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Analysis of the Community Based Planning Process in Holmes Lake Watershed, Lincoln, Nebraska

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INTRODUCTION

In 1998, the Nebraska Department of Environmental Quality (NDEQ) listed Holmes Lake, in Lincoln, NE on the Clean Water Act, Section 303(d) list of impaired and threatened waters. Holmes Lake was listed as impaired due to aquatic life use impairments.

Experts from various agencies worked together to form a Technical Advisory Committee to work closely with a Watershed Advisory Council of local citizens and stakeholders. Technical experts explained the water impairments and possible remedies to citizens. The Watershed Advisory Council then helped to prioritize actions. The lake was drained in 2003. In 2004, sediment was excavated, the shoreline was stabilized, and a wetland developed. The lake was re-filled with water in 2005.

Research has shown that improving an impaired waterbody must go beyond scientific and technical knowledge to include citizen involvement and establish the expectation that citizens have a responsibility to protect their local watershed (Morton, 2011). Watershed management can be most effective by integrating local knowledge with the knowledge of technical experts (Wortmann, Helmers, Gelder, et al., 2008). Therefore, to involve local stakeholders in the development of solutions, the NDEQ implemented a new approach to watershed management, Community Based Planning (CBP). The CBP process yields a higher “potential for success” (LBBNRD, 2005).

In 2009, researchers at the University of Nebraska- Lincoln and Iowa State University developed a survey to evaluate the CBP process and investigate whether or not this method is an effective management approach for impaired watersheds. Although citizens have increasingly been involved in watershed management, the outcomes of citizen participation has not been systematically studied (Morton, 2011).

METHODOLOGY

A random sample of 1800 homeowners was drawn from a list of 5200 homeowners in the Holmes Lake watershed provided by the City of Lincoln. A check of the homeowner addresses by the UNL Mail Services department revealed that 83 homeowners had moved since the list was generated. A confirmatory check of residency within the watershed revealed that 35

homeowners did not actually reside in the watershed. These two groups of homeowners were removed from the list and another 118 randomly selected homeowners were added to the sample. No surveys were returned as undeliverable.

Self-administered mail surveys were sent in February 2010 following Dillman's (2000) design method. First, a post card alerting participants of a survey about the watershed was mailed. One week later, a personalized cover letter including informed consent documentation, a questionnaire, and a return business envelope were mailed. Three weeks later, a follow-up reminder post card was sent to participants who hadn't completed the survey. Three weeks following mailing of the reminder post card, a fourth mailing included another copy of the questionnaire, a return envelope, and an informed consent document was sent to participants who had yet to complete the survey. A total of 810 responses were received, a 45% response rate.

Research Questions

1. What percentage of Holmes Lake residents engage in practices that benefit water quality?
2. What is the awareness level of Holmes Lake residents about the watershed management project?
3. What are the attitudes, beliefs, and values of Holmes Lake residents regarding water quality in Holmes Lake?

RESULTS

Respondent Demographics

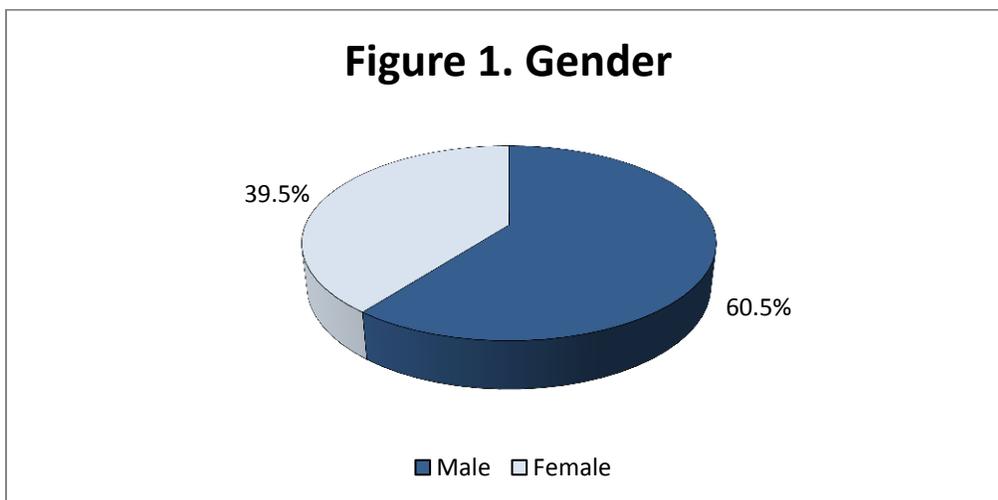


Figure 2. Education completed

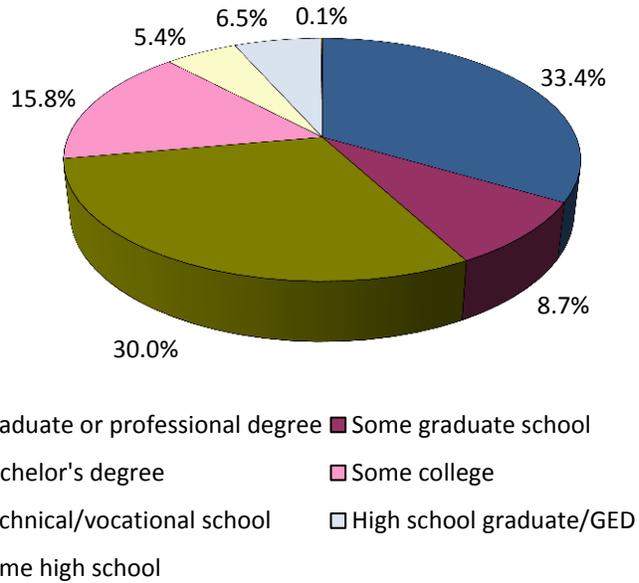


Figure 3. How many years have you lived in the Holmes Lake area?

