Analyzing and Improving the Sustainability of Lake Associations

Jennifer Okajima, Jana McGee, Burnell C. Fischer, and James R. Farmer

The success of an online lake resident survey to improve lake association sustainability

Introduction

Lakes provide many benefits and services, from recreational opportunities to irrigation to aesthetic enjoyment. In order to maintain the ecological quality of their lake, as well as enhance its economic and recreational benefits, lakeshore residents can organize to form lake associations. In theory, lake association sustainability has a direct and positive effect on lake sustainability, as more effectively managed organizations should be better equipped to maintain their natural resources. This requires management of the lake itself, as well as organizational management of the lake association.

In the spring of 2013, at the request of the Hubbard County, Minnesota, Coalition of Lake Associations (COLA), a master's capstone class at the Indiana University School of Public and Environmental Affairs undertook a project to analyze the sustainability of both the COLA and individual lake associations (29 member lake associations) (Figure 1). The resulting class report provided research and recommendations related to increasing lake association sustainability (Finkelstein et al. 2013). As a framework for the report, lakes were viewed as common-pool resources, and COLA and Lake Associations (LAs) as common-pool resource managers.

As part of the larger project, a sub-study surveyed the preferences of

Figure 1. Big Sand Lake is one of 29 lake associations within the lake-rich Hubbard County COLA. Vern Whitten Photography.

lakeshore residents for seven of the 29 lake associations. Based upon suggestions from several of the lake associations and the COLA in fall 2013, the authors created individualized fact sheets based on the data from each of the surveyed lake associations (see Appendix for an example of an individualize fact sheet for the Long Lake Association). In the months after receiving fact sheets the lake associations and COLA have reported positive usage of the fact sheets. Four of the seven lake associations stated they had, or were planning to, distribute the fact sheet on their website (http://www.longlakeliving.org/ and http://mantraplake.webs.com) and/or through their newsletter. Three of the seven lake associations planned to utilize the information to better manage their lake association; one lake association mentioned they were currently updating their lake management plan using the fact sheet data. And, the COLA has expressed interest in future surveys to assist other lake associations in their planning and outreach to members.

Research Methods

An e-mail survey was sent to residents on seven lakes within Hubbard County (a copy of the survey is available from the corresponding author). These lakes were specifically selected by the COLA to represent a range of sizes and robustness of the individual lake associations. The goal was to see if issues and concerns were different depending on the qualitative variations between the lake associations.

Of approximately 716 residents surveyed, 290 completed online questionnaires. The number of respondents ranged from eight on the least-populated lake to 123 on the lake with the greatest number of residents. Acceptable participation rates were garnered for all lakes (response rate ranged from 19–89%). The e-mail invitation with a link to the questionnaire was followed by three reminder e-mails. Participants were limited to completing the survey once.

Along with some basic demographic questions, the 14 survey questions focused particularly on residents' concerns, perceptions of local organizations (COLA, their own LA, the DNR, outside lake users), recreational activities, and especially, residents' understanding of aquatic invasive species (AIS) and water quality issues. As mentioned above, each lake association was later provided with a two- to three-page fact sheet with results specific to their lake. For this article, we will use data and figures from Long Lake, our largest sample size of 123 respondents, with a 46% response rate, to demonstrate how we presented the results to the lake associations for their use.

Results

The survey provided a list of 16 concerns to be ranked in order of importance. AIS emerged as a top concern among residents of all seven lakes, regardless of demographics, sample size, or strength of the local LA. Results showed that the ranking of issues and concerns did not change much across lakes based on strength and size of the lake association (Table 1).

The concern over AIS, as well as land use, is also reflected in the residents' perceptions of the rules and regulations regarding these issues (Figure 2). As opposed to fishing and boating regulation, which residents view as neutral, most survey respondents considered the rules governing AIS and land use at their lakes as somewhat or too lenient.

Respondents generally had the most positive perception of their own lake association, and the most negative perception of non-resident lake users; these results may be linked to the lake residents' concerns about introduction of AIS or user conflicts (Figure 3). Since the majority of lake residents indicated that they used their boat only on their own lake, this suggests that there is at least the perception that non-resident lake users are bringing invasive species to these lakes, leading to conflict between lake residents and non-residents.

