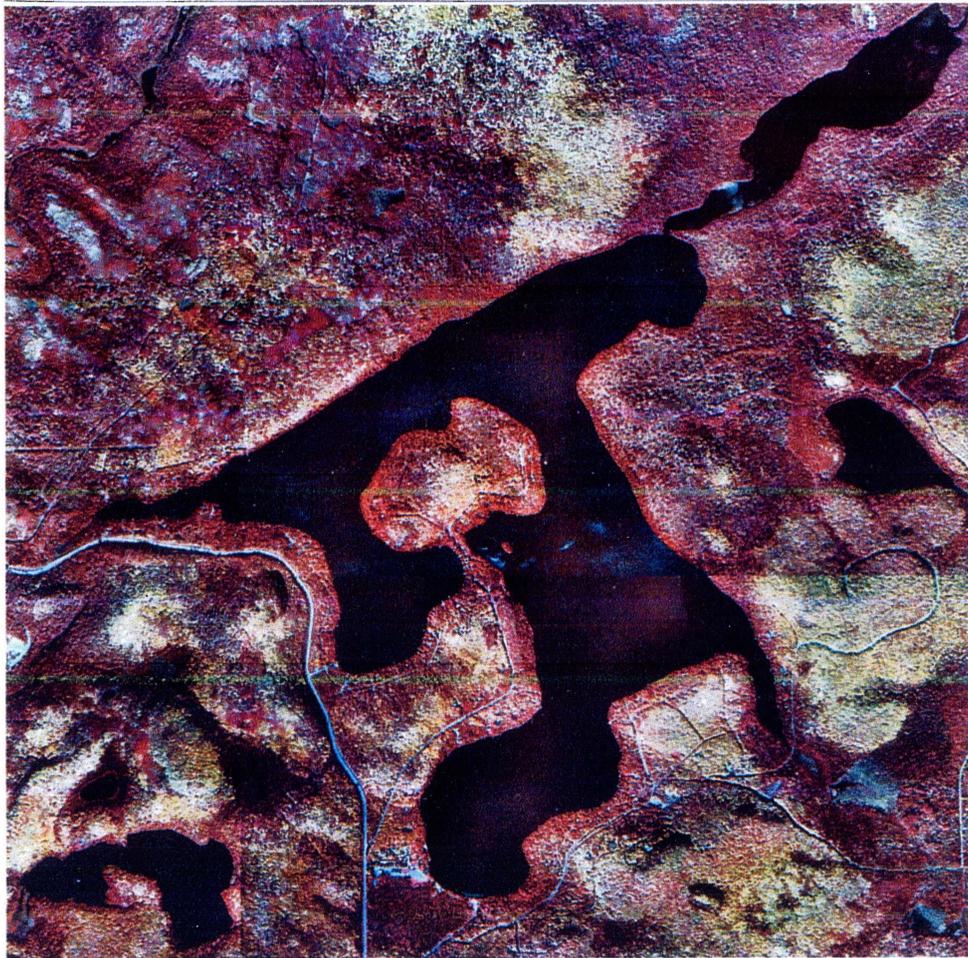


Lake Management Plan

For

Caribou Lake

Lutsen, Minnesota



December, 2008

Minnesota's Lake Superior Coastal Program

Caribou Lake/Lutsen Water Quality Monitoring Program

Caribou Lake Property Owners' Association

December 29, 2008

Project No. 306-STAR05-08

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Acknowledgements

The cover photo of Caribou Lake is provided by the Minnesota Department of Natural Resources and is a sample of the state-wide aerial photos mosaic in Cook County. This photo was taken September 22, 2007 by the Minnesota Department of Natural Resources, Forestry Resource Assessment Office in Grand Rapids.

The Caribou Lake Property Owners Association, as primary authors of this plan, wants to express their appreciation to Cindy Gentz of the Soil and Water Conservation District (SWCD) of Cook County for her contributions to this plan and her assistance in reviewing it. This plan does not reflect the official position or endorsement of the SWCD.

If you have questions or comments related to the Caribou Lake Management Plan, please Caribou Lake Property Owners Association's web site: <http://minnesotawaters.org/index.php?uberKey=1253>

Caribou Lake Management Plan

Introduction

The Caribou Lake Property Owners Association (CLPOA) is the author of this plan with vital financial assistance from the STAR Grant Program of Minnesota's Lake Superior Coastal Program of the Minnesota Department of Natural Resources. Three basic values regarding Caribou Lake are incorporated into this plan:

- Lake water quality is to be protected at all times and improved wherever possible.
- Private property values in the watershed reflect water quality and land owners shall use their property as they see fit fully abiding by all regulations and regulatory decisions.
- The long term future of Caribou Lake is as important as next year in guiding actions and decisions affecting lake water quality and the total lake experience.