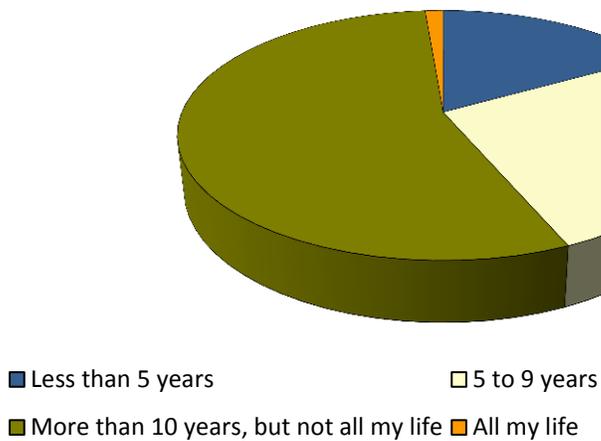


Figure 4. What recreational activities do you/have you engaged in at Holmes Lake? (n=808)

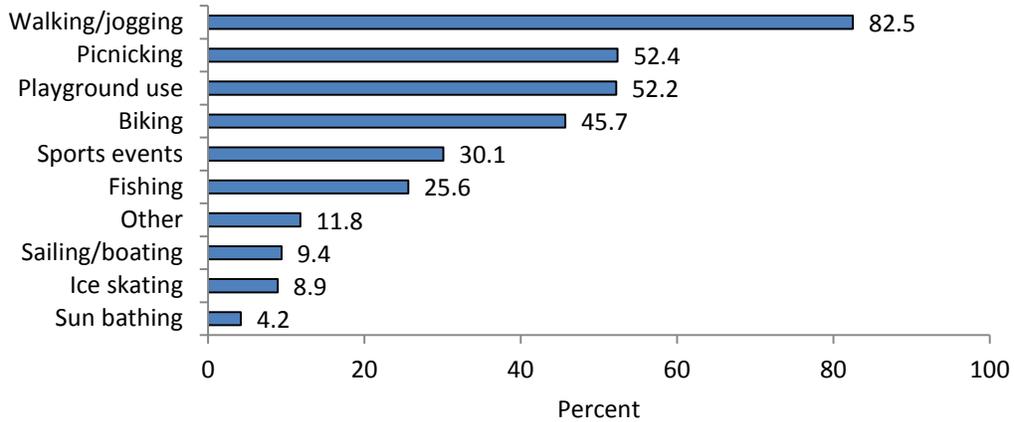
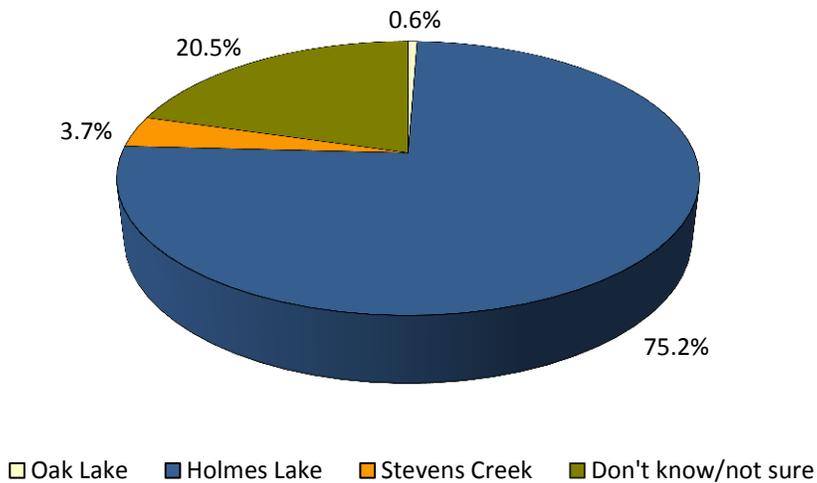


Figure 5. Where water from my land drains



Holmes Lake Residents Knowledge of and Participation in Watershed Council Activities

Figure 6. Does Holmes Lake watershed have a citizen watershed council that helps plan for and protect Holmes Lake?

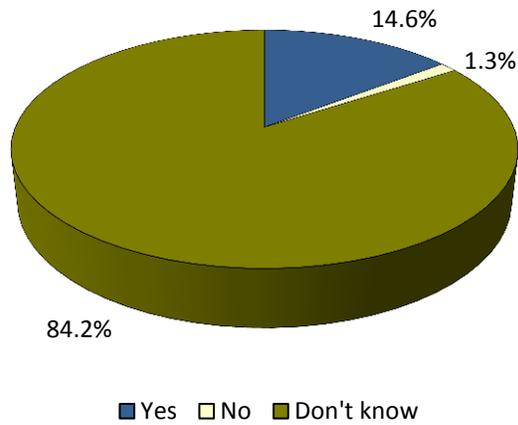


Figure 7. How effective is the Holmes Lake citizen watershed council in protecting the local watershed?

