

Lac du Flambeau Water Quality Survey Report

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Executive Summary

In May 2008, the Survey Research Center (SRC) at the University of Wisconsin – River Falls mailed surveys to 2,575 Lac du Flambeau Tribal members seeking their input on a number of important water resources issues on the reservation. The initial mailing was followed by post card reminders and a second mailing to non-respondents. The overall response rate was 16 percent (417 completed questionnaires). The estimates provided in this report are expected to be accurate to within plus or minus 4.4 percent with 95 percent confidence. Further, non-response bias (concern that non-respondents hold consistently different views than those who completed the questionnaire) does not appear to be a problem with this survey. In general, the sample aligns with the 2000 Census. In short, we expect the sample to accurately represent the opinions of Tribal members.

The following are key observations from the survey results:

1. Although most of the respondents do not live extremely close to water areas on the reservation, over one-quarter of respondents live within 200 feet of a reservation lake and 21% live within a source water protection area.
2. Nearly three-fourths of members were definite in their opinion that more waters should be protected as outstanding resource waters. Only two members said ‘definitely no’ to more waters being protected as outstanding resource waters.
3. Most members were not in favor of any reduction in native aquatic plants even if better boating and swimming was the result.
4. At least one-third of members believe their enjoyment of reservation waters is hampered by trash, shoreline development, algae, and personal water craft.
5. Over three-fourths of respondents fish by hook and line. Nearly one-fourth of members spear fish, and a small number of members report that they use nets.
6. A majority of members eat fish from reservation lakes less than one meal per month; almost one-third have a monthly meal consisting of reservation lake fish.
7. Members eating fish from reservation lakes generally eat walleye/musky and bass/pan fish.
8. Tribal members who own boats, in general, own small boats or non-motorized boats.
9. A majority of members said they don’t utilize 22 of the 29 lakes/rivers described in the survey.
10. Nearly one-half of Tribal members surveyed fish in Lake Flambeau. Lake Flambeau was also the top swimming choice of reservation waters.
11. Lake Flambeau was described as beautiful by the most Tribal members (40%), with Pokegama and Fence Lakes receiving ‘beautiful’ ratings by over one-third of members. No lake or river had more than one-fourth of members describing it as having clear water or having good quality water.

Survey Purpose

The Lac du Flambeau Tribe's Natural Resource Department is considering an update of the Tribal Codes that pertain to water resources of the reservation (water quality standards, shoreline development, and wellhead/source water protection). An important component of the Tribal Code revisions is to obtain Tribal member input. The Tribal Natural Resource Department chose to work with the Survey Research Center (SRC) at the University of Wisconsin – River Falls to survey Tribal members about water issues on the reservation.

Survey Methods

In early May 2008, the Survey Research Center (SRC) at the University of Wisconsin – River Falls mailed surveys to 2,575 Lac du Flambeau Tribal members (including those living off the reservation) seeking their input on a number of important issues facing water resources on the reservation. After two weeks, the SRC mailed postcards to those from whom a completed questionnaire had not been received. A second questionnaire was sent to remaining non-respondents at the end of May. The SRC received a total of 417 completed questionnaires from members for a 16 percent response rate. The estimates provided in this report are expected to be accurate to within plus or minus 4.4 percent with 95 percent confidence.

Any survey has to be concerned with “non-response bias.” Non-response bias refers to a situation in which people who do not return a questionnaire have opinions that are systematically different from the opinions of those who return their surveys. **Based upon a standard statistical analysis that is described in Appendix A, the Survey Research Center (SRC) concludes that non-response bias is not a concern for this sample.**

In addition to the numeric responses, respondents provided additional written comments that were compiled by the SRC from the surveys. **Appendix B to this report contains the complete compilation of comments.**

Appendix C contains a copy of the survey questionnaire with a quantitative summary of responses by question.

Profile of Respondents

Table 1 summarizes the demographic profile of respondents to the survey. Where comparable data were available from the 2000 Census, they were included to indicate the degree to which the sample represents the underlying adult population on the reservation.¹ The data in Table 1 show that, in general, the demographic profile of respondents aligns well with the Census data. The sample had a higher proportion of older respondents and lower proportions of younger respondents, which is not unusual for surveys. When there are significant differences of opinion among demographic groups, they will be noted throughout the various sections of the report.

Table 1: Demographic Profile of Respondents							
Gender	Count	Male	Female				
Sample	376	44%	56%				
Census (18+)	1,009	47%	53%				
Age 18+	Count	18-24	25-34	35-44	45-54	55-64	65+
Sample	396	6%	14%	20%	26%	20%	14%
Census	1,009	15%	20%	24%	14%	12%	13%
Household Size	Count	0	1	2	3	4	5+
Number Adults	381		27%	48%	14%	7%	3%
Number Children (<18)	335	51%	17%	17%	8%	3%	4%
Residential Status	Count	Own	Rent				
Sample	377	55%	45%				
Census (occupied housing units)	524	52%	48%				
Employment Status	Count	Full-Time	Part-Time	Self Employed	Un-employed	Retired	Other
Sample	392	43%	10%	7%	11%	21%	8%
Census (Population 16+)	1,058	64% ²		5%	8%	12% ³	
Annual Household Income Range	Count	<\$15,000	\$15-\$24,999	\$25-\$49,999	\$50-\$74,999	\$75-\$99,999	\$100,000+
Sample	373	27%	23%	25%	16%	6%	5%
Census	510	22%	24%	28%	16%	6%	4%
Highest Level of Education	Count	Less than High School	High School Diploma	Some College/ Tech	Tech College Graduate	Bachelor's Degree	Graduate or Prof. Degree
Sample	394	14%	27%	35%	8%	9%	6%
Census (Population 25+)	831	28%	36%	21%	4%	8%	2%

¹ The questionnaire was sent to Lac du Flambeau Tribal members living on and off the reservation.

² Census employment data does not differentiate between full-time and part-time workers.

³ Percentage based on the number of households with a person receiving retirement income.

Location of Current Home

The first question on the survey asked members, in reference to the Lac du Flambeau Reservation, to describe the location of their current home. As Table 2 indicates, most of the respondents do not live extremely close to water areas on the reservation. However, more than one-quarter of respondents live within 200 feet of a reservation lake and 21% live within a source water protection area.

Table 2: Location of Current Home on the Reservation

Referring to the Lac du Flambeau Reservation, the location of your current home is within...	Count	A source water protection area	200 feet of a Reservation lake	200 feet of a Reservation river	200 feet of a Reservation wetland
	417	21%	27%	0%	4%

- Members that own their place of residence were significantly more likely to live within 200 feet of a reservation lake than renters.
- Members with higher levels of education (Bachelor's, Graduate, or Professional degree) were significantly less likely to live within a source water protection area.

Outstanding Resource Waters Protection

Tribal members were asked if more waters should be protected as outstanding resource waters (a water body that is protected from pollution with stricter permitting requirements) and their answers are summarized in Table 3.⁴ Nearly three-fourths of members were definite in their opinion that more waters should be protected as outstanding resource waters with another 16% who are not as convinced but still open to more protected waters. Very small numbers of Tribal members (6 members in total) chose 'maybe or definitely no' to more waters being protected. Interestingly, 74% of members who currently live in a source water protection area, said 'definitely yes' to the need for more waters to be protected as outstanding resource waters and 73% of those that do not live in a source protection area said 'definitely yes' to the need for more waters to be protected as outstanding resource waters.

Table 3: Should more waters be protected as outstanding resource waters?

Count	Definitely Yes	Maybe Yes	Maybe No	Definitely No	No Opinion
378	74%	16%	1%	1%	9%

Native Aquatic Plants

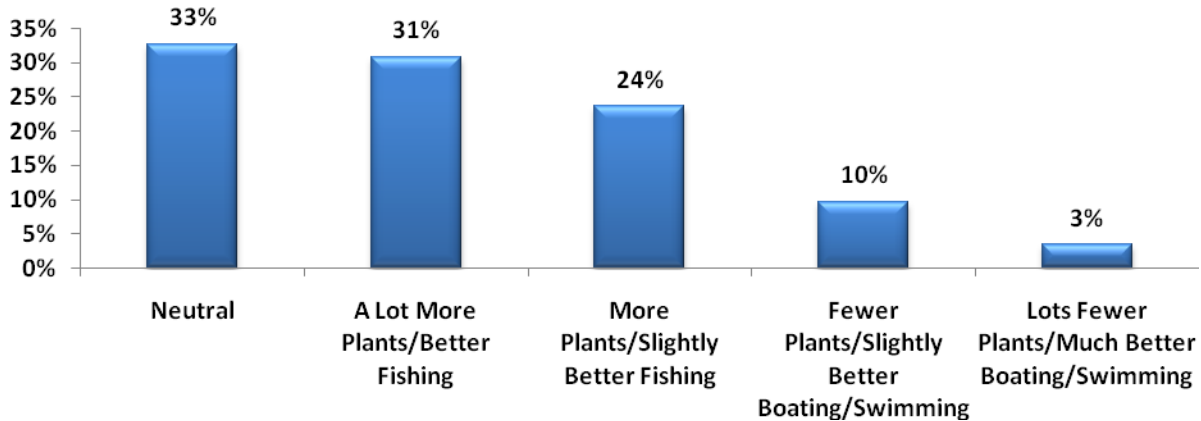
Members were asked to indicate their preference regarding native aquatic plants. Native aquatic plants were described as tending to improve fishing but the plants can make swimming and boating worse.