Having identified the most pressing concerns of lake residents, the survey also provided information on how to target educational programs to different groups of lake users to address these issues. The information noted above, which suggests that non-residents are a major potential source of AIS, may prove useful in designing educational programs about aquatic invasive species, as it implies that the greatest benefit may come from targeting non-resident recreational lake

Table 1. Sixteen Concerns of Long Lake Residents, Ranked in Order of Importance (n=123).

1	Aquatic invasive species
2	Lake pollution from agricultural runoff
3	Pollution from shoreline residences
4	Shoreline owners understanding issues
5	Shoreline development
6	Fisheries management
7	Effectiveness of the lake association
8	Development in the lake watershed
9	Boating practices/etiquette
10	Collaboration and knowledge sharing
11	Funding for lake association
12	Native plant restoration
13	Lake pollution from forestry operations
14	Participation and membership among lake residents
15	Lack of volunteers
16	Recreation user conflicts

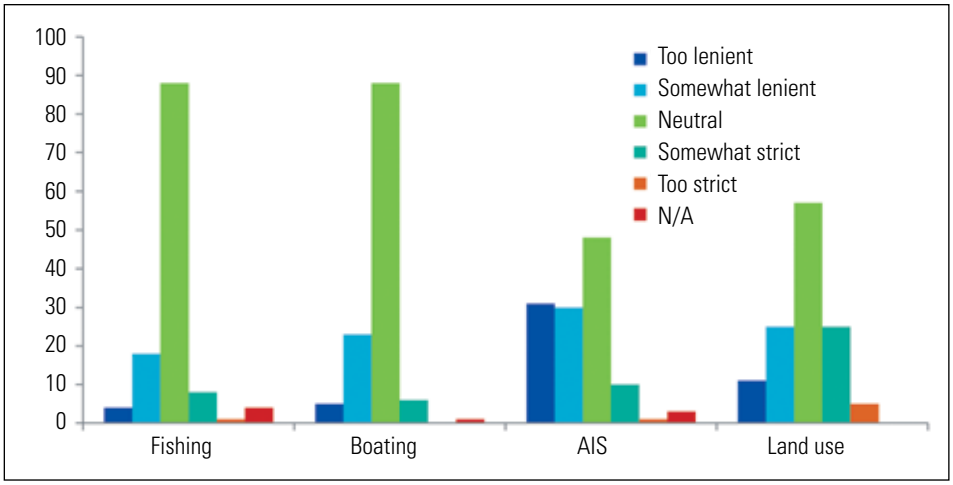


Figure 2. Long Lake residents' views (#'s) of local rules and laws (n=123).

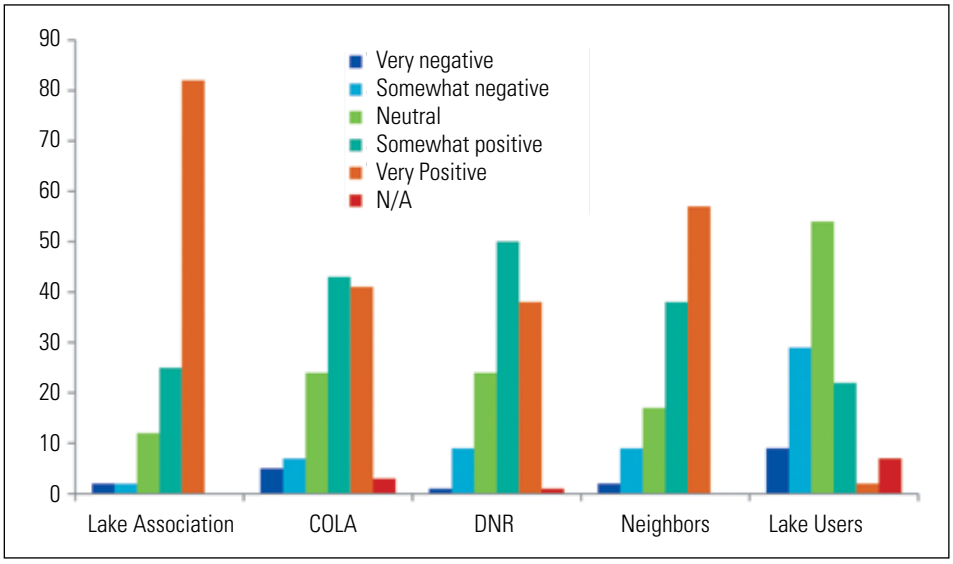


Figure 3. Long Lake residents' perceptions (#'s) of local organizations, neighbors, and lake users (n=123).

users, including guests of lake residents. In terms of outreach to lake residents, the survey results shed light on which AIS and water quality practices residents are currently engaged in (Figure 4). For those who did not engage in these practices (never or N/A), lack of knowledge about what to do was cited by residents of several lakes, particularly those with a younger membership base. This suggests that education of residents, and community-based social marketing techniques, could help to improve engagement in both AIS and water quality practices.