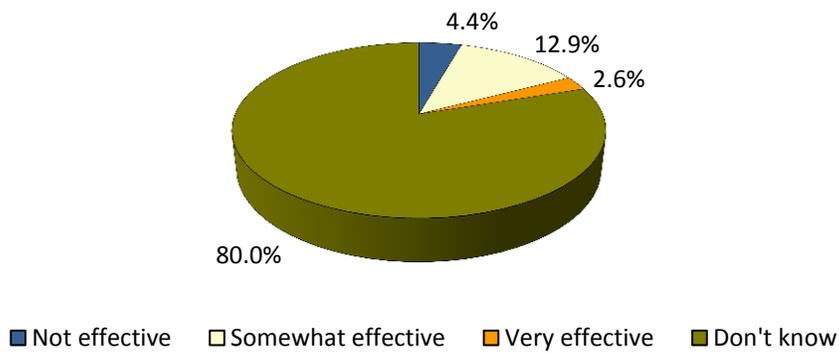
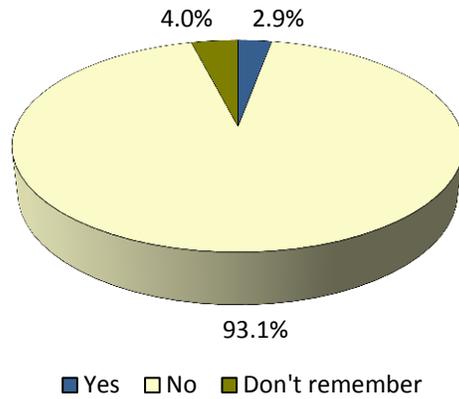
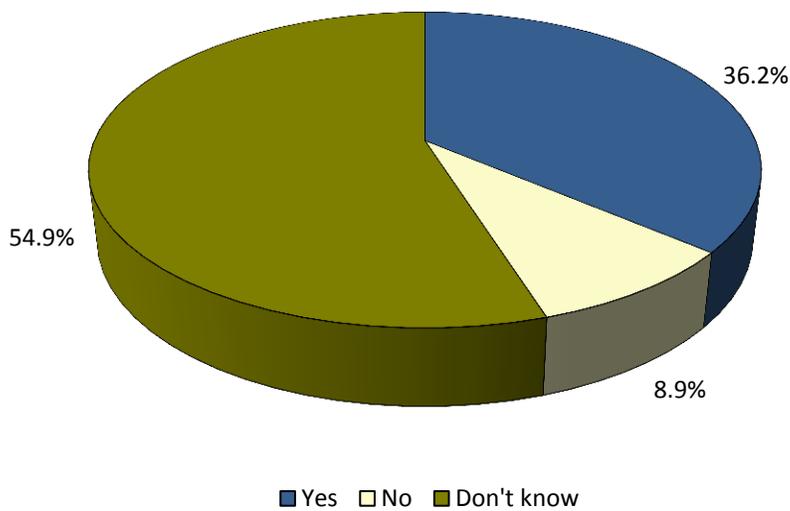


Figure 8. Have you ever attended a meeting of the citizen watershed council?