Nearly one-third of members preferred a lot more plants and better fishing (31%), and nearly one-fourth (24%) favored more plants and slightly better fishing. One-third of members were neutral on this topic. Most members were not in favor of any reduction in plants even if better boating and swimming was the result. (Figure 1). Even tribal members who own boats (see boat section on page 9) are not willing to give up native aquatic plants to make their boating experience better.⁵ Only seven members who own boats said their preference is for lots fewer plants and much better boating/swimming.

⁴ A map of the Reservation source water protection areas, as well as, definitions to terms used in the survey were included in the survey's cover letter.

⁵ 212 respondents reported owning 258 total boats of various types.

Figure 1: Preference For Native Aquatic Plants in Reservation Waters



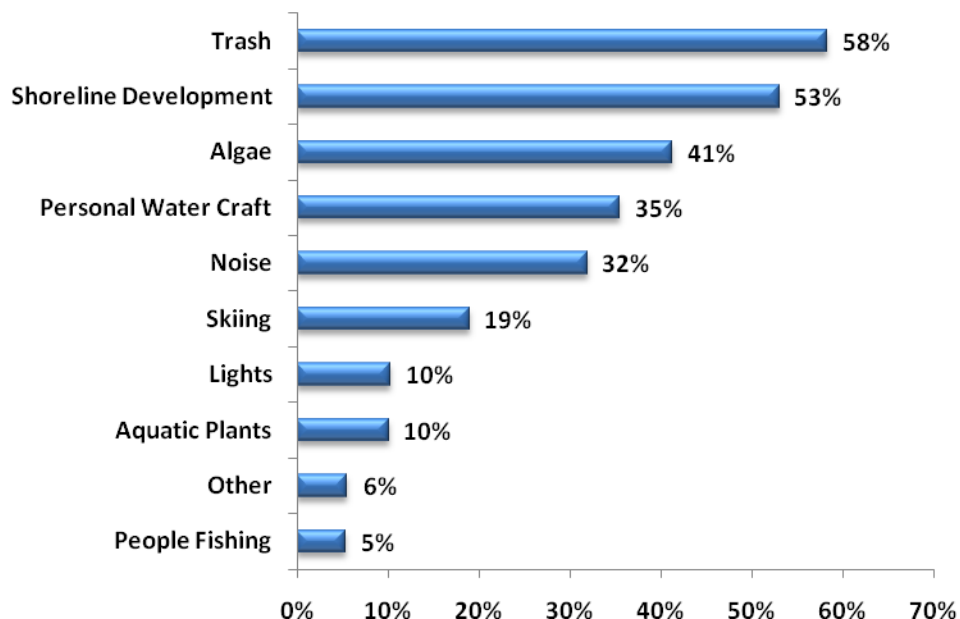
One significant difference of opinion between demographic groups occurred with respect to native aquatic plant preferences included in Figure 1.

- Males were significantly more likely than females to have the preference of wanting a lot more plants and better fishing. Forty percent of all males have this preference versus 23% of all females.

Water Enjoyment

More than one-half of members believe that their enjoyment of reservation waters is hampered by trash and shoreline development. Approximately one-third or more members believe their enjoyment is hampered by algae, personal water craft, and noise. Lower level of annoyance was shown for skiing, lights, aquatic plants, and fishing. (Figure 2).

Figure 2: Things That Make It Hard To Enjoy The Water In Or Around Reservation Waters



Six percent of respondents wrote in “other” deterrents to enjoying reservation waters. Of these, duck worm was the most frequently mentioned by members. Appendix B contains the complete compilation of “other” items mentioned.

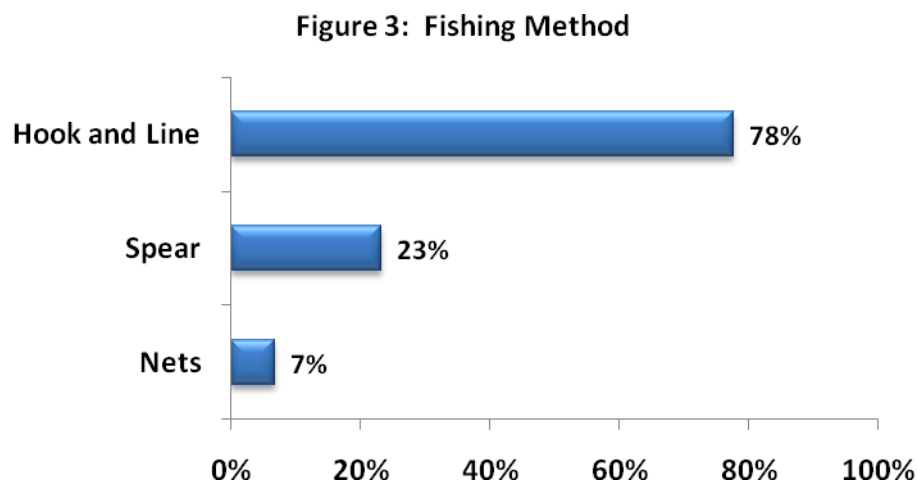
Significant demographic differences with respect to what makes it harder to enjoy the water included:

- Males were more likely than females to say that shoreline development makes it harder to enjoy the water.
- Younger members (under 45) were more likely to say that trash makes it harder to enjoy the water.
- Respondents with children were more likely to say that skiing and trash make it harder to enjoy the water.

Fishing

Method

Members were asked which method(s) of fishing they use. By far, hook and line fishing is practiced by the most members (324 members). Over three-fourths of respondents fish by hook and line. Nearly one-fourth of members spear fish (97 members), and a small number (28) of members report that they use nets. (Figure 3). Members that reported living within 200 feet of a reservation lake were significantly more likely to hook and line, spear, and net fish than those that did not live within 200 feet of a reservation lake.



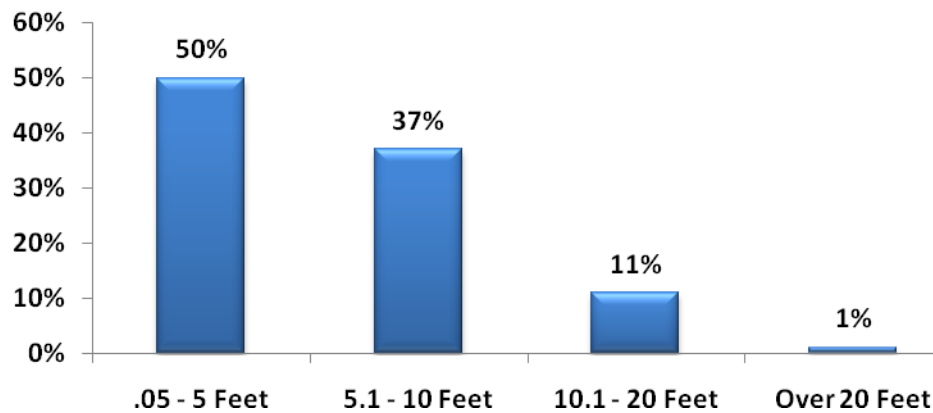
There were few differences in the way different demographic groups fish:

- Younger members (younger than 45) were more likely to fish by hook and line.
- Compared to males, females were less likely to hook and line, net, or spear fish.
- Members with children were more likely to net and spear fish than those without children.

Depth Needed for Spear Fishing

Members were asked their opinion regarding the depth (in feet) needed to see fish for spear fishing. Based on the answers received from over 200 members to this question, half of Tribal members who responded to this question said that .05 – 5 feet is the depth needed to see fish. (Figure 4).

