



# **Black Hawk Lake Watershed Citizen Assessment and Outreach Campaign**

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# Black Hawk Lake Watershed Citizen Assessment and Outreach Campaign

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## Background

The Black Hawk Lake Watershed is located in Sac and Carroll Counties in northwest Iowa. The drainage area to Black Hawk Lake is a 13,156-acre watershed, not including the main body of the lake or nearby Provost Slough. Two parks on the lake—Speaker Park and Crescent Beach Park—are next to the lake and are owned and operated by the city of Lake View. The largest town within the watershed is Lake View (pop. 1,151). The watershed also includes the community of Breda (pop. 409) and the unincorporated town of Carnarvon. There are 176 USDA tracts of farm ground within the watershed, owned by 165 people and operated by 78 farmers.

Black Hawk Lake is the southernmost glacier-formed lake in Iowa. The 922-acre lake (including an inlet slough of 162 acres) has been identified as a major recreational area based on visitation rates, campground use, and population within a 50-mile radius of the lake. This includes the cities of Carroll (pop. 10,126), about 26 miles southeast of Lake View, and Denison (pop. 8,298), approximately 35 miles southwest of Lake View. Both



Carroll and Denison are outside of the Black Hawk Lake Watershed. Black Hawk Lake averaged more than 146,000 annual visitors between 2002 and 2005, according to the 2009 report by the Center for Agricultural and Rural Development (CARD) at Iowa State University. Those visitors spent an average of \$19 million per year, which supported 379 jobs and \$5.1 million of labor income in the region<sup>1</sup>. 2009 came in slightly below these averages with approximately 145,000 visitors spending \$16 million that year.

The Black Hawk Lake Watershed is on the Iowa Department of Natural Resources 303(d) Impaired Water Bodies list due to excess phosphorus and poor water transparency caused by algae and solid particles. It no longer supports its designated use, “primary contact recreation”—

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<sup>1</sup> <http://www.card.iastate.edu/environment/>

activities in which humans are in direct contact with the water, such as swimming, wading, water skiing and tubing.

## Project History

Citizen-led involvement—along with city, county, state, and federal agencies—has been the cornerstone of working toward a community-based watershed program in the Black Hawk Lake Watershed. Cooperation between citizens, government branches and businesses has been key in the early success of lake restoration measures and watershed protection.

The current drive for improving water quality in the Black Hawk Lake Watershed came in 2007 from watershed citizens concerned with the environmental and economic viability of the lake. They raised \$40,000, which the Iowa Department of Natural Resources later matched, to finance a Diagnostic Feasibility Study to determine the restoration potential of the lake. It was the first study of the lake since the early 1980s<sup>2</sup>. The IDNR developed the TMDL for the watershed in 2011. The watershed management plan to improve the water quality of the lake<sup>3</sup> emerged from these key assessments. This plan contained several action items, including best management practices for landowners and farmer operators, periodic water monitoring, and a public outreach strategy. Shortly after the watershed management plan was completed, the Black Hawk Lake Protective Association (BHLPA) formed. The BHLPA included many of the same interested citizens from the 2007 effort.

The Black Hawk Lake Watershed Management Plan names excess phosphorus as the primary reason the lake is on the 303(d) Impaired Water Bodies list. Excess phosphorus causes algal and weed growth, resulting in cloudy, unhealthy water. The Watershed Management Plan lays out a clear strategy for promoting best management practices in the watershed for farmland, urban communities, public land, and the main lake. It outlines targets for each practice, along with potential cost-share motivations for landowners and urban residents. Implementation of the plan following these guidelines is ongoing, with many of the cost-share programs having exceeded, met, or neared the goals set, as of March 2013 (Tables 1 and 2)<sup>4</sup>.

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<sup>2</sup> Iowa Department of Natural Resources and Iowa State University Limnology Laboratory (2010). Black Hawk Lake Diagnostic/Feasibility Study.

<sup>3</sup> Sac County Soil and Water Conservation District (2011). Black Hawk Lake Watershed Management Plan.

<sup>4</sup> NRCS-CD Sac County, personal communication April 2013.

Table 1: Best management practices for Black Hawk Lake Watershed (as of 3/7/13)

PRACTICE	AMOUNT INSTALLED	CONTRACTED (to be installed)	TOTAL APPLIED FOR (to be reviewed)
Cover Crops	407.3 acres		314.2 acres
Terraces	15,100 feet	8,600 feet	5,800 feet (rebuild)
Wetland Restoration	29.6 acres		
Streambank Stabilization	2,165 feet	320 feet	320 feet
Filter Strips	21 acres		
Nutrient Management	1,504.1 acres		913.4 acres
Nutrient Management Plans	5 plans completed		
Grassed Waterway	12,788 feet	1,560 feet	3,175 feet
Strip-till	223.9 acres		109.2 acres
No-till	125.6 acres		503.8 acres
Rain Garden	2 installed	2 to be installed	
CRP Field Windbreak	2.4 acres		
Conservation Easement		39.7 acres	

Table 2: Percent of best management practices implemented to reach Black Hawk Lake Watershed Management Plan goals for Section 319 Funding (as of 3/7/13)

Practice	Goal Set	Percent of Goal Achieved
Cover Crops	200 acres	200%
Terraces	12,000 feet	125%
Wetland Restoration	1 completed	100%
Streambank Restoration	2,500 feet	86%
Filter Strips	25 acres	84%
Rain Barrels	16 rain barrels	75%
Nutrient Management	2,400 acres	63%
Grassed Waterways	28,000 feet	46%
Strip-till/No-till	800 acres	44%
Rain Gardens	10 rain gardens	40%
Mulch Till	1,600 acres	0%
CREP Wetlands	1 wetland	0%
Water and Sediment Control Basin	3 basins	0%
Pond	1 pond	0%
Pasture Management	75 acres	0%

The Watershed Management Plan also sets the goal of reducing the amount of phosphorous released into the watershed by 73 percent of baseline levels. The baseline phosphorous load per season was 36,117 pounds. The goal is to reduce that amount by 16% or 6,664 pounds per season by the end of the first five years. As of March 2013, the installed best management practices have reduced phosphorous load reduction by 1,729.5 pounds per year (Table 3)<sup>5</sup>.

<sup>5</sup> NRCS-CD Sac County, personal communication April 2013

Table 3: Phosphorus load reduction for Black Hawk Lake Watershed (as of 3/7/13)

Installed Practices	<b>1,729.5 pounds per year</b>
Contracted Practices	<b>279.9 pounds per year</b>

While the Watershed Management Plan does not give specific numerical targets for sediment load reduction, the best management practices implemented so far have reduced sediment load by 804.1 tons per year (Table 4)<sup>6</sup>.

Table 4: Sediment load reduction for Black Hawk Lake Watershed (as of 3/7/13)

Installed Practices	<b>804.1 tons per year</b>
Contracted Practices	<b>130 tons per year</b>

While the project is currently exceeding goals for some of the practices, this work includes practices such as terraces, filter strips, and streambank restoration that, historically, land managers have been willing to install if given the right incentive. Other practices such as cover crops, no-tillage and strip-tillage are a much harder sell to farmers in this area despite high incentives. These practices are also at the highest risk of abandonment once the incentive contract has expired. Only a small number of farmers use these practices. Perhaps a new goal for the project team (expanding beyond the goals of the Section 319 funding) would be to increase participation by more farmers, distributing the acres being farmed using best practices both in targeted locations and also more widely across the watershed. The challenge in meeting this goal is to find ways, beyond financial incentives, to change attitudes and increase participation that will lead to long-term sustainable change.

The Black Hawk Lake Watershed Management Plan outlines a public outreach component to go with the enactment of best management practices in the watershed. This Citizen Assessment and Outreach Campaign document boosts the public outreach component of the Watershed Management Plan. It provides detailed information about citizens' perceptions of and attitudes toward water quality, and suggests ways for community and governmental groups to help to change attitudes and behavior by engaging local stakeholders.

## Campaign Goals

The goals of the citizen outreach campaign are to:

- 1) Promote an appreciation of Black Hawk Lake and its economic and ecological value to the area
- 2) Motivate watershed residents to implement best management practices to ensure water entering the lake is as clean as possible
- 3) Foster a long-term commitment to improving water quality by creating a community identity as watershed protectors

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<sup>6</sup> NRCS-CD Sac County, personal communication April 2013



Education about phosphorus and water quality is an important part of this campaign. These goals support the Watershed Management Plan goals of increasing public understanding about water quality problems in the watershed and reducing the phosphorus delivery to the lake. The ultimate goal is the permanent removal of Black Hawk Lake from the IDNR's 303(d) Impaired Water Bodies list by urging citizen investment in and ownership of watershed protection.

Although increasing awareness about water quality through education about phosphorous is important, the main goal of the Black Hawk Lake Watershed Management Plan is to put in place practices that improve water quality. For this to happen, area residents—both urban and rural—will need to change their attitudes about the lake and how it is used. Attitudes are difficult to change. Because people tend to resist learning new information, education alone is not enough. Changes in attitude about the lake will need three additional components:

- 1) Direct experience of a new way of engaging with the lake
- 2) Social pressure from important major players within the watershed
- 3) A community and individual identity as protectors of water quality

An effective outreach campaign must combine knowledge with experience, social pressure, and identity promotion.



The Black Hawk Lake Watershed, in many ways, has a lot of positive momentum that bodes well for the medium-term success of improving the water quality. The top five reasons why the Black Hawk Lake project will be a success over the next five to eight years are:

- 1) Monetary and technical investment by state and local partners in lake cleanup
- 2) Active and concerned citizens working toward watershed protection
- 3) Citizen and local government recognition of the economic importance of the lake to the surrounding communities
- 4) The geographic scale of the watershed, making for ease of coordination



## 5) Cooperation among multiple stakeholders to improve water quality.

Despite these positive forces in favor of the project, there are also challenges to sustainable water quality improvement at Black Hawk Lake. Without active participation of a large number of landowners/operators in the Black Hawk Lake Watershed, the monies, technical skills and time invested will only bring temporary results. Landowners in the area must take ownership of water quality protection as a social good that extends beyond the individual farmer's crop yields, profit margins, and incentive dollars.

Nearly 75 percent (~9,750 acres) of the Black Hawk Lake Watershed is currently in corn and soybean rotation on 176 USDA tracts of farm ground with 165 owners. Only 11 percent of the watershed is in urban or residential areas. A citizen outreach campaign must appeal to both rural and urban audiences, including rural landowners and agricultural renters, year-round Lake View residents and seasonal Black Hawk Lake residents. The campaign should include the town of Breda and the unincorporated area of Carnarvon, as well as the cities of Carroll and Denison. While Carroll and Denison are located outside the watershed, many lake property owners live in the two towns. These communities also benefit economically from visitors to the lake, who frequent area restaurants, retail shops, and motels.

The materials suggested in this report are created with this in mind, and will complement each other in the goal of reaching multiple audiences. In addition to any immediate action generated by this project, this outreach campaign should create *lasting* tools to promote water quality messages and continue to unite the community around the Black Hawk Lake Watershed Project.

It is important to remember that a healthy watershed is reflective of a healthy, vital community. Outreach is an ongoing process that can further community action and build an inclusive community. The central question behind outreach activities is always: What kind of community do we want to live in?

## Research Methodology

A mix of methods, including surveys, listening sessions, and one-on-one interviews, were used to gather information about the attitudes and opinions of the Black Hawk Lake Watershed key players as well as to communicate with a variety of stakeholders in the watershed. For this assessment, we:

- Reached out to watershed residents through a mail survey
- Conducted a lake usage survey with lake visitors
- Carried out listening sessions and participated in field days with landowners and farmer operators in the watershed
- Performed a group interview with the Black Hawk Lake Protective Association
- Conducted one-on-one interviews with key agency personnel.

Each of these methods is explained in more detail below.

## **Watershed Resident Survey**

In 2012, all 961 households within the Black Hawk Lake Watershed received a survey to gauge residents' perceptions and understanding of water quality issues. The survey was sent to landowners and operators, Lake View residents and others in the Black Hawk Lake Watershed. The survey received a 53 percent response rate, an exceptional number for a mailed survey of its length (generally for an assessment like this, a 40 percent response rate for mailed surveys is considered a reliable and representative sample). The high response rate indicates that watershed residents are engaged in the questions concerning the future of Black Hawk Lake. This is not surprising given the economic importance of the lake to the region, but it may indicate a strong willingness among watershed residents to be involved in lake protection. The survey results are considered representative of watershed residents because the demographics of the sample are representative of the general watershed population. This means that no one social group is over-represented in the responses.

In the Black Hawk Lake Watershed, the two main social groups are 1) those who engage in farming versus those who do not and 2) individuals who live on the lake versus those who do not. Of the survey respondents:

- 20 percent indicated they were engaged in farming
- 80 percent were not engaged in farming
- 27 percent indicated that they lived on the lake
- 73 percent lived off the lake.

The survey sample reflects the reality of the watershed, where approximately 20 percent of the residents are farmers.

## **Lake Usage Survey**

A lake usage survey was conducted on two different summer days in 2012 during a particularly difficult year. Lake water levels were low and the water quality of the lake was poor due to drought conditions. This undoubtedly influenced the range of responses gathered. The sample consisted of 33 test groups of 1 to 20 people in a group, representing 135 total lake users. The sample was opportunistic and the survey non-representative. To achieve a more representative sample it is recommended to survey more test groups at random intervals over the course of the year.

## **Meetings, Field Days, Listening Sessions, and Interviews**

Iowa Learning Farms (ILF) has had a presence in the Black Hawk Lake Watershed for approximately three years, having been involved since the initial planning grant meetings in 2009. ILF has met with local stakeholders and agency personnel regularly since that time and attended planning meetings of the forerunner to the Black Hawk Lake Protective Association. ILF has also coordinated and/or assisted in three field days (July 2010, June 2012, and March 2013), promoting conservation farming practice to area landowners and farmer operators in the watershed. During the field days, ILF team members listened to farmers and observed them in their interactions with one another and other stakeholders.

Besides these meetings with landowners and farmer operators, a listening session was held in February 2013. Four farmers from the watershed attended, although more than 25 landowners and farmer operators were invited. The listening session was an opportunity to hear directly from farmers their attitudes concerning Black Hawk Lake and area water quality. The listening session was transcribed and comments are included to help illustrate the data collected from the watershed survey.