Holmes Lake Residents Knowledge of City of Lincoln Activities

Figure 9. The city of Lincoln promotes the use of no-P fertilizer



Holmes Lake Residents Knowledge of Homeowner Activities

Figure 10. My homeowners association promotes installing rain gardens

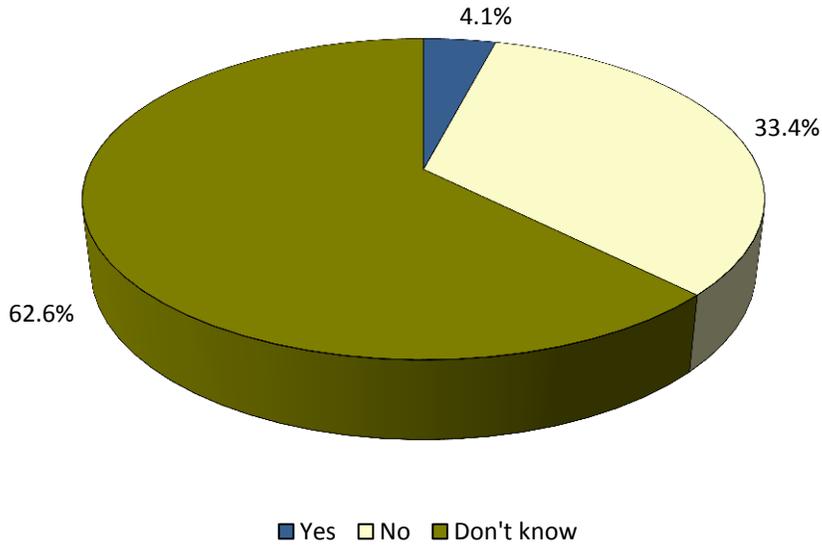
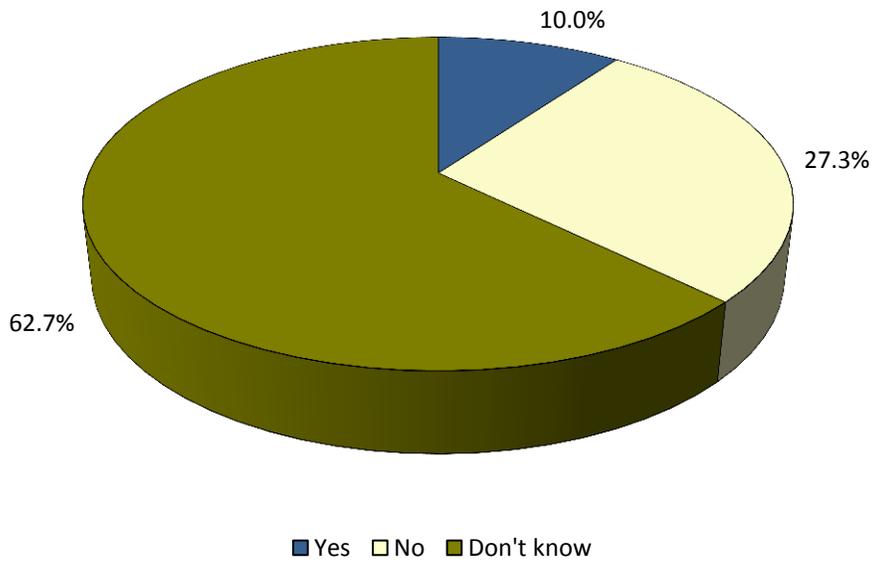
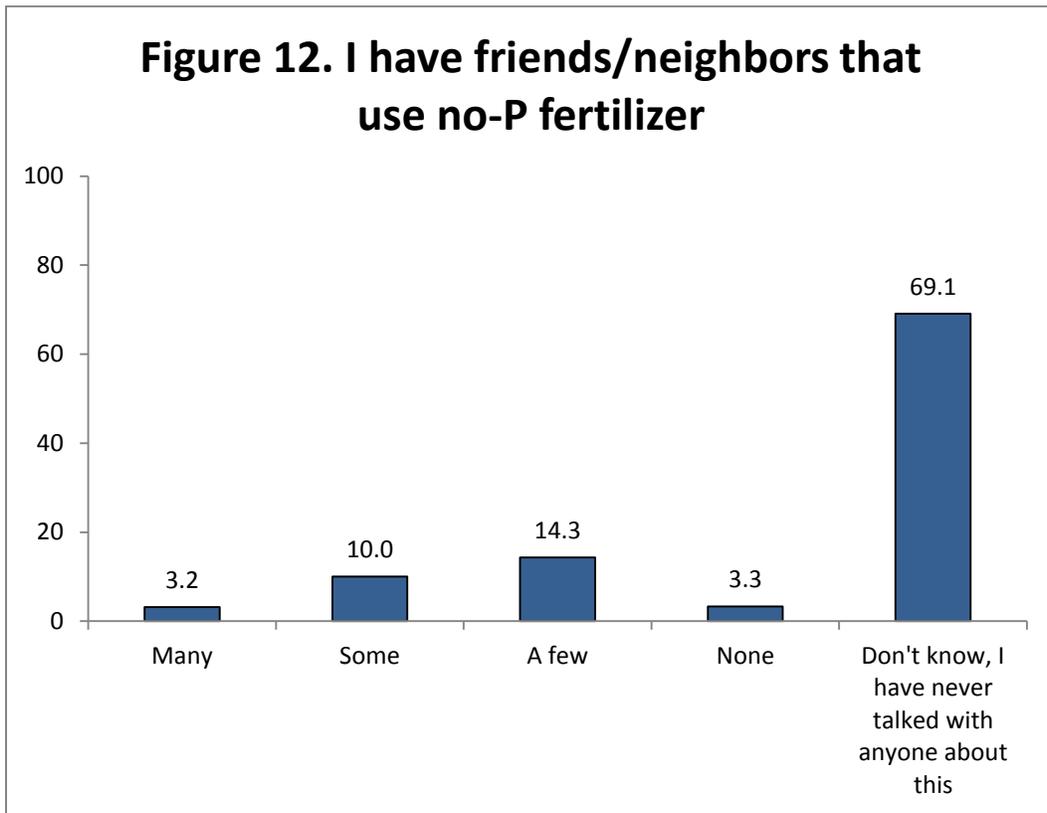