Further, residents were also surveyed about their recreational activities and participation in organizations other than the lake association. Water-related activities, such as motor boating, fishing, and swimming, proved the most popular with lake residents. Church was the most popular membership organization other than the lake association. Not surprisingly, lake users were most likely to encounter information about AIS when engaged in water-related activities. These activities and community groups could provide a way to connect with and educate lake users in the community, outside of activities directly tied to the lake association.

In terms of how best to manage the lake association itself, we found that residents' preferred method of contact was e-mail. This suggested that e-mail can be a more cost-effective and preferred route than traditional mailings, print newsletters, etc. Since this finding is from an e-mail survey, lake residents without e-mail addresses or who did not provide their e-mail address to the lake association were not included, which weakens the strength of this conclusion. Several of the lake associations were encouraged by the strong return to an e-mail survey and will begin the process of converting as many members as requested to an e-mail-only receipt of the lake association newsletters (two to three times/year), thus reducing both mailing and printing costs substantially. And, the use of websites to provide newsletters and other reports in color is another cost benefit they recognize.

Conclusions

The survey results were presented electronically to individual lake associations in the fall of 2013. The information was well received by individual lake association leaders as well as the Hubbard County COLA leadership, who then had data on their members' perceptions, demographics, and other information (e.g., on- and off-water recreational activities, level of involvement with their lake association, and preferred method of contact).

Even with relatively simple methods of data collection and presentation, this type of survey and fact sheet can serve as a valuable tool. An Internet-based survey is a quick and cost-effective way to capture social and environmental dimensions at the lake association level and provides useful information for lake managers. Response rates were generally high when presented this way, and this improved the quality of the data and the strength of many conclusions.

This type of data collection can prove valuable not just for lake association boards but also for lake managers implementing a project such as Maine's LakeSmart program (Welch & Smith 2008), which is designed to improve water quality practices, or AIS awareness practices. Further, if identical surveys are administered to residents on multiple lakes, the data from each lake can be compared; this could shed

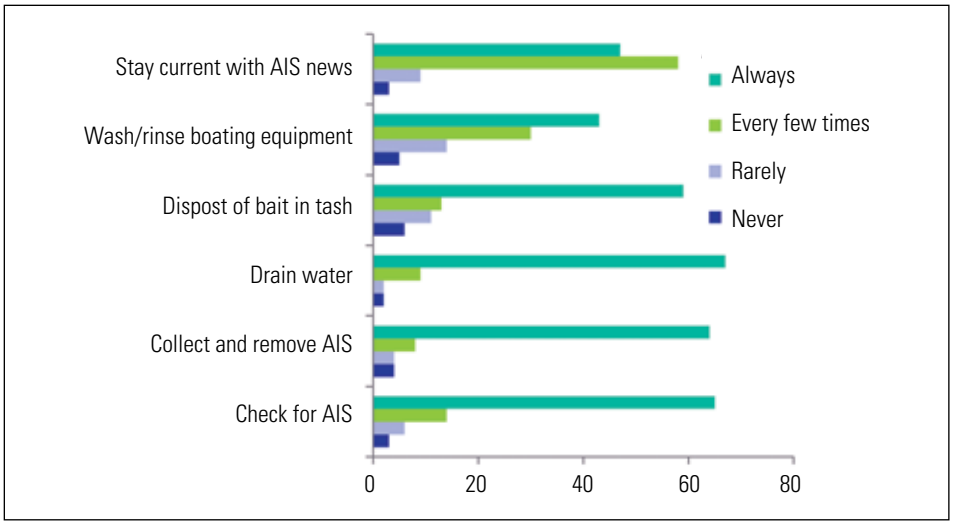


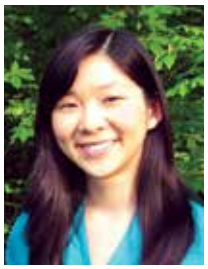
Figure 4. AIS practices that Long Lake residents (#'s) engage in (n=123).

light on how differing ecological, social, and management factors are impacting separate lakes.