Finally, informal and formal conversations were held with a variety of stakeholders in the Black Hawk Lake Watershed. These include local government officials, agency personnel and members of the business and civic communities. Notes from these interviews inform the interpretation of community participation and political will to improve water quality within the watershed.

## **Findings**

Each of the major watershed stakeholders—landowners and farmer operators, Black Hawk Lake residents, Lake View residents, Black Hawk Lake users, and community-based organizations—has a set of opportunities and challenges before them in improving water quality in the watershed. Only when there is coordinated effort, however, in which all stakeholders assume personal and collective responsibility for area water quality improvement, will long-term success be achieved. Examining the current attitudes and behaviors of stakeholders is a first step in devising a plan of action to work toward this long-term success.

## **Audience: Landowners and Farmer Operators**

Although farmers make up only 20 percent of the watershed population, nearly 75 percent of the land in the watershed is in corn and soybean production. Thus a greater responsibility lies on landowners and farmer operators to do their part in reducing water pollution. Survey respondents overwhelmingly indicated agricultural activities as key contributors to impaired water quality. Asked what was responsible for the existing pollution problems in their watershed, the 462 respondents indicated that agriculture crop production (70 percent) and livestock operations (49 percent) were the two main factors. Landowners and farmer operators are a key population group that must be engaged to promote the long-term health of water quality in the watershed.

Landowners and farmer operators play a significant role in improving the water quality by adopting the land management practices that keep nutrients and soil in place. They must be invited at every opportunity to participate in discussions concerning water quality. While regulating nonpoint source water pollution and providing incentives for conservation land management practices are important, connecting with pre-existing values of landowners and farmer operators is also key. When these are sparked, landowners and farmer operators will be more likely to play an active role in improving water quality.

In the survey, 38 percent of farmer respondents said that landowners are most responsible for protecting water quality in their community, twice the number of the next highest response. Asked if every farmer in the watershed is using the best land management practices they can to ensure good soil health and water quality, a farmer operator listening session participant explained:

*R Well, I'd say most of them are doing what they're able to do. There are some places where they're doing some things they shouldn't be doing, but it goes back to their particular practice, what kind of money they want to spend to do what I'm doing.... Many practices shouldn't be done, but I ain't gonna mention any names or anything or what they're doing, but...*

In his view, personal choice and responsibility are driving factors in improving water quality. How farmer operators define “doing what they’re able to do” depends upon the combination of cost, profit, yield, motivation, and personal history, leading to some farmer operators in the watershed using land management practices that do rank improved water quality first.

Qualitative data suggests that landowner responsibility for protecting water quality may be linked to beliefs about limited government involvement in light of private property rights. Listening session participants described the relationship with enforcement agencies in the following way:

*R Comes down to restrictions. Everybody's afraid to show up at a meeting with anyone with the EPA, the DNR, or the Soil Conservation, because they're going to put restrictions on what you can do.*

*R And especially if they aren't practicing those practices anyway, probably.*

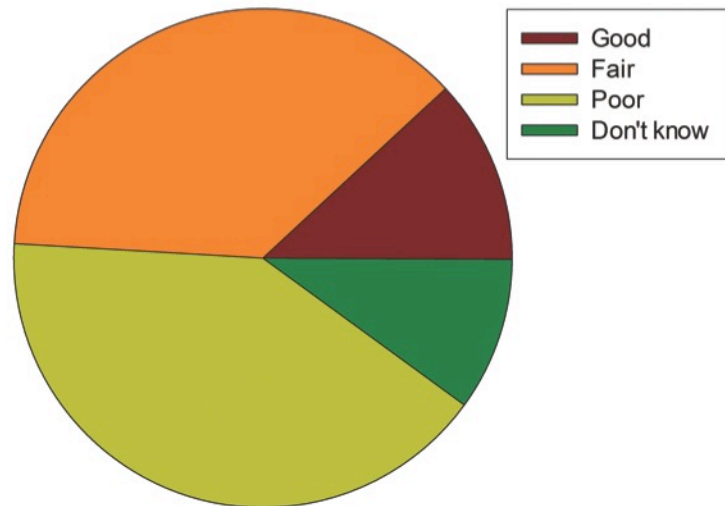
In other words, landowners and farmer operators don’t want to be told how they can farm. Instead, the belief is that land management practices will change if landowners and farmer operators experience the value of doing things differently. Landowner responsibility, while a strong motivating value, is linked to a sense of individualism and personal freedom. In order for responsibility to be a motivating value to improve water quality, it must be linked with a strong moral benefit, personal experience and the idea that freedom entails accountability.

Concern for legacy or posterity is also a strong motivating value. Forty percent of farmer respondents said they had changed their mind about an environmental issue in the past because of concern about the future for their children or grandchildren. Outreach, then, should incorporate both of these values—personal responsibility and care or concern for one’s children or grandchildren—when framing messages and appeals. A particularly strong message would link the two values together—if landowners do not take responsibility for improving water quality now, they are guilty of leaving the environment in decline for their children and grandchildren. Freedom to own land and farm, then, means being accountable to future generations.

To a large degree, farmers in the watershed acknowledge that there is a water quality issue in their area. While only 10 percent of farmers considered groundwater quality to be poor, more than 41 percent described the quality of the surface water as poor, and 78 percent said it as either fair or poor.

Farmers also accept that agricultural practices contribute largely to surface water pollution in the watershed, with 62 percent identifying agricultural crop production and 41 percent identifying livestock and/or poultry operations as being most responsible for existing water quality problems. However, farmers lessen their own responsibility by also stating that urban areas are sources of water pollution. A combined 39 percent of farmer respondents indicated that urban areas were the most responsible for water pollution in their watershed, with 16 percent indicating that waste from urban areas was most responsible and 23 percent laying the blame on urban storm water runoff.

**Farmer Opinion of Quality of Surface Waters in Black Hawk Lake Watershed**



Farmers who participated in the listening session were optimistic that land management practices were changing slowly over time, but found little connection between land management practices and the lake water quality. This farmer in the watershed expresses this dual perspective:

*R Well, I think there would be a natural evolution in the way farming has progressed. My dad, just back up 30 years ago, everything was moldboard plow. It's not being used anymore. So there will be a natural progression of farming and the techniques to be used. Maybe it'd need to be accelerated a little bit more in this area, but generally there's nobody who wants to be abusive to the land. Anything that's happened in the past that's pretty much a cause of Mother Nature dumping six or eight inches of rain in a 24-hour period, some of those things are uncontrollable, and yet they make for real tough issues in the lake.*

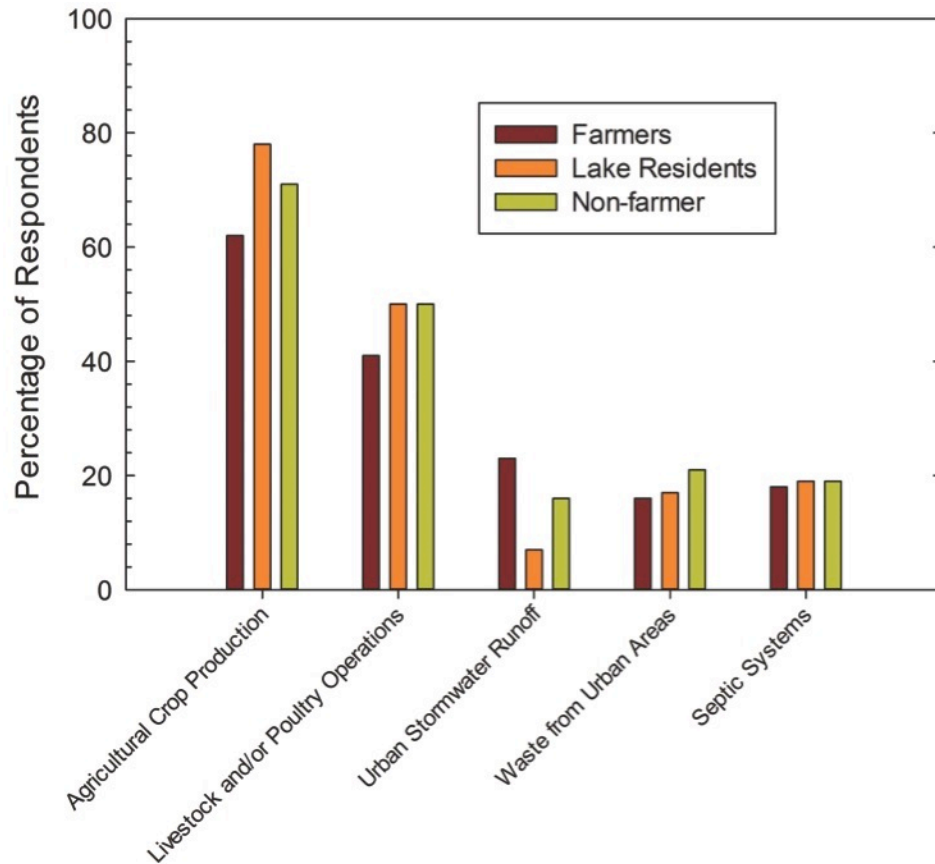
In this farmer's opinion, no one who works the land intentionally wants to harm the environment, and weather events are the major cause of poor water quality. What the farmer leaves unsaid, however, is that heavy rainfall is moving nutrients and soil. While rain is uncontrollable, farmers can reduce soil erosion and nutrient wash through their land management practices. Identifying weather as the root cause of poor water quality in the watershed is tied to the natural characteristics of Black Hawk Lake. Because the lake is shallow, it is more prone to poor water quality related to turbulence.

*R You already tied the environment into it, Mother Nature, weather. I mean, it's never going to be an Okoboji...Because of the depth of the water.*

Thus, in some farmers' appraisals, Black Hawk Lake is at a serious disadvantage, in many ways beyond repair, given the way that agriculture is practiced in the area. The sense is that it would

take more effort and investments than farmers are willing to make in order for the lake to be consistently healthier.

### Practices Considered Most Responsible for Existing Watershed Pollution



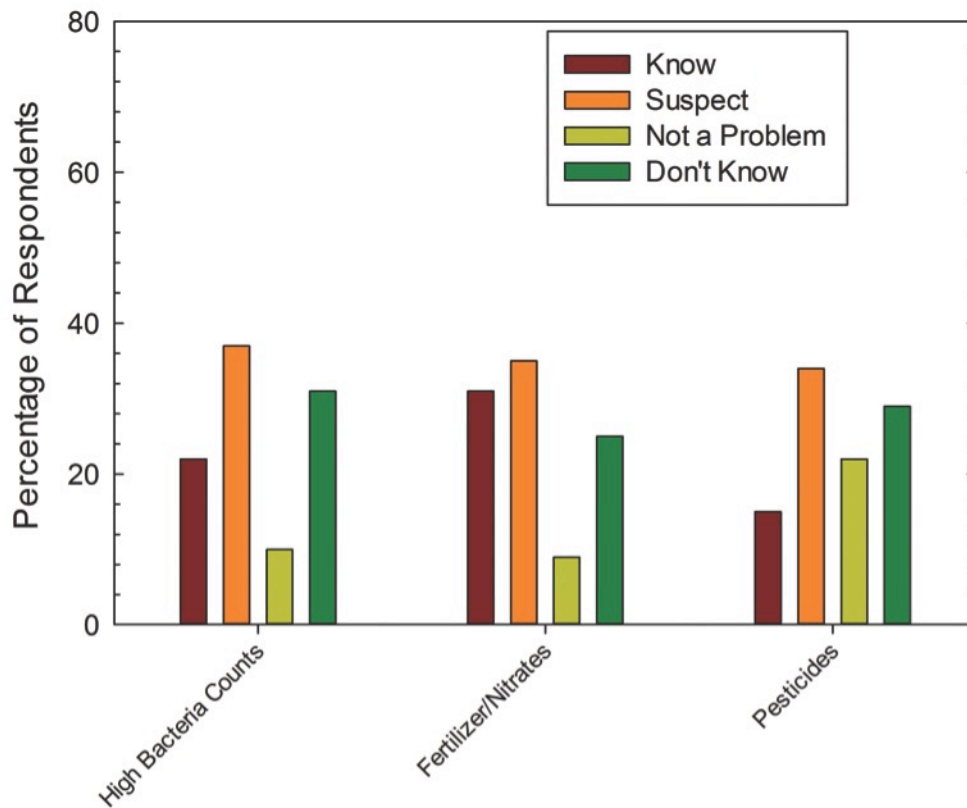
Farmers recognize that agricultural practices greatly contribute to poor water quality in their watershed. Fifty-nine percent of farmer respondents to the survey know or suspect that high bacteria counts affect water quality in their area and 66 percent know or suspect that fertilizers or nitrates impair the water. Likewise, 49 percent of farmer respondents know or suspect that pesticides contribute to poor water quality in their area. While these numbers reflect the willingness of some farmers in the watershed to recognize that their land management practices are having a bad effect on water quality, this knowledge has not connected with efforts by many landowners and operators to do all they can to protect the watershed.

Just as telling is the large percentage of farmer respondents who replied they did not know if agricultural by-products were impairing the water quality in their area. Thirty-one percent of farmer respondents claimed not to know if high bacteria counts were an issue, 25 percent said they did not know if fertilizers or nitrates affected the water quality, and 29 percent said the same for pesticide use. Even more discouraging is the percentage of farmer respondents who claimed agricultural practices had no effect on water quality in their area: 10 percent for high bacteria

counts, 9 percent for fertilizer/nitrate use, and 22 percent for pesticide use. Taken together, the combined “don’t know” and “not a problem” responses indicate a large knowledge gap for landowners and farmer operators in the watershed.

These numbers are particularly disheartening when compared alongside other demographic groups in the watershed. Across the board, farmers downplayed the impact of agriculture, in contrast to nonfarmers and residents who lived on the lake or off the lake. The other three groups all evaluated these agricultural practices as having a greater impact on water quality than did the farmer respondents. Given the health of Black Hawk Lake (excess) and the significant algae bloom problem of recent years (see ISU Downing report 2010), it is unlikely that nonfarmers are over-emphasizing agricultural effects. Instead, it is more likely that farmer respondents are downplaying their role as water polluters by distributing some of the blame to urban and nonfarmer residents and disregarding the relationship between land management practices and water quality. Although farmers often claim a deep-seated knowledge of their land because they work it, the degree to which some farmers choose to not make the connection between how they farm and its impact on water quality is dispiriting.

