Stillaguamish Lakes Outreach Community Assessment - *Lake Howard & Lake Ki*

Snohomish County Public Works Surface Water Management,

Lakes Management Program

Research Conducted by Washington State University Extension

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Introduction

Several lakes within the Stillaguamish Watershed in Snohomish County are exhibiting declining water quality trends. For most of these lakes, non-point source pollution is the primary cause of excessive nutrient inputs from residential sources such as: yard care practices, pet waste, poorly maintained septic systems, and stormwater runoff. The Snohomish County Lake Management Program would like to work with lake communities to reverse trends towards declining water quality. To achieve long-term nutrient reduction, changes in current residential practices in the identified problem areas as well as shoreline restoration need to be adopted and implemented by lake community residents.

The purpose of this study is to better understand the current level of community awareness regarding water quality issues and to identify barriers and possible motivators for changing current household practices. The study relies on telephone interviews of lake and watershed residents from a sub-sample of lakes from the Stillaguamish watershed, which includes Lake Ki and Lake Howard.

The specific landowner practices investigated during this research endeavor include:

- Rainwater Runoff
- Lawn Fertilizer
- Septic Systems
- Shoreline Buffers

Study Goals

1. Identify citizen awareness levels of lake water quality problems and causes and explore citizen awareness levels concerning the connection between resident actions and water quality.
2. Characterize the current behaviors of lake community residents with regards to specific landowner practices.
3. Determine the barriers and incentives to implementing additional and/or different practices that will improve water quality.

Assessment Outcomes

Survey results will assist the Snohomish County Lake Management Program to:

1. Identify the starting point for building awareness in outreach efforts to lake residents.
2. Clarify the focus of outreach efforts by choosing one or two of the landowner practices.
3. Identify strategies using incentives and resources that will best encourage landowners to adopt these desired practices.

Methods

Sample: A total of 211 households in the Lake Ki and Lake Howard watersheds were contacted via mail to introduce the study and request their participation. Some letters were returned due to bad addresses while other respondents no longer had working phone numbers. Of the 211 households, 175 were contacted via phone. Each household was called at least twice though messages were left for residents only once. Some residents reached out to interviewers after receiving their letter or first phone call. A total of 50 landowners were interviewed during the first three weeks of December 2011. Respondents had to be adult property owners or spouses to participate in the survey. Respondents were divided into shoreline property owners and watershed property owners. Watershed property owners were those residing in the watershed but not along the lakeshore.

Method: Telephone interviews with residents were conducted to produce qualitative data. The sample size of respondents was insufficient to produce quantitative, statistically valid data. This data provides a qualitative understanding of residents' perspectives; however it is not possible to generalize the data to the broader population of lake residents.

Timeframe: Data was collected during December 5-22, 2011

Data collection: Telephone interviews were conducted during daytime and evening hours and also on Saturday. At least two phone calls were made to each household during the course of the timeline. Interviews were conducted by experienced social scientists. Comments made by respondents during the length of the interview were typed during the interviews. Interview questions consisted of a possible total of 35 questions. However, questions were tailored for specific landowner type, i.e. watershed or shoreline. Comments were verified by respondents to ensure that interviewers understood the context and meaning of the comments made. Microsoft Excel was used in the analysis of both the qualitative and quantitative data. Interviews lasted an average of 26 minutes per call.

Data Analysis: Analysis of data was conducted in Excel. For the data collected that consisted of qualitative or narrative responses, researchers coded the comments into categories that emerged from the narrative. Some comments emerged multiple times where others were concepts that came up only once or twice. These were included to show the differences and similarities between groups and individual respondents.

Note: Not all percentages add up to 100% due to rounding, and some responses were coded into multiple categories if respondents brought up multiple issues in response to a question. "n" indicates sample size, i.e. n= total number of respondents in sample.

Respondent Characteristics

The table below represents the demographic and ownership characteristics of the 50 households interviewed during the course of the study. Information is not available on the characteristics of the respondents who did not participate in the interviews; therefore it is difficult to assess any major differences between those who participated in the survey and those who did not. Respondent contacts were randomized throughout each ownership type and location in order to try and reach the broadest representation possible.

There is always the possibility that some bias exists within the population of residents who participated versus those who did not. For example, there may be some evidence that respondents who are more motivated by preserving water quality and maintaining the health of "their lake" are more likely to participate in an interview concerning practices tied to water quality. However, no systematic analysis was conducted to parse out the differences between respondents who participated and those who did not.

Respondent Characteristics		Percentage of Respondents (n=50)
Age Group	35-49	8%
	50-64	44%
	65 and older	48%
Gender	Male	58%
	Female	38%
	Couple	4%
Property-type	Watershed	42%
	Shoreline	58%
Residence	Residence on property	100%
	Undeveloped property	0%
Ownership	Owner Occupied	98%
	Renter Occupied	2%
Length of Ownership	Average length	26 years
	Median	22 years
Type of Ownership	Full-time	84%
	Seasonal	16%

Summary of Key Findings and Recommendations

Goal 1: Identify citizen awareness levels of lake water quality problems and causes and explore citizen awareness levels concerning the connection between resident actions and water quality.

