53.7	3.2	15.7	8.2	19.1	2.94 (1.02)	174 / 376
8. Establish riparian vegetation	41.6	24.3	17.3	8.3	8.5	2.02 (1.07)	219 / 375
9. Restore/enhance wetland	62.2	2.4	20.6	9	5.8	2.48 (0.83)	143 / 378
10. Plant vegetated riparian buffer	45	23.8	16.7	8.2	6.3	1.95 (1.02)	208 / 378
11. Protect streambanks and/or shorelines with vegetation	56.2	2.9	19.5	9	12.4	2.7 (0.96)	166 / 379

Specific Constraints of Practices

Regular Septic System Servicing: Having septic system thoroughly cleaned every 3-5 years to remove all the sludge, effluent and scum from the tank.

1. How familiar are you with this practice? (Responses: 389)

16.5% Not relevant

4.9% Never heard of it

13.6% Somewhat familiar with it

10% Know how to use it; not using it

55% Currently use it

2. If the practice is not relevant, please explain why.

3. Are you willing to try this practice? (Responses: 322)

73% Yes or already do

18.3% Maybe

8.7% No

How much do the following factors limit your ability to implement this practice?

Question #	Not at all (4)	A little (3)	Some (2)	A lot (1)	Don't Know (9)	Mean (SD)	Valid Responses / Total Responses
4. Don't know how to do it	61.3	7.3	12.5	6.3	12.5	3.41 (0.98)	251 / 287
5. Time required	60.3	10.7	11.7	4.5	12.8	3.45 (0.91)	253 / 290
6. Cost	33.4	12.7	19.7	23.1	11	2.64 (1.23)	266 / 299
7. The features of my property make it difficult	62.9	11	7.2	4.8	14.1	3.54 (0.87)	250 / 291
8. Insufficient proof of water quality benefit	54.8	7.6	9.3	5.9	22.4	3.44 (0.97)	225 / 290
9. Desire to keep things the way they are	61.9	6.2	10	10.7	11.3	3.34 (1.08)	258 / 291
10. Physical or health limitations	72.3	5.1	8.2	6.8	7.5	3.54 (0.93)	270 / 292
11. Hard to use with my farming system	74.2	1.8	2.2	1.1	20.8	3.88 (0.49)	221 / 279
12. Lack of equipment	62.3	3.9	6.3	9.5	18	3.45 (1.05)	233 / 284

Native Plant Communities Restoration: Restore plant species in a manner designed to produce plant communities comprised of native species.

13. How familiar are you with this practice? (Responses: 373)

7% Not relevant

23.9% Never heard of it

46.6% Somewhat familiar with it

7.5% Know how to use it; not using it

15% Currently use it

14. If the practice is not relevant, please explain why.

15. Are you willing to try this practice? (Responses: 355)

44.2% Yes or already do

44.8% Maybe

11% No

How much do the following factors limit your ability to implement this practice?

Question #	Not at all (4)	A little (3)	Some (2)	A lot (1)	Don't Know (9)	Mean (SD)	Valid Responses / Total Responses
16. Don't know how to do it	27.8	13.5	20.5	18.3	19.9	2.63 (1.18)	262 / 327
17. Time required	30	17.5	19.4	14.4	18.8	2.78 (1.13)	260 / 320
18. Cost	26.6	14.1	21.2	19.1	19.1	2.59 (1.17)	259 / 320
19. The features of my property make it difficult	42.2	10.1	13.5	9.8	24.5	3.12 (1.12)	247 / 327
20. Insufficient proof of water quality benefit	45	8.8	8.4	6.9	30.9	3.33 (1.03)	221 / 320
21. Desire to keep things the way they are	52.6	9.7	14.3	9.3	14	3.23 (1.08)	276 / 321
22. Physical or health limitations	57.9	8.4	13.4	8.7	11.5	3.31 (1.05)	284 / 321
23. Hard to use with my farming system	63.5	2.3	2.6	1.3	30.3	3.83 (0.57)	212 / 304
24. Lack of equipment	45.1	8.6	8.3	9.5	28.6	3.25 (1.11)	225 / 315

Making Decisions for my Property

In general, how much does each issue limit your ability to change your management practices?