A reader of this plan will see a number of things of importance. Actions are called for based on thorough and thoughtful documentation of focus or critical areas of interest. These are presented in the last two sections of this plan. You will also notice frequent reference to three keys to success in protecting and improving Caribou Lake: education, communication and cooperation. If we all do some of each, we will reach our goals. The complete Management Plan is also available on the CLPOA website.

Management Plan Purpose

"If we don't have a plan, how do we know where we're going." To protect and enjoy Caribou Lake now and in the future we know lake water quality is the key. That's where we're going: to implement all practical measures to improve and then protect water quality. This lake management plan describes measures to protect and improve Caribou Lake water quality and indirectly the total lake experience: what affects water quality, what our goal for water quality should be, how can we achieve the goal we set, and what are responsibilities for the various people who can influence this effort to get "...where we're going."

This plan sets goals for concentrations of the chemicals—phosphorus and chlorophyll-a-- that are the primary influences of water quality and the measure of clarity which is indicative of the presence of the chemicals. The goals are achievable for Caribou Lake based historical data and current lake water sampling and analysis. Other areas of lake character and use are also addressed in this plan in terms of protection, prevention and positive actions and/or practices for all who come in contact with Caribou Lake. Although this plan has been authored by CLPOA, this is a plan that needs broad application and buy-in from all private and public stakeholders. This plan is also intended to protect all of the natural assets of Caribou Lake to assure the maintenance of the natural character and other values of importance to all who seek any of the myriad joys and pleasures of a pristine lake in a northern Minnesota setting. Caribou Lake is an asset special to many and all users have a responsibility to assure that future generations have the opportunity we share today. This plan will help us do just that.

The Caribou Lake Property Owners Association (CLPOA)

The CLPOA is an advocacy group of land owners in the Caribou Lake watershed. It was formed 33 years ago to advocate for actions covering all facets of importance to the lake and surroundings. These actions usually involve local or state government units with responsibilities for protective or preventive action. One of the most important and long term actions has been support of the lake water sampling by volunteers. These volunteers deserve exceptional praise and appreciation from all who enjoy Caribou Lake. It takes time, effort and expense under sometimes adverse weather and other conditions. We take a moment here to repeat our sincere gratitude to these volunteers. They deserve that and much more.

More intensive water quality sampling was needed to obtain data for use in this plan. The expense of the increased sampling plus the expense of preparing this plan is covered by a STAR Grant from Minnesota's Lake Superior Coastal Program of the DNR along with matching actual and in-kind expenses incurred by CLPOA. Additional sampling was also funded for Caribou Lake under a Clean Water Legacy grant issued to

Cook County. This plan is the culmination of the efforts of numerous members of the CLPOA plus the help of Cook County staff in the Planning and Zoning Department and the Soil and Water Conservation District staff.

Caribou Lake Characteristics

The physical characteristics and related fisheries and land cover factors for Caribou Lake are as follows:

MNDNR ID NO. 16-0360

Lake area: 728 acres

Mean depth: 12.6 ft.

Maximum depth: 32 ft.

Volume: 9,195 acre-ft.

Mean hydraulic residence time: 1.6 years

Littoral area 60%

Watershed area: 534 acres (excluding Pike Lake)

Ratio watershed area-to-lake surface area: 9.3:1

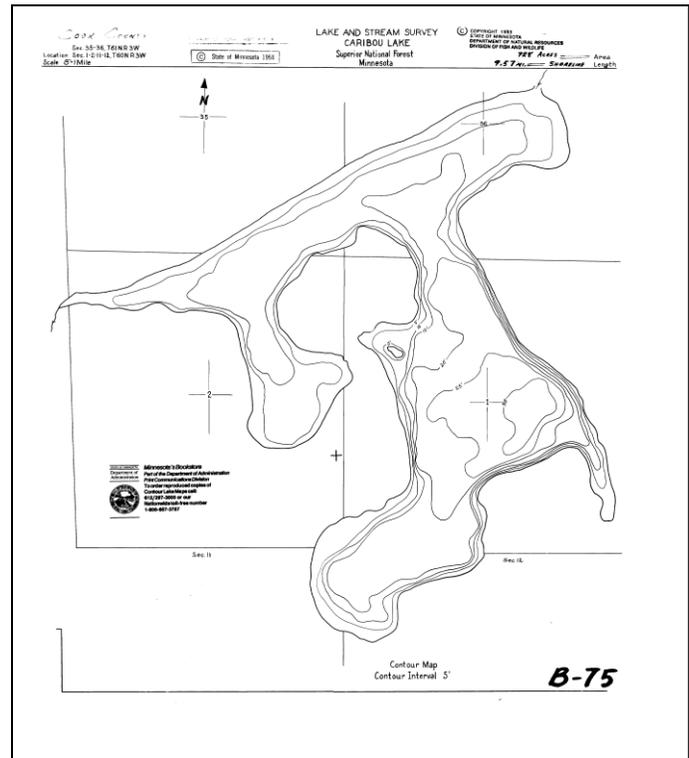
Fisheries-Ecological classification: Walleye

