The project is made possible through the combined efforts of the White Iron Chain of Lakes Association, Lake County, Lake County SWCD and the Minnesota Pollution Control Agency. This Beneficial Use study is part of the Kawishiwi Watershed Protection Project. Data was collected on various uses of identified lakes and streams in the watershed. Those uses and factors which affect them are discussed in this report.

Kawishiwi Watershed Beneficial Use Study

2013

Contents

Refer to Excel Spreadsheet for Appendice

Contributors: Cat Fyre, Jo Kovach, Derrick Passe, Joel Peterson, Wayne Seidel

1. Introduction

'Beneficial Uses' is the legal term for water uses which are protected by law. State law (Minnesota Chapter 7050) specifies the multiple routine uses (e.g. beneficial) of the waters attributed in all MN lakes. It also specifies detailed sub-classifications for each use and assigns these designations to each Minnesota Lake. As lakes are reviewed and lake water quality reassessed during mandated periodic studies these beneficial use classifications are used as the basis for decisions regarding protection and maintenance actions.

This law exists because Minnesota legislators recognize that lakes are inherently of value to the citizens and that there are multiple uses to which the waters are put. It is the policy of the state to protect all waters from significant degradation and to maintain existing water quality as well as related aquatic and wetland habitats. This study begins with a review of the information already available on the uses of the lakes and streams in the watershed and examines the present uses for any differences from historical trends.

This study is part of a much larger review of water quality throughout the Kawishiwi Watershed. The study is a two year effort based on a partnership between the White Iron Chain of Lakes Association (WICOLA), Lake County Soil and Water Conservation District (SWCD), Lake County, and the Minnesota Pollution Control Agency (MPCA). Two grants from MPCA funded much of the work and many volunteers have been essential for its completion. The information resulting from this study will be used to create a management plan to assure the continuing high quality of the waters in the watershed.

The Kawishiwi Watershed is at a critical location in Northeast Minnesota; the upper portion of the watershed is the entrance to the boundary waters and it also contains much of the 8 digit Hydrologic Unit Code (HUC) area or the head waters of the Rainy River. Water flowing through the Kawishiwi watershed enters the Boundary Waters Canoe Area Waters Wilderness (BWCAW) which is protected by federal law and in Minnesota by its classification as an Outstanding Resource Value Waters (ORVW). Because the waters of the Kawishiwi Watershed feed into the BWCAW they are also covered by the ORVW statutes. This set of additional legislative protections specifies stringent protection from pollution.

The present study includes extensive charts identifying use and protection classifications of the many water bodies in the watershed. Ultimately all these uses were synthesized into a single "use" chart identifying current uses, their current protections and suggested action steps to maintain the existing use classifications.

2. Beneficial Use Study Objectives

The Beneficial Use Study is one objective of the KWPP. The purpose of this study is to document information already available on the uses of lakes and streams in the watershed and to identify further study required on its use in order to create a management plan which will preserve and/or improve the quality of the water to maintain the values of the watershed. State law (Minnesota Chapter 7050) designates beneficial uses to all the watershed lakes. This report is intended to address statutory high priority beneficial uses in the watershed

that may require protections. Some may require higher standards of protection due to the Outstanding Resource Value Waters (ORVW) designation of all waters within the BWCAW.

The beneficial uses inherent in water resources are valuable public resources. It is the policy of the state to protect all waters from significant degradation from point and nonpoint sources and wetland alterations and to maintain existing water uses and aquatic and wetland habitats. Additionally, existing beneficial uses and the water quality necessary to protect the existing uses must be maintained and protected from point and nonpoint sources of pollution. Statutory beneficial uses in the watershed include the following:

Class 1 waters, domestic consumption

Class 1B waters. The quality of Class 1B waters of the state shall be such that with approved disinfection, such as simple chlorination or its equivalent, the treated water will meet both the primary (maximum contaminant levels) and secondary drinking water standards issued by the United States Environmental Protection Agency.

Class 1C waters. The quality of Class 1C waters of the state shall be such that with treatment consisting of coagulation, sedimentation, filtration, storage, and chlorination, or other equivalent treatment processes, the treated water will meet both the primary (maximum contaminant levels) and secondary drinking water standards issued by the United States Environmental Protection Agency.

Class 2 waters, aquatic life and recreation

Class 2A waters; aquatic life and recreation. The quality of Class 2A surface waters shall be such as to permit the propagation and maintenance of a healthy community of cold water sport or commercial fish and associated aquatic life, and their habitats. These waters shall be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. This class of surface waters is also protected as a source of drinking water.

Class 2Bd waters. The quality of Class 2Bd surface waters shall be such as to permit the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life and their habitats. These waters shall be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. This class of surface waters is also protected as a source of drinking water.

Class 2B waters. The quality of Class 2B surface waters shall be such as to permit the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life, and their habitats. These waters shall be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable.

Class 3 waters, industrial consumption

Class 3B waters. The quality of Class 3B waters of the state shall be such as to permit their use for general industrial purposes, except for food processing, with only a moderate degree of treatment.