**Figure 4: Depth Needed to See Fish for Spear Fishing:
Based on 211 Responses**

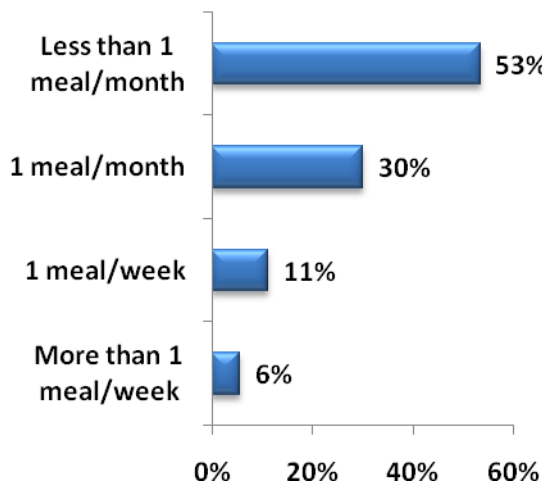


Over a third of Tribal members who responded to this question said that a depth of 5.1 – 10 feet is needed to see fish for spear fishing. Twelve percent said that a depth of over 10 feet is needed.

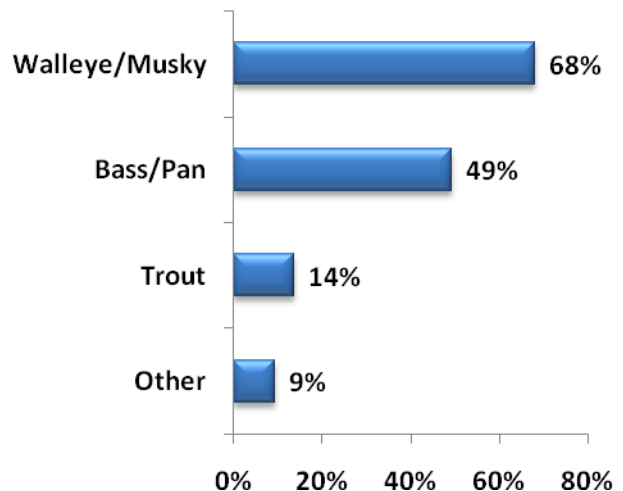
Frequency of Eating Fish and Types of Fish Eaten

Members were asked how often they eat fish from reservation lakes and what type of fish they eat (Figures 5 and 6). A majority of members eat fish from reservation lakes less than one meal per month; almost one-third have a monthly meal consisting of fish from the reservation. Seventeen percent of members reported eating fish from the reservation one or more meals per week.

**Figure 5: Frequency of Eating Fish
from Reservation Lakes**



**Figure 6: Types of Fish Eaten from
Reservation Lakes**



Members that eat fish from reservation lakes generally eat walleye/musky and bass/pan fish. Less common (14%) was eating trout. Nine percent of respondents wrote in “other” types of fish eaten. Of these, whitefish was the most frequently mentioned “other” reservation lake fish eaten. Appendix B contains the complete compilation of “other” reservation fish eaten.

There were some statistically significant differences among demographic groups regarding frequency of eating fish and the types of fish eaten.

- Females were more likely than males to eat fish from reservation lakes less than one meal/month.
- Homeowners were more likely to eat bass/pan fish than renters.
- Unemployed members were more likely to eat trout than employed members.
- Members with annual household incomes of \$50,000 or less were more likely to eat trout.
- Members with a Bachelor's, Graduate, or Professional degree were less likely to eat walleye/musky.

Boats

Table 4 indicates that Tribal members who own boats, in general, own non-motor boats or small boats. 258 total boats of various types were reported. Eight percent own a pontoon boat, 7% own a medium boat, and 5% own a large boat. Only eight members report owning a ski boat. There were relatively few demographic differences with respect to boat ownership. Homeowners were significantly more likely to own a pontoon, large, or medium boat than renters. Members with household incomes of \$50,000 or more were more likely to own a pontoon or large boat; members with less than \$50,000 household income were more likely to own a non-motor boat. Employed members were more likely to own a small or large boat than unemployed members.

Table 4: Type of Boats		
If you have a boat(s), what type do you have?	Count	Percentage of Total Respondents Owning Boats
Non motor boat	84	20%
Small boat <30hp	82	20%
Pontoon	33	8%
Medium boat <75hp	29	7%
Large boat >75hp	22	5%
Ski boat	8	2%

Activity on Tribal Waters

Tribal members were asked to identify activities that they do on 27 lakes and 2 rivers on the reservation. The 'top 5' in each category are summarized in the next section (Figures 7-14). *It should be noted in this section on Tribal water activity and the next section on Tribal water descriptions that many Tribal members do not use the reservation waters listed on the survey (See Figure 14 and Figure 20).*

Figure 7: Fishing Activity in Reservation Waters: Top 5

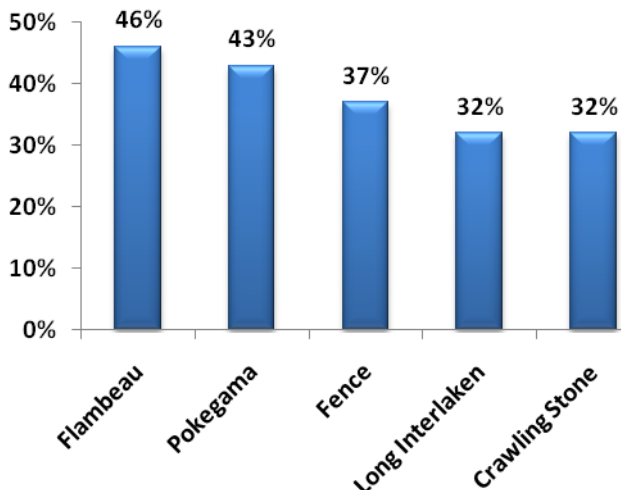
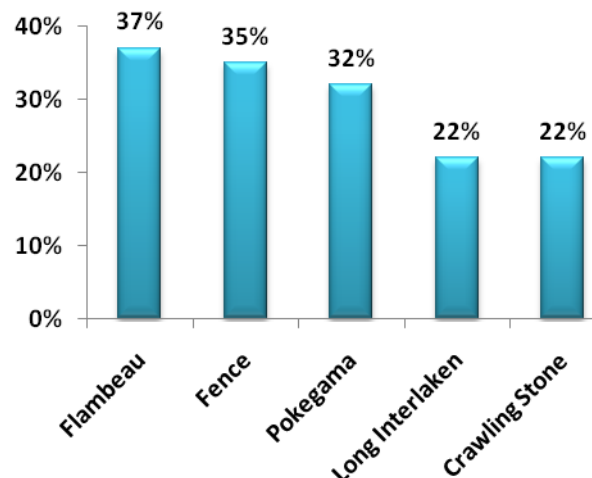


Figure 8: Swimming Activity in Reservation Waters: Top 5



As the first item in Figure 7 indicates, nearly one-half of Tribal members fish in Lake Flambeau. Lake Flambeau was also the top swimming choice of reservation waters. Lakes Pokegama, Fence, Long Interlaken, and Crawling Stone were all in the top 5 for fishing and swimming.

The same five lakes (Flambeau, Pokegama, Fence, Long Interlaken, and Crawling Stone) were in the top 5 for drinking water (Figure 9), although the number of members that use water from reservation waters for drinking purposes is quite low. A relatively small number of members reported hunting on the reservation waters. Bear River had the highest percentage of hunting (31 members), followed by Trout River and Reservation Line (Figure 10).

Figure 9: Drinking Water from Reservation Waters: Top 5

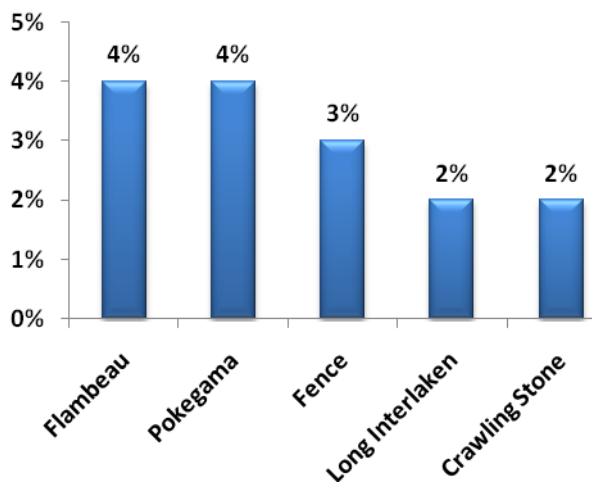
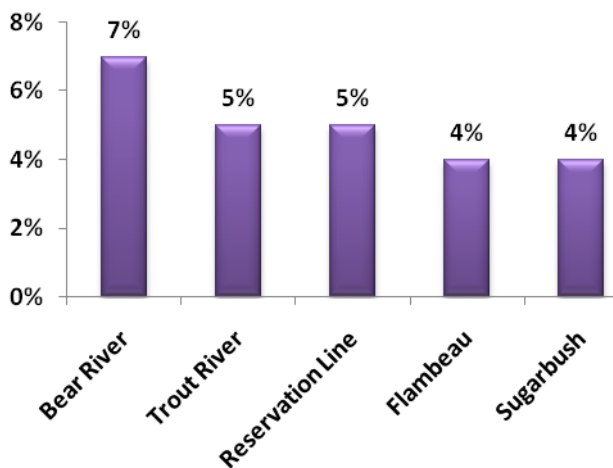


Figure 10: Hunting on Reservation Waters: Top 5



Members were asked to report their spearing and ricing activity on reservation waters (Figures 11 and 12). The same lakes that were in the top 5 for fishing, swimming, and drinking water were also used the most for spear fishing purposes. Relatively few members reported ricing, with the top location being Bear River at 8% (34 members).

