

Table of Contents

1	Introduction
1	Study Area
2	Methods
2	Results
7	Discussion
8	Recommendations
8	Acknowledgements
9	References
11	Figure 1
12	Figure 2 Cedar Creek Watershed
13	Tables 1 through 30
38	Appendix 1 Contents of Cover Letter and Survey

# Results of a Survey of Cedar Creek Watershed Landowners 2005



A  
Cooperative Project  
of the  
Cedar Lake Conservancy  
and  
Minnesota Department  
of  
Natural Resources  
Division of Fish and Wildlife



# Results of a Survey of Cedar Creek Watershed Landowners, 2005

## Table of Contents

Introduction	1
Study Area	1
Methods	2
Results	2
Discussion	7
Recommendations	8
Acknowledgements	8
References	9
Figure 1 Location of the Cedar Creek Watershed in Minnesota	11
Figure 2 Cedar Creek Watershed	12
Tables 1 through 30	13
Appendix 1 Contents of Cover Letter and Survey	38

# Results of a Survey of Cedar Creek Watershed Landowners, 2005

Edward L. Feiler  
Minnesota Department of Natural Resources<sup>1</sup>

## Introduction

During the summer of 2005 members of the Cedar Lake Conservancy and the Minnesota Department of Natural Resources met to discuss lake management concerns and issues. The Cedar Lake Conservancy is a lake association whose members live and/or own property on Cedar Lake. These meetings resulted in a determination that a survey of landowners would be useful. The survey could have several desirable outcomes. Among these would be the development of a mission statement for watershed management that would include the definition of the desired character of the Cedar Creek watershed, a determination of the real issues and problems landowners in the watershed face and the building of a consensus of watershed owners regarding goals and actions to maintain this character. The survey would serve to create the ability to interface watershed owner goals and government goals.

## Study Area

The Cedar Creek Watershed lies in Aitkin and Crow Wing Counties of north central Minnesota approximately 110 air miles north and west of Minneapolis (Figure 1.). Cedar Creek is a direct tributary of the Mississippi River (HUC 7010104<sup>2</sup>). The Cedar Creek Watershed is 48.3 square miles (30,914 acres) and encompasses parts of two townships in Aitkin County (Aitkin, Farm Island) and three townships in Crow Wing County (Bay Lake, Deerwood, Rabbit Lake) and a small portion of the City of Deerwood. None of these governmental units lie entirely within the Cedar Lake Watershed.

Ecologically, the Cedar Creek Watershed is in the Laurentian Mixed Forest Province with land type associations consisting of the Palisade Lake Plain, Aitkin Moraine and Nokay Sand Plain. The Aitkin Moraine covers slightly more than 24,000 acres of the watershed area. Prior to European settlement the most common land cover was mixed red pine and white pine forest (13,000+ acres) with hardwood (deciduous) forest covering another 4,400 plus acres. In the mid 1990s deciduous forest covered 11,700 plus acres of the watershed.

There are fifty-three (53) named and unnamed lakes and wetlands in the Cedar Lake Watershed (Figure 2.). They range in size from 3 to 1812 acres (Cedar Lake). According to Upham "*Cedar Lake, ....., was named from the red cedars that in scanty numbers are found on its hilly shores and islands.*"

<sup>1</sup> Current address: Minnesota Department of Natural Resources, Division of Fish and Wildlife, 1601 Minnesota Drive, Brainerd MN 56401

<sup>2</sup> The Water Resources Council developed a classification of hydrologic drainage basins in the United States. Each hydrologic unit is identified by a unique hydrologic unit code (HUC).

The five townships of the Cedar Lake Watershed had a combined population of 4,228 in 2000, or 30.6 people per square mile. The population tends to be concentrated along the shores of the lakes.

## Methods

Members of the Cedar Lake Conservancy determined the content areas to be used in the survey. Department of Natural Resources staff crafted the questions and survey layout. Both groups reviewed the layouts and approved them. The surveys were sent to all watershed landowners. Minimally different surveys were prepared for riparian and non-riparian landowners. The lists of landowner names were purchased from Aitkin County and Crow Wing County. The list of members of the Cedar Lake Conservancy was also included. This was done since there were Cedar Lake Conservancy members who lived in the watershed but did not own the land. Landowners including governmental units, large commercial lands and non-profit groups were not included in the survey. Each landowner was mailed a letter containing an explanatory cover letter, a survey and a stamped, addressed return envelope (Appendix 1). The cover letter requested surveys be returned by October 31, 2005. The return address was the Cedar Lake Conservancy post office box. When mailed surveys with incorrect addresses were returned by the U.S. Postal Service attempts were to be made to find the correct addresses.

## Results

Members of the Cedar Lake Conservancy assembled and mailed the surveys. The surveys were mailed on October 5, 2005. The last survey accepted was postmarked November 14, 2005. Originally a total of 1216 surveys were mailed. Following attempts to correct addresses, there were a total of 1210 surveys actually mailed. There were 443 surveys returned or a 36.6 percent return (Table 1).

More than half (672) of the surveys were mailed to landowners with addresses in eight cities in Aitkin and Crow Wing Counties (Table 2). The greatest numbers were to the Aitkin zip code (378) and to the Deerwood zip code (264). There were 381 surveys mailed to landowners with zip codes in the metropolitan Twins Cities area. Landowners with zip codes in Greater Minnesota (85) and twenty four other states (72) also received surveys.

Returns were nearly equally divided between Aitkin County landowners (224) and Crow Wing County landowners (201) (Table 3). Returns were most heavily weighted to riparian landowners (374) over non-riparian landowners (69). The identifiable entities with the highest number of returns were Deerwood Township (192), Aitkin Township (124) and Farm Island Township (100). Riparian landowners returned surveys at twice the rate (42.3 percent) of non-riparian landowners (20.7 percent) (Table 4.). The rate of return by county was similar with there being a 37.2 percent return for Aitkin County landowners and 32.8 percent return for Crow Wing County landowners.

There were 14 lakes which had surveys mailed to 10 or more landowners. The 786 surveys mailed to landowners resulted in 345 returned surveys. This was a rate of return of 43.9 percent which ranged by lake from 25.0 percent (Taylor Lake) to 52.6 percent (Dogfish Lake in Aitkin County). The greatest number received was from Cedar Lake which had 181 returns from a mailing of 365 surveys (49.6 percent) (Table 5). There were eighteen water bodies with 50 riparian landowners but no returns (Table 6.)

Landowners were asked to indicate how longed they had owned their property. A number of respondents indicated lengths of time less than one year. All of these were assigned a length of time of 0.5 years. The mean length of ownership for non-riparian landowners was 20.1 years and that for riparian owners was 22.9 years (Table 7.). These were not significantly different at the 95 percent confidence level ( $z = -1.069$ ). There were twenty or more returned surveys from four lakes (Cedar, Hamlet, Shirt and Sunset). The mean length of ownership was 25.2, 22.1, 17.9 and 23.9 years respectively.

Among riparian landowners responding more indicated seasonal residence (217) than full-time residence (150) (Table 8.). Non-riparian landowners one the other hand, were the reverse with 46 indicating full-time residence and 20 indicating seasonal residence. The lakes with 20 or more responses (Cedar, Hamlet, Shirt, and Sunset) each showed the same pattern as for all riparian landowners (i.e. more were seasonal residents) with the exception of Hamlet Lake.

Non-riparian seasonal residents indicated a mean use of their property of 74.8 days per year and riparian landowners indicated a mean use of 80.7 days per year (Table 9). This is not a statistically significant difference at the 95 percent confidence level. Comparing Cedar Lake mean seasonal residence property use of 94.1 days per year with all other riparian owners (66.3 days per year) there is a significant difference at the 95 percent confidence level ( $z = -3.38878$ ).

Riparian landowners responding were somewhat more likely to be retired (193) than not retired (i.e. working) (174) (Table 10). The specific question in the survey related to retirement asked if at least one member of the household was retired. Cedar Lake and Shirt Lake landowners responding showed a similar pattern while landowners from Hamlet Lake and Sunset Lake were nearly equally divided between the two categories. Non-riparian landowners responding were more likely to be working (38) than to be retired (30).

Far and away, property use as a residence was most commonly listed by respondents (357) (Table 11a). Additionally there were 22 combination responses that included residential use with at least one other use (Table 12a). The response from lakes with the greatest number of returns (Cedar, Hamlet, Shirt, Sunset) was similar (Table 11b, 12b).

A dwelling suitable for year around use was the most common property description for both non-riparian (51) and riparian (240) landowners (Table 13a). Seasonal dwellings with no plans to convert in the future elicited 88 responses, the next

highest description of property. The response from landowners on the lakes with the greatest number of returns (Cedar, Hamlet, Shirt, Sunset) was of a similar pattern (Table 13b).

A profile of landowners can be made using location of land owned (riparian, non-riparian), residence status (full-time, seasonal) and retirement status (retired, working) (Table 14a). Based on these parameters a profile of the riparian respondents would look like this.

- Riparian, seasonal, working - 114
- Riparian, seasonal, retired - 102
- Riparian, full-time, retired - 89
- Riparian, full-time, working - 56

The profile of non-riparian respondents would be this.

- Non-riparian, full-time, working - 56
- Non-riparian, full-time, retired - 26
- Non-riparian, seasonal, working - 12
- Non-riparian, seasonal, retired - 8

Cedar Lake respondents had a similar profile to all riparian respondents (Table 14b). It looks like this.

- Riparian, seasonal, working - 58
- Riparian, seasonal, retired - 53
- Riparian, full-time, retired - 44
- Riparian, full-time, working - 21

In terms of numbers the greatest recreational uses by all respondents were summer fishing (378), birding/wildlife observation (348), swimming/wading (346), esthetics<sup>3</sup> (343) and winter fishing (290) (Table 15). Utilizing importance<sup>4</sup>, the top rankings are esthetics (4.33), summer fishing (3.88), birding/wildlife observation (3.87), other recreational boating (3.62) and swimming/wading (3.56).