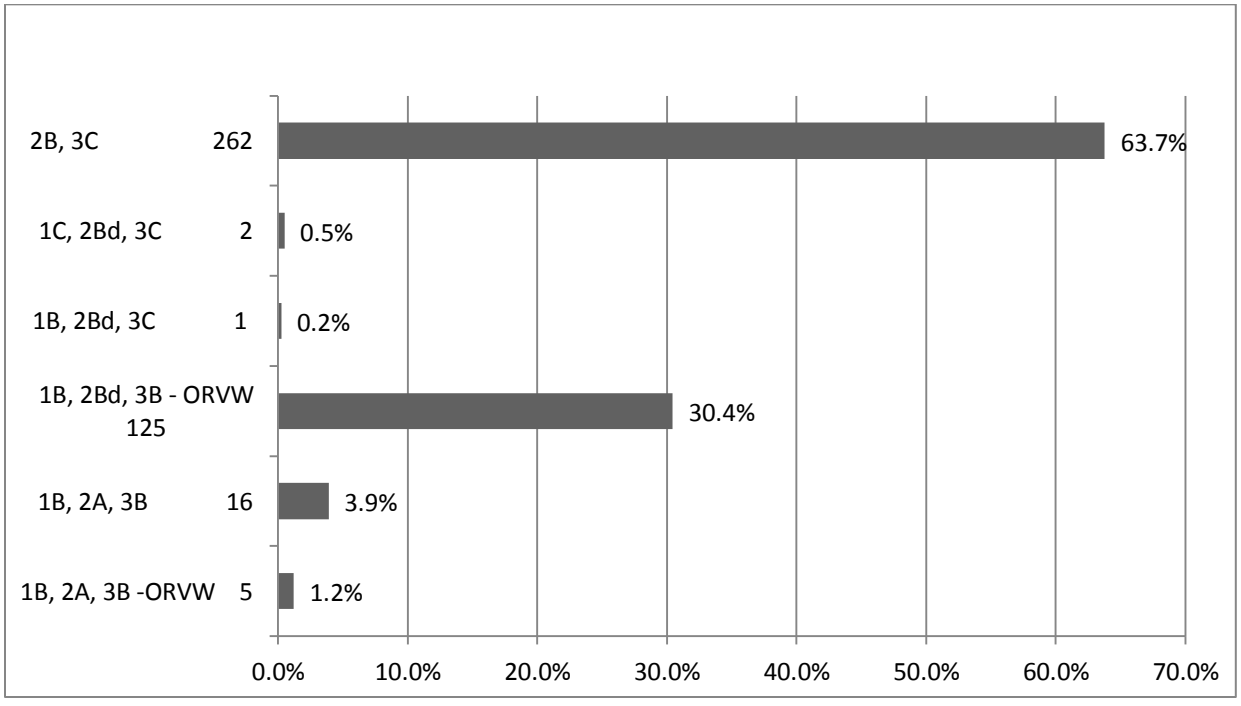
Class 3C waters. The quality of Class 3C waters of the state shall be such as to permit their use for industrial cooling and materials transport without a high degree of treatment being necessary to avoid severe fouling, corrosion, scaling, or other unsatisfactory conditions.

Outstanding Resource Value Waters

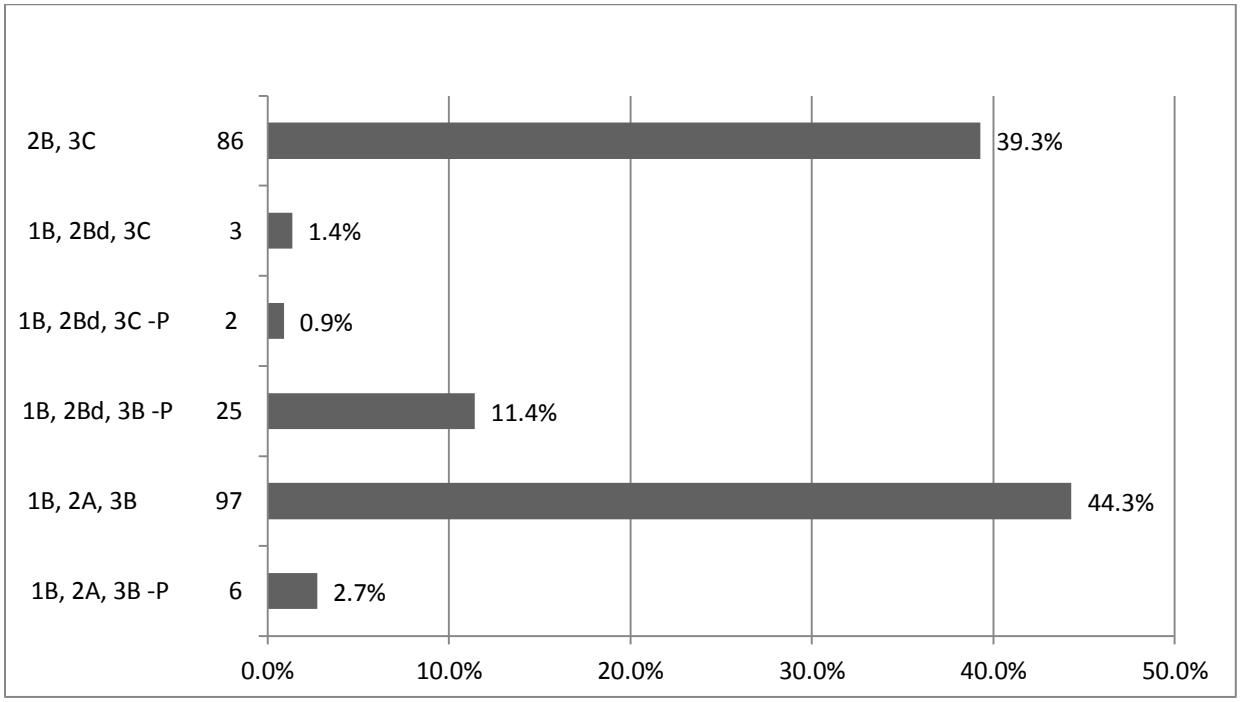
"Outstanding resource value waters" (ORVW) include all waters within the Boundary Waters Canoe Area Wilderness (BWCAW) and other waters of the state with high water quality, wilderness characteristics, unique scientific or ecological significance, exceptional recreational value, or other special qualities which warrant stringent protection from pollution. New Discharges or expansion of existing discharges are prohibited in outstanding resource value waters.