Residents of Lake(s) Ki and Howard represent a fairly heterogeneous group. It appears that shoreline residents are much more aware of water quality problems and perceive the health of the lake as declining. Further, Lake Howard shoreline residents are much more aware of declining water quality than Lake Ki shoreline residents. It is important to note that 42% of Lake Howard residents interviewed attended a Snohomish County workshop on water quality in November 2011, which brought to light the water quality problems in the lake. In total around 20% of all respondents think water quality is *not good* and over 25% think water quality is *very good*. When asked about the sources of pollution, 88% of respondents agreed with the following statement:

> *"Most of the pollution entering the lake doesn't come from a local farm or someone dumping pollution directly into the water. It comes from the homes around the lake and it's carried into the lake by rain running off the ground*."

Indeed, residents are generally aware of the fact that households around the lake are largely responsible for the lake's water quality. Residents living in the watershed reported having less of a direct connection to the lake and typically were less certain about the causes of declining water quality.

The top factors affecting water quality as noted by respondents include problems with septic systems, runoff, development/population pressure, fertilizer use and boats/recreation. Residents also had concerns about waterfowl (ducks and geese) and their effect on water quality. Additionally, Lake Ki residents were worried about public access, pollution from Fourth of July celebrations and general effluent from the highway that is adjacent to the lake.

Goals 2: Characterize the current behaviors of lake community residents with regards to specific landowner practices and Goal 3: Determine the barriers and incentives to implementing additional and/or different practices that will improve water quality.

Rainwater Runoff: Respondents largely stated that runoff from their property soaks into the ground and causes no problems for them. A few expressed their frustrations with Snohomish County engineers, citing personal anecdotes about how runoff management has been worse since the County got involved. However, others cited the converse and said the County engineers had developed a good system. Fifty four percent of respondents claimed they would not want additional resources to manage runoff on their property. However, some landowners were interested in additional resources, including both financial and technical assistance.

Changing landowner practices in regards to stormwater runoff will be a challenging "sell" to landowners who are largely happy with the status quo. The Lakes Management Program will need to illustrate the flaws with current systems being used in order to demonstrate the need for change.

Lawn Fertilizer: Ninety-four percent of respondents indicated that they have a lawn, and 40% of those say they fertilize at varying frequency. However, only 31% of shoreline respondents indicated that they fertilize compared to 52% of watershed respondents. No Lake Howard shoreline respondents said that they fertilize their lawns. It is evident that watershed residents who participated in the survey are less clear about the potential for fertilizers from properties located further from the lake to pollute the lake. For those who do not fertilize, they note that they "do not need to" and that they want to "protect the lake."

The main identified reason for applying fertilizers is that respondents want to have a nice, green lawn that is free of moss and weeds. Over half of those who fertilize only do so once or twice a year. Additionally, 32% of respondents indicated that they already use phosphorous-free or slow release fertilizers when they do fertilize. On the whole, respondents were very open to changing their fertilizer practices, particularly if that will help the lake. Their main concerns are related to the cost of the alternatives and the desire to learn more about these through workshops and/or discounted products.

Changing landowner practices with regards to fertilizer management appears to be the best candidate for outreach efforts with the most willingness to participate on behalf of landowners and the potential outcomes for water quality.

Septic Systems: On average respondents indicated that they had their systems pumped or inspected within the last 3-4 years. Sixty-six percent report that they have their systems "regularly" pumped, defining "regularly" at a little over 4 years. Most respondents would be likely to have their system inspected in the next year if financial incentives were provided. Seventy percent of respondents did not have any concerns with having their systems inspected.

Fewer were willing to participate in a workshop though, most citing that they prefer to call in the professionals, or have expertise in-house, and another 12% reporting having already taken a septic system workshop. Others did note that they were concerned with the possible costs associated with fixing systems or dealing with problems found in an inspection. While this issue did not come up too frequently, it would be important to clarify or address landowner fears around costs associated with problems found in an inspection.

Respondents on the whole are willing to have their systems inspected within the next year; however recommendations about the frequency/need for regular septic system care and maintenance need to be conveyed to respondents. Many felt good about their current

maintenance plan; others were confident in their system's capacity to handle the number of people in the household and/or the newness of the system.

Shoreline Buffers: Out of all respondents interviewed, only 29 of them had shoreline properties. Of these respondents, 62% had swimming beaches, 97% had docks and 76% of them had lawn within 20 feet of the shoreline. About a third of respondents reported having natural shorelines. Respondents living on Lake Ki appear to have a stronger desire to maintain beach access and views of the lake in comparison to respondents living on Lake Howard. Willingness to change the shoreline to anything more natural is very limited.

Respondents want to preserve views and beach access. Many stated that they already have plenty of natural shoreline on their property. There are some concerns about wetland delineation on the lakes and fear about government intervention on private property due to wetland requirements. Some respondents also indicated that they felt the County has sent mixed messages about expectations for shoreline management. Some respondents did indicate a willingness to receive technical help, discounted plants or more information on the types of plants suited for the shoreline environment.

