

Current and Future Conservation Practices in the Winnebago Lake System:

A Survey of Lake Butte des Morts Residents

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Lake Butte des Morts is one of several lakes in the Winnebago System in eastern Wisconsin. The Fox and Wolf Rivers feed the lake, and the Fox drains the lake, continuing eastward through the city of Oshkosh, where it empties into Lake Winnebago. The lake has long been a popular spot for anglers and boaters. However, like many Wisconsin lakes, heavy recreational and industrial use, as well as residential and commercial development, have had negative impacts on lake habitat and water quality. This survey of residential property owners assessed their lawn care habits, their perceptions of lake health and water quality and their knowledge of, and willingness to adopt, appropriate conservation practices. The survey also paid particular attention to landowners' views about alternatives to phosphorous fertilizer and installing buffers. An understanding of these points is critical to planning outreach programs to help improve water quality in the Lake Winnebago System.



Survey Methods

The questionnaire was mailed to the 609 residential property owners on the lake, identified from a list provided by the Winnebago County Land & Water Conservation Department. Private non-residential or commercial properties, parcels without improvements and those without mailing addresses (two) were excluded. The initial survey packet contained the questionnaire, a cover letter, and an addressed, stamped return envelope. This was followed with a reminder postcard sent to non-respondents. Finally, any residents still not responding received a second survey packet. All correspondence was signed by the presidents of the Winnebago Lakes Council and the Butte des Morts Conservation Club. Residents returned 425 completed questionnaires, for a response rate of 70 percent.

Winnebago County Extension and UW-Extension's Environmental Resources Center collaborated to analyze the data using SPSS, a common statistical software program. This proceeded in two phases:

- Phase 1) a descriptive analysis to identify central tendencies and to summarize trends found in the frequencies for all responses.*
- Phase 2) cross-tabulation analyses to compare responses among subgroups identified in the phase one descriptive analysis. For example, in the fertilizer subgroups, of those respondents who use lawn fertilizer regularly, over half did not know what kind they used. In addition, cross-tabulation analysis was used to gain more insights about barriers and incentives to potentially reducing use of phosphorus based fertilizers, as well as increasing installation of buffers.*

**All figures in this report have been rounded to the nearest whole percent.*

Survey Findings

Landowner Profile and Property Descriptions

Among the key findings were characteristics of lake residents based on demographics of the survey respondents. The typical survey respondent is a 59-year-old male, with a 2006 before-tax household income of at least \$50 thousand, a home and lot worth at least \$250 thousand, who has owned the property for an average of nineteen years. For 81% of respondents, their Lake Butte des Morts property is their primary residence. The top two reasons respondents gave for purchasing their lake properties were beauty of the location (59%) and the proximity to water (21%). The most popular activities that respondents participate in include pleasure boating (71%), open water fishing (64%), bird watching (57%) and swimming (55%). The least popular activity was sailing (7%).

More respondents have properties with less than 100 feet of frontage (65%) as opposed to over 100 feet, and almost all properties (92%) have a low bank (less than 10 feet high). Rock riprap is present on 81% of the properties. Sixteen percent of properties have wooden seawalls, 13% have concrete seawalls and 13% have beaches.

Perception of Water Quality and Lake Health

A lack of a strong consensus best characterizes respondents' views about how water clarity, amount of algae, density of aquatic plants, and quality of fishing are changing. Just over half (52%) said that water clarity is increasing, while 20% felt it is decreasing and 23% said it is about the same. A majority (72%) said that the amount of shoreline erosion on their lot is staying the same. Thirty-three percent of respondents said the amount of algae in the lake has increased, and the same number said it is staying about the same. Many respondents think the number of aquatic plants has increased (45%) and about 26% felt that the amount has remained the same. The quality of fishing was seen as about the same for 34% of respondents but had decreased for 24%; 27% were not sure. There was a bit more agreement on what factors and activities are the largest (and the smallest) sources of water pollution. Slight majorities of respondents consider agricultural sources as significant contributors to pollution in Lake Butte des Morts (see Table 1).