Figure 11: Spearing on Reservation Waters: Top 5

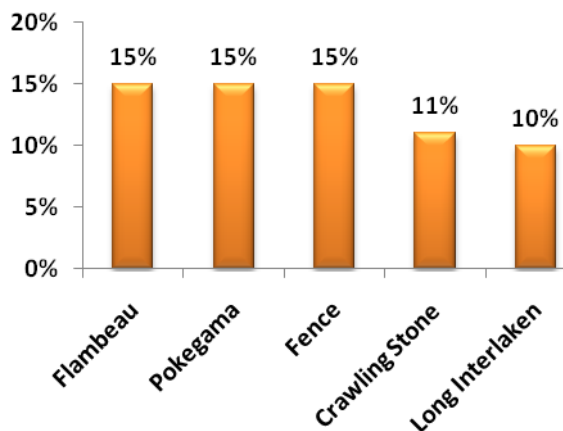
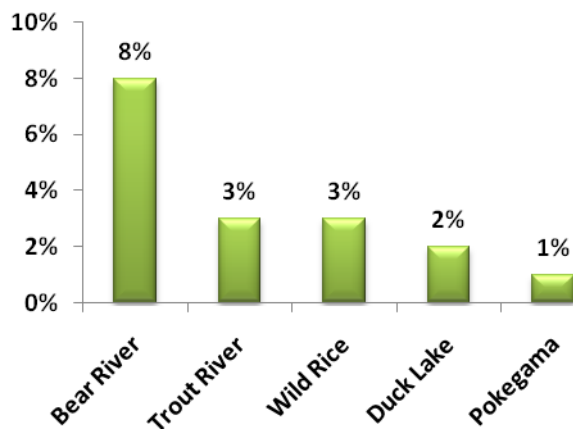


Figure 12: Ricing in Reservation Waters: Top 5



Bear River was the top choice in terms of cultural/ceremonial activity at 13%. (Figure 13). For 7 lakes, two-thirds or more of all members said they did not use them; for 22 lakes/ivers out of the 29 described in the survey a majority of members reported that they don't utilize them. Cranberry and Chewelah Lakes had the highest percentage of 'don't use' responses from members. (Figure 14).

Figure 13: Cultural/Ceremonial Activity on Reservation Waters: Top 5

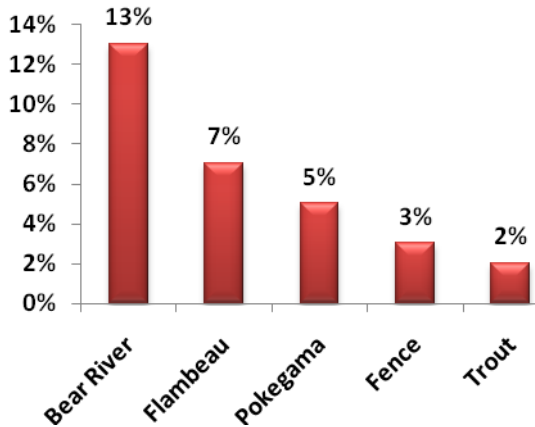
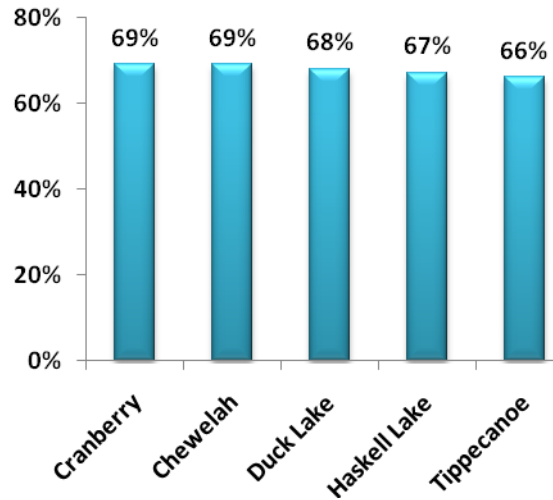


Figure 14: Don't Use: Top 5

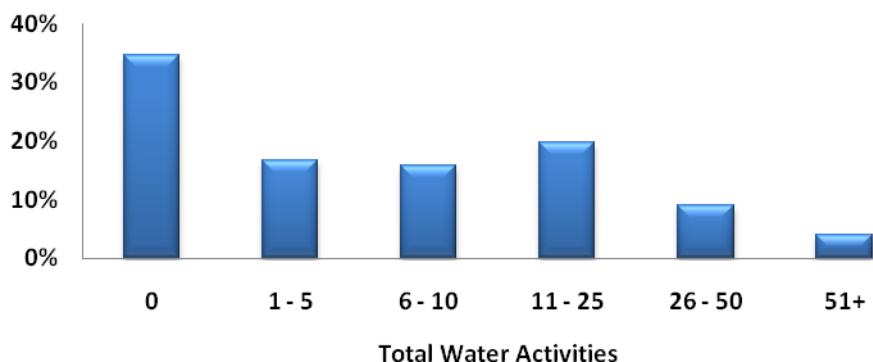


- Females were significantly more likely to say that they do not use the lakes and rivers listed than were males. Females were also more likely to say they do not fish or spear in the waters.

There was a great deal of variation in the amount and type of use of reservation lakes and rivers noted by respondents. This is not surprising since all Tribal members were included in the survey, both those living on the reservation (with ready access to its lakes and rivers) and those living off the reservation (in many cases quite a distance away with, therefore, less access to these water resources).

The SRC created a variable that measures the intensity of lake and river uses by respondents. As noted, respondents were asked if they used a specific lake or river and, if so, if they used it for 7 specific activities (fishing, swimming, drinking, hunting, spearing, ricing, and ceremonies). For each lake/river, the SRC created a total use variable that was zero if they said they did not use the lake and was the sum of the activities they reported engaging in if they did use it. So, if a respondent said that they use Fence Lake for fishing, swimming, spearing and ceremonial purposes, that person's total use of Fence Lake was given a value of 4. We created similar Total Use variables for each of the 29 bodies of water and added all of these totals up in an overall Total Water Activity variable.

Figure 15: Total Water Activity Levels



As Figure 15 indicates more than one-third of all respondents said they don't use any of the 29 reservation bodies of water about which we asked for any of the 7 activities. We assume that many of those living off the reservation are included in this 35% of the total sample.

Of the 65% who report using some of the 29 bodies of water, the average number of activities engaged in was 17; one respondent reported using these lakes for 131 activities! Most of those using the lakes and rivers engage in 25 or fewer activities.

The SRC also looked at the relationship between a respondent's opinion about whether the reservation should create more outstanding resource waters and their use of the 29 lakes/rivers included in the survey. Both those who report never using these waters for any of the 7 activities and those who do are strongly supportive of creating more outstanding resource waters. Interestingly, those who report no use of these lakes/rivers are more supportive (89% said "Definitely Yes") than those who use them (77%).

Water Descriptions

Tribal members were asked to indicate which descriptions were true for the 29 lakes and rivers identified on the survey. The 'top 5' in each category are summarized in the next section (Figures 16-21). Lake Flambeau was described as beautiful by the most members (40%), with Pokegama and Fence Lakes receiving 'beautiful' ratings by over one-third of members.