**Percent of Farmers Acknowledging Condition Affecting Water Quality in the Black Hawk Lake Watershed**



Not all farmers agreed that everyone is doing what they can to improve water quality in the watershed. This listening session farmer indicates some of the challenges in changing farmer operator behavior:



R *Anyway, the cosmetic look is what some of the farmers look at. You know, I want this black, I want that corn to come up, I want it picture perfect right away. So, if it's the cosmetic look – and once they can see through that... I suppose they should go to some meetings and just think and see. I suppose they do— it's all on the books and [inaudible] here and there. I don't know. To get those guys to go to some meetings once in a while is tough to do.*

This farmer suggests that reversing beliefs about how a field should look is a tough task. It takes education, but, as the farmer also commented, it takes willingness to go to a meeting—and that, he believes, seems to be lacking. Anecdotal evidence suggests that farmers in the Black Hawk Lake Watershed are resistant to changes in land management, regardless of the incentives available through federal and state programs. In part this has to do with farmers' resistance to regulations and their attitudes toward government agencies:

R *Where do most of the guys get their recommendations? They don't listen to the NRCS.*

R *The DNR and EPA have really made that tough...because [farmers] know they're going to get jumped on and fined.*

These comments suggest that education campaigns operated through government agencies will only reach those farmers who are already likely to change their land management practices and perhaps are already inclined to be conservation innovators. A general education campaign that links land management practices to water quality and offers financial incentives will not be enough to change how farmers work their land in the long term. A study of farmers throughout Iowa suggests that they are often motivated to change their attitudes and behavior based on the following factors: family support/tradition, response to a major weather event, taking a class/education, and/or response to regulations and penalties<sup>7</sup>. A voluntary compliance program that relies heavily on incentives to change land management practices tends not to affect basic attitudes and values. After the incentives are gone, the landowner or operator will revert back to previous practices if their attitudes were not changed in the process. The current culture norm in agriculture is that conservation only has value while it has a monetary value, and when commodity prices are high the greater monetary value wins.

Campaigns must be targeted specifically toward farmers in the watershed, publicly praising farmers who implement land management practices that improve water quality. Public recognition of farmers who have reduced agricultural runoff from their land has been started in Lake View through the local newspaper, and should be continued throughout the watershed and with greater visibility.

A less public means, but one that has been somewhat effective in other watersheds, is the “performance measurement” approach. Farmers regularly test variables such as field water runoff and stalk nitrate, and share these numbers with other farmers in the watershed. Identifying fields

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<sup>7</sup> Comito, Jacqueline and Matt Helmers, “The Language of Conservation,” *The Citizen Effect: Pathways to Solving Watershed Problems*, L.W. Morton & S. Brown (Eds.), Springer Books, 2010

that score high consistently could bring peer pressure on landowners and operators to take more responsibility for their land management practices. The drawback to this approach is motivating farmers to participate in it; for it to succeed, it must be farmer-led.

Because the direct effects of nonpoint source pollution occur “downstream,” there is little incentive for individual ownership of the collective damaging effects. The performance measurement approach holds farmers accountable to their peers. Likewise, the farmer respondents who indicated they didn’t know if agricultural practices were affecting water quality in their area would no longer be able to fall back on a position of ignorance. Thirty-eight percent of farmer respondents replied that they had changed their mind about an environmental issue due to first-hand experience; by regularly testing water quality in their field runoff, farmers would see firsthand the extent of their contribution to polluting the watershed.

Peer pressure among farmers, both direct and indirect, is a powerful motivator for changing behavior. Farmers feel indirect peer pressure when they realize that the neighbors are all using best land management practices and they are the only ones who haven’t jumped on the bandwagon. In order to reach the critical mass for indirect peer pressure to take hold, a farmer-to-farmer leadership program could increase direct peer pressure. Encouraging farmer leaders to defend the best land management practices for improved water quality, in public forums and private conversations, would promote a change in attitude.

It is also possible to increase landowner and farmer operator participation in water quality protection through a concerted effort to give local co-ops and agronomists incentives to focus more on total soil health, water quality, and conservation land management practices. As farmers in the listening session remind us:

*R Your fertilizer salesman and your agronomist. That’s who the farmers put their trust in. That’s who you have to educate to get things to change.*

*R Or personal experience, what works and didn’t work for them.*

*R That’s true, but the farmer will still have an agronomist come out there, and that’s who they’re going to take the recommendations from.*

These local co-op owners and agronomists are motivated by production, and don’t often include soil health and water quality in their analysis. Too often, they make recommendations contrary to Iowa State University Extension and Outreach or the NRCS<sup>8</sup>. Any effective plan has to prompt these front-line contacts to recommend that farmers implement practices that promote soil health and water quality *as well as* high yields and productivity.

## **Audience: Black Hawk Lake Residents**

Watershed residents living directly on Black Hawk Lake, either full-time or seasonally, have a large stake in improving water quality. Black Hawk Lake is a natural holder for all of the downstream pollution in the watershed—so the lake is the proverbial “canary in the coal mine.”

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<sup>8</sup> NRCS-CD Sac County and ISUEO, personal communication, meeting Feb 2012

The health and cleanliness of the lake is an indicator of the general health of the watershed as a whole. While 55 percent of Black Hawk Lake residents indicated overwhelmingly that they did not know the quality of their groundwater, 62 percent of lake resident respondents said that they believed the quality of the surface water in their area was poor and 83 percent called surface water quality poor or fair. This high response makes sense given that folks who live on the lake are regularly confronted with the effects of surface water pollution.

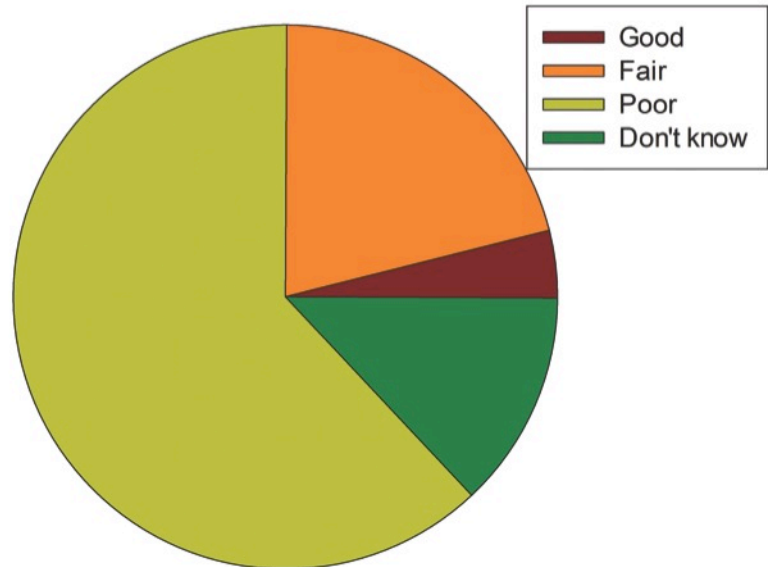
Lake residents have an overwhelmingly negative view about water quality in the area, attributing it mainly to agricultural production, with 78 percent of lake resident respondents citing crop production and 50 percent stating livestock and/or poultry operations as the most responsible for existing water pollution. These numbers coincide with higher values of suspecting or knowing that farm practices are affecting water quality in the watershed:

- 70 percent know or suspect that high bacteria counts are an issue
- 80 percent suspect or know that fertilizer/nitrates are an issue
- 67 percent know or suspect that pesticides are a contributing factor

Not surprisingly, lake residents were *less likely* to claim that these conditions were not a problem:

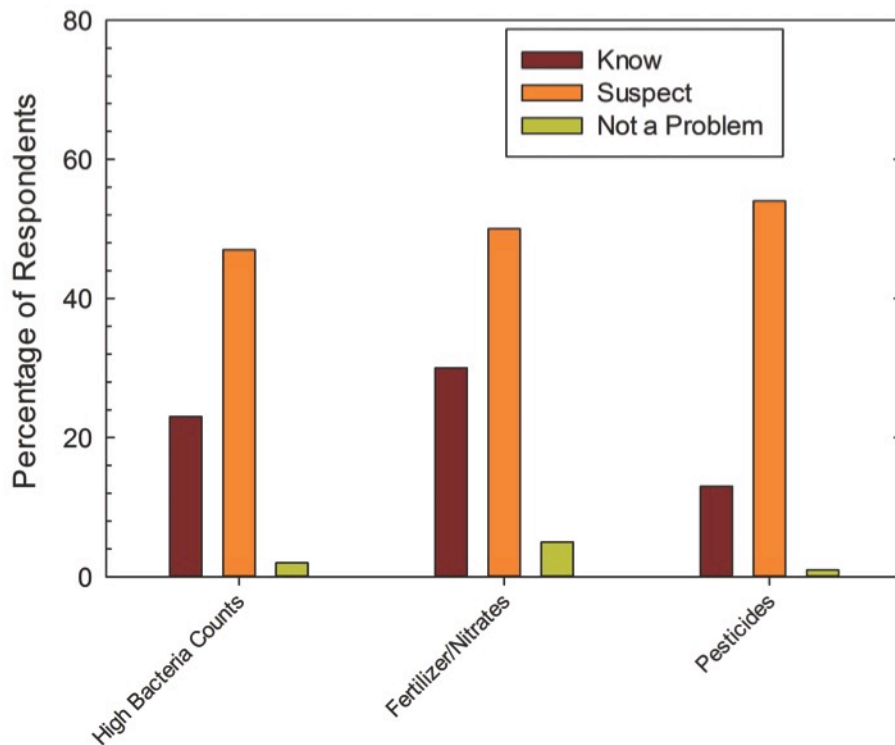
- Bacteria counts, 2 percent,
- Fertilizer/nitrates, 5 percent
- Pesticide use, 1 percent.

**Lake Residents' Opinion of Surface Water Quality in Black Hawk Lake Watershed**



Clearly, lake residents, because of their proximity to the lake itself, are more sensitive to the potential causes of surface water pollution and more likely to pinpoint the problem on agricultural production. That being said, there is a knowledge gap with a significant minority of “don’t know” responses. That some lake residents may not know the causes of impaired water quality indicates an opportunity for further education outreach to lake residents.

**Percent of Black Hawk Lake Residents Acknowledging Conditions Affecting Water Quality in the Watershed**

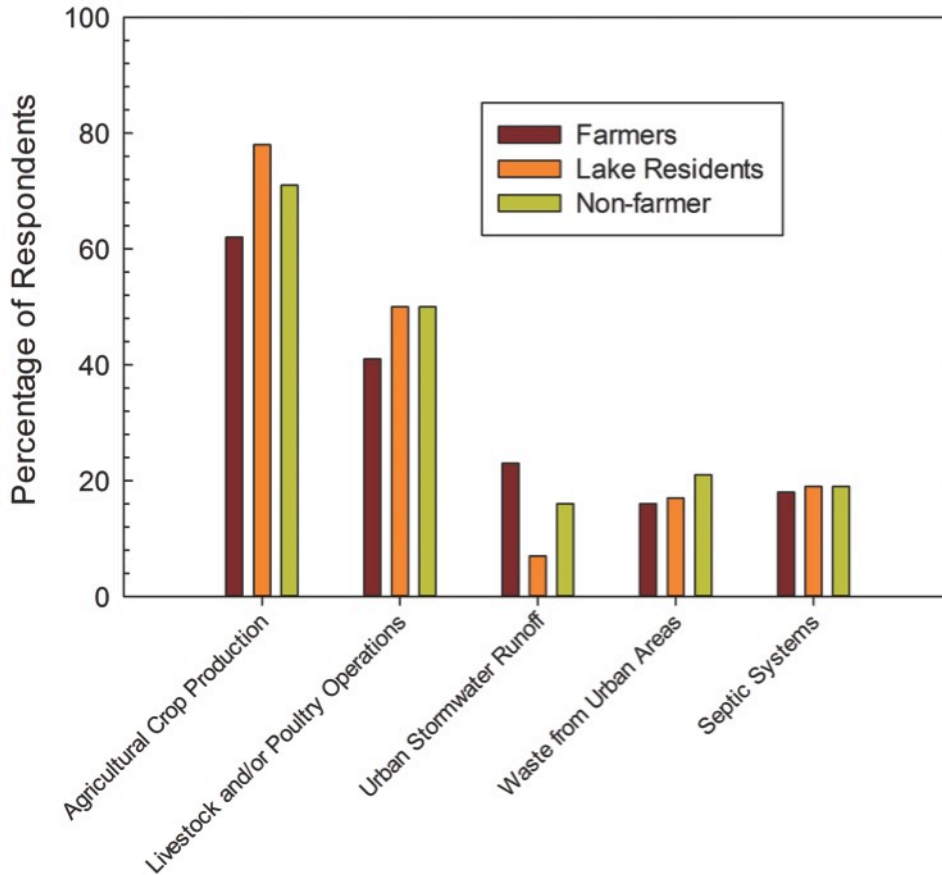


Interestingly, lake residents were the demographic group least likely to identify urban practices in their watershed as sources most responsible for contributing to existing water pollution. Of the lake resident respondents:

- 7 percent cited waste from urban areas as the most responsible
- 17 percent claimed urban storm water runoff
- 19 percent placed septic systems as the leading cause of water pollution

It is uncertain whether lake residents feel they contribute little to poor water quality in comparison to agricultural production, or are unaware that living on the lake has the potential to negatively impact water quality.

## Practices Considered Most Responsible For Existing Black Hawk Lake Watershed Pollution



Black Hawk Lake residents can contribute to watershed pollution through sewage seepage, motorboat and automobile fluid leaks, and trash. However, because they own property on the lake and/or pay fees to live on the lake, they are financially invested in maintaining healthy water quality for Black Hawk Lake. They are also emotionally invested in the area, choosing to enjoy the recreational and lifestyle benefits of lakefront living. While many of the lake residents are seasonal, they still live within the watershed and maintain a vested interest in improving the water quality in the area.

Because the quality of the lake affects enjoyment of it, firsthand experience with poor water quality is a key to getting lake residents involved in watershed protection. Like farmers, 32 percent of lake residents claimed to have changed their mind about an environmental issue in the past because of firsthand experience. Sharing the lake with family is a major component to its recreational use; 40 percent of lake residents said they had changed their mind about an environmental issue over concern for their children or grandchildren. Both of these are powerful leverage points in garnering support for lake protection.

Outreach campaigns should call upon these frames of reference to motivate more active participation in lake protection—using the notion of bringing children or grandchildren to a polluted lake and the health consequences of swimming in and eating fish from the lake. The challenge, however, is maintaining involvement and concern among lake residents when they are seasonally absent; it is easy to forget or diminish a problem when it is not readily obvious.