Enhancing shoreline buffers will be a harder sell to shoreline landowners. The important thing to emphasize will be specific varieties of plants, grasses and shrubs that provide more filtration of runoff while not inhibiting views or beach accessibility. Starting with doable, small actions such as growing grasses longer, removing a little bit of lawn or providing cheap plants and landscaping ideas might help residents to shift some of their shorelines to provide more area to help filtrate runoff.

Strategic Focus:

Also, it is important to note that information about the causes of water pollution, the current state of water quality and easy to implement solutions would generally be well received. Many residents reported a lack of confidence in their understanding of water quality.

Given the relative willingness of respondents to change fertilizer practices and septic system management, outreach efforts in these areas will likely result in the highest implementation rate. If other practices (managing rainwater runoff or restoring shoreline buffers) would result in the greatest improvement to water quality, outreach messages must overcome the strong barriers stated by respondents.

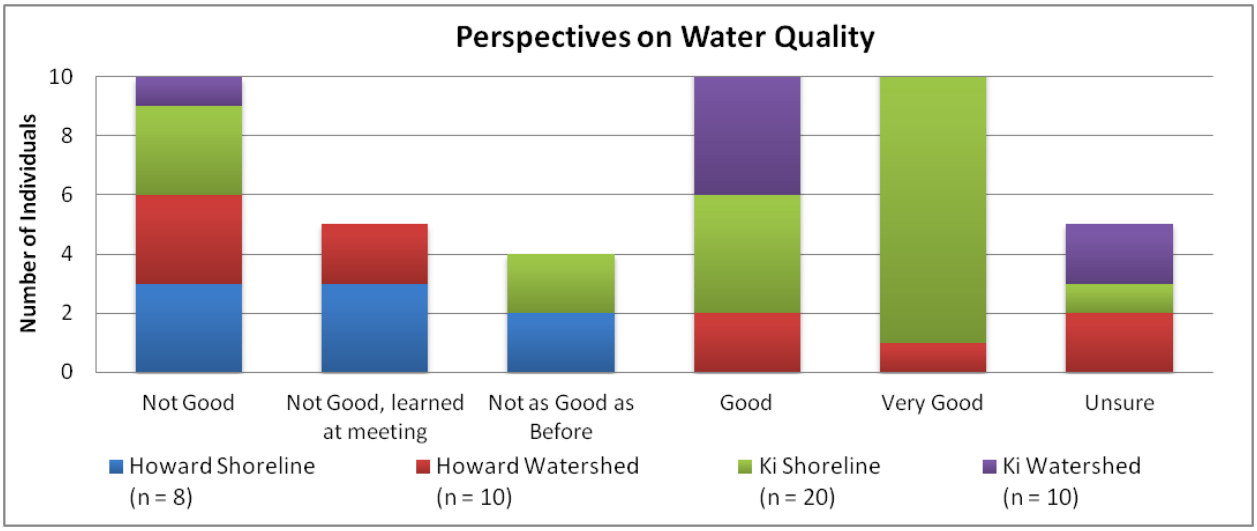
Respondents most clearly stated their willingness to receive information delivered by experts. Based upon direct or indirect frustrating experiences with government agencies (Snohomish County and other state agencies), outreach efforts should partner with community leaders and may benefit by partnering with organizations such as WSU Extension.

Discussion by Question

Perspectives on Water Quality

Question 3: What is your perception of the lake's current health?

Respondents living on Lake Howard's shoreline were most aware of the problems with water quality. Some learned about declining water quality at a community meeting held by the Lakes Management Program. Lake Ki residents' perception of health of the lake is that it is very good.



Question 4: What things do you think could affect the lake's water quality?

Respondents were asked about what factors might be affecting the lake's water quality. The following table describes the majority of their responses. Those responses made by less than 6% of respondents were omitted here.

Factors affecting WQ	Percentage
Septic Systems	44%
Runoff	36%
Development	34%
Fertilizers	30%
Boats/Recreation	22%
Weeds/algae	18%
Pollution/lawn chem.	12%
Water Fowl	12%
Fourth of July	8%
Cars/HWY	8%
Livestock (include goats and chicken)	8%
Non-Resident Recreation	6%
Pesticides/herbicides	6%