Table 1.

Sources perceived by respondents as contributing to pollution in Lake Butte des Morts at high and very high levels:

Source	% of Respondents
agricultural fertilizers and pesticides	56
manure from farm animals	51
storm water runoff from streets	42
soil from farm fields	37
lawn or urban pesticides	37
lawn or urban fertilizers	37
storm water runoff from rooftops, parking lots, driveways	30

Attitudes Toward Lawn and Yard Care

Almost all (99%) respondents have lawn somewhere on their property and have a positive view of lawns and their upkeep.

Over 90% (94% somewhat or strongly agree) value how their lawn looks. How their neighbors view their properties is also important. Most respondents (76% somewhat or strongly agree) care what their neighbors think of their lawn and believe (89% somewhat or strongly agree) their neighbors value a well-maintained lawn. Respondents also believe that a well maintained lawn to the shoreline creates an eye-appealing property (82% somewhat or strongly agree) and increases property value (88% somewhat or strongly agree).

Many factors influence how respondents make decisions about landscaping and yard care. Effects on water quality, local fish and wildlife, lake views, property value, and appearance were all rated as important or very important by about three-fourths of respondents. Interestingly, although respondents care what neighbors think of their lawns and believe that neighbors value a well-maintained lawn, neighbors' attitudes/views was cited as one of two least important factors influencing their own decisions about landscaping and yard care. The other least important factor was a desire to garden.

Lawn Care Practices

use of lawn chemicals

Most respondents agree (68% strongly or somewhat agree) that fertilizing is important for a healthy lawn. Yet, around 71% (strongly or somewhat agree) that using lawn fertilizer with phosphorus adds pollution to Lake Butte des Morts; about 20% do not know if it adds pollution. About half use some sort of fertilizer, though half of these users did not know what kind of fertilizer they use and half chose phosphorus fertilizer over no/low phosphorus fertilizer.

Those applying fertilizer generally do it or have it done one or two times per year. However, using professional lawn care services is relatively uncommon. Most mow (83%), apply fertilizer (68%), or do weed control applications (66%) themselves. About 11% hire professionals to mow, and about 14% hire professionals to fertilize or apply herbicide. Eighty-one percent (81%) of the forty-eight who hire professionals to fertilize do not know what type of fertilizer is applied. Seventy-five percent (75%) of those hiring professionals have a 2006 gross income of more than \$100,000 compared to approximately 40% of the all survey respondents. About a third who hire professionals reported that the market value of their property exceeds \$500,000.

Only about 14% of respondents report already use no- and low-phosphorus fertilizer. Many are not familiar with no- and low-phosphorus fertilizers. Over half don't know if no- and low-phosphorus fertilizer is too expensive (52%), if it is less effective than fertilizer with phosphorus (56%), or if it is readily available (66%). About 52% of phosphorous fertilizer users would consider switching.

About 30% of all respondents never apply weed killer. About 31% applied weed killer once a year compared to about 23% who use weed killer twice a year. Of those who use weed killers, about 41% would consider reducing the amount they use while 21% plan to continue using as they always do.

burning

Most respondents report burning yard waste or leaves on their property (70%) and there is a nearly even split regarding whether the burning is done less than 25 feet from the lake (47%) or more than 25 feet from the lake (53%).

Reducing Use of Phosphorous Fertilizers: Barriers and Incentives

About half of those using phosphorous fertilizers indicated they would consider using an alternative. Also nearly 70% of respondents selected from a list of conservation practices at least one they would be willing to consider if it would reduce pollution in Lake Butte des Morts. In order to effect behavior change in the lake residents and encourage them to adopt appropriate conservation practices, barriers to desired behaviors associated with practices and incentives need to be understood. Both were identified.