Figure 16: Beautiful: Top 5

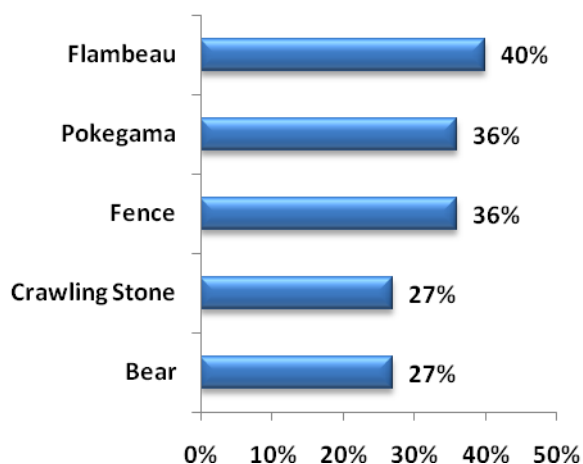
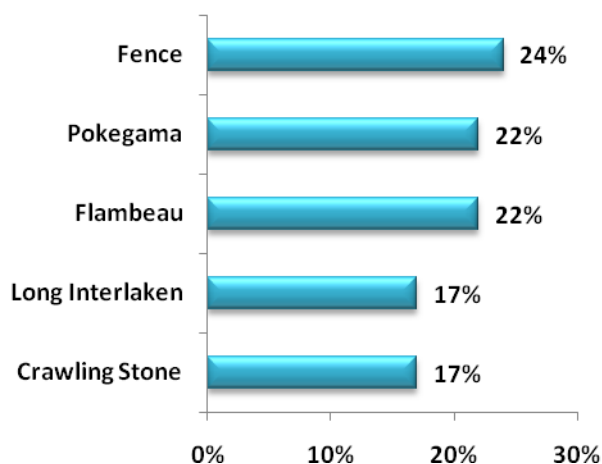


Figure 17: Clear Water: Top 5



The same lakes that were in the top 5 for fishing, swimming, drinking water, and spearing were also the 'top 5' for water clarity. (Figure 17). No lake or river had more than one-fourth of members describing it as having clear water.

As was the case with clear water, no lake or river had more than one-fourth of members describing it as having good water quality. Lake Flambeau had the highest percentage of members describing it as having good water quality at 22%. Pokegama and Fence lakes followed at 19%. (Figure 18). Bear River was the water with the highest percentage of members saying that it had good wildlife at 21%. (Figure 19).

Figure 18: Good Water Quality: Top 5

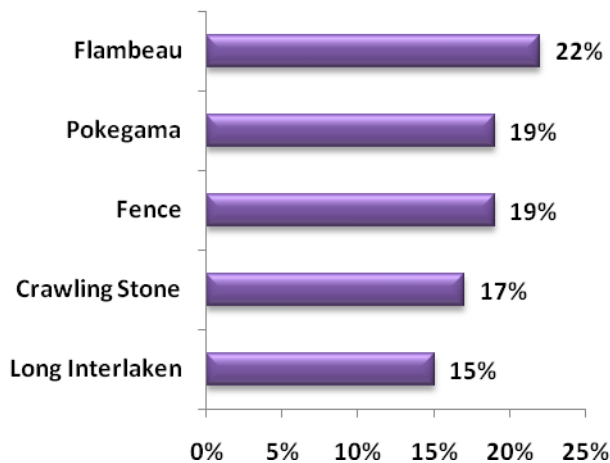
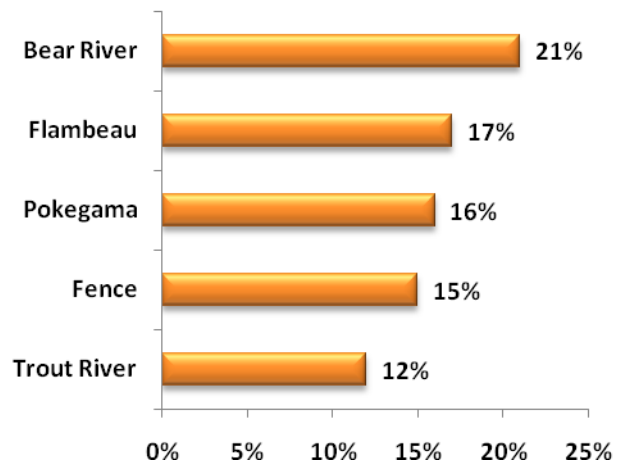


Figure 19: Good Wildlife: Top 5



There were four water descriptions listed on the survey: beautiful, clear water, good water quality, and good wildlife, with an additional option of “use, but don’t agree with the descriptions.” Moss Lake received the highest percentage of members choosing the “don’t agree” category at 10% or 41 members, followed by Fence Lake. As would be expected, the Top 5 ‘don’t use’ waters in the water description section were nearly identical to the Top 5 ‘don’t use’ in the water activity section with Lakes Cranberry and Chewelah being the least utilized. (Figure 21).

- Females were significantly more likely to say that they do not use the lakes and rivers listed. Males were more likely to describe waters as being clear and having good wildlife.

Figure 20: Use, Don't Agree With Descriptions: Top 5

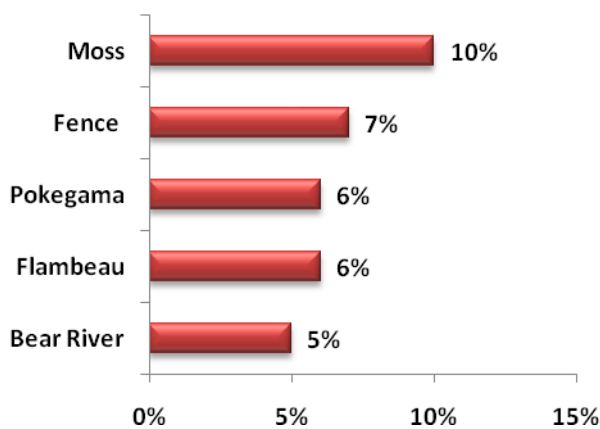
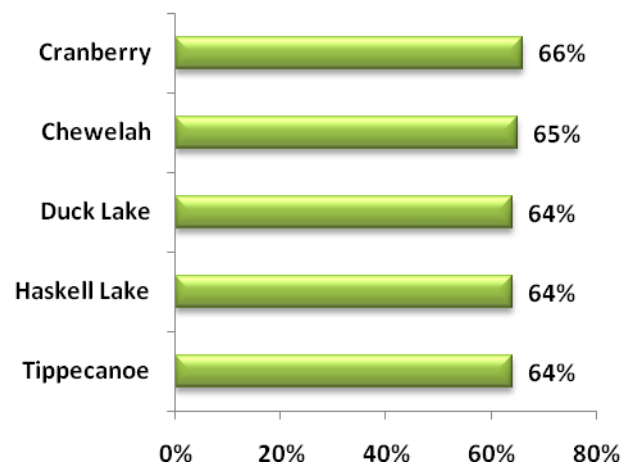
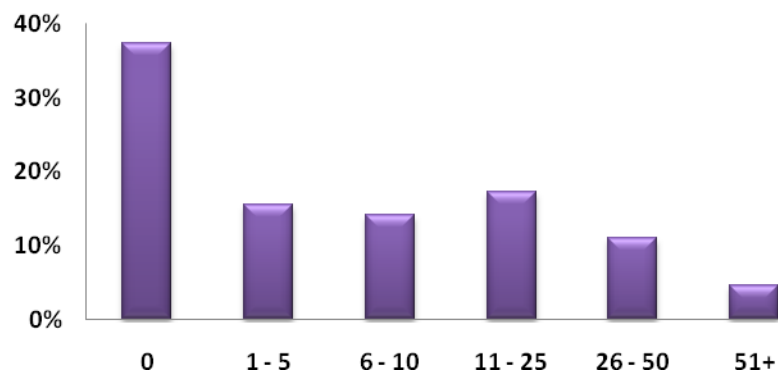


Figure 21: Don't Use



The SRC created a summary rating value for the 29 lakes/ivers that is similar to the summary usage statistic described earlier in the report. Again, if a respondent said they didn't use a particular river or lake, the total rating variable for that body of water was given a zero. Otherwise, we added up all of the characteristics noted by the respondent (beauty, water clarity, water quality, wildlife). Suppose, for example, the respondent said that they use Fence Lake and that it is a beautiful lake with good wildlife. In this case the respondent's Total Lake Quality Rating variable for Fence Lake was entered as a 2. As we did with the lake/river use statistic, we added these ratings across all of the lakes and rivers included in the survey as an overall gage of the quality of these water resources.

Figure 22: Total Lake/River Quality Rating



Comparing Figures 15 and 22, we see that a very similar proportion of Tribal members rated the quality of none of the lakes or rivers included in the survey (37%) as said they engage in none of the activities about which we asked (35%). The similarity of these values is a good thing and probably supports the hypothesis that many of the respondents in this category live off the reservation and don't have ready access to these lakes and rivers.

When we looked at the relationship between the total quality rating and the total water activity level, there is a relatively strong, positive correlation. This means that the people who most use these water resources were also more likely to provide input on their quality. In short, those who may be in the best position to know about the water quality in these lakes/ivers (because they are using them), were more likely to provide input on their quality. The more they used these resources the higher the quality rating they tended to give.

The SRC looked at the relationship between a respondent's opinion about the desirability of creating more outstanding water resources and whether or not they rated the existing quality of water resources on the reservation. Both those who rated the quality of reservation waters and those who didn't are very supportive of creating more outstanding water resources. However, those who didn't rate the quality of any of the existing lakes/ivers in the survey were more supportive of creating more outstanding water resources (88%) than those who rated their quality (77%).