In terms of numbers the greatest recreational uses by riparian respondents were summer fishing (324), birding/wildlife observation (302), swimming/wading (301), and esthetics (300). Utilizing importance, the top rankings are esthetics (4.39), summer fishing (3.88), birding/wildlife observation (3.87) and other recreational boating (3.65).

In terms of numbers the greatest recreational uses by non-riparian respondents were summer fishing (54), birding/wildlife observation (46), swimming (45) and winter fishing (44). Utilizing importance, the top rankings are esthetics (3.93), summer fishing (3.89), birding/wildlife observation (3.87) and winter fishing (3.36).

<sup>3</sup> e.g. enjoying the beauty of scenery, a sunrise or sunset, etc.

<sup>4</sup> where 1 is of low importance and 5 is of high importance

Cedar Lake landowners had the greatest participation in summer fishing (158), swimming/wading (147), esthetics (144) and birding / wildlife observation (Table 16). In terms of an activity's importance Cedar Lake landowners rated esthetics (4.20), summer fishing (3.89), other recreational boating (3.82) and birding / wildlife observation (3.72) the highest.

Seasonal and full time residents gave different importance to recreational activities. The mean values of several of these were significantly different at the 95 percent confidence level. Among seasonal landowners the mean ratings of importance for esthetics (4.49), swimming/wading (3.80), canoeing/kayaking (3.02) and water skiing/tubing (2.99) were each significantly different than the mean values for the same activities rated by full time respondents (4.12, 3.25, 2.63 and 2.43, respectively) ( $z = -2.9599, -3.5204, -2.1938$  and  $-3.0538$ , respectively) (Table 17). Conversely, full time landowners gave a mean rating of importance of 3.35 for winter fishing while seasonal residents had a mean rating of 2.5. This was significantly different at the 95 percent confidence level ( $z = 4.3890$ ).

Retired and working respondents, for the most part, rated the importance of activities similarly. The only two activities for which there was a significant difference at the 95 percent confidence level were swimming/wading and personal watercraft use (Table 18). Retired respondents gave a mean rating of importance of 3.37 for swimming and 1.66 for personal watercraft use, whereas the mean importance of these activities for working respondents was 3.75 and 2.09, respectively ( $z = -2.4486$  and  $-2.1131$ , respectively).

Overall, nearly 60 percent (57.7 percent), of the respondents indicated that they felt that lake water quality had remained the same during their ownership (Table 19). An additional 31.1 percent felt lake water quality had gotten worse during their time of ownership. This same pattern held true for many of the groups identifiable among survey respondents. Percentages of respondents indicating lake water quality was remaining the same were: riparian landowners, 59.1; non-riparian landowners, 49.3; Cedar Lake landowners, 50.4; full time resident landowners, 56.6; seasonally resident landowners, 59.6; retired landowners, 57.0; working landowners, 55.4; Aitkin County landowners, 59.5; and Crow Wing County landowners, 55.5. Percentages of respondents indicating lake water quality was getting worse were: riparian landowners, 31.5; non-riparian landowners, 27.5; Cedar Lake landowners, 41.4; full time resident landowners, 28.9; seasonally resident landowners, 33.3; retired landowners, 30.7; working landowners, 32.6; Aitkin County landowners, 30.6; and Crow Wing County landowners, 32.6.

Landowners were asked to rate the importance of fifteen different lake and watershed issues. The issue with the highest mean rating (4.48) for all respondents was "multiple unit developments are not desirable"<sup>5</sup> (Table 20). Such a mean value

<sup>5</sup> strongly agree = 5, somewhat agree = 4, neither agree nor disagree = 3, somewhat disagree = 2 and strongly disagree = 1; responses of "don't know" were not used to determine the mean.

would be between "somewhat agree" and strongly agree". Four other issue areas had similar response levels: runoff from lawns is an important water quality issue (4.22), shoreland filters (buffer zones) around lakes are important (4.22), enforcement of shoreland regulations is important (4.17), and runoff from tributaries is an important water quality issue (4.06). The mean importance of the remaining issues ranged from 3.06 to 3.81. All issues had 400 or more responses.

The five most important issues for Cedar Lake landowners, in descending order of mean importance were multiple unit developments are not desirable (4.51), runoff from lawns is an important water quality issue (4.34), shoreland filters (buffer zones) around lakes are important (4.34), enforcement of shoreland regulations is important (4.19), and water level fluctuations are a problem (4.04) (Table 21). Development of marginal lakeshore lots is a problem was an issue for Cedar Lake landowners nearly as important with a mean rating of 3.99. The remaining issues had a mean importance between 3.20 and 3.86. All issues had 165 or more responses.

The most important issue for landowners on Hamlet, Shirt and Sunset Lakes was multiple unit developments are not desirable having a mean importance of 4.58, 4.58, and 4.50 respectively (Tables 22-24). The most important issues among these lakes varied. The issues of runoff from lawns is an important water quality issue, shoreland filters (buffer zones) around lakes are important, and enforcement of shoreland regulations is important always had a mean rating of 4.0 or more.

Viewing the importance of issues for lakeshore owners on all lakes *except* Cedar Lake, the issues of multiple unit developments are not desirable (4.53), shoreland filters (buffer zones) around lakes are important (4.30), enforcement of shoreland regulations is important (4.21), and runoff from lawns is an important water quality issue (4.19) were the most important (Table 25).

Taking all riparian owners as a group, the issues with the greatest mean importance were multiple unit developments are not desirable (4.52), shoreland filters (buffer zones) around lakes are important (4.28), runoff from lawns is an important water quality issue (4.27), enforcement of shoreland regulations is important (4.20), and runoff from tributaries is an important water quality issue (4.13), were the most important (Table 26). Non-riparian landowners also gave multiple unit developments are not desirable (4.25) the highest mean importance (Table 27). Other issues for non-riparian owners did not closely resemble riparian issues in level of importance.

Aitkin County landowners and Crow Wing County landowners had similar mean importance rating for issues (Tables 28 and 29). The mean ratings for Aitkin County and Crow Wing County landowners, respectively were: multiple unit developments are not desirable, 4.50 and 4.49; shoreland filters (buffer zones) around lakes are important, 4.25 and 4.21; runoff from lawns is an important water quality issue, 4.20 and 4.25; enforcement of shoreland regulations is important; 4.22 and 4.12; and runoff from tributaries is an important water quality issue, 4.15 and 3.95.



Overwhelmingly, the most common response for communicating results of the survey was by newsletter (383) with the next greatest response being via the Internet (137) (Table 30). Meetings were not a communications method that was highly favored receiving only 49 responses.

### Discussion

A measure of development change can be made from survey responses. The property description question asked respondents to indicate if they either had plans to build on property without a dwelling or to convert seasonally suitable dwellings. Among the 370 riparian responses with property descriptions, 33 indicated plans to build or convert or 8.9 percent. Expanding this to the 887 riparian landowners, to whom a survey was sent, would mean that there would be 79 changes in property status. Similarly, among the 67 non-riparian landowners responses were six with plans to build or nine percent. Expansion to the 323 non-riparian landowners originally mailed surveys would mean that there would be 29 changes in property status. Together, it would appear that there could be a minimum of 108 property changes in the Cedar Creek Watershed.

The importance of issues was quite consistent among the several identified riparian groups. There were five issues among the six riparian groups which were, with only four exceptions out of thirty instances, always given an importance in the top five. The issues were

- Multiple unit developments are not desirable
- Shoreland filters (buffer zones) around lakes are important
- Runoff from lawns is an important water quality issue
- Enforcement of shoreland regulations is important
- Runoff from tributaries is an important water quality issue

The groups were: all riparian landowners, Cedar Lake landowners, Hamlet Lake landowners, Shirt Lake landowners, Sunset Lake landowners and all riparian landowners except those of Cedar Lake.

Among the fifteen issues examined in the survey, riparian and non-riparian landowners did not rate their importance differently. These ten issue areas had mean importance values that were not significantly different at the 95 percent confidence level. The five issues that were different between the two groups were all issues that would intrinsically seem to have more importance to riparian landowners than to non-riparian landowners. In each instance the mean importance for riparian landowners was higher than the mean importance assigned by non-riparian landowners. The issue areas were shoreland filters (buffer zones) around lakes are important, runoff from lawns is an important water quality issue, runoff from tributaries is an important water quality issue, water level fluctuations are a problem. and more control of nuisance beavers is needed. Interestingly, issues also seemingly more important to riparian owners like aquatic plant nuisance problems are increasing and development of marginal lakeshore lots is a problem were not significantly different between the groups.

## Recommendations

The data obtained from the survey can be a useful tool in decision making for many different groups. The complete survey results should be widely distributed to lake associations and coalitions of lake associations (COLAs), county and township boards, planning and zoning agencies and county water plan groups among others. An executive summary should be sent to everyone to whom the survey was originally mailed. The results should also be made available on an appropriate Internet site.

The survey results can be used to develop a watershed level plan. This would imply that citizens organize on a watershed basis. A model for this may be that of the Big Sandy Area Lakes Watershed Management Project (BSALWMP). Organizing and holding a meeting to create a steering committee for this purpose would be a first step.

There were a considerable number of written comments and suggestions provided by survey respondents. Reading these comments provides a more complete sense of the reasoning behind the data presented. It will be useful for plan preparation to have a sense of this reasoning. Therefore anyone taking an active planning role for the Cedar Creek Watershed should spend some time reading these written statements. The written comments have been compiled as a separate document to facilitate this effort.