Classification of Lakes and Streams in the Watershed

Each Lake and Stream in the watershed has a designated grouping of beneficial uses. The following graphs are a breakdown of the beneficial uses by Lake and Assessment Unit Identification (AUID), as streams segments are delineated, for the Kawishiwi Watershed. Appendix B has a detailed breakdown for each Lake and Appendix C has a detailed breakdown of Stream segments. Below the graphs is a table with a description of each use classification grouping.



Minnesota Chapter 7050 Lake Beneficial Uses



Minnesota Chapter 7050 AUID (Stream) Beneficial Uses

Use Classification	Protected For:
2B, 3C	Aquatic recreation including bathing, supporting cool or warm water fisheries and associated aquatic life and habitats. Industrial Use, agriculture and wildlife, aesthetic enjoyment, and navigation.
1B, 2Bd, 3C 1C, 2Bd, 3C 1B, 2Bd, 3B – ORVW	Drinking water, aquatic recreation including bathing, supporting warm and cool water fisheries and associated aquatic life and habitats, industrial use, agriculture and wildlife, and aesthetic enjoyment of scenery and navigation ORVW indicates Outstanding Resource Value Water and is also protected for exceptional quality. Discharges prohibited or greatly restricted.
1B, 2A, 3B 1B, 2A, 3B – ORVW	Drinking water, aquatic recreation including bathing, supporting cold-water fisheries (trout) and associated aquatic life and habitats, industrial use, agriculture and wildlife, aesthetic enjoyment, and navigation. ORVW indicates Outstanding Resource Value Water and is also protected for exceptional quality. Discharges prohibited or greatly restricted.

Minnesota Chapter 7050 Beneficial Use Descriptions

3. Beneficial Uses

"Beneficial uses" are the uses that water resources and their associated aquatic communities provide for people. Minnesota has seven beneficial uses, designated Class 1 through 7, and defined in Minn. R. 7050.0140. This report identifies fourteen uses which are present in the Kawishiwi Watershed (Appendix A). Some of these, such as wild rice and aesthetics are specific to the watershed. Each of these uses was evaluated for:

Expected Outcome – This is the condition or anticipated condition of the use in the watershed. These conditions are specific to this watershed and based on criteria from watershed users.

Existing Protection – Minnesota State Statute 7050 provides for protection of Beneficial Uses of a water body. Additional protections are provided by other State and Federal agencies. These protections are outlined here.

Possible and Plausible – The Clean Water Act was passed in 1975. It established the level of service provided at the time for each Beneficial Use. Not all beneficial uses still exist at this level. This category indicates temporal or spatial changes which may make it impossible to maintain the Beneficial Uses provided at the time of the Clean Water Act.

Specific Actions – Beneficial Uses can be adversely impacted by changes to the water body. This column identifies specific actions that are required to preserve the beneficial use.

Checklist – The final 8 columns are meant to give a quick directory of stressors that may affect each beneficial use.

i. High Priority Beneficial Uses

The most commonly cited beneficial uses are drinking, fishing and swimming. Each use is presented in this way: why it was selected for the study, how it was researched, what were the findings, and recommendations for further study.

Drinking Water – Year Round or Occasional:

Drinking water should meet the Minnesota Department of Health standards; free of dangerous pollutants and water borne diseases. It is important to know which lakes are being used for drinking water to minimize health risks of people who live in the area and also the many visitors who use the watershed for recreational purposes.

With the exception of a small part of the watershed which is in the City of Ely, there are no homes served by municipal water services. Additionally, due to the large number of seasonal homes (65%), a large proportion of the residences in the watershed are assumed to have either a lake water system or a well for their water supply. It is difficult to determine with absolute certainty which lakes were used for year round use as only

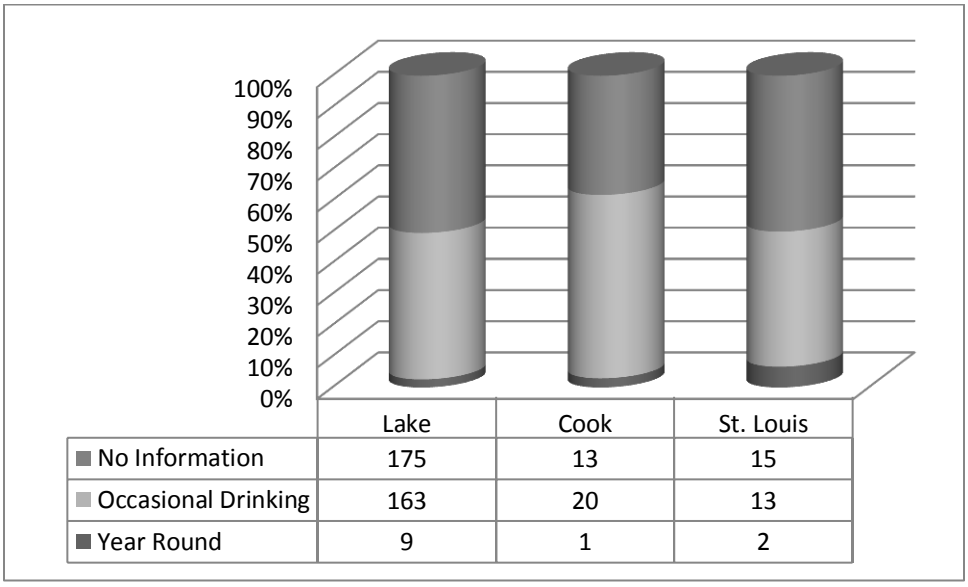
businesses have to be authorized users from the Minnesota Department of Health (MDH). The website used for entries was http://www.health.state.mn.us/divs/eh/water/swp/swa/swainfo/default.cfm.
Only Farm Lake 38-0779 is used by a business entity requiring the Minnesota Department of Health to conduct a source water assessment. The WICOLA interns also noted on their reports that Johnson Lake and eleven other lakes currently being used for year-round drinking purpose; one in Cook County, nine in Lake County and two in St. Louis County.