Management classification: Soft-water walleye

Public access: 1

Inlets: 2 Outlets: 1

Land cover: Forests—75%; water and marsh (including lake) – 23%; residential—2% pasture & open and cultivated—0% ; all within typical range of Northern Lakes and Forests Region



Caribou Lake History

Caribou Lake has a long and interesting history of known human habitation. It is a certainty that undocumented habitation occurred long before our records that start about 1880.

Native Americans camped on the peninsula up to about 1900 and also had a sugar maple camp in the swayback of Maple Ridge at one time. The late 1800's brought stone and timber claim filings in the Cathedral of the Pines area and filings for the first homesteads by bachelors Tom Hand and John Kjeldahl. The early 1900's marked the start of extensive logging all around the lake. Logs were floated to the Sawmill Bay area and the lumber was hauled down the Hall Road to Leonard Landing. Many deadheads were left in the lake from this activity. The logging ended about 1923. A major fire occurred on the north side of the lake in 1910-1911 including the outlet and White Sky Rock areas.

The 1920's brought the first resorts to the lake located in the Cathedral of the Pines and peninsula areas by Albert Pecore, Carl Nelson and Hosey and Stella Lyght. The first walleyes were planted to augment the

northern and perch populations but resulted in an overall poorer fishery. In the late 1930's bass, sunfish and bluegills were introduced which only resulted in a decline of fishing generally.

Through the 1920's and '30's a few individual cabins were built at various locations on the lakeshore. In 1962 the U.S. Forest Service established 37 leased lots in the west bay area. This opened the lake to the first major influx of cabins and lake users. This was followed in 1963 by a major development of privately owned lake shore property by Lutsen Development Company. In the same year, Cathedral of the Pines acquired the Pecore Resort and prepared to operate a summer camp for kids. A more extensive early history of the lake is presented in Appendix A.

In 1975 the Caribou Lake Property Owners Association was formed in response to concerns about development plans and pressures and lake water quality. To address the latter, water quality sampling was begun by volunteers to measure and document widely-accepted water quality parameters. During the late 1970's, logging was conducted in the areas including Murmur Creek, Pike Lake and Deeryard Lake. The first two are upstream and tributaries to Caribou Lake.

Major water quality studies were conducted in the 1980's and '90's by the Minnesota Pollution Control Agency and/or the Minnesota Department of Natural Resources. The CLPOA continued the volunteer water quality sampling into the 2000's and thus there is water quality data starting in 1975, through several years in the '70's, '80's, '90's and the 2000's.

In the early 2000's, Lutsen Development Company (LDC) proposed a major second tier development of 80 lots overlooking the Sawmill Bay area. Following the preparation of an Environmental Assessment Worksheet assessing the potential impacts of this development, the County at the urging of the CLPOA and others decided a full environment impact study (EIS) was required. A consulting firm proposed an Alternative Urban Area-Wide Review (AUAR) and Mitigation Plan be conducted as a preferred option to the EIS. Such a review analyzed the potential impacts throughout the Caribou Lake watershed of any future developments in addition to those of the specific LDC proposal. The latter was revised from the original 80 lots to 38 lots prior to the study thereby reducing the negative impacts of the proposed development. The County accepted this suggestion and the AUAR was conducted and reports submitted in 2004. Water quality sampling data was a critical component of the study. The cost was shared by the County, all lake land owners and LDC.

A Subordinate Service District (SSD) was established for Caribou Lake to enable the County to assess land owners for payment of their share of the AUAR cost. A SSD Advisory Committee to the County Board was set up to offer advice to the Board on issues surrounding the LDC development in light of the AUAR findings. This working committee includes a County Commissioner, two CLPOA members, a Lutsen Township Supervisor, and a LDC representative plus an alternate for each member. SSD's are being used successfully across Minnesota as a means of improving and assuring proper septic management. This governance structure also provides taxation authority to fund educational programs and efforts on topics of importance to Caribou Lake water quality.

This lake management plan being prepared by the CLPOA is the next step in the continuing process of improving and protecting Caribou Lake water quality.

Land Use and Zoning in the Caribou Lake Watershed

There is no historical data on land use in the Caribou Lake watershed. We do have current zoning and existing land use in the watershed. Table LU-1 provides a definition of each zoning district and allowable acreage for development. Tables LU-2 and LU-3 list the acreage and percentage of zoning and land use by category in the watershed.