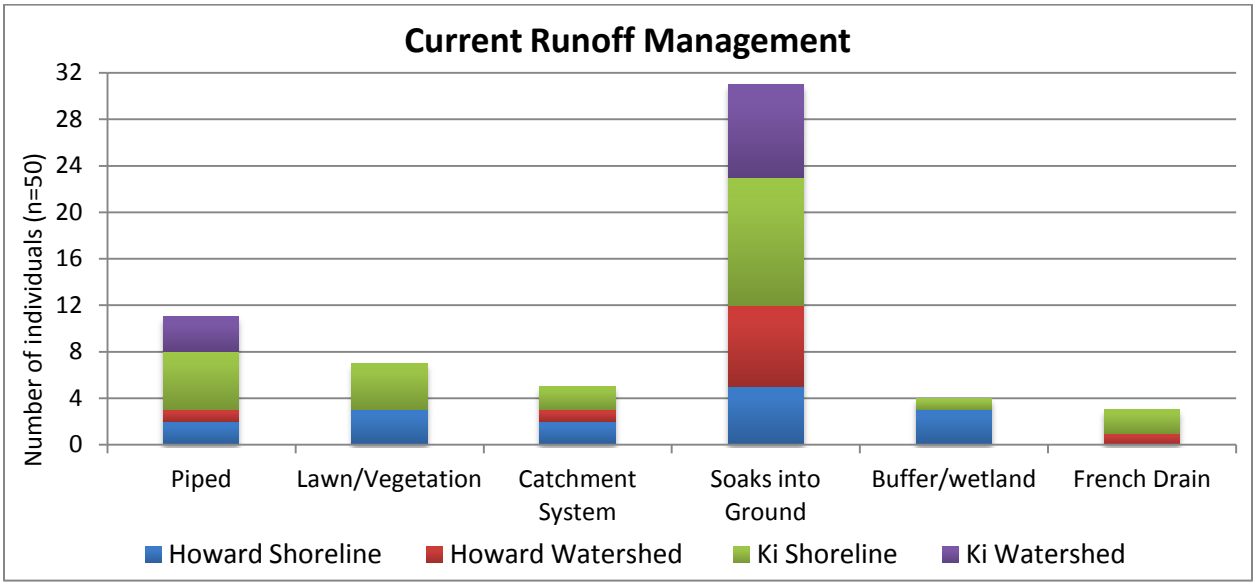
Question 5: "Most of the pollution entering the lake doesn't come from a local farm or someone dumping pollution directly into the water. It comes from the homes around the lake and it's carried into the lake by rain running off the ground." *Do you agree with this statement?*

Eighty-eight percent of all the respondents agreed that water quality was most affected by the homes around the lake. No one directly disagreed with the provided statement about water quality. The remainder of respondents was unsure about the statement. Respondents clarified their answers here by pointing out the factors affecting water quality as described in Question #3.

Rainwater Runoff

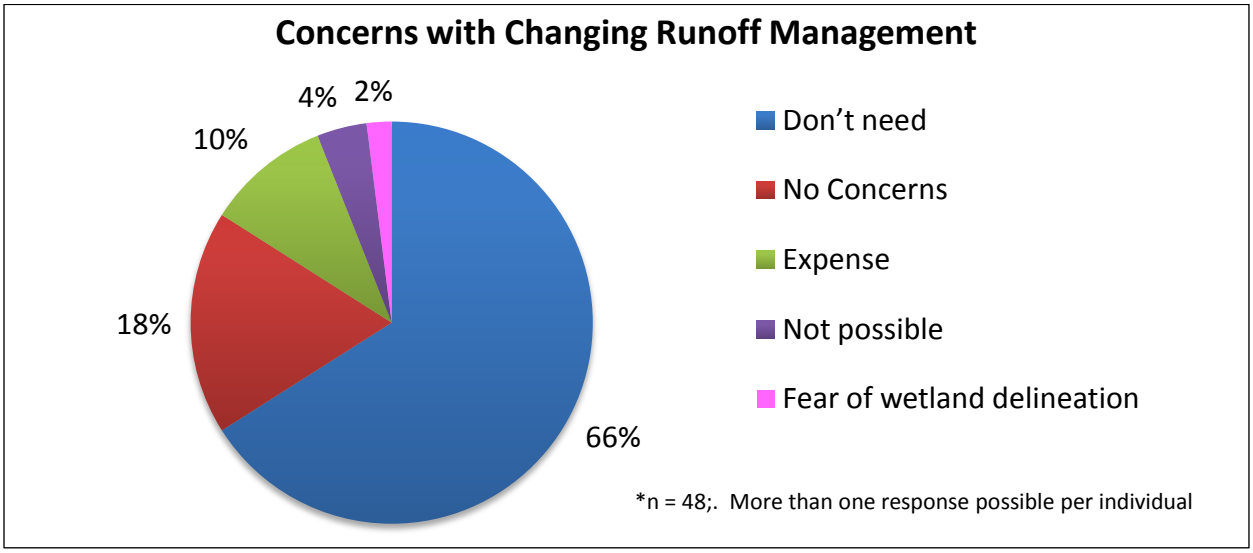
Question 6: How does the rainwater running off your roof and driveway get to the nearest ditch or stream (or lake for shoreline owners) – does it go into a pipe, run over the ground, or soak into the ground?

A majority of respondents on all landowner types noted that runoff simply soaks into the ground or is a combination of the alternatives offered in the question. Some respondents noted specialized catchment systems, the presence of a French drain, in particular, or wetlands on their property.



Question 8: Rainwater running off roofs and driveways picks up pollutants and carries them to the lake over the ground as well as through streams, pipes and ditches. When the runoff is able to soak into the ground, pollutants can be filtered out by plants and soils, helping to protect the lake. Some ways to let the rainwater soak into the ground are to re-route it into planting beds, to spread it across the lawn, or to direct it into a dry well or rain garden. What concerns come to mind for using one of these options to manage rainwater on your property?

Eighty -four percent (n=50) of residents responded that the runoff leaving their property causes no problems for them. Respondents do note some concerns they have when considering changing their current runoff management practices.



Question 9: On a scale of one to five with 5 being very likely and 1 being not likely, how likely are you to use one of these ways to manage water that runs off your roof and driveway?