Occasional use was determined by identifying lakes from the watershed in the Boundary Water Canoe Area Wilderness (BWCAW) using a map of the Kawishiwi Watershed. An assumption was made that every lake in the BWCAW is used occasionally for drinking. Also using detailed maps of the project area, lakes were identified that have primitive campsites which would also indicate that water is used occasionally for drinking. Using this criteria, WICOLA interns identified 20 lakes used occasionally for drinking by seasonal occupants.

Approximately one half of the lakes in the Kawishiwi watershed have been identified as being used for drinking water sources – year-round or occasionally. The principal method for treating this water for drinking purposes is by filtration or boiling, with only limited use of chlorination systems. Chlorination is considered necessary for both 1B and 1C waters.

There are 58 Lakes in the watershed that meet the determinations above that they are used for drinking water purposes but ARE NOT protected for drinking water purposes by State Statute (1B, 1C or 2Bd designation).

This graph shows the drinking water use by county.



	Lake	Cook	St. Louis
No Information	175	13	15
Occasional Drinking	163	20	13
Year Round	9	1	2

Lakes used for Drinking Water in the Kawishiwi Watershed

The Minnesota Department of Health assesses the susceptibility of contamination of drinking water sources using Aquifer Sensitivity and Source Water Susceptibility. Due to the geological conditions in the area, groundwater conditions are closely related to surface water conditions.

Aquifer Sensitivity - Aquifer sensitivity refers to the degree of geological protection afforded the aquifer(s) used by the public water supply.

High - The bedrock aquifer is considered to exhibit a high sensitivity to contamination because of the local geological setting.

Aquifer sensitivity is considered high because either insufficient geologic information is available or existing information indicates the presence of vulnerable geologic conditions.

Source Water Susceptibility - Source water susceptibility refers to the likelihood that a contaminant will reach the source of drinking water. It reflects the results of assessing well sensitivity, aquifer sensitivity, and water quality data.

High - The source of drinking water is considered to exhibit a high susceptibility to contamination because of the local geological setting.

The source of drinking water is considered susceptible because one or more wells exhibit a high sensitivity. Source water susceptiblity is considered high because insufficient information is available to determine the degree of geological protection that is afforded the source of drinking water.

Well water testing from the Spruce Road Area has shown levels of iron, manganese and sulfate in excess of the beneficial use standard of the adjacent surface water (South Kawishiwi River, 1B, 2Bd, 3B-ORVW). (South Kawishiwi Well Testing, USFS Interoffice Technical Memorandum, February 2013). Untreated discharges from these wells to the South Kawishiwi River would not be allowed under state law.

Heavy Metals - Metal sampling has occurred in Birch and White Iron Lakes. There were no exceedances of Minnesota State Standards for the beneficial uses.

Coliform bacteria can cause waterborne diseases. These diseases can cause diarrhea, nausea and jaundice. (MDH Website) Young children and the elderly are especially susceptible. Fecal coliform assays in the White Iron chain of Lakes conducted in 2012 and 2013 showed 10% of the samples contaminated with fecal coliform. The source of coliform contamination is usually from fecal contamination. 95% of the coliform samples in the White Iron Chain were from human sources.

Pharmacological and estrogenic compounds are a growing concern in water resources. These pollutants can have large effects in small concentrations. No traces of these contaminants were found in a 21-day fish exposure in Farm Lake. (SCSU, 2013)

Fishing – Warm water fishery, Cold water fishery:

Fishing in the Kawishiwi Watershed is a vital part of the tourism industry. It is important to know where the fish are now so we can ensure their presence tomorrow.

On the "Lake Information" reports which are available using LakeFinder search page on the DNR website http://www.dnr.state.mn.us/lakefind/, surveys of lakes were done throughout the past 50 years. The table below shows the number of DNR surveys recorded and the three categories of fish in this study. Only 50.6% of the lakes identified for this study have been surveyed.

County	Warm Water Fish	Lake Trout	Stream Trout*	Fish Survey	Percent Surveyed	No Survey or no fish netted	Total Lakes in study
Lake	160	0	14	174	50.1%	173	347
Cook	9	0	1	10	29.4%	24	34
St. Louis	22	0	2	24	80.0%	6	30
Total	191	0	17	208	50.6%	203	411

***Stream Trout include Brown, Rainbow, Brook and Splake**

MN DNR - FISH SURVEYS by County

Water temperature is a factor on how well a species of fish will be able to survive and thrive. Water level will affect the water temperature. Minnesota State Statute 6264.0050 designates trout lakes and streams in Minnesota. Trout are especially sensitive to increases in water temperature. The type of fish - warm or cold water fish will determine the kind of monitoring and frequency required. Another threat to fish populations is leaky septic tanks which can add nutrients that may damage the ecological balance of the habitat. The KWPP recently completed the *Kawishiwi River Watershed Septic System Assessment.* (Wenck, November, 2012) This assessment included a thorough review of County records to create an inventory of 2191 Septic Systems in the Kawishiwi Watershed. Recommendations of this inventory prioritized five lake/areas for water monitoring, six lakes/areas for groundwater monitoring and nine service areas for Community Assessment grants to evaluate the feasibility and costs of various wastewater infrastructure solutions for properties with non-compliant SSTS.