Table LU-1. Cook County Zoning Districts in the Caribou Lake Watershed

District	Description	Min. Lot Size
FAR-1 Forest/ Ag, Recreation	Forest management, agriculture, recreation in remote areas, dwelling permitted.	20 acres
FAR-2 Forest/ Ag Recreation	Same as FAR-1 except with greater emphasis on allowing low density residential uses generally along remote public roads.	10 acres
FAR-3 Forest/ Ag Recreation	Same as FAR-2 but with development at medium rural density.	5 acres
R-1 Single Family Residential	Residential uses at a higher density generally adjacent to Hwy 61 or along Lake Superior.	2 acres
LSR Lake Shore/Residential	Residential uses governed by shore land regulations for lands within 300 feet of certain lakes.	1 acre
RC/R Resort, Commercial/ Residential	Provide for the specific commercial activity of resorts, lodges and outfitters. Limited residential and service businesses also permitted.	5 acres

Table LU-2. Zoning in the Watershed

Zoning	Acres	Percent
FAR-1	704.2	12.5
FAR-2	3.3	0.1
FAR-3	206.5	3.6
LSR	353.3	6.2
R-1	150.3	2.7
RC/R	65.8	1.2
Public	3229.9	57.1
Water	939.2	16.6

Note: Lands owned by the State in trust for Cook County school district FAR-1-- 380.3 acres/ 54% of FAR-1; LSR-- 70.2 acres/20% of LSR

Table LU-3. Existing Land Use Conditions in the Watershed

Land Use	Acres	Percent
Developed	110.9	2.0
Forest	4546.3	80.4
Water	939.2	16.6
Open Space/Recreation	14.0	0.2
Wetlands	42.1	0.7

The developed use listed in Table LU-3 includes farms, rural residences and roads, the latter including the new Caribou Trail area, and totals about 111 acres or 2% of watershed area. Forest and Water uses account for about 80% and 17% respectively, totaling 97% of the watershed. Any future development will reduce the “Forest” acreage.

Figure 1 taken from the AUAR shows the areas and zoning districts. The RC/R is the Cathedral of the Pines site. The LSR area that extends beyond the lakeshore is the Maple Ridge area along Cty Rd 39 where second and third tier development is occurring. A segment of the R-1 area is the Sawmill Bay Hillside area under development by Lutsen Development Company with 38 lots in the plan.

It is important to note that the State owned lands held in trust for the Cook County school district amount to 54% of FAR-1 lands and 20% of LSR lands. Should these lands or a portion of them be sold, they could be developed in accord with the limitations on lot size. This would be a substantial addition to developed lands in the watershed and would have very serious potential impacts on Caribou Lake water quality as indicated in a later discussion.

The importance of this data is the relative size of developed lands and the relationship of future development to the current condition, knowing the vulnerability of Caribou Lake water quality to the current state of development. This vulnerability is the basis of the rationale for measures surrounding future development design, construction and use of private property in the watershed and especially near the lake.

A recent development is the introduction of horses on shoreland lots and other lots in the watershed. Full compliance with relevant zoning regulations and variance decisions when applicable will afford water quality protection to Caribou Lake as with any similar developments.