One way to guarantee active participation from lake residents in improving water quality is through the creation of a Black Hawk Lake homeowners association (HOA). Homeowners associations have the power to write restrictive covenants that help enforce agreed-upon standards. Model covenants for Black Hawk Lake cabin owners could include items such as reduced or eliminated use of fertilizers and pesticides in yards and gardens, use of biodegradable personal care products, and minimal distance requirements for parked cars. Annual fees for HOA membership could help pay for water quality protection measures. Implementing an HOA would require lake residents to voluntarily restrict their actions as cabin owners—incorporation would require a majority of current cabin owners, and membership would need to be mandatory, as would adherence to the covenants. Implementing an HOA in an already established community is difficult, requiring a high degree of organizing, education, and political effort. At this time, such a move does not seem politically feasible.

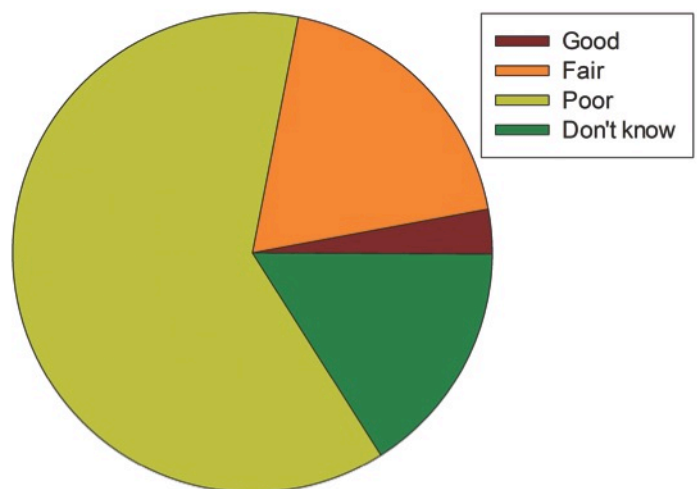
There could be potential benefits in water quality protection for going this route, however. The presence of an HOA could require minimum engagement for absentee or seasonal cabin owners; seasonal residents would be reminded of water quality even when not on the lake if dues were assessed during a lull in cabin usage, such as the winter months. An HOA with an investment in improving lake water quality could be a strong voice for greater political will in the watershed and a leverage point in collaborating with agricultural landowners and operators. If lake residents could point to specific practices and policies they have implemented to lessen water quality concerns, they could use this as a point of civic pride and call on area farmers to do their share.

## **Audience: Lake View Residents**

Residents of Lake View play an important role in promoting and improving water quality in the watershed because they are the largest population center. They also have an enormous stake in the viability of Black Hawk Lake because of the economic impact of tourism on the community. Annual events like the Lake View Water Carnival prove that good water quality is of economic importance to the community and the watershed. When the number of visitors to the lake is up, the town thrives as an economic and social hub of the surrounding area. When anything hinders visitors to the lake, such as algae blooms or poor fishing, the town feels the impact deeply.

Nonfarmers in the watershed have noticed the deteriorating lake quality in recent years. Of nonfarmers in the watershed, which includes most Lake View residents, 81 percent rated the surface water quality as “poor” or “fair.”

**Nonfarmers’ Opinion of the Quality of Surface Waters in Black Hawk Lake Watershed**



Like those who live on the lake, nonfarming respondents have an overwhelmingly negative assessment of surface water quality in their area. And, like the lake residents, nonfarmer respondents attributed the majority of the poor water quality in the area to farmers. For instance:

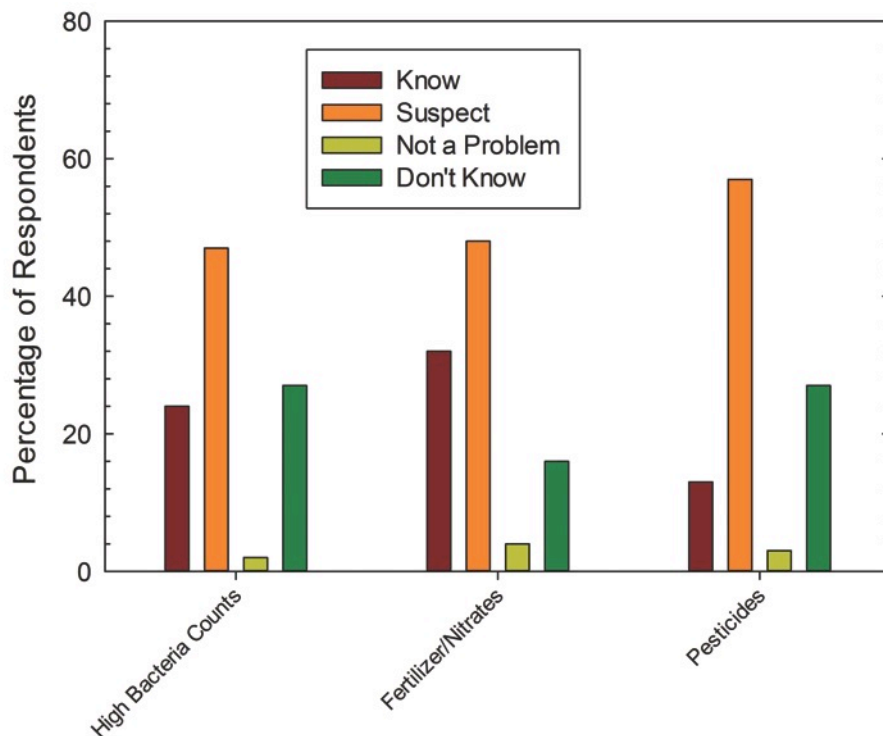
- 71 percent “know” or “suspect” that high bacteria counts affect water quality
- 80 percent feel the same way about fertilizer and nitrate use
- 70 percent named pesticide use as a contributing factor

Taken together, these numbers show a strong assessment by nonfarmers that farming practices are the main contributing factors to poor water quality. Indeed, 71 percent of nonfarmers labeled agricultural crop production as most responsible for the existing watershed pollution, and 50 percent pointed to livestock and/or poultry operations as the major cause.

Conversely, nonfarmers view their own contributions to poor water quality as minimal. Asked what was most responsible for existing water contamination in the watershed:

- 16 percent blamed wastes from urban areas
- 19 percent identified septic systems
- 21 percent indicated urban storm water.

**Percent of Nonfarmers Acknowledging Condition Affecting Water Quality in the Black Hawk Lake Watershed**



Of course, this does not mean that Lake View residents escape responsibility for the current and future state of the watershed. The Lake View Code of Ordinances (Chapter 50.02) cites water pollution as a public nuisance: “Corrupting or rendering unwholesome or impure the water of any river, stream or pond, or unlawfully diverting the same from its natural course or state, to the



injury or prejudice of others” can result in a citation for abatement and a fine. The city has the means to regulate the worst offenders of point and nonpoint source water pollution within city limits. Likewise, the Lake View Code of Ordinances (Chapters 95, 96, and 97) outlines proper treatment of sewage and the penalties for improper handling of sewage and wastewater. Lake View also has stringent public dumping ordinances. Although penalties can prove powerful motivators for citizens, outreach campaigns seeking voluntary reduction in use of lawn fertilizer or hazardous chemical recycling programs go a long way to engage citizen action.

The unincorporated town of Carnarvon is not hooked up to the Lake View wastewater treatment system, but is serviced by homeowner-installed septic systems. Many of these septic systems are in disrepair, causing discharge of waste into the watershed. The Black Hawk Lake Watershed Management Plan identified septic systems in the watershed as contributing to .2 percent of the total phosphorous load contribution (2011:24). Despite this relatively low number, survey results show that the septic system problem carries high visual and symbolic weight in the watershed—nearly 20 percent of all respondents ranked septic systems as one of the leading causes of poor water quality in the area. The Black Hawk Lake Watershed Management Plan recommends a one-time incentive of \$600 to Carnarvon residents who update their septic systems, pushing for 100 percent participation (2011:31). Such a gesture would raise the profile of urban practices to improve water quality and could create greater goodwill with rural residents. It could also demonstrate that urban residents are serious about improving water quality, and be a starting point to engage with others in the watershed about what they are doing on their land to improve water quality. However, it is important that the publicity around the improvement of Carnarvon septic systems point out that this is but one component of a larger campaign.

## **Audience: Black Hawk Lake Users**

The majority of Black Hawk Lake users come from outside the watershed. Lake usage survey respondents traveled an average of 67 miles to get to the lake. Recreation is the primary reason for traveling this distance. Of those surveyed:

- 67 percent used the lake for camping/nature appreciation
- 58 percent used the lake for fishing
- 30 percent used the lake for swimming/beach use.

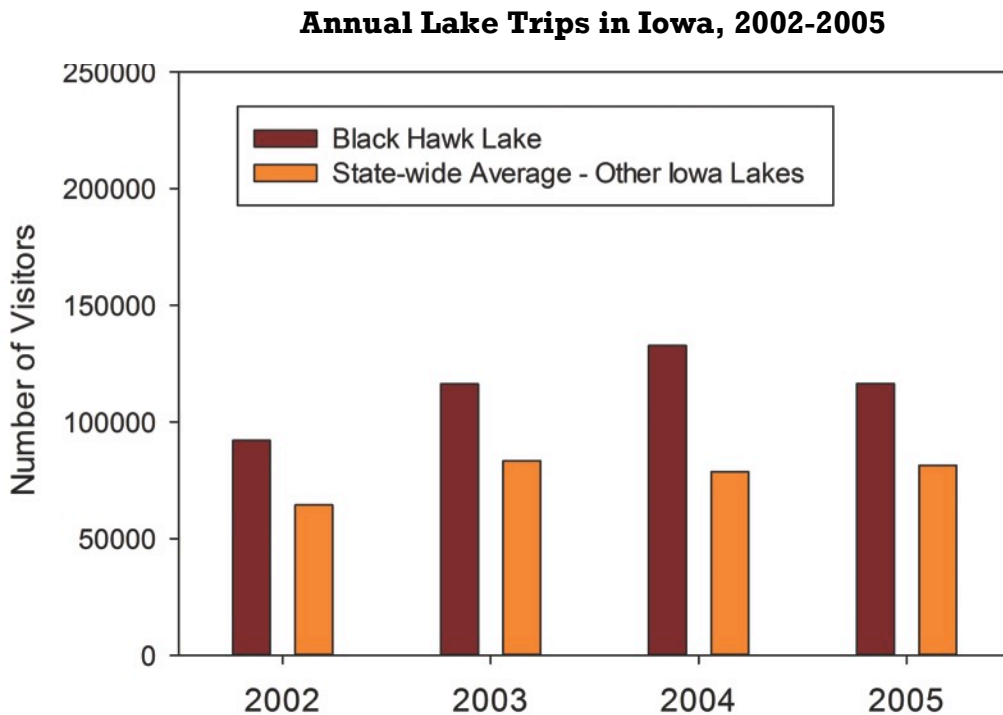
Historic visitor use data for Black Hawk Lake demonstrates that this has been a trend from the late 1970s through the mid-1990s, with fishing and boating use increasing over this time and camping, picnicking, and swimming declining<sup>9</sup>.

Compared to other lakes within a 50-mile radius, Black Hawk Lake ranks as one of the most chosen destinations for recreation, surpassed only by the much larger Storm Lake. In comparing lake use over a four-year period in Iowa, CARD found that single day trips per year for Black Hawk

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<sup>9</sup> See summary in Iowa Department of Natural Resources and Iowa State University Limnology Laboratory (2010). Black Hawk Lake Diagnostic/Feasibility Study.

Lake were consistently higher than the state average between 2002 and 2005<sup>10</sup>. While this data is now a decade old, it reflects the historical preference of Black Hawk Lake among those visiting Iowa lakes. There is a demonstrated correlation between lake use and water quality. The higher the water quality, the more use a lake will receive<sup>11</sup>. If Black Hawk Lake is to continue to be a destination of choice for lake-goers, high water quality will need to be maintained.



While it is unlikely that lake visitors from outside the watershed have any substantial impact on the quality of water, their awareness of the efforts to clean up the lake is equally important. They are the watershed's economic engine, and their continued use of the lake is paramount. The majority of people participating in the lake usage survey for this report said they have been visiting the lake for more than 20 years, with only one in five saying it was their first time visiting. Some lake users mentioned that they have been visiting the lake for more than 55 years.

In the case of long-term visitors, it is clear that Black Hawk Lake evokes an emotional connection that goes beyond recreation. This nostalgic and personal connection to the lake is an important leverage point in fundraising to support its restoration. There has been a concerted effort to raise general watershed awareness for lake users, with current and proposed signage along the Sauk Rail Trail and around the lake (through cooperation between the Sac County Conservation Board, the IDNR, and the Black Hawk Lake Protective Association). Education outreach to area visitors, however, needs to result in financial support for further protection of water quality in the region.

<sup>10</sup> <http://www.card.iastate.edu/lakes/>

<sup>11</sup> Iowa Department of Natural Resources and Iowa State University Limnology Laboratory (2010). Black Hawk Lake Diagnostic/Feasibility Study, pg. 36.

## **Audience: Community Based Organizations and Civil Society Groups**

Community-based organizations (CBOs) and other nongovernmental groups are important partners in the watershed because they are hubs of citizen involvement. While individual citizens can make a difference in community action, it is the collective power of groups that often has greatest impact. With coordination and cooperation among a broad spectrum of CBOs and civic groups, visibility, action, and resources can be combined to greater effect.

In Iowa, there is no governmental jurisdiction that can assess taxes at the watershed level or require mandatory compliance and coordination within the watershed. Some federal and state agencies regulate pollution or agricultural runoff or offer incentives to change behavior, and city and county jurisdictions can fine offenders within their political boundaries. However, watersheds are fractured entities and have no political boundaries.

State code requires the establishment of the Watershed Planning Advisory Council, but its powers are limited to policy recommendations. Likewise, state code also permits the formation of Watershed Management Authorities (WMA), which allow for two or more political subdivisions to enter into 28E agreements. However, WMAs are primarily administrative and advisory in nature, without enforcement or assessment powers. A WMA may face significant political challenges from the watershed's multiple political subdivisions and, as a government entity, may be severely hampered in advocacy. Watershed Management Authorities do not replace the need for combined engagement of a broad spectrum of the public and government entities.