Beach/Swimming:

Public swimming areas should generally have an easily accessible shoreline for safety of the swimmer. The water should be free from coliform, pathogenic bacteria, excess vegetation or algae growth. The swimming area should be free from Aquatic Invasive species which inhibit swimming (eg. Rusty Crayfish, Zebra Mussels,

Eurasian watermilfoil). Designated swim areas should not interfere with the natural habitat of wildlife and use should not cause erosion to the shoreline. Water is aesthetically appealing for swimming if it is clear.

A total of 5 beaches were found using four sources; all are in Lake County. Flat Horn Lake 38-0568 was identified as having a beach using the Lake Information report on the Minnesota DNR LakeFinder website http://www.dnr.state.mn.us/lakefind/. A swimming beach is on the southeast corner along with a carry-in public access which is managed by the US Forest Service. Windy Lake 38-0068 beach was noted by WICOLA summer intern in his report. Fall Lake 38-0811 and Harriet Lake 38-0048 have beaches (DNR website http://www.dnr.state.mn.us/state_parks/starter_kit/beach_list.html).

There are most likely other sandy areas used as beaches throughout the lakes in the watershed and most campsites and cabin properties are used occasionally for swimming. These areas should be identified and water quality should be monitored for the safety of the swimmers.

Yearly visual checks of swimming areas and beaches should be inspected to protect the shoreline from erosion. Water clarity should be tested regularly. Public swimming areas should be sampled for coliform and toxic algae (Cyanobacteria).

ii. Specific Watershed Uses

While drinking, fishing and swimming are the most commonly discussed beneficial uses, due to the large number of lakes and high proportion of public land, specific uses which are included in the Statutory Beneficial Uses are vital to the Kawishiwi Watershed.

Aesthetics

Aesthetics have been noted by residents and visitors through surveys, conversations and public meetings. The expectation of people who live work and play in the Watershed is that they will be able to enjoy the peace solitude and serenity of the lakes and streams. 65% of properties are seasonal, many are vacation homes and cabins on Lakes.

A 2006 WICOLA survey sent out to 536 parcel owners on the White Iron chain of lakes (households and commercial properties) had response rates of 57.6% and 42.1% respectively; an incredibly enthusiastic response rate. The Board of Directors for WICOLA sought non-anecdotal information about which of the many issues were of primary importance to the residents of the chain.

Analysis of the 306 responses found that overwhelmingly they chose to be here because of the peace, quiet, solitude and sense of serenity (45.6%), and 43.3% said they came here for the natural beauty and wilderness feeling. Other frequent responses identified recreational opportunities like fishing and enjoyment of wildlife.

The survey report concluded "People come here to live and enjoy the White Iron Chain of Lakes because of the natural beauty and also because they want to have place where then can enjoy the tranquility, peace and solitude that a home on a lake in northern Minnesota can provide. Thus the issues that are of importance to them are those which intrude upon the reasons why they come to these lakes: degradation of the water quality; destruction of the shoreline and natural environment; motorized craft which impinge upon their sense of tranquility and peace. They also have high expectations that they will be supported by local township, county, state and other officials in their efforts to maintain and enhance the quality of the White Iron Chain of Lakes and their enjoyment of their life upon them. *Source: WICOLA Survey 2006 Report of Findings and Summary.*

The Boundary Water Canoe Area Wilderness was named by National Geographic Magazine as one of the 50 "must visit" destinations in the world. The BWCAW is a federally protected pristine wilderness of 1.3 million acres, with over 1,200 miles of canoe routes. While fishing remains a popular activity in the BWCAW, aesthetic enjoyment is growing in popularity. According to a survey conducted by the USFS, 23% of respondents did not fish during their Boundary Waters experience in 1977. (The Boundary Waters Canoe Area Wilderness: Examining changes in use, users, and management challenges, USDA 2012)

Boating – Motorized or Non-motorized:

Motorized and non-motorized boating should have the appropriate access needed to ensure usage will not cause damage to the environment. Motorized boating will need a concrete, asphalt or gravel surface along with maintained roads to the access areas. Non-motorized public access should be clearly identified, easily accessible, located at a non-sensitive site for erosion, and provide safe access for canoeists and kayakers.

Various types of public access areas are reported on the Lake Finder search page on the DNR website http://www.dnr.state.mn.us/lakefind/. The website lists several reports and a map of the lake. The Lake Information report is the report used for the Beneficial Use Study. Many of the lakes were on Lake Finder however they were not included in the Lake Information Report.

Ownership of public boat accesses were distributed between City, Township, USFS, and DNR. Access conditions were indicated as concrete, gravel and carry-in.

The Superior National Forest website was another source used for motorized boating, website: http://www.fs.usda.gov/activity/superior/recreation/wateractivities/?recid=36905&actid=78.
There are 30 lakes that have concrete or gravel surfaces for motorized boating. There were 6 lakes noted as non-motorized on the MPCA website. There are 118 lakes have non-motorized public access for carry-in. Within these statistics, there are 41 lakes that have multiple public access areas and 15 of these lakes have both motorized and non-motorized public access. Ownership of public boat accesses were distributed between City, Townhip, USFS, and DNR. Access conditions were indicated as concrete, gravel and carry-in. Just under 40% of the lakes in the Watershed have identified public access areas – motorized or non-motorized.