Figure 11. My homeowners association promotes the use of no-P fertilizer



Holmes Lake Residents Knowledge of Friends and Neighbors Activities



Behavior Influence and Intentions

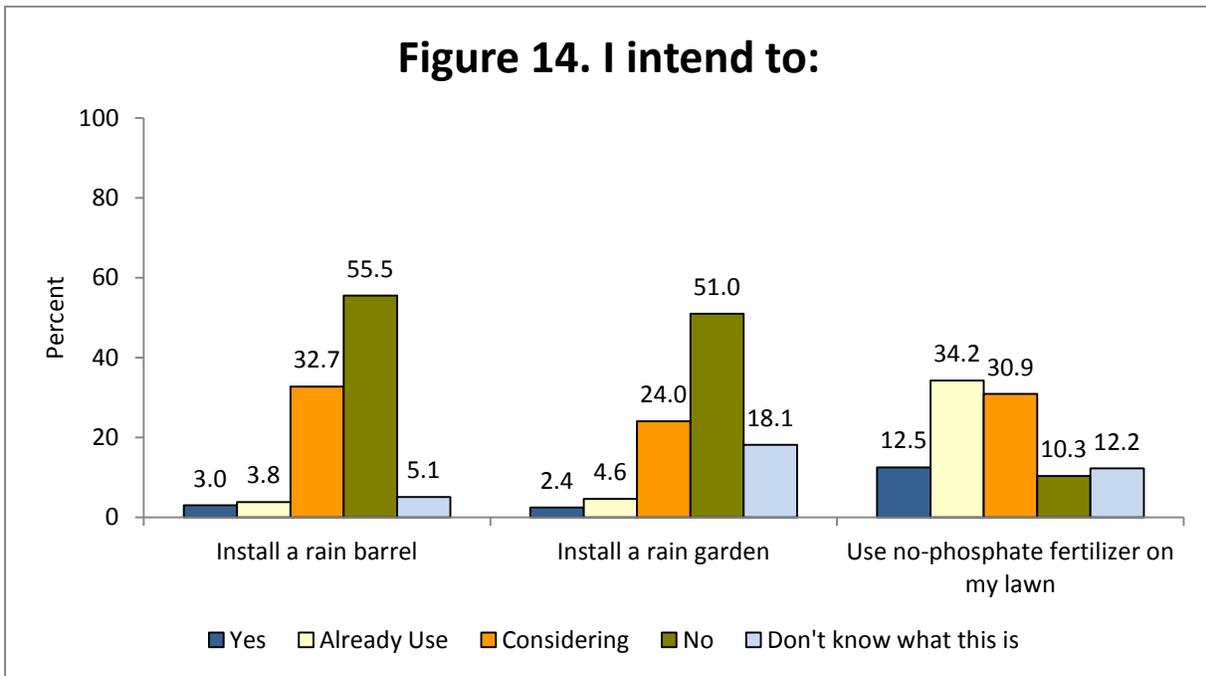
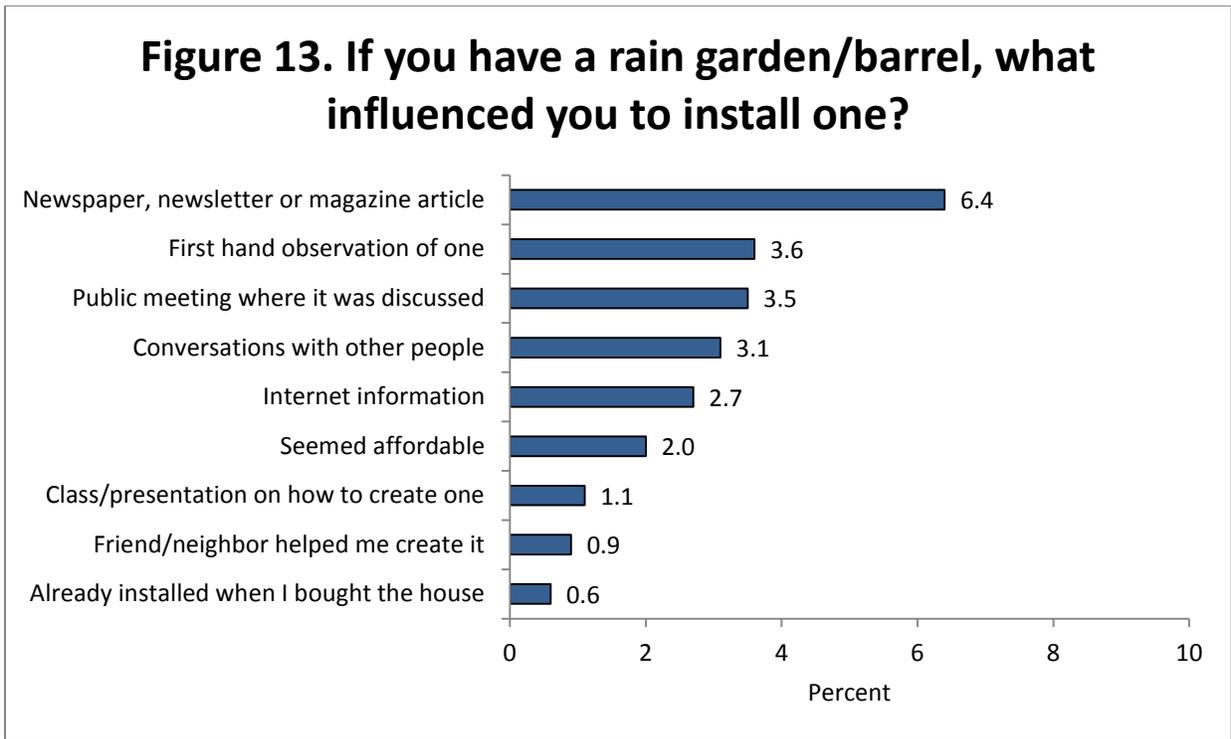