If we are correct in our interpretation of these data, that those who report engaging in none of the activities asked about and who did not rate the quality of any of the lakes/ivers include many who live off the reservation, our analysis indicates that support for creating more outstanding water resources is stronger off the reservation than on.

Additional Comments

In an open-ended question, members were asked if there was anything else they would like to say about current Tribal water resource codes. 112 specific comments were categorized (some respondents wrote about more than one topic) and the responses range from water pollution to personal water craft. Answers are summarized in Table 5, and the complete compilation of comments can be found in Appendix B of this report.

The category with the highest percentage of comments were from Tribal members that live off the reservation and who wanted to clarify where they live (the survey was sent to Tribal members both on and off the reservation). Comments specific to the preservation and protection of waters received the second highest number of comments. Other issues on the reservation had the third highest percentage of comments.

Typical comments include:

“I think protecting the environment and keeping the lakes clean should be a high priority.”

“Start enforcing codes and ordinances on non-members as much as we do on tribal members!”

“Haven't used tribal waters in this area for a couple of years.”

“I've never been to the reservation, but I honestly feel that preservation of the tribe's bodies of water are crucial and important for future generations.”

“Please help save the water. That's all we got.”

Table 5: Additional Comments about Current Tribal Water Resource Codes		
	Count	Percentage
Do Not Live on Reservation	33	29%
Preservation and Protection	11	10%
Other Issues on Reservation	10	9%
General - Reservation Waters	9	8%
Trash	8	7%
Comments Regarding Survey	6	5%
Pollution	6	5%
Specific - Reservation Waters	5	4%
Fish/Fishing Topics	4	4%
Personal Water Craft	4	4%
Spearing	4	4%
Duck Worm and Snails	2	2%
Drinking Water	2	2%
Miscellaneous	8	7%
TOTAL	112	100%

Conclusions

A majority of Tribal members said they don't use 22 of the 29 described in the survey. In terms of water activities, nearly one-half of Tribal members fish in Lake Flambeau. Lake Flambeau was also the top choice for swimming. In addition, Lake Flambeau was described as beautiful by the most members (40%), with Pokegama and Fence Lakes receiving 'beautiful' ratings by over one-third of members.

No lake or river had more than one-fourth of members describing it as having clear water or having good quality water. At least one-third of members believe their enjoyment of reservation waters is hampered by trash, shoreline development, algae, and personal water craft.

Nearly three-fourths of members said that 'definitely' more waters should be protected as outstanding resource waters. Only two Tribal members said 'definitely no' to more outstanding resource water protection.

Most members were not in favor of any reduction in native aquatic plants even if better boating and swimming was the result. Over three-fourths of respondents fish using a hook and line. A substantial number (nearly one-fourth) spear fish.

A majority of members eat reservation lakes fish less than one meal per month; almost one-third have a monthly meal consisting of reservation lake fish.

Appendix A – Non-Response Bias Test

Any survey has to be concerned with “non-response bias.” Non-response bias refers to a situation in which people who do not return a questionnaire have opinions that are systematically different from the opinions of those who return their surveys. For example, suppose non-respondents eat fish from reservation lakes less than once a month (Question 8), whereas most of those who returned their questionnaire eat fish from reservation lakes more than once a week. In this case, non-response bias would exist and the raw results would overstate the frequency of reservation lakes fish consumption.

The standard way to test for non-response bias is to compare the responses of those who return the first mailing of a questionnaire to those who return the second mailing. Those who return the second questionnaire are, in effect, a sample of non-respondents (to the first mailing), and we assume that they are representative of that group. In this survey, 241 members responded to the first mailing and 176 responded to the second mailing.

We found 52 variables with statistically significant differences between the mean responses of these two groups of respondents (Table A1) out of 444 tested. In most cases, the differences of opinions between the first and second mailing are differences of degree (they would round to the same integer value) rather than substantive differences. Because of the relatively small differences in the magnitude of responses of first and second mailing respondents, **the Survey Research Center (SRC) concludes that non-response bias was not a concern for this sample.**

Table A1 – Statistically Significant Differences Between Responses of First and Second Mailings			
Variable	Mean First Mailing	Mean Second Mailing	Statistical Significance
Q1. My home is within 200 feet of a Reservation lake	.33	.19	.001
Q7. Type of Boat: Pontoon	.10	.05	.029
Q7. Type of Boat: Ski Boat	.03	.00	.015
Q8. Eat fish from Reservation Lakes: How Often	3.22	3.46	.020
Q9. Eat fish: Walleye/Musky	.73	.61	.012
Q10a. Fishing: Fence	.41	.31	.033
Q10a. Swimming: Fence	.40	.28	.012
Q10b. Spearing: Ike Walton	.05	.10	.040
Q10e. Fishing: Flambeau	.51	.39	.009
Q10e. Swimming: Flambeau	.41	.32	.044
Q10e. Cultural/Ceremonial: Flambeau	.10	.03	.003
Q10f. Don't Use: Pokegama	.25	.35	.028
Q10f. Fishing: Pokegama	.48	.36	.012
Q10f. Swimming: Pokegama	.37	.24	.005
Q10g. Don't Use: Long Interlaken	.36	.49	.009
Q10g. Fishing: Long Interlaken	.39	.22	.000
Q10g. Swimming: Long Interlaken	.26	.16	.024
Q10h. Don't Use: Crawling Stone	.35	.47	.020
Q10h. Fishing: Crawling Stone	.37	.25	.008
Q10h. Swimming: Crawling Stone	.27	.15	.005
Q10o. Don't Use: Moss	.44	.53	.047
Q10o. Fishing: Moss	.36	.19	.000
Q10t. Fishing: Little Crawling Stone	.29	.19	.016
Q10t. Swimming: Little Crawling Stone	.13	.05	.003
Q10z. Spearing: Duck Lake	.00	.03	.008
Q10bb. Hunting: Bear River	.10	.04	.021

Table A1 – Statistically Significant Differences Between Responses of First and Second Mailings (cont.)

Variable	Mean First Mailing	Mean Second Mailing	Statistical Significance
Q11a. Don't Use: Fence	.24	.35	.017
Q11a. Clear Water: Fence	.28	.18	.012
Q11d. Don't Use: White Sand	.44	.55	.031
Q11e. Don't Use: Flambeau	.20	.34	.002
Q11e. Clear Water: Flambeau	.28	.14	.001
Q11e. Good Water Quality: Flambeau	.27	.15	.005
Q11f. Don't Use: Pokegama	.22	.33	.009
Q11f. Good Wildlife: Pokegama	.20	.11	.025
Q11g. Don't Use: Long Interlaken	.31	.44	.006
Q11g. Clear Water: Long Interlaken	.20	.12	.030
Q11g. Good Water Quality: Long Interlaken	.18	.10	.030
Q11h. Don't Use: Crawling Stone	.32	.43	.032
Q11h. Clear Water: Crawling Stone	.22	.11	.006
Q11i. Use, Don't Agree with the Descriptions: Shish/Gunlock	.07	.02	.039
Q11l. Good Wildlife: Sugarbush	.15	.08	.040
Q11o. Clear Water: Moss	.10	.05	.040
Q11o. Use, Don't Agree with the Descriptions: Moss	.12	.06	.036
Q11t. Don't Use: Little Crawling Stone	.41	.52	.039
Q11w. Use, Don't Agree with the Descriptions: Raven Lake	.06	.02	.036
Q11y. Use, Don't Agree with the Descriptions: Chewelah	.04	.01	.037
Q11z. Good Water Quality: Duck Lake	.01	.05	.020
Q11aa. Use, Don't Agree with the Descriptions: Reservation	.05	.01	.007
Q11bb. Don't Use: Bear River	.32	.45	.009
Q11bb. Beautiful: Bear River	.31	.22	.043
Q13. Age	3.99	3.61	.008
Q15. Place of Residence	1.39	1.54	.003

Appendix B: Lac du Flambeau Water Quality Survey Written Comments

Q4 The items listed below are found in or around Reservation waters. Please mark the three which most make it harder to enjoy the water.

'Other' responses

- Duck worm (5x)
- Pollution (2x)
- Aquatic invasive plants
- Boat racing
- Busy. Don't have time to enjoy the waters.
- Disrespectful people
- Duck mites
- Fence Lake. Shoreline erosion. Swimmer's itch!
- Motor boats
- Oil, gas from water crafts.
- Shallow areas. Running a boat next to inlets.
- Some boats are too big for these lakes.
- Too few public landings.

Q9 If you eat fish from Reservation Lakes, what type(s) do you eat?