Community-based organizations dedicated to watershed protection can carry out most of the same roles as WMAs (education, administration of funds, monitoring, advisory), with the addition of advocacy. They are particularly well positioned to drive community support and advance local solutions. However, as local-level entities, CBOs may lack the time, money and resources to address the big-picture issues of the entire watershed.

## **Audience: Black Hawk Lake Protective Association**

In the Black Hawk Lake Watershed, the main civic group taking the lead on water quality is the Black Hawk Lake Protective Association (BHLPA). It is important to note that there has been at least a 30-year history of citizens banding together over concern for the economic and environmental condition of the lake. The BHLPA is the latest presence of that citizen concern. Founded in early 2011, the BHLPA grew out of an earlier organizing effort, the Lake Restoration Fund, which had raised approximately \$40,000 for cleanup projects. After that money had been spent, many of the same board members reorganized under a new nonprofit organization, the BHLPA, with voluntary annual dues and membership structure, as opposed to one-time donations as with the Restoration Fund. This structure provides the opportunity to strategize for mid- and long-term goals and offers a continuous presence in a way that isolated fundraising, regardless of its success, cannot.

Of the 166 dues-paying members currently in the association, the majority are families and individuals, with about 20 businesses represented. Most of the membership comes from Lake

View residents; in their current membership drive the BHLPA is making a concerted effort to reach out to seasonal residents who own or rent property on the lake. Dues levels range from \$25 to \$100 per year.

Given these modest numbers, the successes of the BHLPA in its first two years are impressive. It received a matching grant from the Sac County Foundation for approximately \$10,000 to build a fish barrier to keep carp from re-entering the lake. Its current budget balance is approximately \$31,000. In addition to membership dues, the BHLPA engages in fundraising events and partners with local civic groups who fundraise for it, such as the Black Hawk Men's Club, the Lake View Community Club and Future Farmers of America. The funds are invested in projects that improve the water quality of Black Hawk Lake. The Lake Protective Association plays a vital role as a recognized civic partner in the watershed, maintaining close working relationships with the NRCS, IDNR, and the Sac and Carroll County Soil and Water Conservation Districts. In sum, the BHLPA is moving in the right direction by building its membership base, fundraising, partnering with other civic, nonprofit, and governmental organizations and seeking outside granting sources for projects.

The Lake Protective Association is aware of the need to increase membership in order to sustain interest and long-term viability of the group. There is concern that after the initial interest created by lake restoration, community awareness and participation may wane. The BHLPA will have to improve its visibility in the watershed, market its message effectively, continue outreach and education efforts and reach out to broader groups of people. Commitment in Lake View with the BHLPA is strong, because the community recognizes the environmental health of the watershed is directly related to its economic health. The two main groups that the BHLPA should continue efforts to reach, then, are weekend visitors to the lake and landowner/operators in the watershed.

Weekend visitors make up a significant portion of the lake users and represent an untapped source of support for lake restoration and water quality improvement projects. Marketing efforts (detailed below) suggest an education and awareness component for lake visitors, highlighting the sources of pollution, the restoration efforts and appeals for financial support.

Incorporating landowners and farmer operators into the BHLPA, however, remains a crucial step in creating a broad coalition to protect water quality. Currently, owner/operator participation in the association is limited. Most engagement with farmers, for instance, is done through go-betweens such as the NRCS and the IDNR. While these governmental organizations have a close working relationship with BHLPA and with area farmers, there are several benefits to reaching out directly to this population. First, it would emphasize the importance of cooperation in solving water quality issues. Second, the BHLPA could have more influence and leverage with farmers who are not willing to participate in cost-share programs or implement conservation practices if it had more farmer members. Significant community pressure along with positive reinforcement promotes behavior changes in a way that educating farmers on the economic and social benefits of conservation practices will not.

# Citizen Outreach Campaign

## Suggested Activities and Components

Outreach is a critical component of gaining continued community investment in protecting the water quality of Black Hawk Lake Watershed. Outreach campaigns are about boosting relationships so this can happen. Successful campaigns combine elements of education, experience, social pressure and identity formation. This section offers several suggestions for a Black Hawk Lake Watershed outreach campaign, each including one or more of the four elements. Whatever course of action the Black Hawk Lake Watershed community decides to take, we recommend a coordinated effort to include all four elements. Likewise, new activities to promote watershed protection should include one or more of these elements.

The suggested activities in this campaign each have a colored box associated with them indicating which elements the activity covers. Some activities use only one element, and several include all elements.

The color codes for the four elements:

■ Education ■ Experience ■ Social Pressure ■ Identity Formation

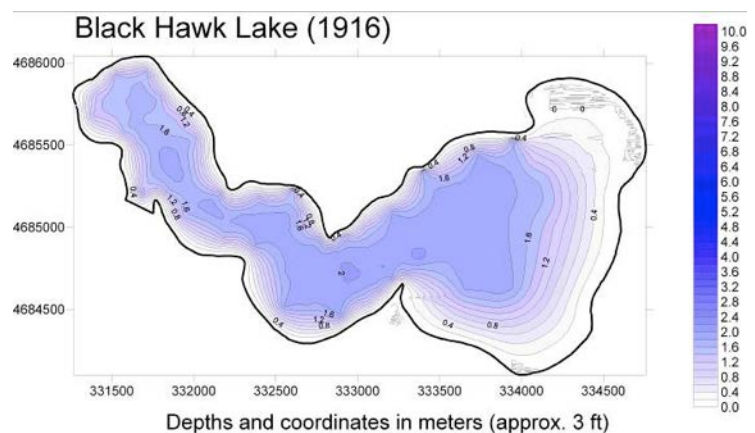
### Promoting Community Identity through Lake History ■ ■ ■

The geologic history of the lake is unique, as it is the southernmost glacial lake in Iowa. It also aptly demonstrates the natural cycles that bodies of water go through. The Diagnostic/Feasibility Study of Black Hawk Lake conducted by the Iowa State University Limnology Laboratory describes the lake's origin:

“Black Hawk Lake was formed by the stranding of ice blocks in glacial materials at the end of the last glacial period. Therefore, the original volume of the lake, before sediment began to accumulate, was quite large and the lake was much deeper than it is today. At the time of formation, the maximum depth of the lake was around 33 feet”<sup>12</sup>.

“The next 10,000 years brought in sediments from the changing watershed and filled in about two-thirds of the basin's volume. By 1916, maximum lake depth had fallen to about 7 feet, or about one-fifth of its original maximum depth”<sup>13</sup>.

The more recent history of the lake demonstrates the interdependence



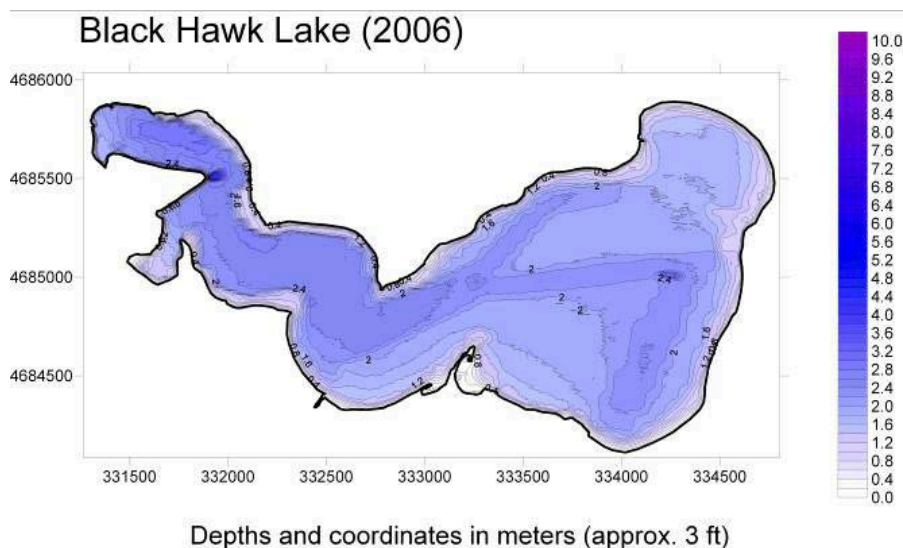
<sup>12</sup> Iowa Department of Natural Resources and Iowa State University Limnology Laboratory (2010). Black Hawk Lake Diagnostic/Feasibility Study, pg. 28.

<sup>13</sup> Iowa Department of Natural Resources and Iowa State University Limnology Laboratory (2010). Black Hawk Lake Diagnostic/Feasibility Study, pg. 29

between human activity in the watershed and the health of the lake, especially in the relationship between groundwater and the lake. The Black Hawk Lake Watershed Management Plan states:

“Major surface water inflows include one major inflow stream, Carnarvon Creek, and several small unnamed tributaries to Carnarvon Creek. Local overland flow also enters the lake through storm sewers and tile drains”<sup>14</sup>.

“In addition to runoff and surface water inflow, direct precipitation and groundwater are part of the lake’s hydrologic system. Like all natural lakes, groundwater plays an important role in the hydrology of Black Hawk Lake. In a study of the water budget of several Iowa lakes, Hanson (1983) estimated that on average, groundwater accounted for approximately 80 percent of the inflow to Black Hawk Lake from 1970 to 1982”<sup>15</sup>.



Even though Black Hawk Lake has been shallow for generations, its natural formation and feeds of groundwater guarantees the lake’s future existence. The geologic history of Black Hawk Lake, while important in promoting the long-term history and future viability, must be supplemented with a vivid social history of the lake and its prominence in the community.

Because it is shallow, some watershed residents have concluded that the lake may be there only to collect the sediment in runoff from the watershed. In particular, conversations with landowners and farmer operators revealed some debate about whether Black Hawk Lake was a viable lake throughout its history. In some descriptions, the lake is portrayed as not much more than a wetland. But the designated use for the lake is primarily recreation, bringing economic viability to the communities on or near the lake. When put together, simply, no lake equals virtually no tourist income to the area. This message must come through clearly to watershed residents in both the outreach campaign and the watershed project. Rural and urban residents are equally responsible for keeping local services and businesses functional and profitable.

<sup>14</sup> Sac County Soil and Water Conservation District (2011). Black Hawk Lake Watershed Management Plan, pg. 12

<sup>15</sup> Sac County Soil and Water Conservation District (2011). Black Hawk Lake Watershed Management Plan, pg. 12

Attitudes toward the lake itself weigh heavily on the success of protecting the water quality of the watershed. While many people in the watershed understand the economic importance of the lake to the area and the importance of the lake to the natural environment, the collective memory of the lake's role in the life of the community is divided. One important component of the outreach campaign should be to develop and promote a clear historical narrative of the lake and engage the community in the active remembrance of the lake through time. A strong narrative that circulates in the community—through promotional material, signage, community dramas, and other media—will translate into greater investment in protecting the lake and be the rallying point around which community identity can continue to be formed.

The city of Lake View and the Black Hawk Lake Protective Association both currently have promotional material that makes up an “official history” of the lake. These resources are an excellent starting point for reflecting a more personal and community connection to the lake. An oral history project of the lake would help highlight the personal and emotional connections the community has with the lake (see page 40). The oral history could then be used in promotional materials and as the basis for possibly a lake history walk or a children's play about the lake's history. Elements of an oral history project could include a wide range of partners such as the State Historical Society and area schools. Incorporation of storytelling performances or storytelling collection booths modeled after the StoryCorps project (<http://storycorps.org/>) at events such as the Lake View Water Carnival would raise the profile of the lake as being at the emotional core of the community.



## Project Visibility

### Logo ■

Because the Black Hawk Lake Protective Association is established within the watershed and the Black Hawk Lake Watershed Project is ongoing, visual branding has already been publicized. The existing logos are familiar to some degree with Lake View residents.



The Water Issues survey contained a question asking which logo was most visually appealing, offering the choices of the current logo (at right) and the two options shown below. Survey results indicated that the logo at left below was most identifiable with watershed residents (66%). Lake View residents embrace the pelicans and officially celebrate their annual return to Black Hawk Lake. Upon request of watershed team, we created a few additional logos without a pelican that also communicate some of the unique features of the lake. Either the Pelican logo or one of the others should be adopted in signage and watershed identification after the Watershed Project is complete, so as to not cause confusion.



Three additional logos:



## Campaign Slogan ■

### **Black Hawk Lake Watershed: People in harmony with soil and water.**

This phrase could be included on all of the awareness components of the campaign in conjunction with the watershed identification logo.

## Watershed Mascot ■



Used as a tool to create visibility, a mascot could be included on promotional material, especially for children. Similar to Smokey the Bear, the mascot could deliver messages about clean water to lake users. The mascot needs to be an identifiable representative of the watershed and the lake, such as a pelican (referred to in this document as Parker the Pelican), frog or even a pier form that mimics the stone piers at the lake.

There could be a large wooden cutout of the mascot at the playground or placed on the beach for photo opportunities, or used as signage about whether the beach is open or closed, etc. If the watershed project group was to get extremely enthusiastic, a mascot costume could be made or purchased for events such as the Water Carnival and the Pelican Festival. The mascot should be something unique to Black Hawk Lake watershed. Keep in mind that many watersheds across the state use a fish or frog as a symbol.

## Watershed Boundary Signs ■ ■

Signs should be placed on roads as people enter the watershed, reading, “Now entering/exiting Black Hawk Lake Watershed” and containing the logo, slogan, and website address. These would mark the boundaries of the watershed, as they exist on the landscape.

They would offer a different view of the area for those who are familiar with the concept of watersheds, and introduce the concept to those who are not, creating conversation pieces for those living in the watershed as well as those who are visiting. Seeing the regular reminder that they are residents of the watershed may also create a sense of ownership for those who live in the watershed but have not concerned themselves with the lake and its water quality in the past.



Some signage about the watershed, sponsored by the IDNR and the BHLPA, is already being installed along the Sauk Rail Trail to help educate and raise awareness.

Also, signage should be added along the Carnarvon Creek to show where it flows to and from. This creek receives primarily water from agricultural areas and flows into Black Hawk Lake. Signage here will reinforce this fact.

## Property Signs ■ ■ ■

As watershed members become aware and involved with the project, they should be praised for changes they made in their farming practices. Property signs could be created for people to put in their yards or at the edge of a field, recognizing them as good conservationist. The signs could read:

I installed (conservation practice) to help improve Black Hawk Lake.