## Acknowledgements

I would like to thank Debra Campbell, Les Martin, Marty Martin, Tom Miller, Nick Priadka, Phil Rzeszutek, Nanci Sauerbrei, Walt Sauerbrei, Chuck Schwalbe, Jim Spaeth and Diane Telshow of the Cedar Lake Conservancy for their work in planning the survey, assembling and mailing the survey and collecting completed surveys from the post office. Thanks must go to Dr. Charles Anderson of the Division of Fish and Wildlife who provided crucial review of the survey contents. I thank Tim Brastrup, DNR Area Fisheries Supervisor in Brainerd, and Kit Nelson, DNR Area Fisheries Supervisor in Aitkin, for providing input to the surveys contents. Ruth Zaleski from the DNR Aquatic Plant Management program in Brainerd provided all the data entry for survey analysis. Her help and support were instrumental in the timely production of this report. Her efforts are greatly appreciated. Tim Brastrup, Kit Nelson and Mike Duval, all from the DNR, provided critical review of the report drafts.

## References

- Anderson, C. 2005. *Personal Communication*. Section of Fisheries Management, Minnesota Department of Natural Resources Saint Paul.
- Anderson, K. A., T. J. Kelly, R. M. Sushak, C. A. Hagley, D. A. Jensen, and G. M. Kreag. 1999. *Summary Report on public perceptions of the impacts, use and future of Minnesota lakes: Results of the 1998 Minnesota lakes survey*. University of Minnesota Sea Grant Program, Duluth, and Office of Management and Budget Services, Minnesota Department of Natural Resources, Saint Paul.
- Anthony, K. 1998. *1998 Survey of Minnesota Residents About Fisheries Management: Results and Technical Report*. Technical Report #98-20 Minnesota Center for Survey Research University of Minnesota, Minneapolis.
- Feiler, E.L. 2000. *Results of a Survey of Knife Lake Riparian Owners*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.
- Feiler, E.L. 2001. *A Property Owner Survey with Respect to Aquatic Vegetation and Its Control, Lake Minnewawa, Aitkin County, Minnesota*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.
- Feiler, E.L. 2001. *Results of a Mail Survey of Riparian Owners in the Tamarack River Watershed, Aitkin and Carlton Counties, Minnesota*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.
- Feiler, E.L. 2002. *A 2002 Survey of the Landowners of Leech Lake, Minnesota*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.
- Feiler, E.L. 2002. *A 2002 Survey of the Landowners in the Dam Lake, Lily Lake and Long Lake Watershed, Aitkin County Minnesota*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.
- Feiler, E.L. 2003. *A 2003 Survey of the Landowners of Grave Lake and the Hay Creek Watershed, Crow Wing County, Minnesota*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.
- Feiler, E.L. 2003. *A 2003 Survey of Horseshoe Lake Property Owners*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.
- Feiler, E.L. 2003. *A 2003 Landowner Survey of the Woman Lake Chain*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.

Feiler, E.L. 2005. *Results of a Survey of the Landowners in the Nokasippi River Watershed, Crow Wing and Morrison Counties, Minnesota in 2005*. Minnesota Department of Natural Resources, Division of Fish and Wildlife.

Freund, J.E. 1960. *Modern Elementary Statistics*. Prentice-Hall, Inc. Englewood Cliffs NJ.

Hagley, C. A., D. A. Jensen, G. M. Kreag and K. A. Anderson. 1999. *Summary Report on treasures under pressure: The future of northeastern Minnesota Lakes: Results of the 1998 public workshops*. University of Minnesota Sea Grant Program. Duluth. and Office of Management and Budget Services, Minnesota Department of Natural Resources. Saint Paul.

Kreag, G. M. 2000. *Comments by survey respondents on public perceptions of the impacts, use and future of Minnesota lakes: Results of the 1998 Minnesota lakes survey*. University of Minnesota Sea Grant. Duluth.

Minnesota Department of Natural Resources Division of Forestry. 1999 June 1. *Ecological Land Type Associations of Minnesota*. <http://deli.dnr.state.mn.us/metadata.html?id=L280000110201> Accessed 2005 June 7.

Minnesota Department of Natural Resources Division of Forestry. 1994 June 1. *Presettlement Vegetation*. <http://deli.dnr.state.mn.us/metadata.html?id=L280000110201> Accessed 2005 June 7.

Upham, W. 2001. *Minnesota Place Names: A Geographical Encyclopedia*. Revised edition of *Minnesota Geographic Names*, 1979. Minnesota Historical Society Press. Saint Paul.