Question #	Not at all (4)	A little (3)	Some (2)	A lot (1)	Don't Know (9)	Mean (SD)	Valid Responses / Total Responses
1. Personal out-of-pocket expense	17.6	16.5	29.3	28.2	8.4	2.26 (1.09)	338 / 369
2. Lack of government funds for cost share	31.8	10.9	15.3	17	25.1	2.77 (1.22)	269 / 359
3. My own physical abilities	45.9	12.8	19.7	15.6	6	2.95 (1.17)	344 / 366
4. Not having access to the equipment that I need	29.1	15.8	17.5	17.5	20.2	2.71 (1.17)	288 / 361
5. Lack of available information about a practice	22.1	14.8	24.6	23.7	14.8	2.41 (1.15)	305 / 358
6. No one else I know is implementing the practice	37.3	9.2	12.9	12.9	27.7	2.98 (1.19)	258 / 357
7. Concerns about reduced yields	55.7	3.1	5.7	3.4	32	3.63 (0.84)	238 / 350
8. Approval of my neighbors	64.6	7.6	5.1	3.9	18.8	3.64 (0.81)	289 / 356
9. Don't want to participate in government programs	50.3	8.9	11.7	10.1	19	3.23 (1.1)	290 / 358
10. Requirements or restrictions of government programs	36.3	9.9	13	14.4	26.5	2.93 (1.21)	261 / 355
11. Possible interference with my flexibility to change land use practices as conditions warrant	36	13.5	13.5	13.8	23.3	2.93 (1.17)	273 / 356
12. Don't know where to get information and/or assistance about those practices	30	13.4	20.2	14.8	21.6	2.75 (1.16)	280 / 357
13. Environmental damage caused by practice	39.6	8	10.5	6.8	35	3.24 (1.07)	228 / 351
14. Concerns about resale value	52.5	9	11.2	11	16.3	3.23 (1.11)	298 / 356
15. Not being able to see a demonstration of the practice before I decide	33.9	11.5	19	15.4	20.2	2.8 (1.18)	285 / 357

About You

1. Do you make the home and lawn care decisions in your household? (Responses: 389)

94.1% Yes

5.9% No

2. What is your gender? (Responses: 387)

61.5% Male

38.5% Female

3. What is your age? (**Mean=62.7**; SD = 13.15; Min = 28; Max = 96; Range = 68; n = 377)

4. What is the highest grade in school you have completed? (Responses: 386)

1.6% Some formal schooling

15.5% High school diploma/GED

15.8% Some college

10.6% 2 year college degree

25.6% 4 year college degree

30.8% Post-graduate degree

5. What is the approximate size of your property? (Responses: 389)

23.9% 1/4 acre or less

24.2% More than 1/4 acre but less than 1 acre

22.6% 1 acre to less than 5 acres

29.3% 5 acres or more

7. How long have you owned your property in the Betsie River Watershed (years)?

(Mean=**16.97**; SD = 8.44; Min = 2; Max = 25; Range = 23; n = 391)

8. Which of the following best describes your property? (Responses: 379)

23.7% In a town, village, or city

40.1% In an isolated, rural, non-farm residence

33.8% Rural subdivision or development

2.4% On a farm

9. Do you use a professional lawn care service? (Responses: 390)

8.5% Yes, just for mowing

2.8% Yes, for mowing and fertilizing

2.6% Yes, just for fertilizing and pest control

3.3% Yes, for mowing, fertilizing, and pest control

82.8% No

10. Where are you likely to seek information about water quality issues? (Responses: 387)

48.8% Newsletters/brochure/fact sheet
38.2% Internet
8.8% Radio
32.6% Newspapers/magazines
14.7% Workshops/demonstrations/meetings
38.5% Conversations with others
12.4% None of the above

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 soil and water?

Question #	Not at all (1)	Slightly (2)	Moderately (3)	Very much (4)	Am not familiar (9)	Mean (SD)	Valid Responses / Total Responses
1. Local watershed project	4.2	10.1	26.5	44.6	14.6	3.3 (0.86)	322 / 377
2. Soil and Water Conservation District	4.2	7.4	28.6	49.1	10.6	3.37 (0.83)	337 / 377
3. Local government	13.1	23	36.4	19.3	8.3	2.67 (0.96)	343 / 374
4. University Extension	6.6	9	26.7	44.7	13	3.26 (0.93)	329 / 378
5. Environmental groups	17.3	18.1	32.2	23.4	9	2.68 (1.06)	342 / 376
6. Farm Bureau	14.2	15.3	30.3	15	25.2	2.62 (1.01)	279 / 373
7. Local garden center	12.4	27.7	37.1	12.1	10.8	2.55 (0.89)	332 / 372
8. Neighbors / friends	9.6	28.1	41.7	14.2	6.4	2.65 (0.86)	350 / 374