Find out more at [www.blackhawklake.org](http://www.blackhawklake.org)

The message needs to be brief so passing travelers can read them. The goal is to motivate people to practice conservation on their land, with the signs sparking interest and curiosity about what is happening within the watershed. In addition to



property signs, watershed residents who are practicing conservation will be recognized on the Black Hawk Lake website and in the *Lake View Resort*, *The Sac City Sun*, the *Breda News* and the *Carroll Daily Times Herald*, encouraging watershed residents to network with one another and strengthen their community around the watershed project.

## Multimedia

A Water Issues survey question asked, “Of the learning opportunities available, which would you be most likely to take advantage of for water quality issues?” The highest response was the use of “printed fact sheets or brochures” (56 percent), followed by “read a newspaper article or series or watch TV coverage” (45 percent) and then “visit a website” (33 percent). The campaign will incorporate all three of these media to help bring awareness and visibility to watershed residents.

## Brochure ■ ■ ■

A general informational brochure could generate interest about the watershed, the project, and its goals. The text and images in the brochure would show examples of good water quality and data that supports positive economics for residents and lake visitors. The brochure should be available at Sac and Carroll SWCD/NRCS and Extension offices, Lake View Chamber of Commerce, and in local retail sites, particularly Lake View, Wall Lake, Carroll and Denison businesses.

## Fact Sheets/Utility Bill Inserts ■ ■ ■

A series of fact sheets could be inserted every three months into utility bills of watershed residents who get their water from a city/rural water system. They could be made specific to the seasonal changes in water quality and how practices contribute differently during different times of the year. In addition to specific information about water quality, the fact sheets should contain information about the watershed project in general, ideas for how community members can change their behaviors to improve their water quality, and short profiles of watershed residents who are making changes to their land for future generations. They should be easy to read and point out where to go to learn more. Placing the fact sheet in a utility bill increases the chance it will be read and creates a connection

between the water bill and water quality that can solidify the message of the project.

For watershed residents who are on a well-water system, the fact sheets may have different informative stories on the links between water quality, their drinking water and their septic systems.

Suggested topics for quarterly fact sheets:

Quarter 1:

- Public recreation opportunities in Black Hawk Lake watershed
  - How outdoor recreation activities in the Black Hawk Lake watershed generate economic benefits for everyone in the watershed
  - Information on wildlife in Black Hawk Lake (things to discover)
- Watershed project goals to be met
- Resident feature/profile

Quarter 2:

- Opportunities for involvement in the Black Hawk Lake watershed project
  - Upcoming watershed project events
  - Information on becoming an IOWATER volunteer
- Progress made to date and watershed project goals
- Resident feature/profile

Quarter 3:

- Nutrients— phosphorus and nitrogen
  - General facts about these nutrients and how/why they are used
  - Sources of phosphorus within the watershed and the problems it causes in the lake
- Progress made to date and watershed project goals
- Resident feature/profile

Quarter 4:

- Urban Conservation
  - Problems caused by storm water runoff and septic systems and possibilities for urban conservation
  - Information on permeable pavers, native landscapes, rain gardens
- Overview of project goals that have been met
- Goals for the future of the watershed project
- Resident feature/profile

## Press releases

Because newspapers were cited as a highly used source for information, regular press releases should be sent to area newspapers, as well as posted on the website, in support of the outreach campaign. A citizen participant could stay in contact with local reporters, alerting them to newsworthy and photo-friendly watershed events.

## Radio

A weekly radio segment focusing on conservation could be aired on KAYL Storm Lake, KWMT Fort Dodge, and the radio stations with the Carroll Broadcasting Group. This also supports the Water Issues survey responses that information received through news media is a significant motivating factor in changing opinions on environmental issues. Public service announcements containing general information about clean water and how it can be cleaned could be created to run on the same radio stations.

## Websites

The Black Hawk Lake Protective Association ([www.blackhawklake.org](http://www.blackhawklake.org)) website is dedicated solely to the long-term health of the lake and the watershed, as is the Black Hawk Lake Water Quality Project website (<http://blackhawklakewaterqualityproject.com>).

These websites are visually clean and appealing, but need more information about the watershed improvement project. On either or both websites, an overview page should be added to include project goals and information on what has been done to date. It should include a page with tips for improving water quality using best management practices, ranging from no-till farming to instructions on creating a rain barrel, and resources for obtaining further information.

With the consent of the BHLPA and the Water Quality Project, all outreach material should include one of the website addresses. In order to promote local awareness and pride in the watershed improvement project, a community page should be a key component of that website. This page would allow people to submit photos of local conservation in action (a farmer standing next to his no-till equipment or a group trash pick-up day, for example) or lake usage photos that illustrate the beauty of the area.

Because many survey respondents indicated their concern for the future and what the water quality will be like for their children and grandchildren, the website should also include an educational component for the young generation. There could be a page just for children's activities such as hands-on water quality experiments that are easy to do at home, a water quality crossword puzzle, or a page to print and color. This can help kids get an early start on taking pride in their local watershed and understanding water quality issues.

## Social Media

Black Hawk Lake and Lake View have a Facebook page in place, where notices of events and updates are posted. This page has a good following already and is a useful tool for social conservations and photos. The people who "like" this Facebook page are either regular visitors to the lake or former residents nostalgic for the lake and the town.

The BHLPA already has a Twitter account as well, which is a good tool when it is used consistently.

The group and/or watershed coordinator might consider a blog to share more in-depth information that may not be appropriate for Facebook or Twitter. Blog followers receive an email whenever there is a new posting, which is not found on a website, or Facebook (unless the user is set up to receive



updates). A blog can be short or lengthy, technical or social, serious or humorous. The blog administrator (watershed project coordinator) can decide what type of information appears in each method of social media. Blogs are free to set up and use and can be linked to the website and the Facebook page.

## Community Involvement

Lake View is a highly social community. With 22 annual events listed on the city's website ([www.lakeviewlifestyle.com](http://www.lakeviewlifestyle.com)), there are many opportunities for the citizen outreach campaign to make a splash. The city's events provide an avenue for watershed residents to gather and learn about water quality challenges and instill pride in Black Hawk Lake and the watershed.

Several events are highly appropriate for raising awareness of the lake's water quality, including the Annual Pelican Festival in April and the Lake View Water Carnival in July. The watershed group could have an exhibit booth, host a seminar, or sponsor an activity during the event (for example the Pelican Plunge). When the activity is tied directly with the lake and water quality, the importance of water quality is front and center (i.e., this event couldn't happen if the water was unhealthy).

### Lake View Businesses

According to the Water Issues survey results, 98 percent of respondents "always or sometimes" visit local shops and restaurants. Promoting and encouraging the involvement of local businesses is vital for visibility as well as community ownership of the project.

A variety of businesses in and around Lake View have high visibility or are considered "hot spots" within the community. Several business owners expressed willingness to participate in project outreach by displaying posters in their windows and support materials on their counters. But the local businesses need to step up and participate even more for watershed project support and continued economic success.

Businesses within the watershed could start a "pelican campaign" (similar to MDA and JDRF), in which customers purchase a picture of Parker the Pelican for \$1.00, sign it, and post it at the business. Collection jars and donation information could be placed at area restaurants, campgrounds, and other places frequented by tourists. The money raised could fund specific project improvements such as playground equipment, water monitoring kits, picnic areas or mini/disc golf course upkeep. A creative person could craft a pelican with a bill that would hold donated change to be placed on counters, which would draw attention to the project.

Among businesses in Lake View are: Outlaws Drive In, The Trapper's Den, Jerzee's Sports Bar and Grill, Kathy's Corner and Laney's Corral, Lake View Foods, Lake View Resort, Lake View Redemption Center, Lake View Plumbing and Heating and bait shop, Farmers State Bank, Iowa State Bank, Reflections Salon, Sparky's One Stop, and Jacobsen Hybrid Corn Company Inc.

## Community-focused Events

### **“Out to the Lakes” Watch Party**

The Lake View Public Library could host a party to screen the award-winning film, “Out to the Lakes.” The film was shot at Black Hawk Lake and features local residents as well as environmental experts from the IDNR, Iowa State University, and the University of Iowa. The film offers insight to what Iowans know, or don’t know, about water quality. Survey respondents indicated that “firsthand observation” (31 percent) was a motivating factor in changing their mind about environmental issues. Lake View Public Library has a copy of the film, and copies could be available for participants to take home along with additional support materials.

### **Ride the Rail event**

One annual event with potential for broad visibility is Ride the Rail. This event attracts bicycle riders from all over the state for a 33-mile ride on the Sauk Rail Trail. The June event alternates the starting point between Swan Lake and Black Hawk Lake. The trail is a great place to promote project awareness. One way is to place small educational signs along the Sauk Rail Trail; the IDNR is investing in such signage.

### **Farmers Markets**

The Lake View Farmers Market is a popular weekly event from May to October; the Carroll and Denison Farmers Markets are held weekly from June through October. Those involved with the watershed project could staff a booth at these three farmers markets a few times during the season with information about the project and what community members can do to improve water quality in their area. Handouts at the booth would include the general informational brochure and additional fact cards about water quality and what can be done to improve it. The booth should appeal to all ages. Kids could take home a picture of Parker the Pelican to color or a worksheet regarding pollution and water quality. Maybe a giveaway item such as a pen or pencil with the website addresses printed on it could be offered at the booth. They are inexpensive and used often.

The handout and kids’ activities distributed at the farmers markets could be compiled into a workbook and made available through the Lake View, Carroll, and Denison chambers of commerce as a resource when the farmers markets are not open.

### **Lake View Water Carnival**

The Lake View Water Carnival is long-standing event, celebrating its 60th year in 2013. Part of the celebration features “Art in the Park,” an arts and crafts show. Vendors of different talents showcase fine woodworking, sewing, metal work and other art. This would be an opportunity to showcase art focused on Black Hawk Lake. A poster contest could be based on a central theme, such as “How I see Black Hawk Lake in 50 Years,” with different categories based on age or grade. A photography contest could focus exclusively on Black Hawk Lake. The contest would engage people with the lake, its beauty, and its long-term health for the next generation of lake users, and provide an emotional connection and appeal to those long-term lake users.



The Water Carnival also has an annual street parade where thousands line the 12-block route within Lake View. Watershed Project volunteers could pass out candy with information and support material about the restoration project and how they could help, or simply the website address directing them to find out more information. This could also include an appearance by Parker the Pelican.

### **Kids Pioneer Day at the Log Cabin, Lake View** ■ ■

The Water Rocks! group could be a part of this event, usually held in August, teaching children about watersheds and water quality. Through fun, engaging hands-on activities, students will experience educational lessons on watersheds and the impacts of land management choices on soil and water quality. Adding this to the traditional activities of the day would instill an appreciation for the watershed and Black Hawk Lake in the next generation of landowners.

### **5K or 12K Fun Run/Walk** ■ ■ ■

Black Hawk Lake Park could sponsor a 5K–12K fun run/walk around Black Hawk Lake. According to the website [www.walkjogrun.net](http://www.walkjogrun.net), the distance around the lake is 12 kilometers. This distance is a great middle ground for novice and expert runners. Fall would be an ideal time to hold a “Turkey Trot” or “Pelican Pace” because participants get to enjoy the changing colors of the trees, further enhancing their appreciation of the lake. The event could start or stop at Black Hawk Lake, or be held entirely at the lake if trails allow. T-shirts containing the watershed logo and mascot, pen or pencil and project brochures can be given to participants. The Turkey Trot offers a different usage of the lake area and brings a new audience to the lake as well. The Sauk Rail Trail is also used for running, so the trail could be incorporated into the fun run/walk. Proceeds would go to the Black Hawk Lake Protective Association (BHLPA).

### **Halloween in September** ■ ■ ■

Each year Camp Crescent hosts Halloween in September. Campers decorate their campsites for Halloween, and the campsites are judged for creativity. This would be a fun opportunity to have park staff, volunteers, or Parker the Pelican dress up and pass out candy or a pen or pencil to campground visitors. Attached to the candy could be information and support material about the restoration project, how they could help, or simply the website address.

### **Breda Rain Barrel Demonstration Day** ■ ■ ■

In April of 2012 the Sac and Carroll County Soil and Water Conservation Districts, along with the city of Breda, held an event to promote the use of rain barrels and offer information about the cost-share program. Involving area youth groups could help to expand on the success of this promotion. Boy Scouts and Girl Scouts, 4-H groups, and students from East Sac County Community School Districts could paint several rain barrels to raffle and/or auction. Decorating rain barrels has become quite popular recently, and could generate more interest in the event as well as curiosity about rain barrels inside and outside of the watershed.

## Outdoor Activities

### Golf Courses ■ ■ ■

The Spring Lake Country Club in Wall Lake, Breda Golf Club, Majestic Hills Golf Course in Denison, Carroll Country Club, and Carroll Municipal Golf Course are just a few of the 20 golf courses within a 30-mile radius of Black Hawk Lake. Golf courses are popular social spots for residents of the watershed. As part of the watershed outreach campaign, a special scorecard could include facts about the watershed project, the challenges that are being addressed, the project logo and the web address.

So that people don't just glance at the information, these scorecards could be numbered and used in a daily drawing for a small prize or free beverage, funded by the watershed project. Additional options could be to include a coupon as part of the scorecard or for golfers to present a completed scorecard to receive a custom golf ball or pencil with the project logo on it.

Additionally, the golf courses should be encouraged to implement some appropriate conservation practices, so that they can be recognized as being environmental leaders in the area.

### Miniature Golf ■ ■ ■

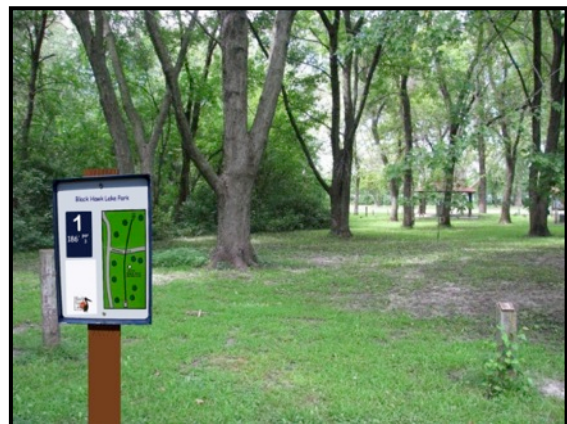
Located in Camp Crescent and just a few feet from the lake is a 19-hole miniature golf course. This is a hot spot for campers, as well as locals who enjoy activities along Black Hawk Lake. A miniature golf tournament or similar event would be an ideal mix of fun and promotion. Each person who participates would get a souvenir golf ball with the project or watershed logo on it. This would be a great way to bring people down to the lake, and would leave them with a reminder of their watershed and the ongoing project.