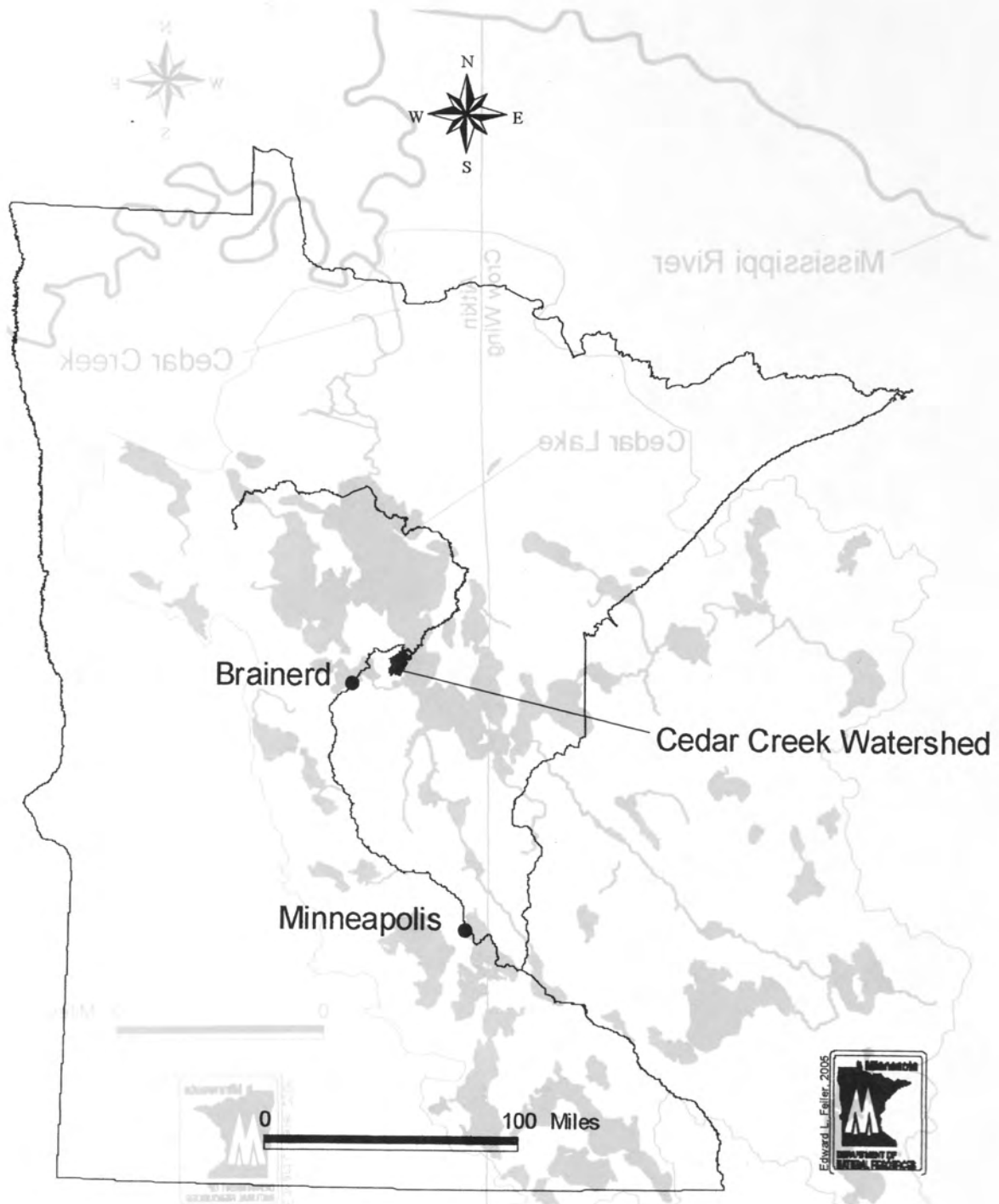


Figure 1. Location of the Cedar Creek Watershed in Minnesota

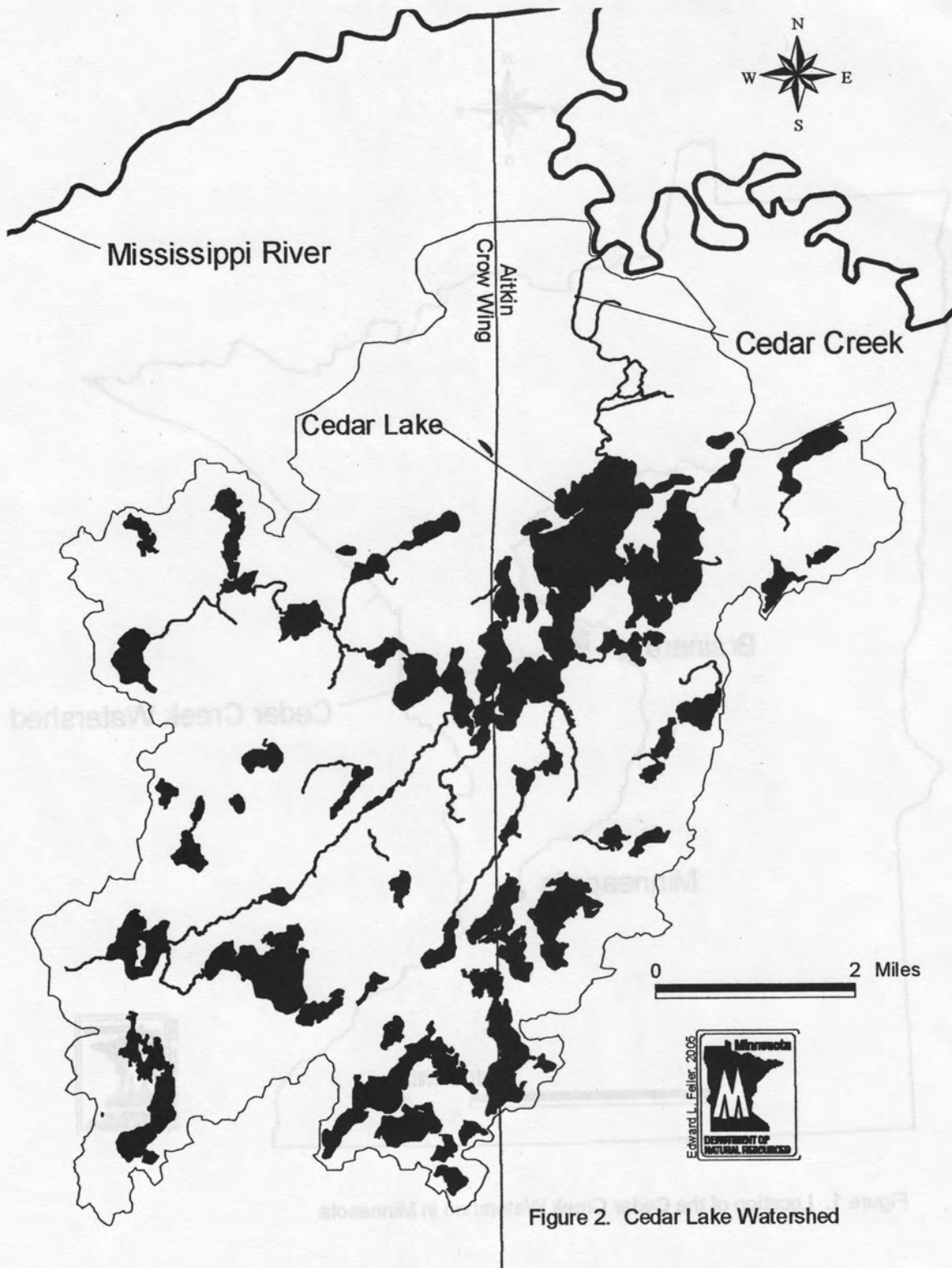


Figure 2. Cedar Lake Watershed

Table 1. Mailing and Return Data, Cedar Creek Watershed Landowners Survey, 2005

Number of Surveys Originally Mailed	1216
Returned with Undeliverable Addresses	6
Total Surveys Delivered	1210
Total Surveys Returned	443
Percent (%) Returned	36.6

Table 2. Address Locations of Mailed Surveys, Cedar Creek Watershed Landowners Survey, 2005

Description	Number
Local cities in Aitkin and Crow Wing Counties (8)	672
Metropolitan Twin Cities (78)	381
Greater Minnesota cities (46)	85
Other states (24)	72
	1210
Local Cities	Number
Aitkin	378
Brainerd	12
Crosby	11
Deerwood	264
Ironton	4
McGregor	1
Merrifield	1
Nisswa	1
	672
Minneapolis	47
Saint Paul	23

Table 3. Property Location Indicated on Returned Surveys, Cedar Creek Watershed Landowners Survey, 2005

Location	Riparian	Non-Riparian	Total
Bay Lake Township	0	2	2
Deerwood Township	156	36	192
Deerwood City	1	1	2
Rabbit Lake Township	1	4	5
Total Crow Wing County	158	43	201
Aitkin Township	113	11	124
Farm Island Township	88	12	100
Total Aitkin County	201	23	224
Not Indicated	15	3	18
Total	374	69	443

Table 4. Comparison of Riparian and Non-Riparian Returns by County, Cedar Creek Watershed Landowners Survey, 2005

County	Riparian			Non Riparian			Total		
	Mailed	Returned	%	Mailed	Returned	%	Mailed	Returned	%
Aitkin	499	201	40.3	99	23	23.2	598	224	37.4
Crow Wing	388	158	41.8	324	43	18.4	612	201	32.8
Unknown	-	15		-	3		-	18	
Total	887	374	42.3	323	69	20.7	1210	443	36.6



Table 5. Riparian Returned Surveys by Lake, Cedar Creek Watershed Landowners Survey, 2005

Lake <sup>6</sup>	Mailed	Returned	Percent
Anderson	1	1	100.0
Ann	7	1	14.3
Black	20	7	37.3
Blue (1-181)	23	8	34.8
Brennen	1	1	100.0
Carlson	3	1	33.3
Cedar	365	181	49.6
Dogfish (1-185)	19	10	52.6
Dogfish (18-58)	5	1	20.0
Finn	2	2	100.0
Goose (Arbor)	17	7	44.3
Hamlet	60	27	45.7
Jim	4	1	25.0
Placid (Long)	45	16	36.4
Long (18-501)	2	2	100.0
Pickerel	22	6	28.9
Portage	15	6	41.9
Prescott	3	1	33.3
Rushmeyer (Blue)	5	1	20.0
Shirt <sup>7</sup>	85	36	42.8
Sunset	60	22	37.4
Tarr	1	1	100.0
Taylor	12	3	25.0
Thornton	26	9	36.0
Townline	17	7	43.3
Unnamed (18-74)	3	2	66.7
Unnamed (18-560)	1	1	100.0
Vorce	2	1	50.0
Unstated <sup>8</sup>	-	12	-

<sup>6</sup> From records of Aitkin County, Crow Wing County or the Cedar Lake Conservancy

<sup>7</sup> Includes Bergland Lake (18-426)

<sup>8</sup> Eight were in Crow Wing County and four were in Aitkin County

Table 6. Lakes for which there was a mailing but no surveys were returned, Cedar Creek Watershed Landowners Survey, 2005

Lake	Mailed
Black Shadow	3
Casey	2
Cedar Creek <sup>9</sup>	8
Christmas	1
Erickson	1
Larson	1
Little Hamlet	6
Lost Long	2
Mississippi River	6
Peterson	3
Poor Farm	3
Sand	1
Unnamed (1-224)	1
Unnamed (1-398)	1
Unnamed (18-73)	3
Unnamed (18-510)	3
Unnamed (18-511)	4
Unnamed (18-565)	1
	50

<sup>9</sup> Two surveys listed both Cedar Creek and Long Lake (18-501)<sup>1</sup> and are included for Long Lake (Table 5).

Table 7. Length of Ownership Comparison for Riparian and Non-Riparian Landowners, Cedar Creek Watershed Landowners Survey, 2005

	1 <sup>st</sup> Quart	3 <sup>rd</sup> Quart	Mode (n)	Mean	Range <sup>10</sup>	Median	N
Non-Riparian	6	27	11(5)	20.1	0.5-115	14.5	68
Riparian	8	35	5(18)	22.9	0.5-105	18	358
Total	8	33.75	5(23)	22.5	0.5-115	18	426
Cedar Lake				25.2	1-105		175
Hamlet Lake				22.1	0.5-95		27
Shirt Lake				17.8	0.5-80		32
Sunset Lake				23.9	3-75		21
All Lakes except Cedar Lake				20.8	0.5-95		183

Table 8. Residence Status from Returned Surveys, Cedar Creek Watershed Landowners Survey, 2005

	Seasonal	Full Time	Not Indicated	Total
Non-Riparian	20	46	3	69
Riparian	217	150	7	374
Total	237	196	10	443
Cedar Lake	112	66	3	181
Hamlet Lake	12	15	0	27
Shirt Lake	20	15	1	36
Sunset Lake	19	3	0	22
All Lakes except Cedar Lake	105	84	4	193

<sup>10</sup> Landowners indicating their property was purchased in 2005 were assigned a length of ownership of 0.5 years. Seven of the eight responses were riparian.

**Table 9. Mean Days of Seasonal Use per Year, Cedar Creek Watershed Landowners Survey, 2005**

	Mean Days of Use / Year	Number	Range
Non-Riparian	74.8	17	6-150
Riparian	80.8	204	7-250
Total	80.3	221	6-250
Cedar Lake	94.0	107	10-250
Hamlet Lake	75.0	11	30-200
Shirt Lake	64.1	17	15-135
Sunset Lake	87.2	18	20-180
All Lakes except Cedar Lake	66.3	97	7-200

**Table 10. Retirement Status from Returned Surveys, Cedar Creek Watershed Landowners Survey, 2005**

	Retired	Working	Not Indicated	Total
Non-Riparian	30	38	1	69
Riparian	193	174	7	374
Total	223	212	8	443
Cedar Lake	98	81	2	181
Hamlet Lake	12	13	2	27
Shirt Lake	22	12	2	36
Sunset Lake	11	11	0	22
All Lakes except Cedar Lake	95	93	5	193

Table 11a. Use of Property from Returned Surveys for Non-Riparian and Riparian Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Non-Riparian	Riparian	Total
Residential	48	309	357
Commercial	1	0	1
Resort	0	8	8
Farm	3	3	6
Other <sup>11</sup>	8	39	47
Residential and Farm	7	8	15
Residential and Commercial	1	1	2
Residential and Other	0	3	3
Residential and Resort	0	1	1
Residential, Commercial, Farm and Other	0	1	1
Not Indicated	1	1	2

Table 11b. Use of Property from Returned Surveys by Lake, Cedar Creek Watershed Landowners Survey, 2005

	Cedar	Hamlet	Shirt	Sunset	All but Cedar
Residential	156	23	33	19	153
Commercial	0	0	0	0	0
Resort	4	1	0	0	4
Farm	1	0	0	0	2
Other	13	2	3	2	26
Residential and Farm	3	1	0	0	5
Residential and Commercial	1	0	0	0	0
Residential and Other	0	0	0	1	3
Residential and Resort	1	0	0	0	0
Residential, Commercial, Farm and Other	0	0	0	0	1
Not Indicated	1	0	0	0	0

<sup>11</sup> Among the "other" uses listed by survey respondents: hunting, timber, investment, recreation, recreation/camping, cabin, vacation, vacation home, seasonal, vacant land and "waiting"

Table 12a. Use of Property from Returned Surveys for Non-Riparian and Riparian Landowners with Multiple Uses Expanded<sup>12</sup>, Cedar Creek Watershed Landowners Survey, 2005

	Non-Riparian	Riparian	Total
Residential	56	323	379
Commercial	2	2	4
Resort	0	9	9
Farm	10	12	22
Other	8	43	51
Not Indicated	1	1	2

Table 12b. Use of Property from Returned Surveys by Lake with Multiple Uses Expanded<sup>13</sup>, Cedar Creek Watershed Landowners Survey, 2005

	Cedar	Hamlet	Shirt	Sunset	All but Cedar
Residential	161	24	33	20	162
Commercial	1	0	0	0	1
Resort	5	1	0	0	4
Farm	4	1	0	0	8
Other	13	2	3	3	30
Not Indicated	1	0	0	0	0

<sup>12</sup> For multiple use categories, each use as put into its appropriate area. This results in higher numbers if totaled than actual returns.