County	Total Lakes in Survey	Motorized Access		Non-motorized Access	
		Number of Lakes	Percent of Lakes	Number of Lakes	Percent of Lakes
Lake	347	20	14.5%	97	39.8%
Cook	34	0	0.0%	7	41.2%
St. Louis	30	9	45.0%	14	66.7%
Total	411	29	14.4%	118	48.9%

BOATING – Motorized and Non-motorized by County

Motorized and non-motorized boating can impact a lake and a stream if the owner of the craft is not informed or cautious about aquatic invasive species (AIS). Some exotics can alter or destroy existing uses. Educating the public about AIS and the changes to native vegetation or other aquatic life before a lake or stream is infested is critical. All public access areas should have craft cleaning instructions. The public access areas should also be checked periodically for deterioration of the landing and shoreline due to erosion. All accesses should be designed or redesigned to limit the introduction of automobile pollutants into the water body.

Birch Lake Boat Landing

Wild Rice:

Wild Rice is a valuable food source for people and wildlife. It grows in shallow water and slow-flowing streams with nutrient rich soft bottoms. After sprouting, the stems lay below the water surface until about halfway through the 4 to 5 month growing cycle. At mid summer a long slender leaf floats on the surface. During this period the plants can easily be uprooted with changes in water levels or wave action. During mid to late summer the plants grow to full height and ripen in late August-early September. It is important to know where wild rice is growing in order to preserve ideal growing conditions.

Data was collected from the Wild Rice Resource Guide Third Edition (2009) produced by the 1854 Treaty Authority which listed the lakes producing wild rice. The guide can be found at this website http://www.1854treatyauthority.org/. The list confirmed previous findings from the Wild Rice Distribution and Abundance in Minnesota Report which can found in pdf format here http://files.dnr.state.mn.us/fish_wildlife/wildlife/shallowlakes/statewide-inventory-wild-rice-waters.pdf.

Wild rice grows in all three counties in the Kawishiwi Watershed: Cook County - 1 out of 34 lakes, Lake County - 50 out of 347 lakes, and St. Louis County - 7 out of 30 lakes.

Extreme water level changes can be an issue for the first months of growth of wild rice as the young plants can be easily pulled up from soft lake bottoms or stream beds. Another problem for wild rice is competing with other plants for space and light. Aquatic invasive plant species such as purple loosestrife can interfere with the growth of wild rice. Invasive rusty crayfish may destroy whole beds of rice. Minnesota Water Quality rules on sulfates include rice production areas. There are several organizations and reports published by these organizations that address the issues of growing wild rice. The 1854 Authority website includes links to these reports for review http://1854treatyauthority.org/wildrice/otherinfo.htm for further study when developing a plan.

Float Plane Landing:

Float or seaplanes require a large enough space for planes to land safely. Pilots must only land where the landing will not endanger any life or habitat. Float planes are a common sight in the watershed since there are many lakes and few highways. The USFS uses float planes to patrol and provide emergency services in the BWCAW . Federal Airspace restrictions regulate air travel in the BWCAW, but other lakes in the watershed see occasional float plane use.

The Seaplane Pilots Association website has a Water Landing Directory by state. See the following http://www.seaplanes.org/mambo/index.php?option=com_content&task=view&id=122&Itemid=235&page=inc-states&state=MN. Using this website, the landing list for Minnesota identified lakes that are open and closed for float plane landing. Special policies listed below were also taken into consideration when identifying float/seaplane landing sites.

Agency: Minnesota Division of Parks and Recreation

Policies: Seaplanes are prohibited on lakes contained entirely in State Parks, except by permit or in the event of an emergency (including for the purpose of conducting a rescue).

Agency: Voyageurs National Park

Policies: Due to the presence of the spiney water flea, with the exception of lakes specifically open (see Waterway Regulations), all bodies of water in Voyageurs National Park are closed to seaplanes.

Agency: Superior National Forest

Policies: Seaplanes are prohibited in the Boundary Waters Canoe Area Wilderness (BWCAW). Note also Prohibited Areas P-205 and P-206 extending from the surface to 4000' MSL depicted on current NOAA Sectional Charts.

There are 130 lakes that do not allow float or seaplane landing in the study. Only Farm Lake 38-0779 was identified as being used regularly for landing.

Lakes used for landing should be identified and depending on the frequency of their use be monitored for any deterioration to the water quality, aesthetics and environment. **Float planes may also be a vector for invasive species such as spiny water flea, Eurasian water milfoil and purple loosestrife.**

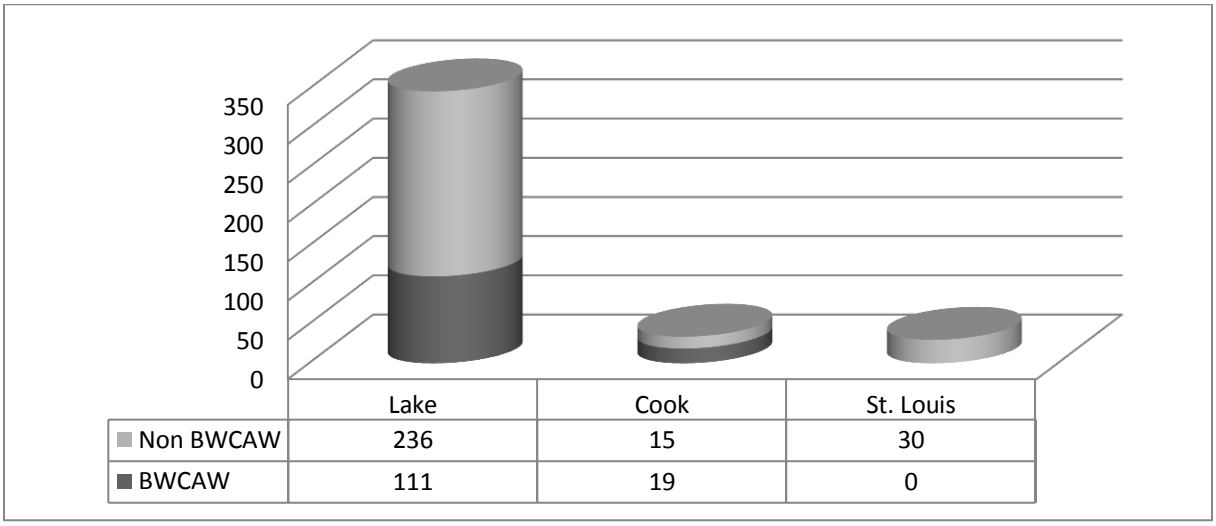
Tourism:

Tourism remains an important economic driver in the watershed. There are twenty nine resorts, camps and outfitters located in the Kawishiwi Watershed. These businesses are water dependent in that they rely on the fishing, boating and lakes in the watershed.

4. Outstanding Resource Value Waters

Lakes:

All waters within the Boundary Water Canoe Area Wilderness (BWCAW) are protected as Outstanding Resource Value Waters under Minnesota's rules 7050.0180 subpart 3. Prohibited discharges.



Outstanding Resource Value (BWCAW) Lakes in the Kawishiwi Watershed

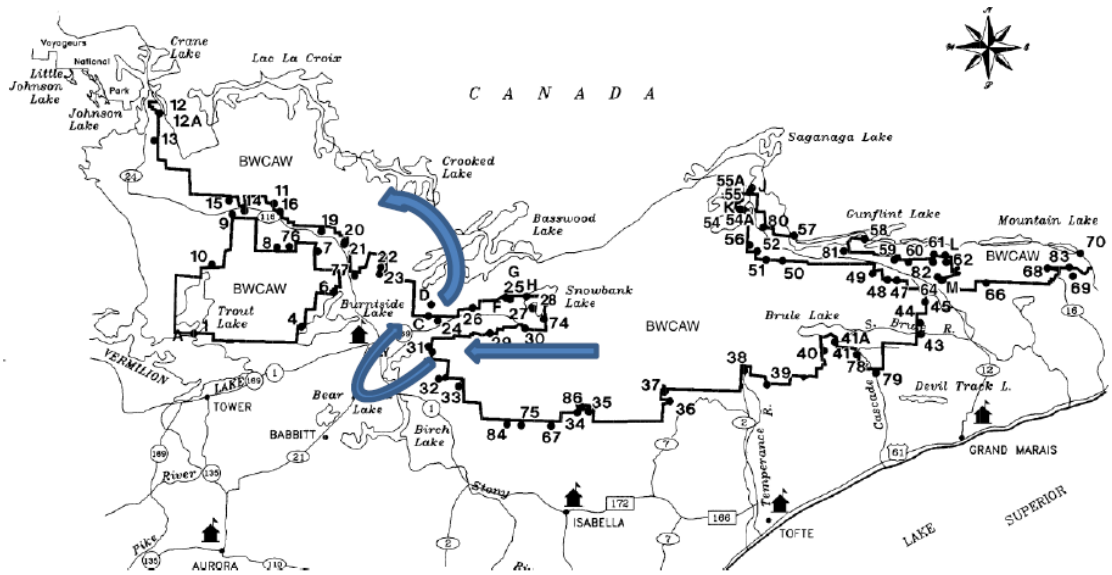
5. Assessment status for beneficial uses

Only a small percentage of lakes and streams have been assessed regarding support of their beneficial uses. Of the 411 Lakes in the Kawishiwi Watershed, 134 (33%) fully support the beneficial uses, 23 (6%) have insufficient data and 254 (62%) did not indicate that any data was available. (MPCA, 2011).

Of the 219 Stream reaches (AUIDs), 215, or 98% lack sufficient data to assess their beneficial use, 2 (1%) are impaired for one or more uses and 2 (1%) have no impairment of assessed use(s).

6. Other considerations

Water flow path – The Kawishiwi River originates in the Isabella area and enters the BWCAW via a large network of small streams from the Superior National Forest. Recreation, fishing, logging and granite quarrying activities occur here. Streams include the Island and Little Isabella Rivers and Mitawan and Filson Creeks to form the Kawishiwi River. The Kawishiwi exits the BWCAW into a developed and developing portion of the watershed. Resorts, mining, cabins, homes, campgrounds, a golf course and Power dams exist here allowing the river to sweep pollutants back into the BWCAW at Fall Lake.



Schematic Drainage Map of Kawishiwi Watershed

Climate change – Changes in the climate may affect beneficial uses. These include longer open water seasons, warming waters, excessive algae blooms, and faster chemical reactions. The geology has many sulfur and metallic compounds. Continued deposition of aerial pollutants such as mercury, sulfur, and nitrogen compounds can enter the water directly and through surface runoff. Since many of these lakes are oligotrophic, they have a reduced buffering capacity to assimilate these pollutants.

Setbacks/riparian buffers – County ordinances and DNR regulations control shore land setbacks. Maintenance of these setbacks and vegetative buffers is critical to maintaining water quality. Due to the rocky shorelines in many parts of the watershed, vegetative buffers are easily disturbed causing erosion into the water bodies.