'Other' responses

- Whitefish (10x)
- Perch (7x)
- Northern (6x)
- Crappie (4x)
- Blue Gill (3x)
- Bullhead (3x)
- Sucker (3x)
- Panfish (2x)
- Smelt (2x)
- All
- Catfish
- Cisco
- None
- Red Horse

Q14 Employment Status

'Other' responses

- Disabled (10x)
- SSI (7x)
- Inmate/Prison/Incarcerated (5x)
- Student (3x)
- Artist
- Housewife
- Laid off
- Medical leave
- Reduced hours. Not by choice
- SSI & SSDI
- Widow

**Q20 Please provide any additional comments concerning current Tribal Water Resource Codes:
112 Comments**

Do Not Live on Reservation – 33 Comments

- Do not live on reservation/I do not live on reservation (2x)
- Can't give you more answers because I don't live on reservation.
- Do not live on reservation, but I do come to Flambeau to visit family and bring my children. They love the wildlife around the lakes and lakes seem very clean.
- Don't live near or on reservation.
- Haven't been on reservation for a long while - but am always concerned about the water on the reservation. It is the livelihood of the people. Good water should always be most important.
- I am resident of California.
- I did not complete #10 & #11. I own a home but have not lived there over 3 years.
- I do not live on the reservation right now. I do think the U.S. is in a food crisis (with food being so expensive). I think natives should be prepared to provide their own food on reservation waters and lands.
- I do not live in Wisconsin
- I don't live in LDF. I don't eat the fish; I don't swim, nor drink the water! I really have no interest in this really!
- I don't live on reservation land. I've got my own well on my own land.
- I don't live there, but don't let them develop the shoreline, etc.
- I don't reside in LDF.
- I frequently go visit relatives in LDF but when I do, I go to these lakes. That's what I am basing my answers on. I live in Minnesota.
- I haven't been to LDF since 1994. I don't remember which lake I used to fish on. Sorry, I don't think my survey appeals to the research.
- I live far off reservation, so do not have the opportunity to enjoy the water resources.
- I live in Colorado so my input may not be helpful.
- I live in Idaho. I don't have an opinion.
- I live in Michigan and visit annually to visit relatives. Clean water is important to me anywhere.
- I live out of state.
- I live outside of Wisconsin, in Michigan; I am not familiar with the issues addressed in this survey.
- I live several hundred miles away and visit the reservation seldom. I try to steer clear of those (omitted).
- I really can't tell you anything about this. I don't live anywhere around that area. I'm sorry.
- I (name omitted) am a member of the tribe, but haven't ever lived there. I feel I'm unable to respond to most of this survey, but will do my best. If I were living there, I would certainly be able to provide my thoughts and ideas. I travel up to the Northwoods in July each year and I do visit LDF. Love the area.
- I wish I could give a better perspective, but since my father passed away a year ago, I've only been to Flambeau once. Although I wish I could live there, I live in Milwaukee.
- It's been a lifetime away, but come back in the summer for vacation.
- I've never been to the reservation, but I honestly feel that preservation of the tribe's bodies of water are crucial and important for future generations.
- Left reservation several years ago. Not returned to live, only to visit.
- Living off reservation, I was unable to answer any of the questions. However, I am planning to retire in 5 or 6 years and am considering moving to LDF. I really hope that there are still pristine waters to enjoy in my old age.
- No real opinion until return to Wisconsin in 2009.
- Survey was really not applicable to me, as I don't live there.
- We live in Arizona. I don't feel we can respond appropriately, however we feel ground water should be protected.

Preservation and Protection – 11 comments

- As Anishinaabe, we have a cultural duty to preserve and protect the waters in our territory.
- For our reservation to sustain life (human, animal, & vegetation), our waters must be plentiful and healthy for generations to come.
- I think protecting the environment and keeping the lakes clean should be a high priority.
- It is in our tribe's best interest to protect what little wetlands we have. Economic development and tourist dollars, though needed, we can live without. I love Flambeau and the beauty. Let's keep it that way.
- Miigwetch for taking care of God's water, earth.
- Please help save the water. That's all we got.
- Protect it now while there is still a chance of cleaning it.
- Protect our lands and it will protect us.

- Thank you for helping preserve Mother Earth!! Keep up all your good work!
- The water quality is very clean there so let's keep it clean.
- Water is a big deal of importance. It will never be the same (lakes). People are too worried about money.

Other Issues on Reservation – 10 comments

- Get rid of junk cars.
- I often wonder where casino waste goes.
- Maintain strict septic tank regulations.
- Need houses for more tribal members on lake.
- Question: Why am I able to provide info that you value for this but not able to vote absentee? You can see my income. How can I (as an elder) be expected to drive all the way to Flambeau for each vote! I care. I am knowledgeable. Let the people off reservation vote absentee. We care!
- Regulate non-members as we do tribal members.
- Start enforcing codes and ordinances on non-members as much as we do on tribal members!
- The building wouldn't be bad but the people that would live there would cause the place to not be clean! Let there be peace in the Valley! Be sure the right decisions are made.
- Timber on reservation needs to be addressed as well.
- We shouldn't have to pay for water and sewer.

General - Reservation Waters – 9 comments

- Haven't used tribal waters in this area for a couple of years.
- I don't participate with lakes and I rarely ever ate fish, but I enjoy it.
- I don't bother with the lakes. Just for swimming sometimes.
- Lakes are fine. Fish are good quality and healthy.
- Lakes could be designated as "fishing" (more aquatic plants), others designated as "swimming/recreational" (lower plants).
- No clearing vegetation from lakes.
- The lakes today are well managed. Keep up the good work.
- The waters need to be cleaned of all the trees in them.
- We don't need to sell any of our lakes!!

Trash – 8 comments

- A lot of trash along shores.
- Clean out some of the lakes so we can swim in some of them. So that we don't cut our feet on the stuff in the lakes.
- Clean up trash from Bear River.
- Have individuals convicted of tribal crimes clean the trash around tribal waters as a part of community service.
- I think our lakes are beautiful except for the garbage around & in the lakes.
- Need to clean shorelines of lakes in township from debris from logging area.
- People keep throwing bottles, cans, and trash in the water.
- Would like to see them kept clean and free of garbage.

Comments Regarding Survey – 6 comments

- As much financial problems that the LDF tribe has, how can we justify such a useless poll, just another way to use my people's money. This survey is something that a 4th grader could have produced. Thank you for your concern.
- Better map to see area.
- Good to have input.
- More specific questions.
- This survey should be done by over paid tribal D.N.R. or water resource employees, not any universities! P.S. Do not send anymore of this crap. We do not live there.
- This was a great survey!

Pollution – 6 comments

- Ban farming & pesticides from contaminating the watershed area.
- Lake pollution.
- More people, more boats, more pollution. It can't be regulated.
- Use Clean Water Act to stop pollution.
- You ask about clear water but you don't ask about water that isn't, that you can't see in.
- You can see the oil on top of the lakes.

Specific - Reservation Waters – 5 comments

- Clean up Bear River. Needs to be cleaned very bad.
- Cloud Lake could be used but wasn't listed.
- Improve boat landing on Fence Lake, and dredge inlets.

- Test Cranberry Bog Lakes.
- Why (does) Moss Lake looks so gross - I use to swim in that - one time clean lake.

Fish/Fishing Topics – 4 comments

- We need weeds to get oxygen so fish won't die in Fall.
- Fishing on reservations waters by non Indians should be restricted to lottery system only.
- Tagging of setlines.
- Wish I had a dock so I can fish more often from the lake I live on.

Personal Water Craft – 4 comments

- No jet ski's.
- Keep jet skies of the chain of lakes.
- Reduce personal water craft (non Tribal members).
- Until you can reduce the amount of high-speed recreational motor boats and jet skis, etc., this survey is useless.

Spearing – 4 comments

- Close all lakes for spearing (5yrs).
- Keep spearing to a minimum.
- Limit spear fishing to on-off years to allow replenishing and game fish growth.
- Too many tribal lakes are closed for spearing.

Drinking Water – 2 comments

- Provide better drinking water for homes close to lakes and swamp drainage. Water tastes like mud & metal.
- Quality of drinking water.

Duck Worm and Snails – 2 comments

- Duck worm and snails on chain are a problem. Bring back the rusty crayfish.
- Plant crabs to get rid of snails and duck worm.

Miscellaneous – 8 comments

- Help the tribe more often.
- I feel so bad that I really don't keep up with my tribal happenings. Could you please send me a newsletter or newspaper? Thank You.
- Info on public meeting on this matter.
- Moved back - 3 years ago and still don't know much about the reservation.
- None
- None at this time.
- The tribe should eradicate purple loosestrife and Eurasian milfoil.
- Very good.

Appendix C: Quantitative Summary of Responses by Question

LAC du FLAMBEAU WATER QUALITY SURVEY

****PLEASE RETURN BY MAY 16, 2008****

Using blue or black ink, please fill the circle that most closely describes your perspective on the following:

Please fill the circle: Like this: ● Not like this: ✓ ✗ /

PLEASE SEE THE BACK OF THE COVER LETTER FOR A MAP OF THE RESERVATION SOURCE WATER PROTECTION AREAS AND DEFINITIONS OF TERMS USED IN THE SURVEY.