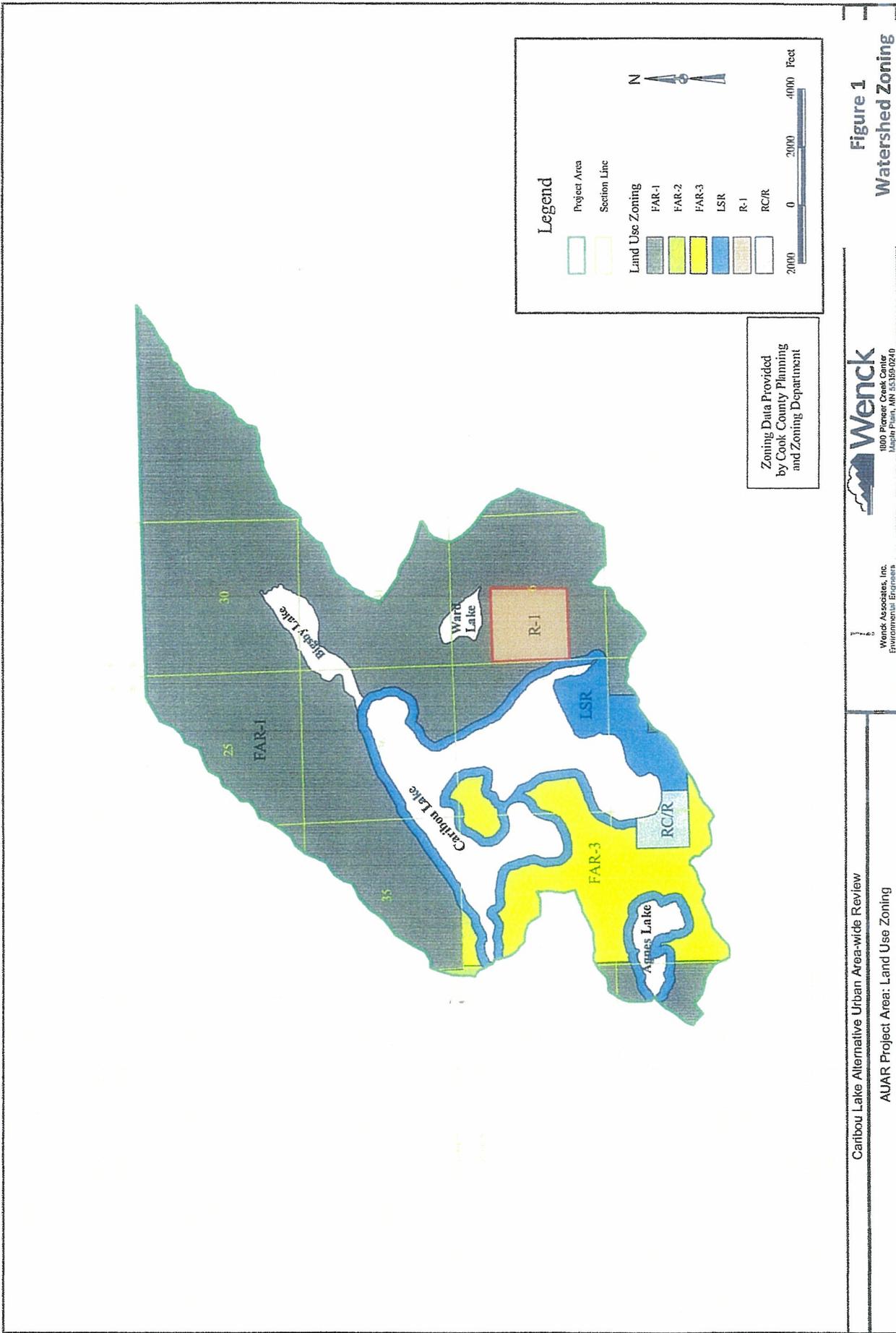


Figure 1
 Watershed Zoning

Caribou Lake Water Quality

Water quality might be called the “life blood” of a lake community. When we speak of water quality the general assumption is that we’re talking about the “look and feel” of the lake—how clear is the water—and how good is the fishing. The first affects our perception of quality and our inclination to play in it and generally enjoy being on it, in it and/or near it. The second consideration is the fishery characteristics, i.e. what fish populate the lake, in what volume and what quality.

Caribou Lake as an Arrowhead Region lake is expected by all to compare somewhat favorably with Boundary Waters’ lakes, fairly or not. That means very high quality both in terms of clarity and being contaminant free and a decent fishing lake. Land owners around Caribou Lake have the strongest interest in this “life blood”. They live here or spend much of their free time here so the lake experience is important and the value of their property is directly tied to the actual and perceived water quality.

Fortunately there are quantitative measures of water quality that support the “look and feel” of the lake. These are measures of specific substances in the lake, namely phosphorus measured as total phosphorus and chlorophyll-a as a measure of algae bloom; plus clarity measured using a device called a Secchi disk. Other measures are temperature of the water, lake level, and oxygen content. The first three measures are the critical and most common measures of water quality.

A long history of water sampling and analysis by scientists studying water quality has established the relationship between the three measures. The most critical of the three is the phosphorus concentration. It is a common nutrient in lake water coming from numerous sources especially associated with human activity. It is the nutrient that controls the growth of chlorophyll-a, hence the algae bloom in lakes. The latter is a strong influence on the clarity of lakes—how far down can we see into the water and how pleasant is swimming. As algae blooms reach higher concentrations, the blooms move from nuisance to intolerable to dangerous for people and pets. In all of this discussion, we are not addressing lake water for human consumption which would have much more stringent and comprehensive quality measures.

There has been an active history of lake water sampling by volunteers and state agencies at Caribou Lake starting in 1975 and continuing off and on through the current summer season totaling about seven summers of sampling. The water quality measures have varied from year-to-year and season-to-season depending on various conditions of weather and activities in the watershed. An overall summary of the results of this sampling are as follows:

Parameter	Range
Total Phosphorus (mean)	15 to 30 ppb
Chlorophyll-a (mean)	4 to 12 ppb
Secchi disk (mean)	6 to 9 ft

Note: ppb is parts per billion, measured as milligrams per liter

Total phosphorus at 15 ppb is excellent and at 30 is the highest level for a lake to be considered recreational. Chlorophyll-a at 10-20 ppb will produce mild to more nuisance algae blooms. Clarity at the above levels is considered recreational with minor aesthetic problems. It should also be noted that small changes in phosphorus and chlorophyll-a concentration result in large changes in lake clarity; improving as concentrations decrease and degrading as concentrations increase. Caribou Lake morphology and other characteristics, e.g. lake vegetation and lake bottom characteristics, will also influence the interactions of these contaminants, especially clarity.