References

Finkelstein, S., H.G. Gaddis, R.K. Hook, S.C. Johnson, N.D. Masay, J.J. McGee, J. Okajima, A.K. Praeuner, J. K. Prygoski, V. Radkov, R.J. Ramos, A. Reynolds, P.V. Ripley, R.M. Rosen, E.M. Schneider, S.R. Swaminathan, S. Tang, A. Vautrinot, K.K. Walsh, and E.M. Zeller. 2013. Guidelines for sustainable lake associations and coalitions of lake associations: research and recommendations. Working Paper W13–14. SPEA V600 Capstone Course report prepared for Hubbard County COLA, Park Rapids, MN. Bloomington: Indiana University, The Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis.

Welch, B. and C. Smith. 2008. Moving Maine's LakeSmart from Pilot to Statewide: Lessons Learned. *LakeLine*, 28(3): 27-32.



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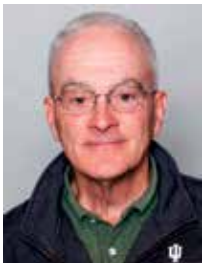

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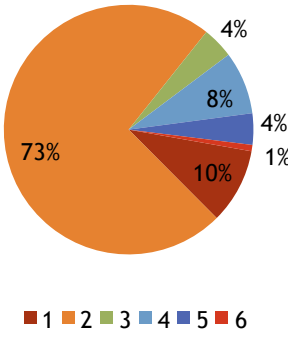
APPENDIX

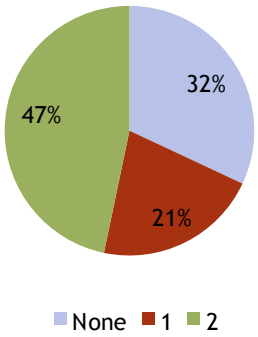
Long Lake - Lakeshore Resident Online Survey

- Indiana University's School of Public and Environmental Affairs spring 2013 capstone course entitled "Lake Management Associations: Developing Sustainability Guidelines" formed to address issues faced by its client, the Hubbard County Coalition of Lake Associations in Minnesota.
- A 14-question online survey of lakeshore residents on 7 Hubbard county lakes was conducted as part of this project. It was completed between February 21, 2013 and March 5, 2013.
- The online survey was sent to 266 Long Lake residents, and 123 residents responded. This factsheet summarizes those results.
- All results are shown in frequencies and not percentages (except for pie graphs).
- *Starred figures indicate multiple answers were allowed.

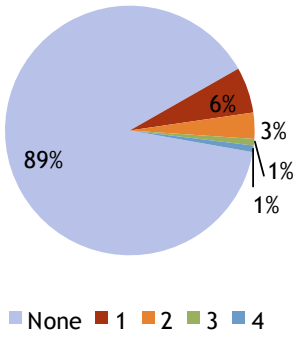
Household Size



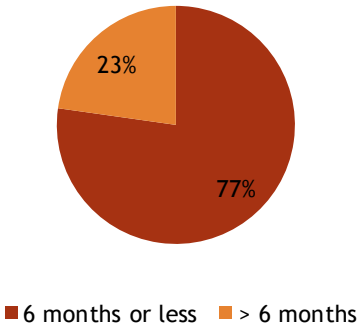
# of Retirees in Household



# of People <18 in Household

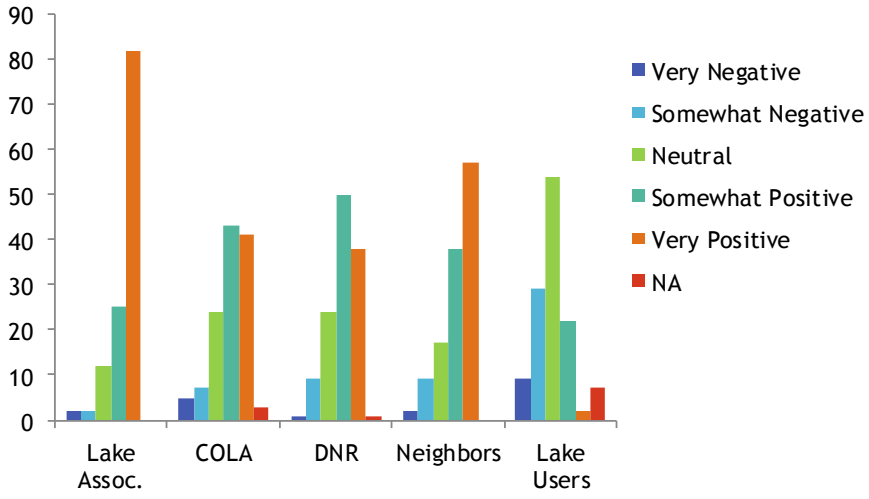


# of Months Residents Spend on the Lake



- Average age of Long Lake respondents was 66, median = 65.
- Respondents have owned their lake homes for an average of 23 years, median = 21 years.
- Most respondents (78/123) listed "enjoying the scenery and setting" as the most important factor for becoming a lake property owner.