Figure 15. Landscaping Practices

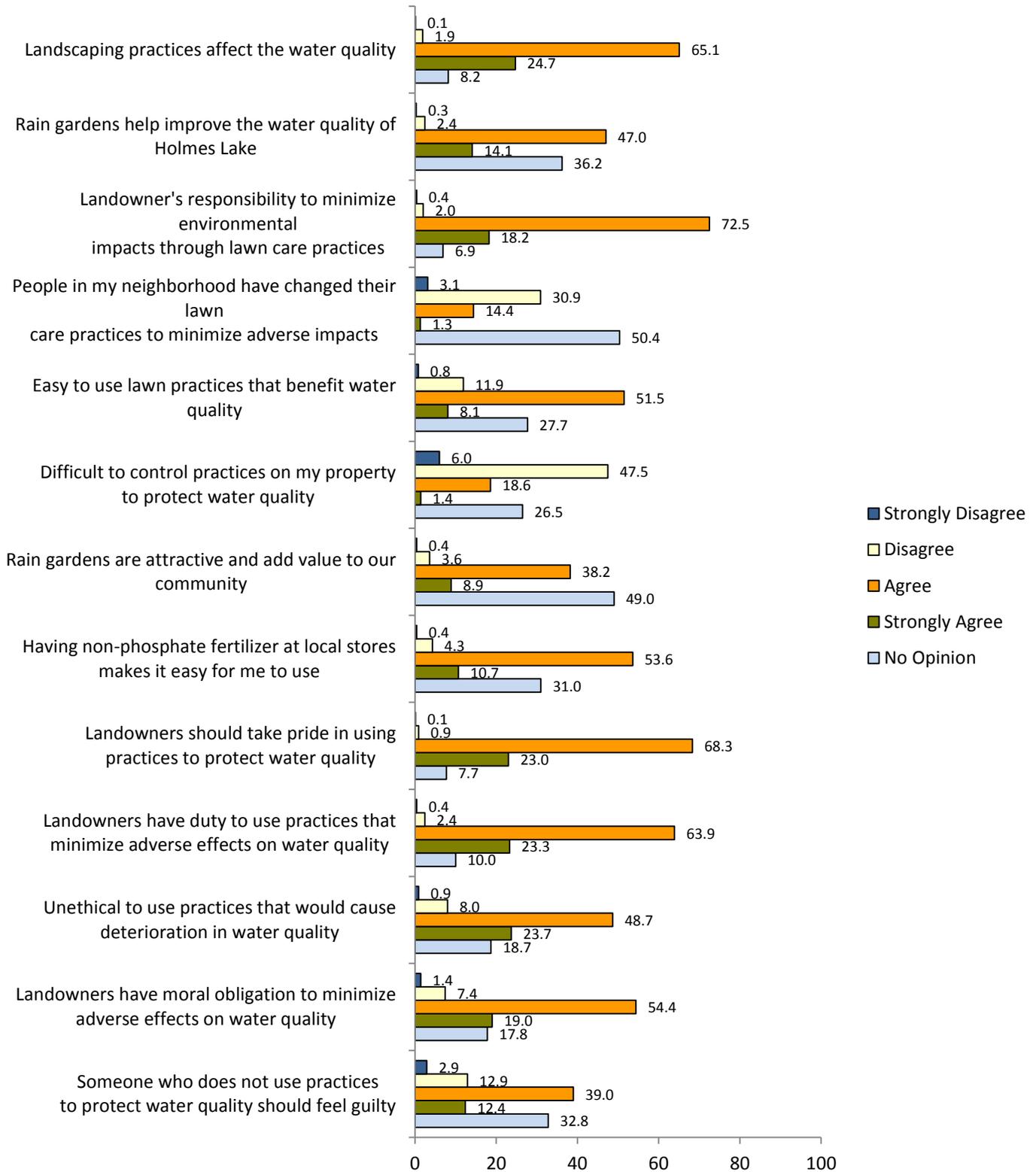


Figure 16. Water quality in Holmes Lake

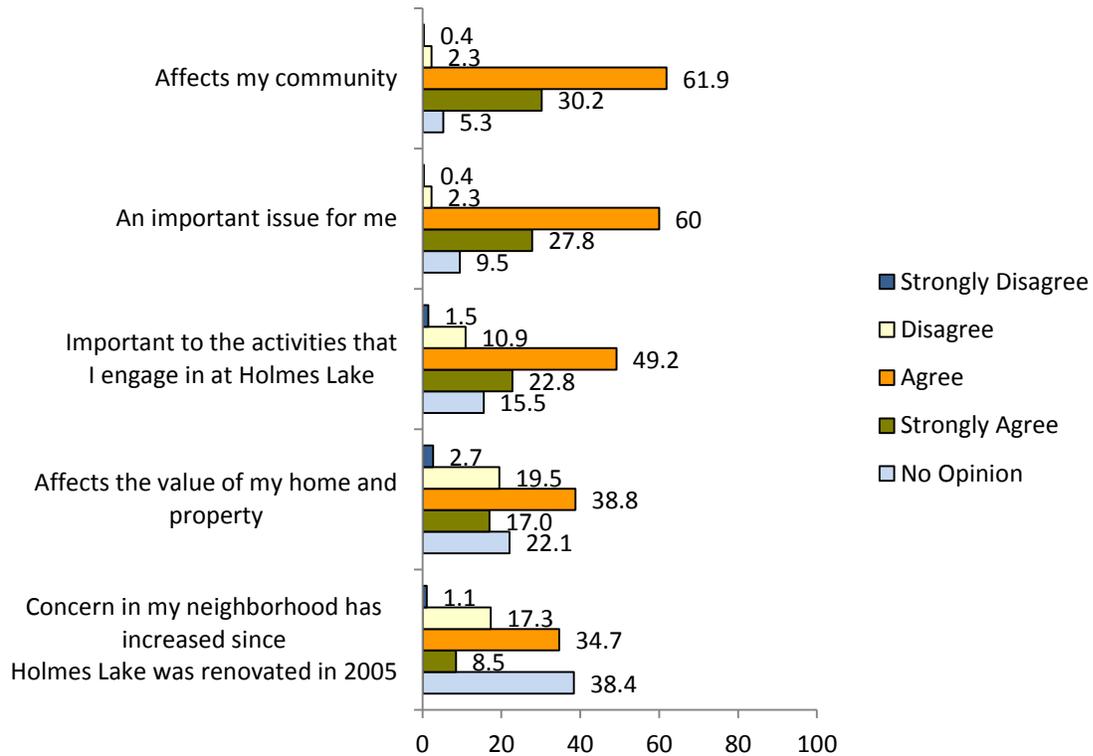
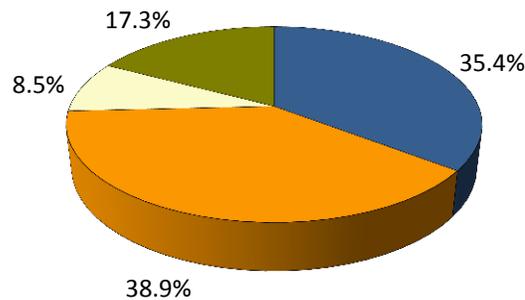
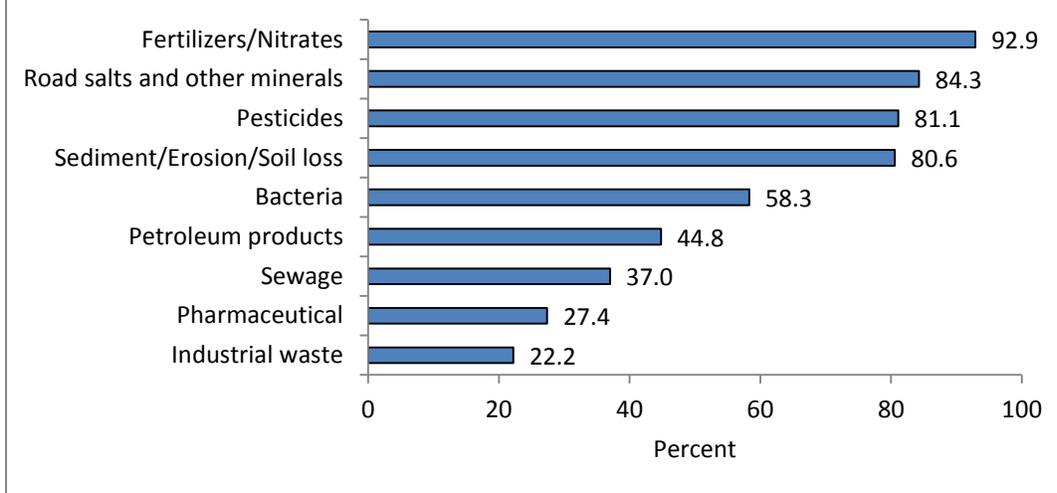


Figure 17. Do you think your community can protect the lake so it stays off a future impaired list? (n=792)



- Yes, chances are excellent we can continue to protect it and prevent future impairment
- Not sure we can change our landscaping practices enough to keep it off the list
- No, I do not believe we are doing enough to keep it off the impaired list
- I don't know

Figure 18. Which of the following do you think affect the quality of water in Holmes Lake? (n=808)



DISCUSSION

Several interesting findings from this study are revealed about landowners in the Holmes Lake watershed. While respondents were generally aware of water quality issues and the role of landscape practices in managing water quality they are largely unaware of the role of the watershed planning council and the City of Lincoln in protecting Holmes Lake. A large majority of Holmes Lake respondents (75%) know that runoff from their property drains to Holmes Lake; however, a large majority (84%) also do not know that the citizen watershed council plans to protect the lake and do not know how effective the council is in protecting the lake (80%). Ninety-three percent of the respondents have never attended a council meeting. A majority of the respondents don't know that the City of Lincoln actively promotes the use of no-P fertilizer (55%); whether or not their homeowner association promotes the conservation practices