By and large respondents are pretty happy with their current runoff management system. Most did not see a reason to change their behavior because the status quo is working well for them. Over half indicated that they were already implementing the preferred strategies for managing rainwater which included: re-routing into planting beds, spreading across lawn, or directing water into a dry well or rain garden.

Likeliness to Change Current Runoff Practices (Scale 1-5)		Percentage of Respondents (n=50)
Not Likely	**1**	24%
	2	0
	3	4%
	4	4%
Very Likely	**5**	16%
Already Do		52%
Average Number (between 1-5)		2.75
Median Number		2

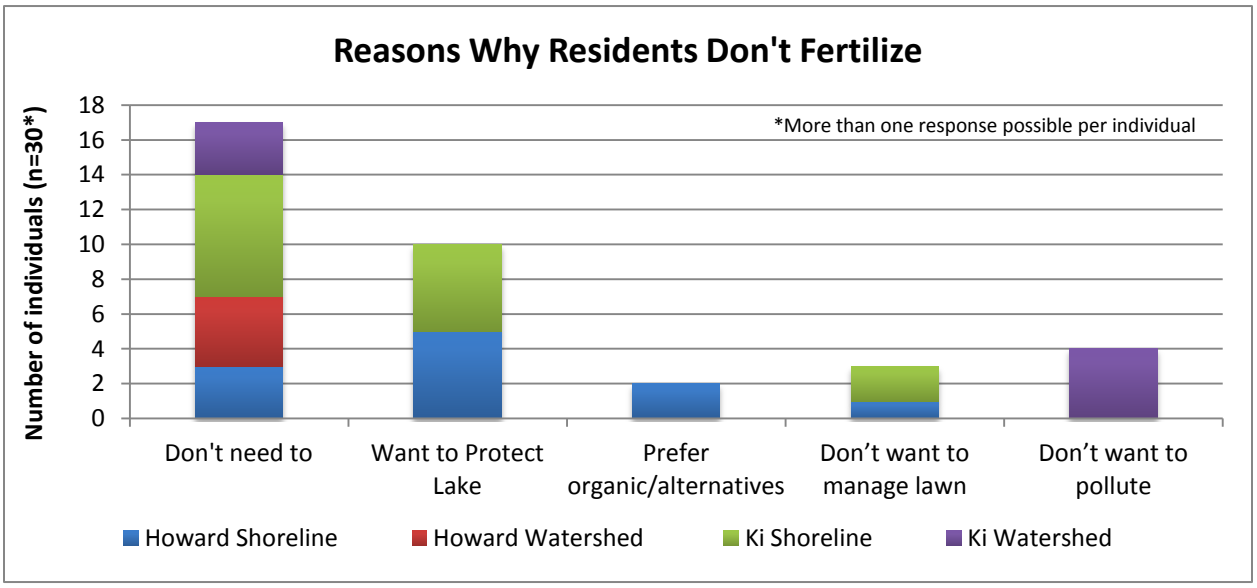
Most respondents did not think they needed any additional resources (54%) because they were not intending to change their management practices (n=48). However, a few were interested in getting additional resources on runoff management, which included: technical expertise (27%), financial incentives (17%) and rain garden design (10%).

Lawn Fertilizer

Changing fertilizer management practices holds the most promise in regards to changing behaviors among lake residents. Fewer residents living along the shoreline are fertilizing their lawns. Ninety-four percent of all respondents have a lawn. Fifty-two percent of watershed landowners fertilize compared to 31% of the shoreline landowners. Lake Howard shoreline respondents indicated that they do not fertilize largely due to fear about polluting the lake.

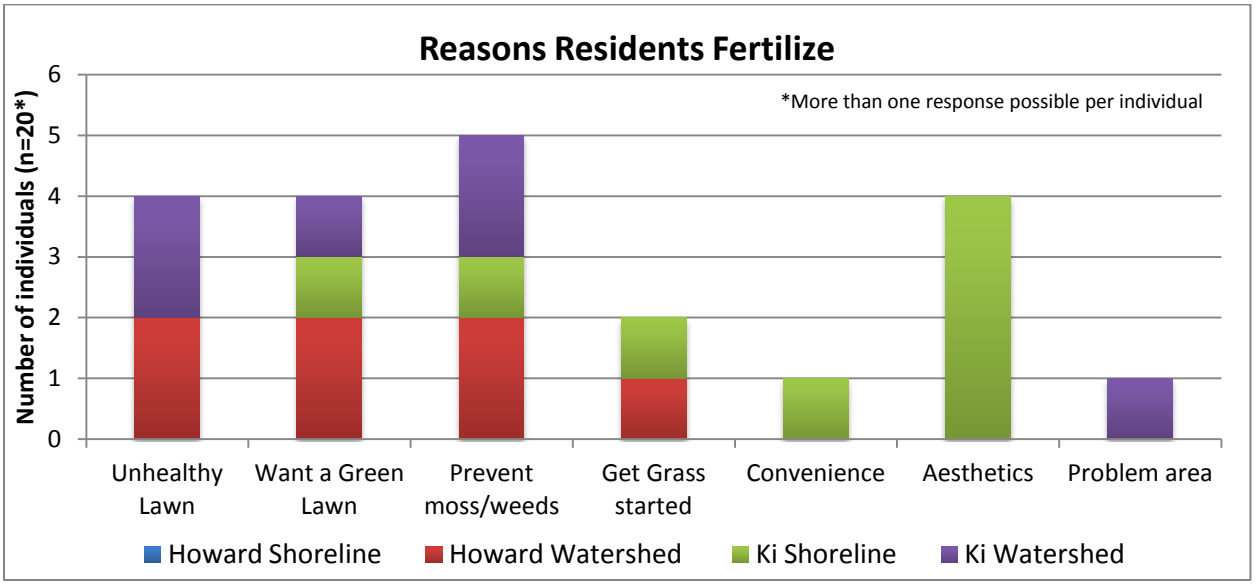
Question 13: Why do you choose not to use fertilizer?