- 1. Referring to the Lac du Flambeau Reservation, please fill in the circle(s) that best describes the location of your current home. (● Mark all that apply or leave blank if none apply)**

My home is within a source water protection area	My home is within 200 feet of a Reservation lake	My home is within 200 feet of a Reservation river	My home is within 200 feet of a Reservation wetland
21%	27%	0%	4%

Definitely Yes Maybe Yes Maybe No Definitely No No Opinion

- 2. Should more waters be protected as outstanding resource waters?**

74% 16% 1% 1% 9%

- 3. Native aquatic plants tend to improve fishing but make swimming and boating worse. Based on the following scale, indicate your preference for reservation waters. (● Mark only one)**

A lot more plants & better fishing	More plants & slightly better fishing	Neutral	Fewer plants & slightly better boating/swimming	Lots fewer plants & much better boating/swimming
31%	24%	33%	10%	3%

- 4. The items listed below are found in or around Reservation waters. Please mark the THREE which most make it harder to enjoy the water. (● Mark only three)**

Lights	Algae	People fishing	Shoreline Development	Noise
10%	41%	5%	53%	32%

Skiing	Personal water craft	Aquatic plants	Trash	Other: <i>specify</i> See Appendix B
19%	35%	10%	58%	6%

- 5. If you fish, what method do you use? (● Mark all that apply)**

Hook and Line	Nets	Spear
78%	7%	23%

- 6. In your opinion, what is the depth needed to see fish for spear fishing?**

.05 – 5 Feet	5.1 – 10 Feet	10.1 – 20 Feet	Over 20 Feet
50%	37%	11%	1%

- 7. If you have a boat(s), what type do you have? (● Mark all that apply)**

Pontoon	Large boat >75hp	Medium boat <75hp	Small boat <30hp	Non motor boat	Ski boat
8%	5%	7%	20%	20%	2%

- 8. If you eat fish from Reservation Lakes, how often?**

More than 1 meal/week	1 meal/week	1 meal/month	Less than 1 meal/month
6%	11%	30%	53%

- 9. If you eat fish from Reservation Lakes, what type(s) do you eat? (● Mark all that apply)**

Bass/Pan	Trout	Walleye/Musky	Other: <i>specify</i> See Appendix B
49%	14%	68%	9%

10. Please fill in the circle(s) of any activity that you do on each of these waters. (• Mark all that apply)

	Lakes	Don't Use	Fishing	Swimming	Drinking Water	Hunting	Spearing	Ricing	Cultural/ Ceremonial
A	Fence	34%	37%	35%	3%	3%	15%	0%	3%
B	Ike Walton	65%	9%	2%	0%	2%	7%	0%	0%
C	Little Trout	55%	20%	5%	1%	4%	9%	0%	1%
D	White Sand	53%	20%	11%	1%	3%	9%	0%	1%
E	Flambeau	29%	46%	37%	4%	4%	15%	0%	7%
F	Pokegama	29%	43%	32%	4%	3%	15%	1%	5%
G	Long Interlaken	41%	32%	22%	2%	1%	10%	0%	2%
H	Crawling Stone	40%	32%	22%	2%	2%	11%	0%	1%
I	Shishebogama \ Gunlock	53%	21%	4%	0%	2%	9%	0%	0%
J	Buckskin	61%	13%	1%	1%	2%	6%	0%	0%
K	Wild Rice	64%	10%	3%	1%	4%	6%	3%	1%
L	Sugarbush	53%	19%	10%	1%	4%	9%	1%	2%
M	Stearns	60%	13%	4%	1%	2%	7%	0%	1%
N	Plummer	64%	10%	2%	0%	1%	4%	0%	0%
O	Moss	48%	29%	11%	2%	2%	5%	0%	1%
P	Tippecanoe	66%	8%	3%	0%	1%	4%	0%	0%
Q	Bolton	62%	13%	2%	0%	2%	6%	0%	0%
R	Mitten	59%	16%	4%	0%	2%	3%	0%	1%
S	Broken Bow	65%	10%	3%	0%	2%	3%	0%	1%
T	Ltl Crawling Stone	50%	25%	10%	1%	1%	8%	0%	1%
U	Haskell Lake	67%	9%	2%	0%	2%	2%	0%	0%
V	Zee Lake	66%	8%	1%	0%	1%	1%	0%	0%
W	Raven Lake	66%	9%	1%	0%	2%	1%	0%	1%
X	Cranberry	69%	4%	1%	0%	3%	2%	0%	1%
Y	Chewelah	69%	3%	1%	0%	3%	2%	1%	0%
Z	Duck Lake	68%	5%	1%	0%	3%	1%	2%	0%
AA	Reservation Line	61%	11%	3%	0%	5%	2%	0%	1%
	Rivers								
BB	Bear	43%	26%	7%	1%	7%	6%	8%	13%
CC	Trout	58%	16%	2%	1%	5%	6%	3%	2%

11. Please indicate which of the following descriptions are true for each of these waters. (● Mark all that apply)

	Lakes	Don't use	Beautiful	Clear Water	Good water quality	Good Wildlife	Use, but don't agree with the descriptions
A	Fence	29%	36%	24%	19%	15%	7%
B	Ike Walton	61%	10%	4%	3%	5%	4%
C	Little Trout	53%	14%	10%	8%	9%	4%
D	White Sand	49%	17%	14%	12%	7%	4%
E	Flambeau	26%	40%	22%	22%	17%	6%
F	Pokegama	26%	36%	22%	19%	16%	6%
G	Long Interlaken	36%	26%	17%	15%	11%	5%
H	Crawling Stone	37%	27%	17%	16%	10%	5%
I	Shishebogama \ Gunlock	50%	13%	8%	8%	8%	5%
J	Buckskin	58%	11%	4%	6%	6%	4%
K	Wild Rice	61%	10%	5%	5%	7%	3%
L	Sugarbush	51%	16%	8%	9%	12%	3%
M	Stearns	57%	12%	7%	6%	7%	3%
N	Plummer	61%	11%	5%	4%	6%	3%
O	Moss	46%	16%	8%	7%	9%	10%
P	Tippecanoe	64%	10%	4%	5%	6%	2%
Q	Bolton	60%	10%	5%	5%	6%	3%
R	Mitten	58%	11%	5%	6%	6%	3%
S	Broken Bow	63%	9%	4%	4%	5%	2%
T	Ltl Crawling Stone	46%	18%	13%	11%	9%	4%
U	Haskell Lake	64%	8%	2%	3%	4%	3%
V	Zee Lake	63%	8%	3%	3%	5%	3%
W	Raven Lake	61%	10%	3%	3%	5%	4%
X	Cranberry	66%	8%	2%	2%	4%	2%
Y	Chewelah	65%	8%	1%	2%	4%	2%
Z	Duck Lake	64%	8%	2%	3%	6%	2%
AA	Reservation Line	59%	12%	3%	4%	8%	3%
	Rivers						
BB	Bear	38%	27%	13%	14%	21%	5%
CC	Trout	52%	16%	9%	9%	12%	3%

DEMOGRAPHICS Please tell us some things about yourself.

12. Gender:	Male	Female	13. Age:	18–24	25–34	35–44	45–54	55–64	65+
	44%	56%		6%	14%	20%	26%	20%	14%
14. Employment Status:	Employed Full Time	Employed Part Time	Self Employed	Un-employed	Retired	Other: <i>specify</i> See Appendix B			
	43%	10%	7%	11%	21%	8%			
15. Place of Residence:	Own	Rent							
	55%	45%							
16. Number of Adults (18 or older) in Household:	0	1	2	3	4	5+			
		27%	48%	14%	7%	3%			
17. Number of Children (under 18) in Household:	51%	17%	17%	8%	3%	4%			
18. Annual Household Income Range:	Less than \$15,000	\$15,000 – \$24,999	\$25,000 – \$49,999	\$50,000 – \$74,999	\$75,000 – \$99,999	\$100,000 or More			
	27%	23%	25%	16%	6%	5%			
19. Highest Level of Education:	Less than high school	High school diploma	Some college/tech	Tech college graduate	Bachelor’s degree	Graduate or professional degree			
	14%	27%	35%	8%	9%	6%			

20. Please provide any additional comments concerning current Tribal Water Resource Codes:

See Appendix B for Comments

Please return your survey by May 16, 2008 to:
Survey Research Center
University of Wisconsin – River Falls
410 S. Third St.
124 Regional Development Institute
River Falls, WI 54022
Thanks for completing the survey!

Barcode

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