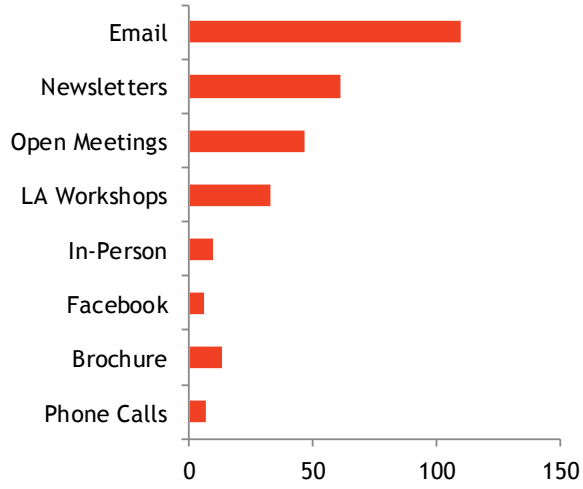
Long Lake Residents' Perception of Local Organizations, Neighbors and Lake Users



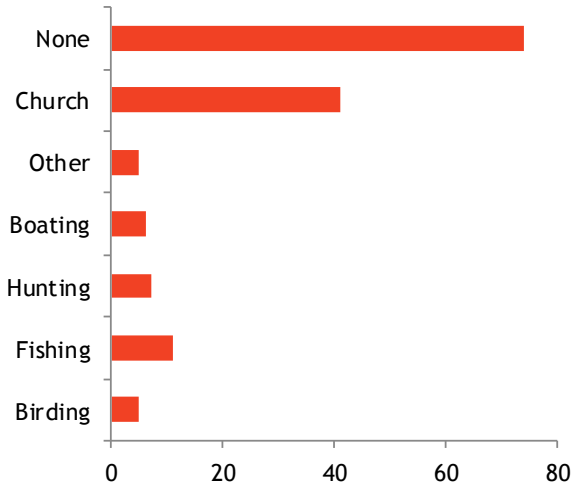
Ranking of Lake Residents' Concerns (#1 most important)	
1	Aquatic invasive species
2	Lake pollution from agricultural runoff
3	Pollution from shoreline residences
4	Shoreline owners understanding issues
5	Shoreline development
6	Fisheries management
7	Effectiveness of the lake association
8	Development in the lake watershed
9	Boating practices/etiquette
10	Collaboration and knowledge sharing
11	Funding for lake association
12	Native plant restoration
13	Lake pollution from forestry operations
14	Participation and membership among lake residents
15	Lack of volunteers
16	Recreation user conflicts

APPENDIX

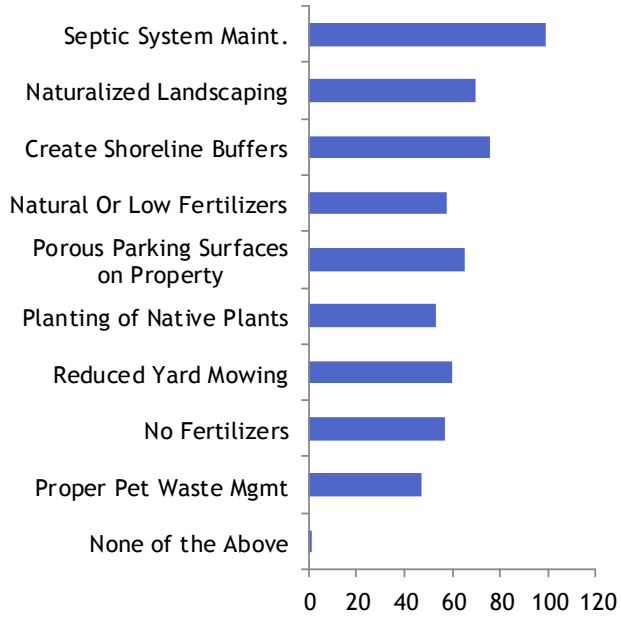
***Long Lake Residents' Preferred Contact Method**