Residential sewer and water services – The Kawishiwi Watershed is sparsely populated. Except for a small area of the watershed served by the City of Ely, there are no municipal sewer and water systems available. Additionally, seasonal users are more likely to use Lake water systems due to cost. Many residents chose to use lake water since groundwater in the area is naturally high minerals. The prevalence of lake water systems make protection of this beneficial use very important to the Watershed.

7. Summary

Beneficial uses are the uses that water resources and their associated aquatic communities provide for people. Minnesota has seven beneficial uses, designated Class 1 through 7. These uses are the basis for protecting water quality in the state. Beneficial uses are commonly referred to as fishing, swimming and

drinking, but cover a much wider range of uses. Protection of these uses is required by State Statute R. 7050.0140.

The Kawishiwi Watershed is a state and national treasure due to the rich abundance of pristine lakes and streams found nowhere else in country. These water resources provide a multitude of existing beneficial uses for mankind and the environment. Many of these uses are a direct benefit to people such as drinking water, water-based recreation, hydro-power generation (?), and aesthetics. Other beneficial uses correlate more broadly to healthy aquatic ecosystems and include uses such as wild rice and aquatic fish and wildlife. The unique geology of the region and the location of the Kawishiwi Watershed in relation to the BWCAW, Voyageurs National Park, and Quetico Provincial Park in Canada make it imperative that the water quality be protected so these beneficial uses can continue. Keeping the water clean will help to preserve the local values, traditions and customs that residents and visitors alike hold in such high regard.

This study researched and documented a wide variety of existing beneficial uses for the purpose of protecting them through a watershed management plan. The following recommended actions should be considered for inclusion in this plan:

1. Water Quality Monitoring: Monitoring the lakes and streams for degradation will be a part of the Kawishiwi management plan (Implementation Plan?). The type and frequency of testing for pollutants will be determined by the use of the lakes and availability of funding. Yearly investigation of boat access, swimming and other areas that might deteriorate the shoreline with use would be advisable but may not be practical in some of the more remote areas. The recreational use of this area and its economic value to the community at large, make it imperative to keep the best monitoring and protections in place to keep the status of this special watershed intact. Specific attention needs to be given to sensitive areas identified in the Kawishiwi River Watershed Septic System Assessment and the need for further location-specific testing.
2. Aquatic Invasive Species Education: As in many areas of the country, the watershed lakes have the possibility of being infested by aquatic invasive species (AIS) vegetation or aquatic life. Continued public education on the effects of AIS on the environment and prevention is an effective way to inhibit the spread of AIS and should be included in a management plan to ensure the quality of the water in the watershed. Particular emphasis should be placed on the status and control of spiny water flea, rusty crayfish, purple loosestrife, and Eurasian water milfoil.
3. Erosion Control and Stable Water Levels: Actively eroding sites, including properties undergoing development, should be restored and stabilized to prevent sediment and other pollutants from entering lakes, streams and wetlands.
4. Public Education: (survey, video, presentations on SSTS/AIS/Shoreland BMPs/Forestry BMPs/Erosion Control & Water Levels/ etc.)
5. Climate Change: Research implications of climate change. Climate change will impact the Kawishiwi Watershed and may change the way our lakes and streams can be used. Climate change can affect the

amount of water, velocity of the flow and temperature. The amount of water depends on precipitation and its form. Increase rainfall instead of snowfall can be damaging. Too much rain can cause additional runoff and flooding which can lead to erosion of shorelines. These changes can impact all of the uses presented in this study in some way and should be considered when developing a management plan.

6. Shoreland Best Management Practices – Shoreland property owners shall follow commonly accepted shoreland best management practices.
7. Forestry Best Management Practices – Private individuals, industry and units of government shall follo commonly accepted forestry best management practices.
8. Pollutant 'management' – Pharmaceuticals and endocrine disrupters shall be disposed of in a way that prevents them from entering surface water and groundwater.
9. Subsurface sewage treatment systems shall be properly designed, constructed and maintained to avoid undesired water quality impacts to surface water and groundwater.

Overall, expanded data collection, researching the potential implications of global climate change, including public education on AIS and other issues, enhanced water quality monitoring/testing and visual checks of water bodies are all key tasks to include in the developmentof a comprehensive management plan that would help protect and maintain the Kawishiwi Watershed.

Appendices – Refer to attached Beneficial Use Study Worksheet (Excel File) for Appendices

9. Appendix A Summary of Beneficial Uses

The following table is a summary of existing uses in the watershed, regulations that protect the use, specific actions that can protect the use and stressors that may affect the use in the future. This information is attached as an Excel Spreadsheet. (Beneficial Use Study Worksheet .xlsx)

10. Appendix B

The following table is a listing of Lakes in the Kawishiwi Watershed and the associated Beneficial Uses as designated by the Minnesota State Statute Chapter 7050 WATER QUALITY STANDARDS FOR PROTECTION OF WATERS OF THE STATE. The table is adapted from the Report "A Water Quality Assessment of Select Lakes within the Kawishiwi River Watershed", MPCA, January 2011. This information is attached as an Excel Spreadsheet. (Beneficial Use Study Worksheet .xlsx)

11. Appendix C

The following table is a listing of Streams in the Kawishiwi Watershed and the associated Beneficial Uses as designated by the Minnesota State Statute Chapter 7050 WATER QUALITY STANDARDS FOR PROTECTION OF WATERS OF THE STATE. This information is attached as an Excel Spreadsheet. (Beneficial Use Study Worksheet .xlsx)

12. Appendix D

The following table is a listing of Lakes in the Kawishiwi Watershed and Observed Uses on those Lakes. This information is attached as an Excel Spreadsheet. (Beneficial Use Study Worksheet .xlsx)