For those that do not fertilize their lawn (out of all respondents 60% do not), the majority indicated that they do not need to. In particular shoreline residents indicated that they want to protect the lake. Lake Ki residents indicated that they do not want to pollute but did not draw direct connections between their actions and the lake.



Question 14: Why do you choose to use fertilizers on your lawn?

For those who do fertilize their lawns they claimed that fertilizing is necessary to create nicer, greener lawns and lawns free of moss and weeds.



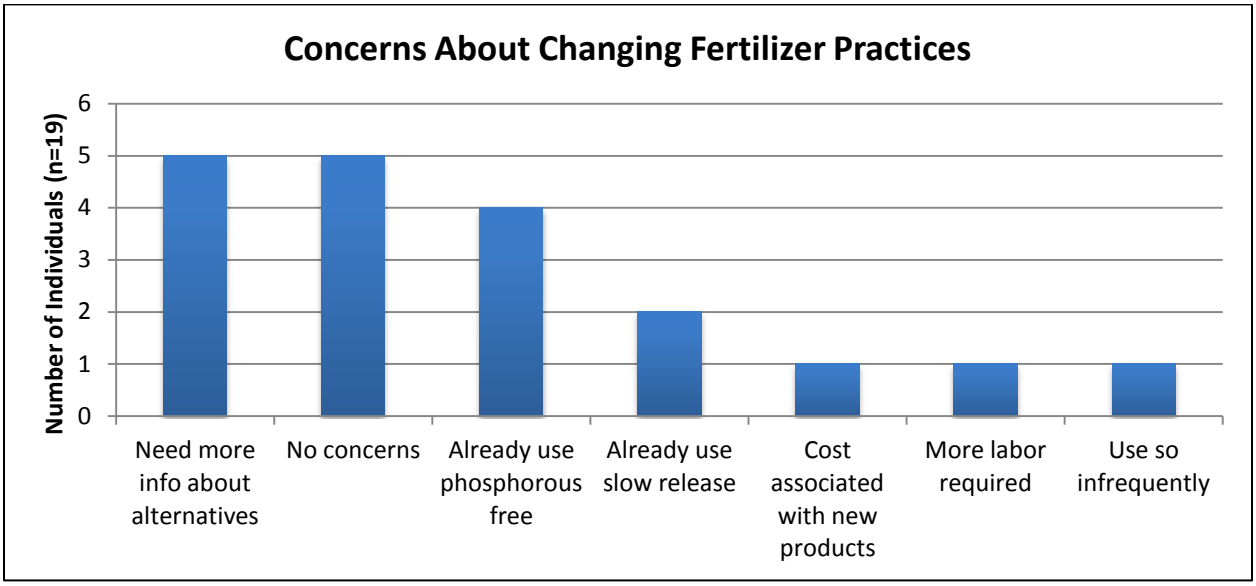
Question 15: How frequently do you apply fertilizer?

For those that fertilize most do so between one and two times a year while others noted that they only use phosphorous-free fertilizers. Many respondents said that they only fertilize every few years to get grass seed started or address problem areas.

Fertilizer Frequency	Percentage of Respondents (n=19)
1 time a year	32%
2 times a year	32%
3 times a year	11%
Every few years	16%
Rarely	5%
Every six weeks	5%

Question 16: One thing we have found is that nutrients from fertilizers can hurt lake water quality. There are alternatives that can reduce the impact of fertilizers on the lake. These alternatives include: using slow-release or phosphorus-free fertilizers or not using fertilizer at all. What concerns come to mind when thinking of switching to one of these alternative approaches?

When asked what concerns respondents have for changing current fertilizer practices, many respondents didn't have any. Most concerns related to needing more information about alternatives and the potential costs associated with them. Some respondents (32%) also noted that they already use phosphorous-free or slow release fertilizers.



Question 17: If you knew you could still have a healthy lawn, how likely are you to change your current fertilizer practices to reduce their impact on the water quality in the lake? On a scale of 1 to 5, with 5 being very likely and 1 being not likely what best represents your thoughts on this?

Respondents were very open to changing their fertilizer management practices. This particular issue appears to be a very good priority for outreach since residents are already open and willing to change their behavior if given a little more information.