of rain gardens (63%) and no-P fertilizer (63%); or have discussed no-P fertilizer with others (69%). While most respondents do not intend to install a rain barrel (56%) or rain garden (51%), a majority are considering or already use no-P fertilizer (65%).

With regard to landscaping practices, a large majority of respondents agree or strongly agree that landscaping practices (90%) and rain gardens (73%) improve water quality and that landowners

have a responsibility to minimize environmental impacts (91%). However, a majority has no opinion or disagrees as to whether their neighbors have changed lawn care practices to minimize adverse impacts (81%). A majority agrees or strongly agrees that it is easy to use lawn care practices that benefit water quality (60%) and a majority disagree or strongly disagree that it is difficult to control lawn care practices on their property (54%). A small majority has no opinion, disagrees, or strongly disagrees that rain gardens are attractive or add value to the community (53%). A majority agree or strongly agree that having no-P fertilizer at local stores makes it easier to use (64%). A large majority agrees or strongly agrees that landowners should take pride in using practices that protect water quality (91%), have a duty to use practices that minimize adverse effects on water quality (92%), that it is unethical to use practices that cause deterioration in water quality (72%), and have a moral obligation to minimize adverse effects on water quality. A majority also agrees or strongly agrees that someone who does not use practices to protect water quality should feel guilty (51%).