A system has been devised to combine these measures and compare the quality results with similar measures for other lakes in the ecological region. It is called the Carlson Trophic State Index (TSI). The sampling results for this summer (2008) are better than most years and yet by the Carlson Index, Caribou Lake would be ranked at the 39th percentile (61% of regional lakes would be ranked better). There is room for improvement and consistency in water quality. Not surprisingly, the lake water samples indicated some degradation in quality from early to late summer, as concentrations of phosphorus and chlorophyll-a increased and clarity decreased with some algae bloom. Equally important is that there has been significant improvement from previous years in Caribou Lake water quality because of actions taken in the watershed.

The lake fishery was initially northern pike and perch according to lake historical record. Walleyes were introduced in the late 1920's which resulted in a depletion of northerns. Bass, sunfish and bluegills were introduced in 1938 without success. The current game fishery includes walleyes, small mouth bass, northerns and perch all indicative of the desirable water quality, depth and bottom characteristics of Caribou Lake.

Regional Patterns in the Watershed

Caribou Lake is located in the Tofte-Lutsen area of Cook County—considered the west end and one of the major recreational destinations in the County, if not the state of Minnesota. Caribou Lake is one of the focal points of this area as suggested in quotes by real estate agents, even if slightly exaggerated. This creates great interest and demand for recreational opportunities and for property in the Caribou Lake watershed. Development interest and initiatives continue around Caribou Lake especially in the second and third tier areas as available shoreline property is in short supply. Other lakes in the watershed include Bigsby Lake which is closely connected to Caribou Lake by a narrow rocky flowage and although small, difficult to access and substantially covered by weed beds has seen initial development of shoreline property. Lake Agnes and Ward Lake have no direct connection to Caribou Lake and are currently undeveloped. The County Local Water Management Plan calls for continuing only canoe access to Ward Lake and discourages development on both lakes. Precipitation data are available from the Minnesota Climatology Working Group website (<http://Climate.umn.edu>). Rainfall average is about 28 inches although recent data for 2001 indicated about 38 inches. The latter is substantially above the norm and indicative only of an unusual year.

The shape of Caribou Lake and the landscape surrounding it and throughout the watershed creates unique hydrologic characteristics for the lake. The Murmur Creek-Bigsby Lake flowage provides the bulk of the water load to Caribou Lake entering the long northern portion of the lake. The AUAR analysis concluded that three distinct bays exist including the northern and two southern extensions on either side of the peninsula. The bays differ in depth hence in residence time and in potential for differences in contaminant concentration. Water quality sampling was conducted at seven different sites on the lake this summer to address this aspect of Caribou Lake hydrology. According to the AUAR, a soil survey has not been conducted in Cook County but available soil data indicates that the soils in the watershed vary locally from clay loams to sandy gravel deposits. Like most of the Arrowhead Region, soil cover over bedrock in Cook County is generally thin. The AUAR reports that predominantly bedrock with possible thin cover of glacial till (North Shore Volcanics) accounts for 70% of landforms in the watershed and clay loam deposits (Superior Highland Till Plain) the other 30%. A related concern is the appropriate design, placement and construction of septic systems based on on-site soils assessment. Another concern with thin soils is the highly erodible conditions when slopes exceed 6 percent. Such erosion can be a significant source of contamination for receiving water bodies such as Caribou Lake.

Geologically speaking, there are no sinkholes, shallow limestone formations or karst conditions in the watershed. Depending on the competency (fracturing) of the bedrock, the underlying groundwater contained within the fractured bedrock could be impacted by surface contaminants especially household chemicals, paints, oils, fertilizers/pesticides, etc. contaminating the local water supply and/or discharges into Caribou Lake.

Lake Management Focus Areas

The 17 focus areas identified and discussed in this section are topics that directly or indirectly impact lake water quality or are themselves impacted by the water quality of Caribou Lake. The previous sections of this plan have provided background material, data and information on aspects of these focus areas. This section will focus on information, issues and rationale for each topic to support the goals, objectives and action plans described in the last and management section of this lake management plan. Some overlap and repetition of suggestions and recommendations occurs among the focus areas. This reflects the overlap and interrelationships characteristic of the natural world of a lake watershed such as that of Caribou Lake as well as the importance of these suggestions and relevance to various topics; hence their repetition.

1. Water Quality

This is the primary concern and focus of this management plan. As indicated in the previous “Water Quality” background section, water quality is the “life blood” of a lake community. Protection and improvement of Caribou Lake water quality is the major purpose of the actions described in this plan.