Willingness to Change Fertilizer practices (Scale 1-5)		Percentage of Respondents (N=20)
Not Likely	**1**	0
	2	0
	3	5%
	4	14%
Very Likely	**5**	45%
Already Have Changed		35%
Average Number (between 1-5)		4.62
Median Number		5

Respondents indicated specific things that would motivate them to change their current fertilizer practices. These include (n=15):

- Discounts on materials (47%)
- Workshop (20%)
- Additional information on products and availability (20%)
- Recognition (14%)

Septic System Maintenance

On average, respondents had their septic systems inspected or pumped a little over three years ago. Seventy percent[1] of those respondents said that they had their systems "regularly" pumped. Respondents defined regularly at a little over 4 years, on average.

Question 22: If you knew there was financial assistance available for septic system repairs, how likely would you be to have your system inspected in the next year? On a scale of one to five with 5 being very likely and 1 being not likely what best represents your thoughts on this?

Many respondents were willing to have their septic system inspected within the next year if provided with financial incentives.

Willingness to Have Septic System Inspected w/in year (Scale 1-5)		Percentage (n= 48)
Not Likely	**1**	26%
	2	4%
	3	11%
	4	6%
Very Likely	**5**	43%
	Unsure	6%
	Already have it inspected regularly	6%
	Average number (between 1-5)	3.42
	Median number	4.25

Some respondents noted that they had some concerns with having their systems inspected or pumped within the next year. While 70% of respondents did not have concerns, those that did cited the following issues:

- May lead to costly repairs (9%)
- Have new system, inspection unneeded (9%)
- Prefer to call professionals when needed (6%)
- Prefer not to disclose financial situation (2%)
- Recently inspected (2%)

Question 23: How likely would you be to attend a workshop on septic system care and maintenance held in your neighborhood? On a scale of one to five with 5 being very likely and 1 being not likely what best represents your thoughts on this?

Respondents were less likely to attend a workshop on septic system care and maintenance when compared to getting their system inspected within the next year. Only 35% of respondents indicated that they had any concerns with taking a septic system workshop. These

[1] *Based on 47 respondents – one respondent has new system and two others have outhouses.*

respondents wished to qualify their low willingness to participate in a septic system workshop. Some reasons that respondents were unwilling to take a septic system care and maintenance workshop include (n=17):

- Already have expertise (29%)
- Have taken workshops before (35%)
- Trust professionals (12%)

Willingness to take septic workshop (Scale 1-5)		Percentage (n=48)
Not Likely	**1**	42%
	2	6%
	3	8%
	4	10%
Very Likely	**5**	33%
Average number (between 1-5)		2.89
Median number		3

Question 24: What ideas do you have to encourage you or your neighbors to attend such a workshop? Note: Multiple answers were encouraged

When respondents were asked how they or their neighbors could be encouraged to attend a septic system care and maintenance workshop, they listed a set of great ideas. These have been included as they capture general ideas about how to do outreach to residents living on or near both Lake Ki and Lake Howard.

Incentives for participating in workshops	Percentage (n=47)
Don't Know	28%
Frame the problem: Improving water quality	23%
Hold meeting in community space/ Comfort	13%
Financial incentives	11%
Flyers/Mailers	13%
Use community leaders to outreach	13%
Bundle with other workshop topics	6%
Provide different options of days/evenings	6%
Send emails	4%
Have private org./expert run meeting	4%
Include new information, many already have older information	4%
Make phone calls	4%
Assuage fears about costs	2%

Shoreline Buffers

Only respondents who live on Lake(s) Ki and Howard shorelines answered the following questions about shoreline buffers for a total sample size of 29. Sixty-two percent of owners had swimming beaches, with more swimming beaches on Lake Ki among those interviewed. Almost all respondents had docks (97%). Many of these same respondents had a lawn within 20 feet of their shoreline (76%). However over a quarter of respondents indicated that they already had a natural shoreline buffer (28%).

For respondents who have chosen to keep their shorelines natural they listed the following reasons (n=8):

- Wetland on property (38%)
- Desire to keep natural shoreline (38%)
- Couldn't change it (13%)

Question 29: A naturally vegetated shoreline with taller grasses, trees, or shrubs acts like a filter and prevents pollution from reaching the lake. If you could still preserve lake views and access to the water, how likely would you be to replace some of your lawn along the lakeshore with taller grasses, shrubs, or trees to help protect water quality? On a scale of one to five with 5 being very likely and 1 being not likely what best represents your thoughts on this?