A clear majority of residents agree or strongly agree that water quality in Holmes Lake affects their community (92%), is an important issue to them (88%), is important to the activities that they engage in at Holmes Lake (72%), and affects the value of their property (56%). However, a slight majority have no opinion as to whether concern in their neighborhood has increased since Holmes Lake was renovated. Additionally, a slight majority are not sure that landscaping practices can change enough to keep Holmes Lake off the impaired waterbodies list.

The results of this study indicate that landowner knowledge of landscape management practices impact on water quality and their ability to influence water quality is generally high. However, they generally are unaware of the Community Based Planning process and the activities the watershed management council and the City of Lincoln have taken to improve water quality in Holmes Lake. Future efforts to maintain good water quality in Holmes Lake should consider these two issues.

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APPENDIX

Holmes Lake Resident Survey 2009:

I intend to use no-phosphate fertilizer on my lawn (select one answer)

- a. Yes
- b. Already Use
- c. Considering
- d. No
- e. Don't know what no-phosphate fertilizer is

I intend to install a rain garden (select one answer)

- a. Yes
- b. Already Use
- c. Considering
- d. No
- e. Don't know what no-phosphate fertilizer is

I intend to install a rain barrel (select one answer)

- a. Yes
- b. Already Use
- c. Considering
- d. No
- e. Don't know what no-phosphate fertilizer is

The water from my land drains into:

- a. Oak Lake
- b. Holmes Lake
- c. Stevens Creek
- d. don't know/not sure

Which of the following do you think affect the quality of water in Holmes Lake? (select all that apply)

- a. fertilizers/nitrates
- b. sediment/erosion/soil loss
- c. pesticides
- d. bacteria
- e. petroleum products
- f. sewage
- g. pharmaceutical
- h. industrial waste
- i. road salts and other minerals

Holmes Lake has been on the US EPA impaired water body list over the past few years. Do you think your community can protect the lake so it stays off a future impaired list?

- a. yes, chances are excellent we can continue to protect it and prevent future impairment
- b. not sure we can change our practices enough to keep it off the list
- c. no, I do not believe we are doing enough to keep it off the impaired list
- d. I don't know

What recreational activities do you/have you engaged in at Holmes Lake?

- a. Walking/jogging
- b. picnicking
- c. sailing/boating
- d. sun bathing
- e. fishing
- f. play ground use
- g. sports events
- h. ice skating
- i. Biking
- j. other

How many years have you lived in Holmes Lake area?

- a. all my life
 - b. more than 10 years but not all my life
 - c. less than 5 years
 - d. 5-9 years
- Please circle one answer per question.

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Landscaping practices affect the water quality in Holmes Lake					
Rain gardens in the Holmes Lake area help improve the water quality of Holmes Lake					
It is each landowner's responsibility to minimize environmental impacts through their lawn care practices					
People in my neighborhood have changed their lawn care practices to minimize adverse impacts on water quality					
Concern for water quality in my neighborhood has increased since Holmes Lake was renovated in 2005					
Someone who does not use practices to protect water quality should feel guilty					
Landowners should take pride in using practices to protect water quality					
It is easy to use lawn practices that benefit water quality					
I find it difficult to control practices on my property to protect the water quality					
Landowners have a duty to use practices that minimize adverse effects on water quality					
It is unethical to use practices that would cause deterioration in water quality					
Holmes Lake water quality is an important issue for me					
The water quality of Holmes Lake affects my community					
Rain gardens in the Holmes Lake area are attractive and add value to our community					
I intend to use no P fertilizer next spring					
Landowners have a moral obligation to minimize adverse effects on water quality through their lawn practices					
The water quality and condition of Holmes Lake affects the value of my home and property.					
Having no-P fertilizer at local stores makes it easy for me to use the product.					
Water quality is important to the activities that you engage in at Holmes Lake					

I have friends and neighbors that use no-P fertilizer

- a. many b. some c. a few d. none e. don't know, I never had the conversation with anyone

My homeowners association promotes the use of no-P fertilizer

- a. yes
- b. no
- c. don't know

My homeowners association promotes installing rain gardens

- a. yes
- b. no
- c. don't know

The city of Lincoln actively promotes the use of no-P fertilizer

- a. yes
- b. no
- c. don't know

Are you aware of the citizen watershed council that helps plan for and protect the Holmes Lake watershed?

- a. yes if yes, have you ever attended a meeting? a. yes b. no
- b. no
- c. don't know

How effective is the citizen watershed council in protecting the local watershed?

- Very effective somewhat effective not effective don't know

If you have a rain garden or rain barrel, what influenced you to install one? (check all that apply)

- a. newspaper, newsletter and magazine article
- b. first hand observation of one
- c. conversations with other people
- d. public meeting where it was discussed
- e. class/presentation on how to create one
- f. seemed affordable
- g. friend/neighbor helped me create it
- h. internet information
- i. already installed when I bought the house

What year were you born? 19 ____

What level of education have you completed?

- a. less than high school or some high school
- b. high school graduate/GED
- c. some college or vocational training
- d. college graduate
- e. advance college/professional degree

Are you? male or female