Volunteer lake water sampling is essential. Water quality is measured as concentrations of total phosphorus and chlorophyll-a and by depth of clarity using a Secchi disk. The phosphorus and chlorophyll-a concentrations are measured in lake water samples obtained by volunteers carefully trained to assure the quality and integrity of each sample. Caribou Lake has been fortunate to have citizen volunteers over the years and consistently during the last few years. These samples are carefully taken from the lake, labeled and preserved; then shipped to an environmental laboratory for analysis. This care is necessary for the acceptance of the results and use in this plan and entry into a nationwide database.

Water quality data is available from the summer of 1975 off and on until more consistent sampling started in the early 2000's. Generally the results have been as follows:

Tot Phosphorus—15-30 ppb, Chlorophyll-a—4-12 ppb, Secchi disk—6-9 ft.

During this summer of 2008, grants supported the most extensive sampling program. Samples were taken at 7 sites, 5 different times from early summer to early fall. The results of this sampling effort are:

Parameter	Measurement	Range	Trophic Status Index (TSI)
Total Phosphorus (mean)	15.7 ppb	9-27 ppb	43
Chlorophyll-a (mean)	8.8 ppb	2-19 ppb	50
Secchi disk (mean)	6.4 ft	4.5-8 ft	50
Combined TSI			48

Notes:
1) Results of sampling for summer 2008 sampling season

2) ppb is parts per billion, measured as milligrams per liter

These results indicate that Caribou Lake water quality is equal to the best condition since testing began. Actions to improve water quality as described elsewhere in this plan have been effective. We hope to establish this as a pattern and maintain these levels of the three measures.

The Carlson Trophic State Index (TSI) figures are calculated numbers using measured concentrations and Secchi disk readings. The index value permits a comparison of Caribou Lake conditions with 800 other lakes in the Northern Lakes and Forests Region. A TSI of 50 would rank Caribou Lake at the 39th percentile. In other words, 61% of lakes in this region will have lower TSI values, hence better water quality.

In opinions expressed in MPCA reports of the late 1980's, such TSI values are not unexpected in a lake such as Caribou given existing development and characteristics of the lake, e.g. watershed, lake bottom, topography. The same MPCA reports state that any changes in land use in the watershed should occur in such a manner as to minimize the amount of nutrients, especially phosphorus, that may enter the lake as a result of these changes.

Other MPCA and DNR reports suggest that a goal of 20ppb or less for phosphorus should be achievable and result in favorable chlorophyll-a concentrations and Secchi disk readings. These reports further assert the necessity of continuing lake water sampling and monitoring to measure the state of water quality and any changes that may be occurring. The data from sampling is essential to water quality measurement and to this lake management plan.

2. Land Use and Zoning

The map in previous Figure 1 taken from the AUAR report shows land use and zoning in the Caribou Lake watershed. We found that there is no historical data to link water quality in Caribou Lake with the level of development in the watershed. Land use and zoning are important focus areas for this lake management plan.

We will summarize some salient facts regarding land use and zoning from that previous section and then present a modeling analysis of the potential impact of levels of development on water quality. It is important to note that the State owned lands held in trust for all public schools in Minnesota amount to 54% of FAR-1 lands and 20% of LSR lands. Contrary to common belief, Cook County school trust lands are not held in trust for Cook County schools. Rather revenues generated from all of these lands in the state are distributed on a per-pupil basis to all of Minnesota's public schools. Any change in ownership to private use and development could result in a substantial addition to developed lands in the watershed with very serious potential impacts on Caribou Lake water quality.

Developed land use including shore land, farms, rural residences, roads and the new Caribou Trail area totals about 111 acres or 2% of the watershed area. Forests and water account for about 80% and 17% respectively, totaling 97% of the watershed. Any future development will reduce the "Forest" acreage.

The point of this discussion is to show the relative size of developed lands and the relationship of future possibilities to the current condition, knowing the vulnerability of Caribou Lake water quality to the current state of development. This vulnerability is the basis of the rationale for measures surrounding future development design, construction and use of private property in the watershed and especially near the lake. Lacking data, a modeling approach was used in the AUAR to assess the vulnerability and potential for impacts of development on Caribou Lake water quality.