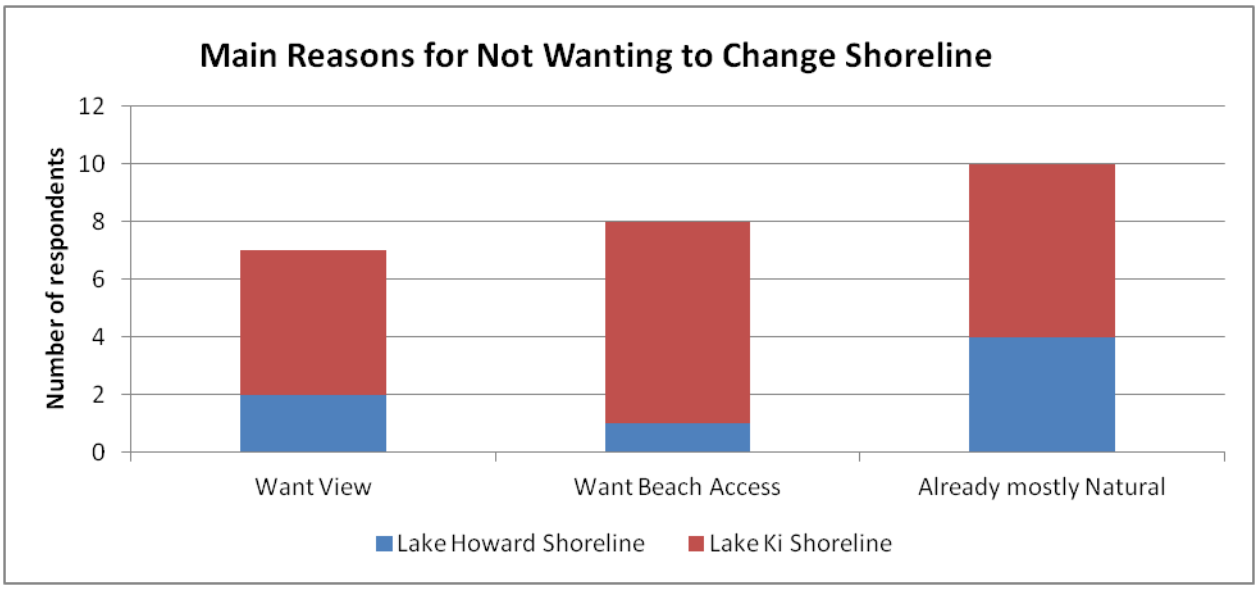
When comparing shoreline management to other management practices that landowners could chance, changing shoreline buffers would be the least likely activity that landowners would engage in.

Respondents in general want to preserve beach access and views on their properties and are hesitant to make changes on their properties as a result of this. Respondents from Lake Ki are more concerned about preserving views and beach access when compared to respondents on Lake Howard.

Willingness to Change Shoreline (Scale 1-5)		Percentage (n=21)
Not Likely	**1**	52%
	2	10%
	3	5%
	4	0
Very Likely	**5**	10%
	Unsure	24%
	Average number (between 1-5)	1.75
	Median number	1

Question 30: What are your concerns about changing your shoreline? Note: Respondents were encouraged to give multiple answers.

In general, people were not as open to making changes to their shorelines. This is likely due to their attachment to lake views and beach access. It may be possible to engage landowners in discussions about shoreline management if it is tied to preserving water quality at both Lake Ki and Lake Howard. In addition, if residents could be shown that they could indeed preserve access and views while adding more of a shoreline buffer, they may be willing to do so. However, due to the strong responses given by respondents who do not want to make changes to their shorelines, outreach efforts must overcome these barriers to be effective at all.



Question 31: If you were to change your shoreline, what types of assistance or resources would be most helpful?

Respondents were asked to list what types of resources would be most helpful if they were to change their shoreline in any way. While the majority of them do not want to change their shoreline from its current state (71%), others do note some additional resources that might be helpful if they were to change their shoreline.

- Discounted plants (14%)
- Workshops/Specifically on types of plants to use and where to plant it (14%)
- Help with labor (5%)

Recommendations for Strategic Outreach

Telephone interview participants largely want to preserve water quality at their lake(s). While many of them believe that the water quality at their lake is good or very good, many are concerned about it declining. Residents at Lake Howard have been more educated about the declining health of the lake in comparison to Lake Ki residents. The Snohomish County Lakes Management Program should focus on areas for outreach and action that have the most traction with residents. Outreach on fertilizer management and septic system maintenance may produce the best results given the relative willingness on the part of landowners to engage in new management practices in these areas.

Residents are somewhat resistant to making changes to their shorelines or to managing their runoff differently than they are already doing. It may be difficult to do outreach in these areas due to a lack of willingness coupled with lack of clarity on the importance of changing behaviors. In order to conduct effective outreach on rainwater runoff and shoreline buffers, barriers for residents must be overcome. In the case of rainwater runoff, residents need to have more information about how their current practices might be hurting water quality at their lake. In the case of changing shoreline buffers, residents will need more information about ways they can change their shorelines without drastically reducing views or beach access.

Watershed residents are not as cognizant of their role in the health of their lake. Tying their behaviors directly to lake water quality will be important for driving home the importance of changing behaviors.

Due to direct and indirect frustrating experiences with various Snohomish County and state agencies, there was a general sentiment that participants were frustrated with government agencies (18% of respondents). In addition, some residents were concerned about County departments that have contradictory regulations (e.g. new development sited close to the lake despite the purported desire for shoreline buffers). While these sentiments do not reflect a large percentage of the respondents, a general tension emerged between residents who felt the County was not regulating enough while others felt they regulated too much. As a result, outreach messengers must include trusted technical experts and community leaders. Developing effective partnerships with these key messengers is vital to the success of outreach activities.

Generally, respondents were very interested in taking part in this study, and while not all saw water quality as a problem, most agreed that residents along the lake were responsible for protecting the health of the lake. Many respondents were more than willing to adopt new management practices in order to preserve and enhance the health of the lake.