Analysis identified lawn appearance and property value as key barriers to reduction of phosphorus fertilizer and use of no- or low-phosphorous alternatives. Lack of knowledge about costs and availability of alternatives, lack of knowledge about their own fertilizer use and general consequences of fertilizer use also emerged as potential barriers. Essentially, residents seemed to be worried that switching fertilizers may result in a poorer lawn and heightened costs. They also seemed to be unaware of their own lawn practices and the potential impact phosphorus has on the lake.

However, respondents showed willingness to consider changes to at least some of their lawn practices. Three factors emerged as potential incentives for behavior change among the fertilizer user subgroups: location of their properties, participation in recreational activities and water quality:

location

Beauty of the location was a primary reason for purchasing property in the fertilizer (phosphorus or alternatives) subgroups. If it was shown that a decrease in phosphorus fertilizer use would maintain or improve the beauty of the location, respondents may be more willing to engage in the target behavior, i.e., decreasing their use of phosphorous fertilizers.

recreational activities

Respondents reported enjoying a variety of recreational activities (71% of all respondents pleasure boat, 64% open water fish, 57% bird watch, and 55% swim). In addition, 9% of all respondents reported boating/water sport activities as one of the two reasons why they purchased their properties. Fertilizer users and others reported similarly high levels of open water fishing (63% of phosphorus fertilizer users and 66% of all other users). However, boating and water sports appear to be especially important to phosphorus fertilizer users. About 26% of this subgroup selected boating/water sport activities as one of the two reasons why they purchased their lake property, compared to 6% of all other users. More phosphorus fertilizer users engaged in boating/water sport activities than all other users: pleasure boating (78% vs. 64%) and jet skiing (25% vs. 14%).

Number of Residents Already Engaged in Selected Conservation Practices:

- ✓ Keep their sidewalks and driveways clear of grass clippings and leaves (9 out of 10)
- ✓ Use mulching lawn mower (8 out of 10).
- ✓ Direct downspouts to the lawn (7 out of 10)
- ✓ Use a community drop-off site for hazardous household waste (7 out of 10).
- ✓ Have soil tested (4 out of 10)
- ✓ Have a compost pile for yard waste (5 out of 10).
- ✓ Use a community drop site for yard waste (5 out of 10).
- ✓ Created a rain garden (4 out of 10)
- ✓ Use rain barrels (2 out of 10)
- ✓ Installed shoreline buffer (4 out of 10)

All other users were marginally more likely to report fishing and hunting potential as a reason for purchasing the property (5% compared to 3% of phosphorus fertilizer users).

water quality

About 41% of all respondents strongly agreed, and 30% of respondents somewhat agreed, that lawn fertilizer with phosphorus pollutes Lake Butte des Morts. However, phosphorus fertilizer users seemed less aware of both the negative impacts of traditional fertilizer and the reduced impacts of no/low phosphorus fertilizer to water quality in the lake. About 60% of all other users strongly agreed that using phosphorus fertilizer pollutes Lake Butte des Morts, compared to 30% of phosphorus fertilizer users. If phosphorus fertilizer users could be shown that reducing phosphorous levels in Lake Butte des Morts would benefit them by improving water quality for their own recreational activities, they may be more willing to switch to a no- or low-phosphorous alternative.



Lake Butte des Morts, 1987

Use of Shoreline Buffers

Thirty-six percent of lake residents have installed shoreline buffers and, of those, 68% report that the buffer covers all or most of their waterfront length. The average buffer width is 6-15 feet (45%) and 72% are less than 15 feet wide. Only 10% have a buffer wider than 26 feet. When deciding to install a buffer, the benefit to water quality (61%), improved fish and wildlife habitat (56%), and improved appearance of the property (50%) were the most important reasons. The least important reason was a financial benefit or presence of a cost share program (80% rated as not important).