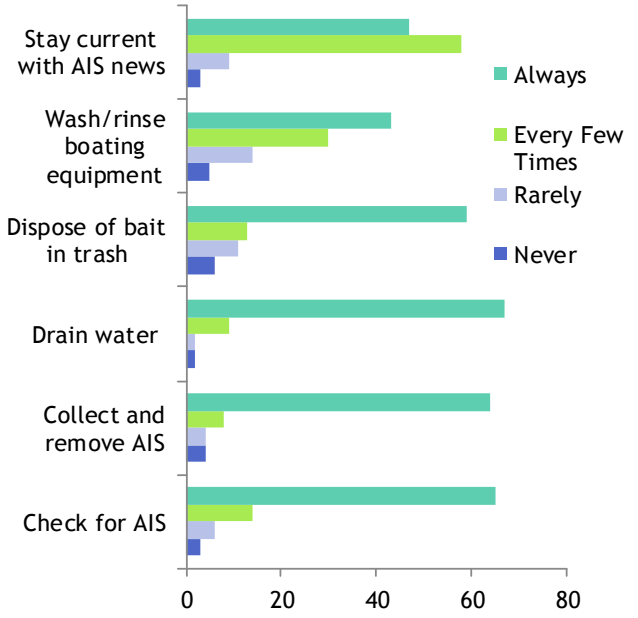
***Organizations Long Lake Residents are Involved In**



***Water Quality Practices Long Lake Residents Engage In**

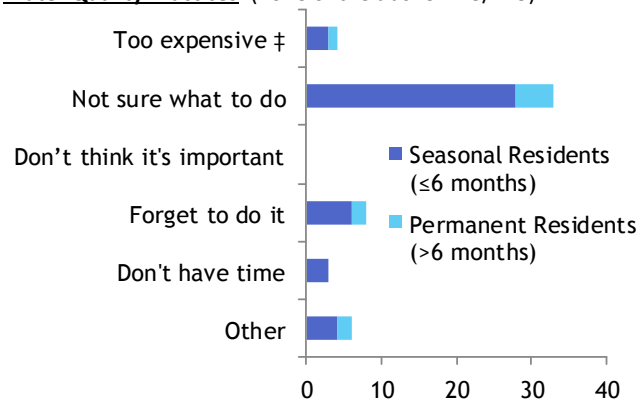


***AIS Practices Long Lake Residents Engage In**



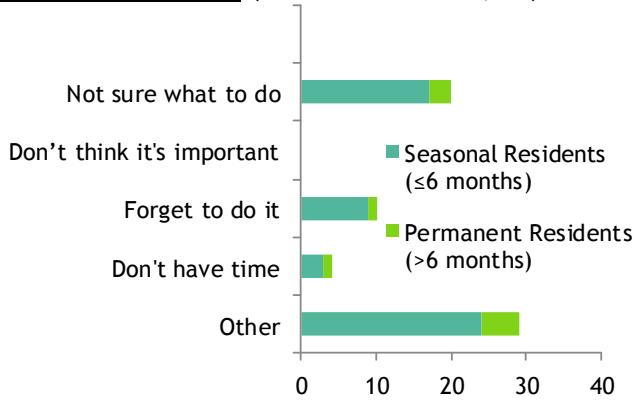
***Factors Preventing Long Lake Residents from Engaging in Water Quality and AIS Prevention Practices, Broken Down by Permanent and Seasonal Residents (respondents who answered "none of the above" and are not included in figure)**

Water Quality Practices: (none of the above = 73/123)