### Disc Golf ■ ■ ■

A nine-hole disc golf course is located in Black Hawk Lake State Park. The popularity of disc golf has grown substantially in the past 10 years, with more than 150 courses in Iowa. Many enthusiasts travel the state looking for the next course to try.

While the course at Black Hawk Lake has been in existence since 2001, the course's incomplete hole markers make course navigation confusing. Markers could be added on the course, showing an illustration of the hole location, along with information about the watershed project and water quality in general. Local businesses could sponsor a hole by including their logo on the sign; their sponsorship would go toward the watershed project. A disc golf tournament could be held with a portion of the proceeds going to the Black Hawk Lake Protective Association (BHLPA).



## **Geocaching**

Geocaching is a real-world, outdoor high-tech treasure hunt using GPS-enabled devices. Participants navigate to a specific set of GPS coordinates and attempt to find the cache (container) hidden at that location. Geocaching is a fast-growing activity across the United States, with hundreds of free smartphone applications for GPS/geocaching.

Black Hawk Lake State Park could have its own geocaching map, to encourage people to visit all of the park's locations, explore the park's many areas and learn more about the watershed. Geocaching would appeal to that 67 percent of lake usage respondents who indicated that they spent time at the park for nature appreciation, and would help geocachers discover the park. Cache locations would be available for all to find and download on the website. Each cache could include a trivia fact about the lake, watershed, or park and caches could change to coordinate with other park events. Youth groups could participate together, or people venture out on their own. As a great family activity, geocaching would be a useful addition to Black Hawk Lake Park, since 43 percent of lake usage respondents had an average of three children with them.

## **Iowa Learning Farms Field Day**

An Iowa Learning Farms field day could be held on the farm of a watershed resident who is demonstrating conservation farming practices. The field day is an opportunity for farmers and watershed residents to visit a farm and learn about different conservation practices that support healthy soils and healthy water bodies and minimize transport of phosphorus and nitrogen into waterways. The field day could offer simultaneous tracks addressing topics for both urban and rural residents, such as no-till/strip-till, cover crops, nutrient and manure management, rain barrels, and organic gardening. .

## **Citizen Involvement**

Survey respondents said they were most likely to change their minds about an environmental issue over "concern about the future for children/ grandchildren" (39 percent) or through "firsthand observation" (31 percent). Several of the suggested activities support these reasons for the change of mindset. Most are family-oriented and could involve multiple generations. But there are also many ways individuals can become involved in the watershed improvement project, such as becoming an IOWATER volunteer, becoming a leader in a youth or church group, or serving on a planning committee for events.

Involving the cities of Lake View and Wall Lake and the Soil and Water Conservation Districts (SWCD) of Sac and Carroll Counties will help bring many people's attention to the watershed project and the importance of Black Hawk Lake to their economies.

## **IOWATER Water Quality Monitoring**

Involving the local community with the water quality monitoring is a perfect opportunity for community members to see how and where the monitoring is being conducted. Working with

IOWATER, watershed residents can see how and where water samples are being taken. They will be more apt to trust the findings, engage in ownership of the watershed, and become physically involved.


A local IOWATER workshop could be conducted as part of the campaign, explaining how water sampling is done and certifying volunteers to monitor water quality. Watershed residents should be encouraged to participate in the workshop with their children or grandchildren of appropriate ages; they could then monitor the water together, nurturing ownership of the watershed and pride in water quality through multiple generations.


### **Farmer-to-Farmer Leadership Program**

Farmers are more apt to listen to other farmers who working under similar conditions. A farmer-to-farmer peer outreach program in the watershed should be started, where farmers who use conservation land management practices on their land counsel and encourage farmers who are reluctant to do so. This would help create positive peer pressure, additional moral support and recognition for farmers. A peer education program would establish a visible network of like-minded farmers and landowners. Visibility is key: the more vocal and active they are, the more they will influence those farmers and landowners who are reluctant to change land management practices.

### **Youth Groups**

Involving youth groups, such as Boy Scouts, Girl Scouts or 4-H, in the watershed project helps to bring awareness of the issues involving the watershed to new, younger audiences—engaging the minds and energy of the next generation who will be taking care of water quality. The groups could plan service projects that help the lake, such as trash pick-up days, painting picnic tables in the park, etc. They could also help at some of the above events such as farmers markets, Rain Barrel Demonstration Day and Halloween in September.

 **Watershed Awareness Week:** An awareness week could be held by itself or as part of an established community event such as the Water Carnival. Local school kids or youth groups could partner with main street businesses to paint murals on each window, much like schools do for homecoming week, reflecting what students see when they think of Black Hawk Lake. This would generate project awareness as well as bring traffic to the local businesses.

 **Black Hawk Lake Oral History:** Youth group members could interview older citizens of the community, capturing their memories of what the lake and park was like during their childhood, to create an oral history of Black Hawk Lake. Individual memories could be compiled into a memory book or research paper. This project would also be a possible topic for Iowa/National History Day students (grades 6-12), or perhaps a State Historical Society research grant could be obtained for a community member to pursue in-depth work.

### **Area Churches**

Forty-eight percent of survey respondents indicated that they are very active within their local church. People often use their church for idea exchange and discussion on a variety of topics, religious and

nonreligious. Since clean water is a human right, discussing within the church community why and how to clean up local waters would be appropriate.

The utility fact sheets could be adapted for inserting into church bulletins in Carroll, Lake View, Wall Lake, and rural churches including, but not limited to:

Lake View: Emmanuel Lutheran, First Congregational United Church of Christ, Lakes United Methodist

Carroll: First Assembly of God, Bethel Baptist, Faith Baptist, Holy Spirit Catholic, St. Lawrence Catholic, Central Christian, Grace Christian Fellowship, Church of Christ, Trinity Episcopal, St. John's Lutheran, St. Paul's Lutheran, First United Methodist, First Presbyterian

Breda: St. Bernard's

Wall Lake: Peace Lutheran, St. Joseph's Catholic, Trinity Presbyterian and Wall Lake Baptist.

# WATER ISSUES IN IOWA

## Black Hawk Lake Watershed Survey Results

### Introduction

This document reports the results of a survey conducted for the *Community Assessments: Key Components to Successful Community-based Watershed Improvement Project*. This project is a collaboration between Iowa State University Extension, the Iowa Department of Natural Resources, and the Sac County Soil and Water Conservation District.

Funded by Sac County Soil and Water Conservation District and Iowa Department of Natural Resources Section 319 funds, the purpose of this project is to develop and test a community assessment tool that can be used by watershed action teams and coordinators to better gauge the community understanding of watersheds. Effective community assessments will allow watershed groups to develop goals, outreach, and education regarding water quality challenges based on the values of the people living in the watershed.

The survey was based on a water issues survey that was administered to the four states in the Heartland Region in 2007. Using a similar survey, local watershed groups will be able to compare their findings to the statewide findings. Black Hawk Lake watershed has approximately 961 households distributed throughout the town of Lake View, the communities of Breda and Carnarvon, and the surrounding rural area. All households within the watershed received a mail survey.

The survey was conducted using a modified Dillman Tailored Design Method. A three-step process was followed: 1) a first mailing of the survey and a cover letter explaining the purpose of the survey; 2) a reminder postcard two weeks later sent to non-respondents; and 3) a second mailing of the survey to remaining non-respondents.

Of the 961 surveys mailed, 509 were completed and returned, an overall response rate of 53 percent. This is an exceptional response rate for a mail survey of its length. The survey results are considered representative of watershed residents because the demographics of the sample are representative of the general population of the watershed. This means that no one social group is over-represented in the responses.

This report presents the tabulated results of the surveys. The tables present the questions and response categories as they were presented in the surveys. The number of responses for each question or question item is provided in parentheses. Responses with highest rankings are highlighted in blue.

**1. Best first step to improve Black Hawk Lake Watershed? (n=448)**

	All
Eliminate carp	4%
Dredge the lake	28%
Multi-faceted approach	41%
Nonpoint sources of pollution	27%
All of the above	Less than 1%

**Water Issues** (CHECK THE BEST ANSWER, UNLESS MULTIPLE ANSWERS ARE INDICATED.)

**2. Where do you get your drinking water? (CHECK ALL THAT APPLY)**

	All
Well (individual well or well that serves fewer than 15 residences) (n=46)	9%
Rural water system (n=22)	4%
River, stream, pond, or lake (individual system) (n=0)	0%
City water system (n=402)	80%
Purchase bottled water (n=117)	23%
Produce own with reverse osmosis (RO) system (n=35)	7%
Don't know (n=4)	1%

**3. Do you feel that your home drinking water is safe to drink? (n=495)**

	All
Yes	87%
No	13%

**4. In your opinion, what is the quality of groundwater (sources of well water) in your area? (n=494)**

	All n=494	Nonfarming n=370	Farming n=94	On Lake n=124	Off Lake n=340
Good	24%	20%	38%	17%	26%
Fair	31%	30%	35%	21%	35%
Poor	11%	12%	10%	7%	13%
Don't know	34%	38%	17%	55%	26%



5. In your opinion, what is the *quality of surface waters* (rivers, streams, lakes) where you live?  
(n=495)

	All n=495	Nonfarming n=371	Farming n=94	On Lake n=125	Off Lake n=340
Good	6%	3%	12%	4%	5%
Fair	23%	19%	37%	21%	23%
Poor	57%	62%	41%	62%	56%
Don't know	14%	16%	10%	13%	16%

6. Do you know of or suspect that any of the following conditions are affecting water quality in your area?

	All	Nonfarming	Farming	On Lake	Off Lake
<b>High bacteria counts</b>	<b>n=462</b>	<b>n=350</b>	<b>n=88</b>	<b>n=122</b>	<b>n=316</b>
Know	23%	24%	22%	23%	24%
Suspect	45%	47%	37%	47%	44%
Not a Problem	4%	2%	10%	2%	5%
Don't know	28%	27%	31%	28%	27%
<b>Fertilizer/nitrates</b>	<b>n=477</b>	<b>n=359</b>	<b>n=91</b>	<b>n=124</b>	<b>n=326</b>
Know	31%	32%	31%	30%	32%
Suspect	46%	48%	35%	50%	44%
Not a Problem	5%	4%	9%	5%	5%
Don't know	18%	16%	25%	15%	19%
<b>Heavy Metals (e.g., lead, arsenic)</b>	<b>n=451</b>	<b>n=339</b>	<b>n=89</b>	<b>n=119</b>	<b>n=309</b>
Know	2%	2%	1%	1%	2%
Suspect	22%	21%	27%	14%	26%
Not a Problem	10%	10%	12%	8%	11%
Don't know	66%	67%	60%	77%	61%

<b>Hardness</b> (e.g., calcium, other minerals)	<b>All n=466</b>	<b>Nonfarming n=349</b>	<b>Farming n=92</b>	<b>On Lake n=120</b>	<b>Off Lake n=321</b>
Know	30%	31%	30%	17%	35%
Suspect	30%	29%	29%	33%	28%
Not a Problem	9%	9%	11%	9%	9%
Don't know	31%	31%	30%	41%	28%
<b>Pesticides</b>	<b>n=469</b>	<b>n=352</b>	<b>n=92</b>	<b>n=122</b>	<b>n=322</b>
Know	14%	13%	15%	13%	14%
Suspect	53%	57%	34%	54%	52%
Not a Problem	6%	3%	22%	1%	9%
Don't know	27%	27%	29%	32%	25%
<b>Animal waste</b>	<b>n=474</b>	<b>n=355</b>	<b>n=92</b>	<b>n=120</b>	<b>n=327</b>
Know	17%	17%	17%	15%	18%
Suspect	46%	49%	34%	49%	45%
Not a Problem	10%	7%	22%	6%	12%
Don't know	27%	27%	27%	30%	25%
<b>Septic Systems</b>	<b>n=460</b>	<b>n=345</b>	<b>n=91</b>	<b>n=120</b>	<b>n=316</b>
Know	7%	6%	8%	7%	6%
Suspect	34%	36%	25%	31%	34%
Not a Problem	11%	10%	18%	12%	12%
Don't know	48%	48%	49%	50%	48%
<b>Pharmaceuticals</b> (i.e. antibiotics, personal care products)	<b>n=459</b>	<b>n=346</b>	<b>n=90</b>	<b>n=121</b>	<b>n=315</b>
Know	2%	3%	3%	4%	2%
Suspect	21%	22%	19%	20%	22%
Not a Problem	12%	12%	14%	11%	13%
Don't know	65%	63%	64%	65%	63%

**7. In your opinion, which of the following are most responsible for the existing pollution problems in rivers and lakes *in Iowa*? (CHECK UP TO 3 ANSWERS)**

	<b>All</b>	<b>Nonfarming</b>	<b>Farming</b>	<b>On Lake</b>	<b>Off Lake</b>
Agriculture crop production	68% <b>n=341</b>	72% <b>n=270</b>	57% <b>n=55</b>	79% <b>n=99</b>	65% <b>n=226</b>
Erosion from roads and/or construction sites	9% <b>n=44</b>	9% <b>n=35</b>	6% <b>n=6</b>	11% <b>n=14</b>	8% <b>n=27</b>
Wastes from urban areas	22% <b>n=110</b>	19% <b>n=70</b>	35% <b>n=34</b>	12% <b>n=15</b>	26% <b>n=89</b>
Industry	10% <b>n=52</b>	10% <b>n=38</b>	10% <b>n=10</b>	10% <b>n=12</b>	10% <b>n=36</b>
Wild animals/pets	11% <b>n=55</b>	9% <b>n=35</b>	15% <b>n=14</b>	9% <b>n=11</b>	11% <b>n=38</b>
Livestock and/or poultry operations	52% <b>n=262</b>	54% <b>n=204</b>	43% <b>n=41</b>	56% <b>n=70</b>	51% <b>n=175</b>
Septic systems	18% <b>n=91</b>	18% <b>n=69</b>	16% <b>n=15</b>	23% <b>n=29</b>	16% <b>n=55</b>
Urban storm water runoff	27% <b>n=134</b>	26% <b>n=97</b>	33% <b>n=32</b>	22% <b>n=28</b>	29% <b>n=101</b>
Landfills	3% <b>n=13</b>	3% <b>n=10</b>	3% <b>n=3</b>	2% <b>n=2</b>	3% <b>n=11</b>
Wastewater treatment plants	6% <b>n=31</b>	5% <b>n=18</b>	12% <b>n=12</b>	2% <b>n=3</b>	8% <b>n=27</b>
Streambank erosion	23% <b>n=114</b>	23% <b>n=88</b>	23% <b>n=22</b>	25% <b>n=31</b>	23% <b>n=79</b>