Analysis comparing residents with and without shoreline buffers showed the two groups are alike in several ways: they enjoy the same recreational activities, have similar attitudes toward lawns and sources of pollution to Lake Butte des Morts, and they both have mixed feelings about buffers. The respondents were asked to indicate their level of agreement (from strongly agree through strongly disagree) with a series of statements about buffers. About 36% strongly agreed that buffers protect water quality. However, the combination of “strongly agree” and “somewhat agree” showed that respondents have some concerns about buffers. These concerns were: buffers may reduce property values (53%), buffers are messy and look unkempt (56%), buffers make lake access difficult (62%), and buffers obstruct lake views (65%). Furthermore, respondents indicated that they did not know where to go for technical assistance (54%), installing a buffer is too expensive (53%), and maintaining a buffer is too expensive (62%).

Some key difference between those with and those without buffers were noted. Residents without buffers more often had less shoreline and felt more strongly that buffers are a hindrance to lake access and views. Residents with buffers practiced certain environmentally sound behaviors with more frequency, particularly composting and ensuring minimal use of salt to melt winter ice.

Increasing Buffer Use - Barriers and Incentives

Analysis showed that the major barrier to installation of more buffers is concern about lawn appearance and property values. Installing a buffer may reduce lawn size and lawns are highly valued. Furthermore, many respondents associate a healthy green lawn with increased property value. Likewise, a substantial numbers of respondents viewed buffers as being messy and unkempt.

Four different factors were identified as possible incentives to induce landowners to install shoreline buffers: location, recreational activities, wildlife habitat improvement and water quality:

location

The majority of property owners with and without buffers alike reported that the primary reason why they purchased their property was because of the beauty of the location (66% of those with buffers, 54% of those without). If those without buffers could be shown that buffers need not be unsightly or difficult to maintain, and that they can enhance the beauty of the surroundings, they may be more willing to install shoreline buffers on their properties.

recreational activities

Those in the non-buffer subgroup were marginally more likely to engage in open water fishing (68% compared to 57% of buffer owners) and pleasure boating (74% compared to 68% of buffer group). Similarly, slightly more of those without buffers (9%) listed boating/water sport activities as their primary reason for purchasing the property over owners with buffers (7%). Slightly more landowners without buffers (5%) listed fishing/hunting potential as their primary reason over owners with buffers (3%). Particular emphasis on the improvement of Lake Butte des Morts for fishing, hunting and boating, and water sport activities through buffer installation may encourage a behavior switch.



View from the Lake Butte des Morts Boat Club, 1953

positive effect on fish/wildlife habitat

Showing the positive impact of buffers on wildlife habitat may also induce behavior change. Those in the buffer subgroup reported that the most important factor for installing/maintaining a buffer was improved fish or wildlife habitat (56% reported as important or very important). Non-buffer owners skipped this question.

positive effect on water quality

Many respondents associate buffers with improved water quality while valuing the recreational aspects of Lake Butte des Morts. About 80% of all respondents agreed, to some degree, that buffers help protect water quality while the remaining 20% disagreed. About 56% of those in the buffer subgroup strongly agreed that buffers help protect water quality compared to 24% of the non-buffer subgroup. When combined with those who somewhat agreed with the statement, over 90% of the buffer subgroup and 72% of the non-buffer subgroup agreed to some degree that buffers protect water quality.

Barriers and Incentives: Observations on Survey Results

Ideally, outreach activities to help improve water quality in the Lake Winnebago System will be planned with full knowledge of barriers and incentives to specific behaviors and practices. Results of the survey provide sufficient information about barriers to increasing use of no- or low-phosphorous fertilizers and installation of more shoreline buffers. The data on incentives is somewhat less straightforward. Although some incentives for adopting these practices emerged from the survey results, these are primarily related to perceptions of Lake Butte des Morts rather than actual behaviors. Needed is information about factors that will provide incentives for actual behavior change.

Additional data collection concentrating on specific behavioral incentives to change fertilizer and shoreline buffer use may be helpful. The next logical step in planning an education strategy may be to hold focus groups with Lake Butte des Morts property owners who already have shoreline buffers and use alternative fertilizers.