<sup>13</sup> Refer to footnotes for Table 12a.

Table 13a. Property Description from Returned Surveys for Non-Riparian and Riparian Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Non-Riparian	Riparian	Total
No dwelling and no plans to build	7	12	19
No dwelling with plans to build in the future	6	15	21
Seasonal dwelling and no plans to change	3	85	88
Seasonal dwelling with plans to convert <sup>14</sup>	0	18	18
Dwelling suitable for year around use	51	240	291
Not Indicated	2	4	6
Total	69	374	443

Table 13b. Property Description from Returned Surveys by Lake, Cedar Creek Watershed Landowners Survey, 2005

	Cedar	Hamlet	Shirt	Sunset	All but Cedar
No dwelling and no plans to build	6	0	3	0	6
No dwelling with plans to build in the future	4	0	2	0	11
Seasonal dwelling and no plans to change	46	4	5	7	39
Seasonal dwelling with plans to convert	9	2	0	4	9
Dwelling suitable for year around use	116	21	26	11	124
Not Indicated	0	0	0	0	4
Total	181	27	36	22	193

<sup>14</sup> to year around use

**Table 14a. Residence, Riparian and Retirement Status from Returned Surveys, Cedar Creek Watershed Landowners Survey, 2005**

	Non-Riparian		Riparian	
	Full time	Seasonal	Full Time	Seasonal
Working	26	12	56	114
Retired	20	8	89	102
Total	46	20	145	216

**Table 14b. Residence, Riparian and Retirement Status from Returned Surveys, by Lake, Cedar Creek Watershed Landowners Survey, 2005**

	Cedar		Hamlet		Shirt		Sunset		All but Cedar	
	Full Time	Seasonal	Full Time	Seasonal	Full Time	Seasonal	Full Time	Seasonal	Full Time	Seasonal
Working	21	58	7	6	3	9	1	10	35	56
Retired	44	53	6	6	12	11	2	9	45	49
Total	65	111	13	12	15	20	3	1	80	105
	176		25		35		22		185	



Table 15. Mean Importance<sup>15</sup> of Recreation Uses for Non-Riparian and Riparian Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Non-Riparian (n)	Riparian (n)	All (n)
Esthetics <sup>16</sup>	3.93 (43)	4.39 (300) <sup>17</sup>	4.33 (343)
Fishing (summer/open water)	3.89 (54)	3.88 (324)	3.88 (378)
Birding/wildlife observation	3.87 (46)	3.87 (302)	3.87 (348)
Other recreational boating <sup>18</sup>	3.32 (31)	3.65 (250)	3.62 (281)
Swimming/wading	3.29 (45)	3.60 (301)	3.56 (346)
Fishing (winter/ice)	3.36 (44) <sup>19</sup>	2.82 (246)	2.90 (290)
Canoeing/kayaking	2.94 (32)	2.83 (228)	2.85 (260)
Water skiing/tubing	2.74 (35)	2.76 (242)	2.76 (277)
Personal watercraft (jet skis)	2.00 (27)	1.88 (171)	1.89 (198)
Sailing	1.48 (25)	1.59 (165)	1.58 (190)

<sup>15</sup> where 1 is of low importance and 5 is of high importance

<sup>16</sup> e.g. enjoying the beauty of scenery, a sunrise or sunset, etc.

<sup>17</sup> significantly higher at the 95 percent confidence level than for non-riparian landowners (z = -2.0202)

<sup>18</sup> other than those listed

<sup>19</sup> significantly higher at the 95 percent confidence level than for riparian landowners (z = 1.9976)

Table 16. Mean Importance<sup>20</sup> of Recreation Uses for Lake Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Cedar Lake (n)	All Other Lakes (n)
Esthetics <sup>21</sup>	4.30 (144)	4.47 (156)
Fishing (summer/open water)	3.89 (158)	3.87 (166)
Other recreational boating <sup>22</sup>	3.82 (126)	3.48 (124)
Birding/wildlife observation	3.72 (138)	3.99 (164)
Swimming/wading	3.70 (147)	3.50 (154)
Water skiing/tubing	3.10 (125) <sup>23</sup>	2.40 (117)
Fishing (winter/ice)	2.84 (122)	2.81 (124)
Canoeing/kayaking	2.68 (99)	2.95 (129)
Personal watercraft (jet skis)	2.08 (90) <sup>24</sup>	1.65 (81)
Sailing	1.57 (79)	1.62 (86)

<sup>20</sup> where 1 is of low importance and 5 is of high importance

<sup>21</sup> e.g. enjoying the beauty of scenery, a sunrise or sunset, etc.

<sup>22</sup> other than those listed

<sup>23</sup> significantly higher at the 95 percent confidence level than for other lake landowners  
(z = 3.7801)

<sup>24</sup> significantly higher at the 95 percent confidence level than for other lake landowners  
(z = 1.9624)

Table 17. Mean Importance<sup>25</sup> of Recreation Uses by Residence Type, Cedar Creek Watershed Landowners Survey, 2005

	Full Time (n)	Seasonal (n)
Esthetics <sup>26</sup>	4.12 [141]	4.49 [198] <sup>27</sup>
Fishing (summer/open water)	3.76 [161]	4.00 [212]
Birding/wildlife observation	3.88 [152]	3.85 [192]
Swimming/wading	3.25 [144]	3.80 [197] <sup>28</sup>
Other recreational boating <sup>29</sup>	3.47 [111]	3.75 [166]
Canoeing/kayaking	2.63 [104]	3.02 [152] <sup>30</sup>
Water skiing/tubing	2.43 [107]	2.99 [165] <sup>31</sup>
Fishing (winter/ice)	3.35 [141] <sup>32</sup>	2.50 [145]
Personal watercraft (jet skis)	1.88 [80]	1.93 [115]
Sailing	1.50 [72]	1.64 [115]

<sup>25</sup> where 1 is of low importance and 5 is of high importance

<sup>26</sup> e.g. enjoying the beauty of scenery, a sunrise or sunset, etc.

<sup>27</sup> significantly higher at the 95 percent confidence level than for full time landowners (z = -2.9599)

<sup>28</sup> significantly higher at the 95 percent confidence level than for full time landowners (z = -3.5204)

<sup>29</sup> other than those listed

<sup>30</sup> significantly higher at the 95 percent confidence level than for full time landowners (z = -2.1938)

<sup>31</sup> significantly higher at the 95 percent confidence level than for full time landowners (z = -3.0538)

<sup>32</sup> significantly higher at the 95 percent confidence level than for seasonal landowners (z = 4.3890)

Table 18. Mean Importance<sup>33</sup> of Recreation Uses by Retirement Status, Cedar Creek Watershed Landowners Survey, 2005

	Retired (n)	Working (n)
Esthetics <sup>34</sup>	4.34 [158]	4.31 [179]
Fishing (summer/open water)	3.78 [181]	3.99 [191]
Birding/wildlife observation	3.86 [175]	3.86 [166]
Swimming/wading	3.37 [162]	3.75 [178] <sup>35</sup>
Other recreational boating <sup>36</sup>	3.64 [133]	3.60 [143]
Fishing (winter/ice)	2.80 [132]	3.02 [154]
Canoeing/kayaking	2.77 [123]	2.92 [131]
Water skiing/tubing	2.64 [118]	2.86 [154]
Personal watercraft (jet skis)	1.66 [86]	2.09 [110] <sup>37</sup>
Sailing	1.69 [84]	1.43 [103]

<sup>33</sup> where 1 is of low importance and 5 is of high importance

<sup>34</sup> e.g. enjoying the beauty of scenery, a sunrise or sunset, etc.

<sup>35</sup> significantly higher at the 95 percent confidence level than for retired landowners (z = -2.4486)

<sup>36</sup> other than those listed

<sup>37</sup> significantly higher at the 95 percent confidence level than for retired landowners (z = -2.1131)

Table 19. Perceptions of Lake Water Quality, Cedar Creek Watershed Landowners Survey, 2005

	Getting Better	Staying the Same	Getting Worse	Not Indicated	Total
Non-Riparian	4	34	19	12	69
Riparian	10	221	118	25	374
All	14	255	137	37	443
Cedar Lake	4	91	75	11	181
Hamlet Lake	2	19	4	2	27
Shirt Lake	0	24	11	1	36
Sunset Lake	1	16	5	0	22
All Lakes except Cedar	6	130	43	14	193
< 9 yrs Ownership	4	79	18	14	115
9 to 18 yrs Ownership	2	61	40	5	108
19 to 34 yrs Ownership	0	56	37	6	99
> 34 yrs Ownership	7	46	39	12	104
Full Time	8	111	56	21	196
Seasonal	6	141	79	11	237
Retired	6	127	68	22	223
Working	7	125	68	12	212
Aitkin County	7	133	68	16	224
Crow Wing County	6	113	66	19	204