**8. In your opinion, which of the following are most responsible for the existing pollution problems in rivers and lakes *in your watershed*? (CHECK UP TO 3 ANSWERS)**

	All	Nonfarming	Farming	On Lake	Off Lake
Agriculture crop production	70% n=352	71% n=268	62% n=60	78% n=98	67% n=230
Erosion from roads and/or construction sites	8% n=42	9% n=33	7% n=7	10% n=13	8% n=27
Wastes from urban areas	16% n=81	16% n=61	16% n=15	7% n=9	19% n=67
Industry	4% n=18	4% n=14	3% n=3	1% n=1	5% n=16
Wild animals/pets	10% n=49	8% n=32	12% n=12	10% n=12	9% n=32
Livestock and/or poultry operations	49% n=244	50% n=186	41% n=39	50% n=63	47% n=162
Septic systems	19% n=94	19% n=70	18% n=17	19% n=24	18% n=63
Urban storm water runoff	21% n=105	21% n=78	23% n=22	17% n=22	23% n=78
Landfills	4% n=19	3% n=12	6% n=6	2% n=3	4% n=15
Wastewater treatment plants	4% n=20	3% n=10	9% n=9	3% n=4	4% n=15
Streambank erosion	21% n=106	22% n=83	21% n=20	27% n=34	20% n=69

**9. Do you know where water goes that falls onto your land or yard? (CHECK ALL THAT APPLY)**

	All	Nonfarming	Farming	On Lake	Off Lake
Storm drain and then straight to the river	32% n=161	35% n=130	23% n=22	26% n=33	34% n=119
Directly into a nearby creek	14% n=73	11% n=41	26% n=25	21% n=27	11% n=39
Roadside ditch and then stream or river	16% n=83	13% n=49	32% n=31	13% n=17	18% n=63
It gets absorbed into the land	47% n=239	45% n=170	62% n=59	45% n=57	50% n=172
Don't know	17% n=85	18% n=68	9% n=9	13% n=17	17% n=60

## Soil Erosion Issues

### 10. Do you have any soil erosion on your property?

	All n=469	Nonfarming n=349	Farming n=90	On Lake n=117	Off Lake n=322
None	61%	67%	39%	63%	60%
A little	30%	23%	56%	28%	30%
Moderate	3%	3%	3%	4%	3%
A lot	5%	6%	2%	5%	6%
Don't know	1%	1%	0%	0%	1%

### 11. What are some of the ways that you try to prevent or fix soil erosion on your property? (CHECK ALL THAT APPLY)

	All
Continuous no-till or strip-till (n=40)	8%
Leaving vegetation on the ground in garden (n=81)	16%
Following the natural contours of the land (either farmland or in landscaping) (n=84)	17%
Planted windbreaks (n=46)	9%
Grassed waterway or grass strip around garden (n=104)	21%
Placing mulch on all exposed soil on land (n=70)	14%
Use of native plantings to protect streambanks (n=39)	8%
Cover crops (n=25)	5%
We don't do anything (n=40)	8%
Not applicable (n=214)	42%

**12. Have you or someone in your household done any of the following as part of an individual or community effort to conserve water or preserve water quality in the last five years?**  
 (CHECK ALL THAT APPLY)

	All
Changed the way your yard is landscaped (n=72)	14%
Reduced your water consumption (i.e. stopped watering lawn) (n=186)	37%
Reduced your use of pesticides, fertilizers, or other chemicals (n=181)	36%
Increased residue on row crop acres (n=39)	8%
Addressed erosion on your land (n=68)	13%
Pumped your septic system (n=21)	4%
Tested your drinking water (n=49)	10%

## Governance

**13. In your opinion, does the environment receive the right amount of emphasis from government and elected officials in your community?** (CHECK ONE ANSWER)

	All n=214	Nonfarming n=369	Farming n=93	On Lake n=124	Off Lake n=338
<u>Not enough emphasis</u> is placed on environmental protection	43%	45%	37%	49%	42%
Environmental protection receives about the <u>right amount of emphasis</u>	20%	18%	29%	18%	21%
<u>Too much emphasis</u> is placed on environmental protection	8%	6%	17%	6%	8%
Don't know	29%	31%	17%	27%	29%

**14. In your opinion, who should be most responsible for protecting water quality in your community? (SELECT ONE)**

	<b>All n=211</b>	<b>Nonfarming n=340</b>	<b>Farming n=79</b>	<b>On Lake n=116</b>	<b>Off Lake n=303</b>
Environmental Protection Agency (EPA)	5%	6%	3%	10%	4%
Natural Resources Conservation Service (NRCS)	5%	3%	10%	2%	6%
Iowa Department of Agriculture and Land Stewardship (IDALS)	3%	3%	1%	2%	4%
Iowa Department of Natural Resources (IDNR)	20%	20%	14%	23%	17%
Local Soil and Water Conservation District (SWCD)	19%	21%	14%	21%	19%
Your county, city, or town	13%	13%	10%	10%	14%
Individual citizens without land	0%	0%	0%	0%	0%
Landowners	22%	19%	38%	22%	23%
Don't know	12%	13%	8%	9%	13%



**15. How well do you feel each one of these groups is fulfilling their responsibility for protecting water quality in your community? (CIRCLE ONE ANSWER PER GROUP. LEAVE IT BLANK IF YOU “DON’T KNOW.”)**

							Responses given in average rating				
							All	Nonfarming	Farming	On Lake	Off Lake
	<i>Very Well</i>	<i>Well</i>	<i>Okay</i>	<i>Poorly</i>	<i>Very Poorly</i>						
Federal government (EPA, NRCS) (n=156)	5	4	3	↑	2	1	2.49	2.42	2.69	2.36	2.52
State government (DNR, IDALS) (n=161)	5	4	3	↑	2	1	2.7	2.67	2.79	2.66	2.71
Your county, city, or town govt. (n=161)	5	4	3	↑	2	1	2.79	2.75	2.87	2.67	2.81
Soil and water conservation district (SWCD) (n=159)	5	4	3	↑	2	1	2.95	2.87	3.16	2.79	2.99
Your community (n=167)	5	4	3	↑	2	1	2.82	2.8	2.82	2.84	2.79
The landowners (n=158)	5	4	3	↑	2	1	2.7	2.54	3.13	2.46	2.76
Individual citizens (n=158)	5	4	3	↑	2	1	2.64	2.62	2.61	2.64	2.61

## Water Quality Education

### 16. Have you received water quality information from the following sources?

(CHECK ALL THAT APPLY)

	All	On Lake	Off Lake
Television	31% n=155	32% n=40	30% n=103
Internet	15% n=78	19% n=24	14% n=48
Newspapers	49% n=248	52% n=66	49% n=168
Radio	24% n=121	25% n=31	24% n=82
Extension Service	23% n=117	18% n=23	25% n=86
Iowa Learning Farms	14% n=70	13% n=17	14% n=48
Universities	13% n=64	9% n=12	13% n=45
Schools (elementary and secondary)	3% n=17	4% n=5	3% n=10
Agricultural trade/commodity groups	8% n=40	7% n=9	8% n=28
Environmental agencies (government)	20% n=99	19% n=24	19% n=67
Environmental agencies (citizen groups)	17% n=88	23% n=29	14% n=50

**17. Would you like to learn more about any of the following water quality issue areas?**  
(CHECK ALL THAT INTEREST YOU)

	<b>All</b>
Agricultural water management on row crop acreages <b>(n=68)</b>	13%
Animal manure and waste management <b>(n=75)</b>	15%
Drinking water and human health <b>(n=218)</b>	43%
Environmental restoration <b>(n=68)</b>	13%
Nutrients and pesticide management <b>(n=78)</b>	16%
Pollution assessment and prevention <b>(n=68)</b>	13%
Water conservation <b>(n=70)</b>	14%
Water policy and economics <b>(n=26)</b>	5%
Watershed management <b>(n=140)</b>	28%
Private well and septic system management <b>(n=40)</b>	8%
Small acreage water and land management <b>(n=26)</b>	5%
Home and garden landscaping for water quality <b>(n=87)</b>	17%
Other: All of the above <b>(n=2)</b>	Less than 1%
Farm runoff <b>(n=1)</b>	Less than 1%
Alternative fertilizers <b>(n=1)</b>	Less than 1%
Phosphate on land adjacent to lake <b>(n=1)</b>	Less than 1%
Wetland restoration <b>(n=1)</b>	Less than 1%
Won't do me any good <b>(n=1)</b>	Less than 1%

**18. Have you ever changed your mind about an environmental issue as a result of:**

(CHECK ALL THAT APPLY)

	All	Nonfarming	Farming	On Lake	Off Lake
News coverage (TV, newspapers, Internet, etc.)	30% n=151	32% n=121	22% n=21	34% n=43	29% n=99
Field days	6% n=33	6% n=23	9% n=9	6% n=7	7% n=25
Conversations with other people	23% n=118	24% n=90	20% n=19	25% n=31	23% n=78
Attending public meetings or participating in volunteer activities	18% n=89	17% n=65	21% n=20	24% n=30	16% n=55
Classes or presentations	8% n=41	7% n=27	9% n=9	12% n=15	6% n=21
Speech by an elected representative	2% n=11	2% n=9	0% n=0	1% n=1	2% n=8
Firsthand observation	31% n=157	28% n=105	38% n=37	32% n=41	29% n=101
Financial considerations	5% n=27	5% n=17	6% n=6	5% n=6	5% n=17
Concern about the future for your children/grandchildren	39% n=197	38% n=142	40% n=38	40% n=50	38% n=130

**19. Of the following kinds of learning opportunities available, which would you be most likely to take advantage of for water quality issues? (CHECK UP TO 3 ITEMS)**

	All	On Lake	Off Lake
Read printed fact sheets, bulletins, or brochures	56% n=282	64% n=81	52% n=180
Visit a website for information and tips	33% n=168	40% n=50	32% n=111
Short course	8% n=43	8% n=10	8% n=29
Look at a demonstration or display	19% n=98	15% n=19	20% n=70
Read newspaper article or series or watch TV coverage	45% n=227	44% n=56	44% n=153
Watch a video	11% n=57	13% n=16	12% n=40
Volunteer in a one-time learning activity (e.g. water monitoring, streamside restoration or education)	9% n=47	9% n=11	9% n=32
Take a course for certification or credit	3% n=16	4% n=5	3% n=11

Get trained for a regular volunteer position (e.g. as a watershed steward or a water quality monitor)	4% <b>n=19</b>	6% <b>n=7</b>	3% <b>n=10</b>
Ask for a home, farming, or workplace water practices assessment	6% <b>n=33</b>	5% <b>n=6</b>	7% <b>n=24</b>
Attend a fair or festival	6% <b>n=29</b>	2% <b>n=3</b>	7% <b>n=23</b>

**20. Are you now participating, or have you participated, in any of the following activities in the last five years? (CHECK ALL THAT APPLY)**

	<b>All</b>
Master Gardener program ( <b>n=15</b> )	3%
Volunteer water quality monitoring ( <b>n=12</b> )	2%
Lake or river protection groups ( <b>n=53</b> )	10%
Town conservation commissions ( <b>n=14</b> )	3%
Other water or environmental protection groups ( <b>n=36</b> )	7%

**21. Which logo do you like? (n=452)**

	<b>All</b>
Logo A	66%
Logo B	29%
Logo C	5%



A.



B.



C.

**Please answer the following as they pertain to you**

**22. Where do you live? (n=217)**

	<b>All</b>
Inside city limits, not engaged in farming	52%
Inside city limits, engaged in farming	7%
Outside city limits, not engaged in farming	6%
Outside city limits, currently engaged in farming	8%
On the lake, not engaged in farming	22%
On the lake, engaged in farming	5%

**23. Approximately what is the population of your community?**

93 respondents identified population to be less than 1200 (average = 875)

274 respondents identified population to be 1200 or greater (average = 9298)

**24. How long have you lived in your area?**

<b>All n=454</b>	<b>Nonfarming n=340</b>	<b>Farming n=89</b>	<b>On Lake n=109</b>	<b>Off Lake n=320</b>
Average: 31 years	Average: 28 years	Average: 38 years	Average 24 years	Average 33 years

**25. To what extent are you currently active in your local community?**

	<b>All</b>
<b>Frequent local shops and restaurants (n=465)</b>	
<i>Never</i>	2%
<i>Sometimes</i>	51%
<i>Always</i>	47%
<b>Attend local sporting events (n=390)</b>	
<i>Never</i>	32%
<i>Sometimes</i>	53%
<i>Always</i>	15%
<b>Active member of local church (n=426)</b>	
<i>Never</i>	22%
<i>Sometimes</i>	30%
<i>Always</i>	48%
<b>Participate in local social clubs (n=391)</b>	
<i>Never</i>	49%
<i>Sometimes</i>	37%
<i>Always</i>	14%
<b>Participate in environmental/garden club (n=361)</b>	
<i>Never</i>	79%
<i>Sometimes</i>	16%
<i>Always</i>	5%
<b>Attend school events (n=392)</b>	
<i>Never</i>	32%
<i>Sometimes</i>	56%
<i>Always</i>	12%

**26. What is your gender? (n=491)**

	<b>All</b>
Male	60%
Female	40%

**27. What is your age? (n=484)**

Average of 62 years old (range ages 22-97)

**28. How many people live in your household? (n=482)**

# of individuals	Individuals 18 and over	Individuals under 18
1	25%	29%
2	66%	38%
3	7%	26%
4	2%	6%
5		1%

**29. What level of education you have completed? (n=490)**

	All
Less than high school or some high school	3%
High school graduate	30%
Some college or vocational training	26%
College graduate	28%
Advanced college degree	13%

**30. What is your current occupation? (n=201)**

	All
Farming	7%
Manufacturing/Contracting/Transportation	7%
Food service/Recreation/Tourism	1%
Education	3%
Technology/Communications	2%
Management/Retail	13%
Government	2%
Service sector	3%
Retired	45%
Professional (Lawyer/Doctor/Insurance)	10%
Disabled	1%
Unemployed	1%
Self-employed	5%

**30. Are you engaged in farming? (n=471)**

	All	On Lake	Off Lake
Yes	20%	17%	21%
No	80%	83%	79%