‡The option "too expensive" was only provided for water quality practices

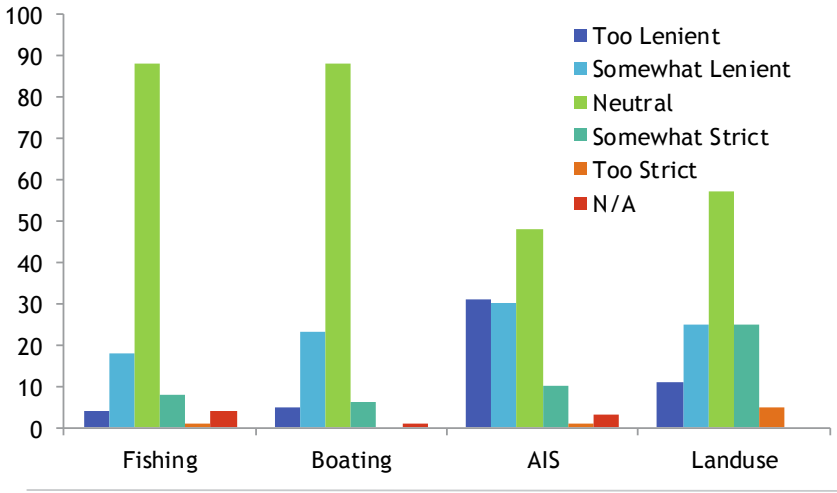
AIS-Prevention Practices: (none of the above = 66/123)



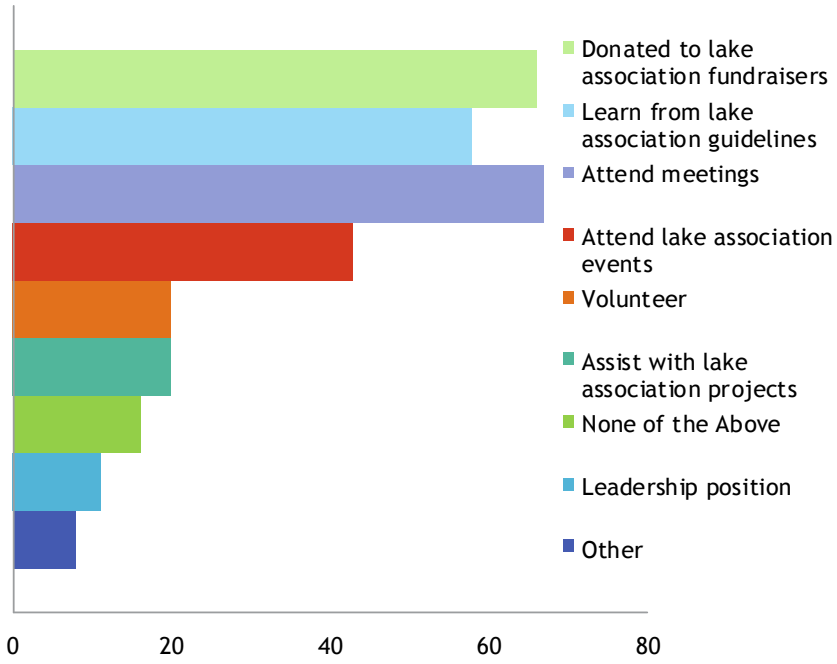
**Most residents that said "other" factors prevented them from engaging in AIS prevention because they only boated in Long Lake

APPENDIX

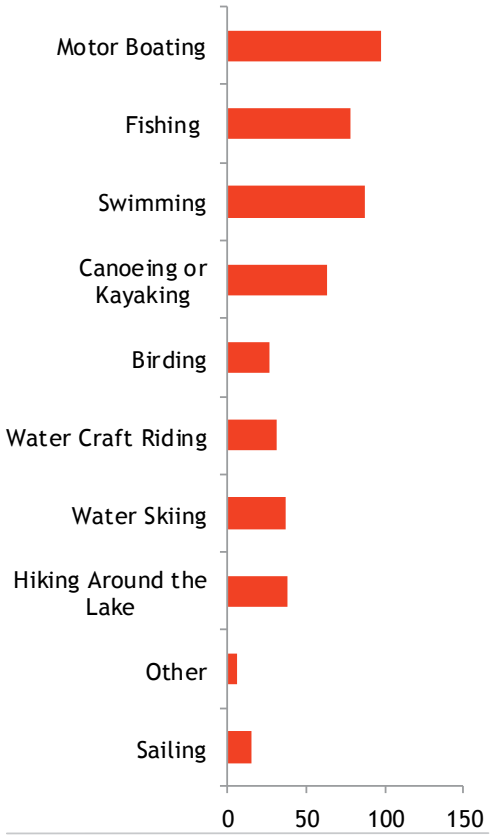
Long Lake Residents' Views of Local Rules and Laws



***Involvement of Long Lake Residents with the Lake Association**



***Recreational Activities Residents Engage in on Long Lake**



Hubbard County COLA

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Online survey conducted by the Indiana University School of Public and Environmental Affairs Capstone Course.

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