Table 20. Importance of Issues for All Respondents, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>38</sup>	n	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.48	419	71.1	12.2	7.6	2.9	3.6	2.6
Runoff from lawns is an important water quality issue	4.22	425	50.3	26.8	8.0	7.1	2.6	5.2
Shoreland filters [buffer zones] around lakes are important	4.22	419	48.4	25.5	10.3	4.5	2.9	8.3
Enforcement of shoreland regulations is important	4.17	420	45.7	31.9	11.2	5.2	2.6	3.3
Runoff from tributaries is an important water quality issue	4.06	417	37.2	25.2	18.0	3.6	2.4	13.7
Aquatic plant nuisance problems are increasing	3.81	414	27.8	31.2	19.1	6.0	4.3	11.6
Development of marginal lakeshore lots is a problem	3.71	416	31.7	28.1	14.9	9.9	7.9	7.4
More control of nuisance beavers is needed	3.71	423	30.2	24.6	19.1	9.9	5.9	10.2
Water level fluctuations are a problem	3.69	421	26.1	26.4	26.4	6.2	5.2	9.7
Crowded lake use conditions are going to be a future problem	3.66	420	30.0	30.7	14.8	9.3	9.5	5.7
Fisheries survey, census and stocking are appropriate	3.53	420	20.0	30.7	15.9	7.9	9.3	16.2
Non-compliant septic systems are causing water quality issues	3.53	420	20.2	22.9	16.9	7.4	8.1	24.5
Second tier development around the lake[s] is a problem	3.31	417	12.2	23.7	27.6	7.2	8.1	21.1
Boat wakes are a serious shoreline erosion cause	3.24	422	18.2	26.5	22.5	13.0	13.7	5.9
Private, multiple party dock access is an increasing problem	3.06	417	11.8	15.1	28.5	13.9	13.9	24.2

<sup>38</sup> don't know responses were not used to calculate the mean

Table 21. Importance of Issues for Cedar Lake Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>39</sup>	n	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.51	174	71.3	17.2	2.3	3.4	4.0	1.7
Runoff from lawns is an important water quality issue	4.34	176	58.0	25.6	4.0	8.0	1.7	2.8
Runoff from tributaries is an important water quality issue	4.34	173	52.6	23.1	13.9	1.7	1.2	7.5
Shoreland filters [buffer zones] around lakes are important	4.25	173	50.9	25.4	9.2	4.6	2.9	6.9
Enforcement of shoreland regulations is important	4.19	173	48.0	30.6	9.8	6.4	2.3	2.9
Water level fluctuations are a problem	4.04	177	40.1	29.4	19.2	1.7	4.5	5.1
Development of marginal lakeshore lots is a problem	3.99	175	38.9	32.6	7.4	10.3	4.0	6.9
Aquatic plant nuisance problems are increasing	3.86	168	28.0	35.1	19.0	3.0	5.4	9.5
Non-compliant septic systems are causing water quality issues	3.83	173	25.4	25.4	18.5	4.0	4.0	22.5
Crowded lake use conditions are going to be a future problem	3.81	173	33.5	33.5	11.6	10.4	6.4	4.6
Fisheries survey, census and stocking are appropriate	3.77	175	30.3	30.9	10.9	10.3	6.3	11.4
More control of nuisance beavers is needed	3.63	174	27.6	21.3	25.9	9.8	5.2	10.3
Second tier development around the lake[s] is a problem	3.54	172	14.5	29.7	26.2	5.8	4.7	19.2
Private, multiple party dock access is an increasing problem	3.36	173	15.6	22.0	27.7	5.8	9.2	19.7
Boat wakes are a serious shoreline erosion cause	3.20	175	16.0	28.6	22.9	14.3	13.7	4.6

<sup>39</sup> don't know responses were not used to calculate the mean

Table 22 . Importance of Issues for Hamlet Lake Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>40</sup>	n	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.58	24	75.0	12.5	8.3	4.2	0	0
Shoreland filters [buffer zones] around lakes are important	4.39	27	48.1	29.6	3.7	0	3.7	14.8
Enforcement of shoreland regulations is important	4.30	27	55.6	29.6	7.4	3.7	3.7	0
Runoff from lawns is an important water quality issue	4.15	27	55.6	22.2	7.4	0	11.1	3.7
More control of nuisance beavers is needed	4.00	26	38.5	34.6	15.4	0	7.7	3.8
Runoff from tributaries is an important water quality issue	3.71	26	30.8	19.2	19.2	0	11.5	19.2
Development of marginal lakeshore lots is a problem	3.50	26	30.8	19.2	19.2	11.5	11.5	7.7
Aquatic plant nuisance problems are increasing	3.45	25	16.0	32.0	20.0	16.0	4.0	12.0
Crowded lake use conditions are going to be a future problem	3.41	27	25.9	29.6	18.5	11.1	14.8	0
Water level fluctuations are a problem	3.38	27	18.5	25.9	29.6	0	14.8	11.1
Private, multiple party dock access is an increasing problem	3.38	27	18.5	25.9	29.6	0	14.8	11.1
Boat wakes are a serious shoreline erosion cause	3.15	27	14.8	33.3	18.5	18.5	14.8	0
Non-compliant septic systems are causing water quality issues	3.25	26	15.4	26.9	7.7	15.4	11.5	23.1
Fisheries survey, census and stocking are appropriate	2.86	26	0	30.8	30.8	3.8	19.2	15.4
Second tier development around the lake[s] is a problem	2.77	26	15.4	11.5	26.9	0	30.8	15.4

<sup>40</sup> don't know responses were not used to calculate the mean



Table 23 . Importance of Issues for Shirt Lake Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>41</sup>	n	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.58	36	80.6	8.3	5.6	0	5.6	0
Shoreland filters [buffer zones] around lakes are important	4.49	36	69.4	16.7	2.8	5.6	2.8	2.8
Runoff from lawns is an important water quality issue	4.47	36	66.7	22.2	5.6	2.8	2.8	0
Enforcement of shoreland regulations is important	4.37	35	54.3	31.4	11.4	2.9	0	0
Boat wakes are a serious shoreline erosion cause	3.94	35	45.7	22.9	17.1	8.6	5.7	0
Runoff from tributaries is an important water quality issue	3.90	35	34.3	31.4	11.4	2.9	8.6	11.4
More control of nuisance beavers is needed	3.83	36	36.1	33.3	11.1	8.3	8.3	2.8
Aquatic plant nuisance problems are increasing	3.79	35	34.3	28.6	17.1	5.7	8.6	5.7
Crowded lake use conditions are going to be a future problem	3.62	36	27.8	30.6	16.7	11.1	8.3	5.6
Fisheries survey, census and stocking are appropriate	3.35	36	11.1	25.0	13.9	2.8	11.1	36.1
Water level fluctuations are a problem	3.27	36	13.9	30.6	22.2	16.7	8.3	8.3
Private, multiple party dock access is an increasing problem	3.27	36	13.9	30.6	22.2	16.7	8.3	8.3
Development of marginal lakeshore lots is a problem	3.18	36	19.4	13.9	33.3	13.9	11.1	8.3
Non-compliant septic systems are causing water quality issues	3.09	36	5.6	22.2	19.4	8.3	11.1	33.3
Second tier development around the lake[s] is a problem	2.77	35	0	20.0	31.4	8.6	14.3	25.7

<sup>41</sup> don't know responses were not used to calculate the mean

Table 24. Importance of Issues for Sunset Lake Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>42</sup>	n	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.50	21	76.2	0	14.3	0	4.8	4.8
Enforcement of shoreland regulations is important	4.45	22	50.0	31.8	9.1	0	0	9.1
Shoreland filters [buffer zones] around lakes are important	4.11	21	42.9	19.0	23.8	4.8	0	9.5
Private, multiple party dock access is an increasing problem	4.11	21	42.9	19.0	23.8	4.8	0	9.5
Crowded lake use conditions are going to be a future problem	4.05	21	38.1	28.6	19.0	0	4.8	9.5
Runoff from lawns is an important water quality issue	4.0	22	40.9	22.7	13.6	13.6	0	9.1
Runoff from tributaries is an important water quality issue	4.0	20	20.0	40.0	20.0	0	0	20.0
Boat wakes are a serious shoreline erosion cause	3.65	22	31.8	22.7	18.2	9.1	9.1	9.1
Aquatic plant nuisance problems are increasing	3.61	22	18.2	27.3	27.3	4.5	4.5	18.2
More control of nuisance beavers is needed	3.61	22	31.8	13.6	13.6	18.2	4.5	18.2
Development of marginal lakeshore lots is a problem	3.58	21	23.8	28.6	23.8	4.8	9.5	9.5
Second tier development around the lake[s] is a problem	3.56	22	22.7	9.1	27.3	13.6	0	27.3
Water level fluctuations are a problem	3.39	22	18.2	18.2	31.8	4.5	9.1	18.2
Non-compliant septic systems are causing water quality issues	3.13	22	4.5	31.8	9.1	13.6	9.1	31.8
Fisheries survey, census and stocking are appropriate	2.94	22	22.7	0	27.3	13.6	18.2	18.2

<sup>42</sup> don't know responses were not used to calculate the mean

Table 25. Importance of Issues for Landowners on All Lakes except Cedar Lake, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>43</sup>	N	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.53	184	75.0	7.1	11.4	1.6	2.7	2.2
Shoreland filters [buffer zones] around lakes are important	4.30	185	49.7	25.7	8.6	3.8	2.2	9.7
Enforcement of shoreland regulations is important	4.21	186	45.7	34.4	12.9	2.7	2.2	2.2
Runoff from lawns is an important water quality issue	4.19	187	48.1	26.7	10.2	5.9	2.7	6.4
Runoff from tributaries is an important water quality issue	3.91	183	29.	27.3	18.6	3.3	3.8	18.0
More control of nuisance beavers is needed	3.89	186	36.0	28.0	12.9	7.5	5.9	9.7
Aquatic plant nuisance problems are increasing	3.70	183	25.1	27.9	19.7	9.3	4.4	13.7
Water level fluctuations are a problem	3.55	185	18.9	26.5	29.7	7.0	4.9	13.0
Crowded lake use conditions are going to be a future problem	3.48	185	24.9	30.3	18.4	6.5	14.1	5.9
Development of marginal lakeshore lots is a problem	3.43	181	21.0	28.7	22.7	8.8	11.0	7.7
Fisheries survey, census and stocking are appropriate	3.29	184	13.0	37.2	20.1	5.4	12.5	21.7
Boat wakes are a serious shoreline erosion cause	3.29	186	22.0	23.1	23.1	11.8	14.0	5.9
Non-compliant septic systems are causing water quality issues	3.21	186	11.8	21.5	18.8	9.7	10.2	28.0
Second tier development around the lake[s] is a problem	3.09	185	10.3	17.3	29.2	8.1	11.4	23.8
Private, multiple party dock access is an increasing problem	2.68	184	7.1	9.2	27.7	7.1	19.6	29.3

<sup>43</sup> don't know responses were not used to calculate the mean

Table 26. Importance of Issues for Riparian Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>44</sup>	N	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.52	358	73.2	12.0	7.0	2.5	3.4	2.0
Shoreland filters [buffer zones] around lakes are important	4.28	358	50.3	25.7	8.9	4.2	2.5	8.4
Runoff from lawns is an important water quality issue	4.27	363	52.9	26.2	7.2	6.9	2.2	4.7
Enforcement of shoreland regulations is important	4.20	359	46.8	32.6	11.4	4.5	2.2	2.5
Runoff from tributaries is an important water quality issue	4.13	356	40.4	25.3	16.3	2.5	2.5	12.9
Water level fluctuations are a problem	3.80	362	29.3	27.9	24.6	4.4	4.7	9.1
Aquatic plant nuisance problems are increasing	3.77	351	26.5	31.3	19.4	6.3	4.8	11.7
More control of nuisance beavers is needed	3.77	360	31.9	24.7	19.2	8.6	5.6	10.0
Development of marginal lakeshore lots is a problem	3.71	356	29.8	30.6	15.2	9.6	7.6	7.3
Crowded lake use conditions are going to be a future problem	3.64	358	29.1	31.8	15.1	8.4	10.3	5.3
Fisheries survey, census and stocking are appropriate	3.54	359	21.4	29.0	15.6	7.8	9.5	16.7
Non-compliant septic systems are causing water quality issues	3.52	359	18.4	23.4	18.7	7.0	7.2	25.3
Second tier development around the lake[s] is a problem	3.31	357	12.3	23.2	27.7	7.0	8.1	21.6
Boat wakes are a serious shoreline erosion cause	3.25	361	19.1	25.8	23.0	13.0	13.9	5.3
Private, multiple party dock access is an increasing problem	3.03	357	11.2	15.4	27.7	6.4	14.6	24.6

<sup>44</sup> don't know responses were not used to calculate the mean

Table 27. Importance of Issues for Non-Riparian Landowners , Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>45</sup>	n	Percent [%]						Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]		
Multiple unit developments are not desirable	4.25	61	59.0	13.1	11.5	4.9	4.9	4.9	6.6
Aquatic plant nuisance problems are increasing	4.04	63	34.9	30.2	17.5	4.8	1.6	11.1	11.1
Enforcement of shoreland regulations is important	3.95	61	39.3	27.9	9.8	9.8	4.9	8.2	8.2
Runoff from lawns is an important water quality issue	3.91	62	35.5	30.6	12.9	8.1	4.8	8.1	8.1
Shoreland filters [buffer zones] around lakes are important	3.91	61	37.7	24.6	18.0	6.6	4.9	8.2	8.2
Crowded lake use conditions are going to be a future problem	3.77	62	35.5	24.2	12.9	14.5	4.8	8.1	8.1
Development of marginal lakeshore lots is a problem	3.75	60	43.3	13.3	13.3	11.7	10.0	8.3	8.3
Runoff from tributaries is an important water quality issue	3.58	61	18.0	24.6	27.9	9.8	1.6	18.0	18.0
Non-compliant septic systems are causing water quality issues	3.57	61	31.1	19.7	6.6	9.8	13.1	19.7	19.7
Fisheries survey, census and stocking are appropriate	3.45	61	11.5	41.0	18.0	8.2	8.2	13.1	13.1
More control of nuisance beavers is needed	3.36	63	20.6	23.8	19.0	17.5	7.9	11.1	11.1
Second tier development around the lake[s] is a problem	3.31	60	11.7	26.7	26.7	8.3	8.3	18.3	18.3
Private, multiple party dock access is an increasing problem	3.21	60	15.0	13.3	33.3	6.7	10.1	21.7	21.7
Boat wakes are a serious shoreline erosion cause	3.20	61	13.1	31.1	19.7	13.1	13.1	9.8	9.8
Water level fluctuations are a problem	2.96	59	6.8	16.9	37.3	16.9	8.5	13.6	13.6

<sup>45</sup> don't know responses were not used to calculate the mean

Table 28. Importance of Issues for Aitkin County Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>46</sup>	n	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.50	213	70.9	14.1	5.6	2.8	3.8	2.8
Shoreland filters [buffer zones] around lakes are important	4.25	211	47.9	26.1	9.5	5.2	1.9	9.5
Enforcement of shoreland regulations is important	4.22	213	47.9	30.0	10.8	5.2	1.9	4.2
Runoff from lawns is an important water quality issue	4.20	215	47.4	27.4	8.4	88.4	1.4	7.0
Runoff from tributaries is an important water quality issue	4.15	211	39.3	25.1	18.0	3.3	0.5	13.7
Development of marginal lakeshore lots is a problem	3.96	210	37.1	31.4	10.5	8.6	4.3	8.1
Water level fluctuations are a problem	3.90	214	32.2	27.6	23.4	2.8	4.2	9.8
Aquatic plant nuisance problems are increasing	3.84	209	27.8	30.1	19.1	3.8	4.8	14.4
Crowded lake use conditions are going to be a future problem	3.79	211	28.9	33.6	16.1	7.6	5.7	8.1
More control of nuisance beavers is needed	3.71	215	29.3	22.8	19.5	10.7	4.7	13.0
Fisheries survey, census and stocking are appropriate	3.64	213	25.4	29.1	13.6	9.4	8.0	14.6
Non-compliant septic systems are causing water quality issues	3.63	212	21.2	21.7	17.9	6.1	6.1	26.9
Second tier development around the lake[s] is a problem	3.42	212	13.7	25.0	27.8	6.6	6.1	20.8
Boat wakes are a serious shoreline erosion cause	3.21	214	15.9	25.7	25.2	13.6	12.1	7.5
Private, multiple party dock access is an increasing problem	3.16	213	12.7	16.0	29.6	5.6	11.7	24.4

<sup>46</sup> don't know responses were not used to calculate the mean

Table 29. Importance of Issues for Crow Wing County Landowners, Cedar Creek Watershed Landowners Survey, 2005

	Mean <sup>47</sup>	n	Percent [%]					Don't know
			Strongly agree [5]	Somewhat Agree [4]	Neither agree or disagree [3]	Somewhat disagree [2]	Strongly disagree [1]	
Multiple unit developments are not desirable	4.49	192	72.4	9.4	9.9	2.6	3.1	2.6
Runoff from lawns is an important water quality issue	4.25	196	54.6	25.5	6.6	5.6	4.1	3.6
Shoreland filters [buffer zones] around lakes are important	4.21	194	50.0	23.7	10.3	4.1	4.1	7.7
Enforcement of shoreland regulations is important	4.12	193	44.0	33.7	10.4	5.7	3.6	2.6
Runoff from tributaries is an important water quality issue	3.95	192	34.9	25.0	16.7	4.2	4.7	14.6
Aquatic plant nuisance problems are increasing	3.79	192	28.1	32.3	18.2	8.9	3.6	8.9
More control of nuisance beavers is needed	3.67	194	30.4	26.3	19.1	9.3	7.7	7.2
Crowded lake use conditions are going to be a future problem	3.54	195	31.3	27.7	13.3	10.3	13.8	3.6
Development of marginal lakeshore lots is a problem	3.47	192	27.1	23.4	20.3	9.9	12.0	7.3
Water level fluctuations are a problem	3.43	193	18.1	25.9	29.0	9.8	6.7	10.4
Non-compliant septic systems are causing water quality issues	3.42	194	19.6	23.2	13.9	8.8	10.8	23.7
Fisheries survey, census and stocking are appropriate	3.41	193	14.0	33.2	17.1	6.7	10.4	18.7
Boat wakes are a serious shoreline erosion cause	3.27	194	20.6	27.8	19.1	12.4	15.5	4.6
Second tier development around the lake[s] is a problem	3.18	192	9.9	22.9	26.0	7.3	10.9	22.9
Private, multiple party dock access is an increasing problem	2.93	190	11.1	14.2	26.3	7.9	16.8	23.7

<sup>47</sup> don't know responses were not used to calculate the mean

Table 30. Preferred Methods for Communicating Survey Results, All Landowners, Cedar Creek Watershed Landowners Survey, 2005

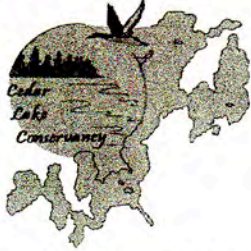
---

Newsletter	383
Internet	137
Newspaper	104
Meetings	49

---



## Appendix 1. Contents of Cover Letter and Survey



October 5, 2005

### Management Plan Team

*Debra Campbell*

*Marty Martin*

*Chuck Schwalbe*

*Tom Miller*

*Ed Walczak*

*Les Martin*

*Nick Priadka*

**CLC Board**

**of Directors**

**Les Martin, President**

(218) 628-0625

(218) 927-6501

**Bill Ebel, Vice**

**President**

(218) 534-3571

**Noel Bailey, Secretary**

(218) 927-6379

**Jim Spaeth, Treasurer**

(218) 927-2691

**Walt Sauerbrei,**

**Membership/**

**Communication**

(218) 927-1344

**John Menge**

(952) 472-2753

**Summer: (218) 927-**

**2891**

**Phil Rzeszutek**

(218) 927-6861

To All Property Owners in the Cedar Brook Watershed

At the June meeting of the Cedar Lake Conservancy, the membership voted to develop a Cedar Lake Management plan with the intended purpose of gathering information about the current issues on Cedar Lake and to develop a plan so we can all work together on the issues that are important to you.

As a first step, we are sending out the enclosed survey to find out what are these important issues. In developing this survey, it became apparent that we needed to know what is happening throughout the total watershed since all the water from the watershed eventually comes through Cedar Lake on its way to the Mississippi. For this reason, the survey is being sent to all the property owners and those who use the lakes in the total Cedar Brook watershed. We have made arrangements to share these results with the other homeowner's associations in the watershed as well as the involved townships.

Your participation in this survey will ensure that we have everyone's thoughts about the issues important for your recreational use and enjoyment of the lakes while we work to preserve our watershed's natural resources. We have attempted to keep the survey simple and brief. Please take a few minutes to fill it out as accurately as you can. You can be assured of complete anonymity, as an independent third party will read the survey. You will not be identified in anyway.

Please use the enclosed, stamped envelope to return the survey by October 31<sup>st</sup>, 2005. Happy Halloween! If you have any questions about this survey please contact Les Martin (218-927-6105 or 218-628-0625) or Tom Miller (218-820-2824).

Sincerely,

Lake Management Plan Team and the  
Cedar Lake Conservancy Board



<input type="checkbox"/>	Fishing (summer / open water)
<input type="checkbox"/>	Fishing (winter / ice)

<input type="checkbox"/>	Canoeing /kayaking
<input type="checkbox"/>	Other Recreational boating <sup>49</sup>

10. During your time of property ownership would you say the overall water quality of the lake is:

Getting better.....	<input type="checkbox"/>
Staying the same....	<input type="checkbox"/>
Getting worse.....	<input type="checkbox"/>

11. To what extent do you agree with each of the following statements with regard to the Cedar Creek Watershed and/or the lake you own property on?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Don't know
Aquatic plant nuisance problems are increasing						
Boat wakes are a serious shoreline erosion cause						
Crowded lake use conditions are going to be a problem in the future						
Development of marginal lakeshore lots is a problem						
Fisheries survey, census and stocking are appropriate for the lake						
Non-compliant septic systems are causing water quality problems						
Enforcement of shoreland regulations is important						
More control of nuisance beavers is needed						
Multiple unit developments are not desirable						
Privately owned, multiple party dock access is an increasing problem						
Runoff from lawns is an important water quality issue						
Runoff from tributaries is an important water quality issue						
Second tier development around the lake(s) is a problem						
Shoreland filters (buffer zones) around lakes are important						
Water level fluctuations are a problem						

12. What is the best way for you to receive information about the results of this survey and future watershed planning efforts? (check all the apply)

Newsletter.....	<input type="checkbox"/>
Newspaper.....	<input type="checkbox"/>
Meetings.....	<input type="checkbox"/>
Internet Website....	<input type="checkbox"/>

<sup>49</sup> all boating other than those listed above

13. What do you value most about living in the Cedar Creek Watershed?

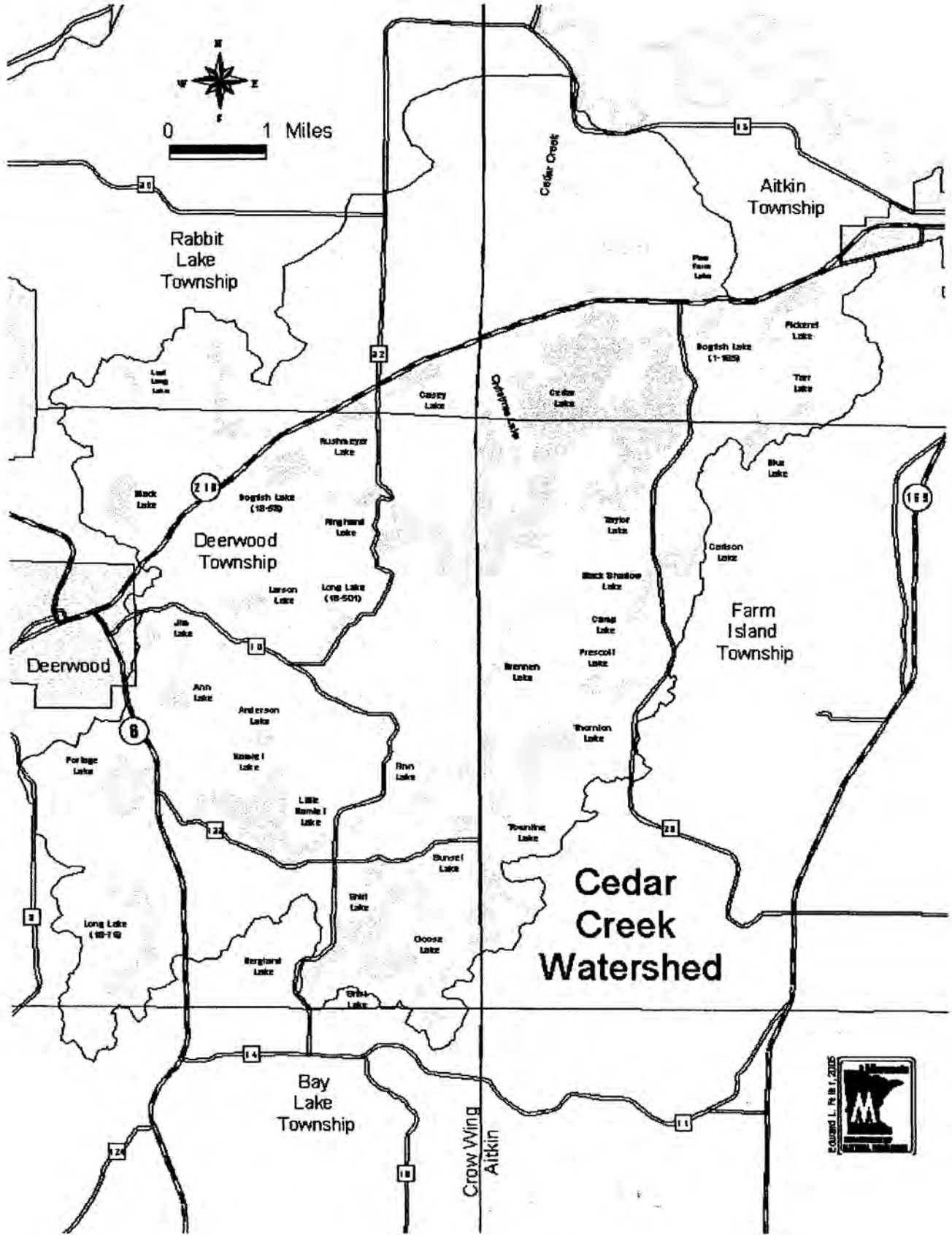
---

---

14. Are there other comments you would like to share with us?

---

---



1. I own property in the Cedar Creek Watershed in:

(see map; check all that apply)

BAY LAKE TOWNSHIP .....

DEERWOOD TOWNSHIP.....

DEERWOOD CITY.....

RABBIT LAKE TOWNSHIP.....

AITKIN TOWNSHIP.....

FARM ISLAND TOWNSHIP.....


2. The lake in the Cedar Creek Watershed I use and/or am most familiar with is \_\_\_\_\_ Lake.

3. I (My family) purchased / obtained my (our) property in \_\_\_\_\_(year).

4. I am a: Full time resident


Seasonal resident

5. **As a seasonal resident**, I use my property approximately \_\_\_\_\_ days per year.

6. At least one of the primary owners of this property is retired:

Yes	
No	

7. The principal use of my property is:

(check all that apply)

Residential.....

Commercial.....

Resort.....

Farm.....

Other \_\_\_\_\_


8. My property is best described as:

No dwelling and no plans to build.....

No dwelling with plans to build in the future.....

Seasonal / warm weather dwelling and no plans to change.....

Seasonal / warm weather building with plans to convert to year around use.....

Dwelling suitable for year around use.....


9. How important is your participation in these water-oriented activities? Please enter a number from "1" to "5" for all activities that you participate in. A "1" indicates low importance and a "5" indicates high importance. If you do not participate in an activity please do not enter a number.

<input type="checkbox"/>	Birding / wildlife observation	<input type="checkbox"/>	Personal watercraft (jet skis)
<input type="checkbox"/>	Swimming / wading	<input type="checkbox"/>	Water skiing / tubing
<input type="checkbox"/>	Esthetics <sup>50</sup>	<input type="checkbox"/>	Sailing
<input type="checkbox"/>	Fishing (summer / open water)	<input type="checkbox"/>	Canoeing /kayaking
<input type="checkbox"/>	Fishing (winter / ice)	<input type="checkbox"/>	Other Recreational boating <sup>51</sup>

10. During your time of property ownership would you say the overall water quality of watershed lakes is:

Getting better.....	<input type="checkbox"/>
Staying the same....	<input type="checkbox"/>
Getting worse.....	<input type="checkbox"/>

11. To what extent do you agree with each of the following statements with regard to the Cedar Creek Watershed and/or the lake you own property on?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Don't know
Aquatic plant nuisance problems are increasing						
Boat wakes are a serious shoreline erosion cause						
Crowded lake use conditions are going to be a problem in the future						
Development of marginal lakeshore lots is a problem						
Fisheries survey, census and stocking are appropriate for the lake						
Non-compliant septic systems are causing water quality problems						
Enforcement of shoreland regulations is important						
More control of nuisance beavers is needed						
Multiple unit developments are not desirable						
Privately owned, multiple party dock access is an increasing problem						
Runoff from lawns is an important water quality issue						
Runoff from tributaries is an important water quality issue						
Second tier development around the lake(s) is a problem						
Shoreland filters (buffer zones) around lakes are important						
Water level fluctuations are a problem						

<sup>50</sup> e.g. enjoying the beauty of scenery, a sunrise or sunset, etc

<sup>51</sup> all boating other than those listed above

12. What is the best way for you to receive information about the results of this survey and future watershed planning efforts? (check all the apply)

Newsletter.....

Newspaper.....

Meetings.....

Internet Website....

13. What do you value most about living in the Cedar Creek Watershed?

---

---

14. Are there other comments you would like to share with us?

---

---