Table LU-4 lists development scenarios and subsequent area additions to developed lands and numbers of residential units which were factored into the water quality modeling done in the AUAR. The "Maximum" scenario includes all potential developable lands thus resulting in an increase from 2% to 7% in developed lands and 455 total units. Both increases of developed land and new residence units were of grave concern and were included as a "worst case" situation. The "Existing plus LDC" scenario reflects the current state of development and known plans. The others are modifications of the "Existing" scenario. As indicated in Table LU-4, the scenarios predict the total number of housing units in the watershed. Water quality modeling was then done in the AUAR analysis to assess the linkage of the additional development and land use. The modeling clearly showed that Caribou Lake, by its character, is especially vulnerable to development. Specific measures were identified as essential for any new development including that proposed and now underway, e.g. best management practices in design and construction of residences and personal life style decisions. Such practices are essential to protect water quality at levels identified as goals for this plan. These results

and the AUAR recommendations provide part of the basis for the contents of this management plan regarding methods and controls for future development in the watershed to protect Caribou Lake water quality.

Table LU-4. AUAR Development Scenarios Over Next 10-20 Years In Watershed

Scenario	Acres Developed	Total Housing Units in Caribou Lake Watershed
Maximum possible	393.5----7%	455
Existing plus Lutsen Development Co. Proposal of 38 lots	142.2----2.5%	180
Environmental Assessment Worksheet & Recommendation by CLPOA	130.7---2.3%	162
Cluster Subdivision	139.9---2.5%	180
Low Impact Development and Conservation Design	137.0---2.4%	180

3. Conservation Easements and Trusts

Conservation easement is an encumbrance that creates a legally enforceable land preservation agreement between a landowner (grantor) and a government agency or a qualified land protection organization (grantee) for the purposes of conservation.

The primary purpose of this easement is to protect the land from certain forms of development or prohibits certain specific uses, but also allows the owner to remain the owner of the land. This does not make the land public. Rather, the grantee organization, which is usually a “land trust” that buys or receives easements through donation, provides monitoring and enforcement of the restrictions on the land. Furthermore, the owner continues to bear all costs and liabilities related to ownership and maintenance of the property. Less commonly, county or city governments also buy easements as part of land use planning projects, or watershed protection or for ecological reasons. Conservation easements first began to be used for large agricultural tracts of land that were being bought up at an alarming rate and subdivided in multiple housing lots. Currently, forest regions such as the Caribou Lake watershed are now being recognized for the potential for significant losses associated with development.

In some instances in exchange for an easement, the landowner may also gain state and/or federal tax advantages. Under Internal Revenue Code 170(h) three standards must be met for tax deduction purposes. 1. The easement must be perpetual (never-ending for current and all future owners). 2. The easement must be held by a qualified governmental or non-profit organization. 3. The land to be donated must qualify by serving a valid “conservation purpose” in one of 5 areas:

- public recreation and/or education
- significant natural habitat
- scenic enjoyment
- pursuant to local governmental policy, such as farmland or forest land
- historic preservation.

Note: Any of these five areas may be applicable to the Caribou Lake watershed.

The potential amount of tax savings depends on many things including, how long the donor has owned the property, and how it's used, the donor's income and the value of the property. Conservation easements can potentially be used as a tool for lowering or eliminating inheritance taxes or reducing the land's selling price to a level that the next generation can afford.

Easements must be recorded on the title. Easements may affect financing of land because of the loss of its potential development value. Be aware that cash/money needs to be given in most cases to pay for monitoring and compliance enforcement. All kinds of non-profit organizations (more than 1,500 land trusts across the US) exist to serve the easement's purpose but owners must be careful whom they entrust to this job. Smaller organizations may be under funded and lack the money to enforce the easement. On the other hand, larger groups often have stricter standards or harder criteria for the land to meet acceptance into their programs.

To begin the process, contact a local land trust. Talk to someone knowledgeable in easements. Land owners need to negotiate the terms of the easement and consider whether building lots will be reserved, what uses of the land are permitted or prohibited, whether to allow public access. If seeking a tax deduction, an appraisal to find the value of the land is necessary as opposed to a land survey, which is usually not necessary. Easements need to be filed if tax benefits are desired. One must also file special forms. Owners continue to remain in contact with the land trust and someone from the trust monitors the property annually to ensure that the conservation agreement is being maintained.

Prior to the mid 1990's, conservation easements in Minnesota have seldom been used. That is changing. In 2005, the DNR & Trust for Public Land preserved 3,100 acres of forested land owned by Potlatch Corp. The Trust for Public Lands now has its own North Woods Initiative begun in 2000, which has protected more than 75,000 acres in the north woods alone. Most of these protected properties consist of land tracts larger than 100 acres although one success story is listed with only 35 acres but the property lies within Voyageurs National Park. In early 2007, Minnesota Land Trust started the North Shore Protection Initiative-"the first concentrated effort to create an integrated conservation strategy for the North Shore, from Duluth to the Canadian Border".

In Minnesota the term "conservation easement" has specific meaning under Minnesota law: A nonpossessory interest of a holder in real property imposing limitations or affirmative obligations the purposes of which include retaining or protecting natural, scenic, or open-space values of real property, assuring its availability for agricultural, forest, recreation, or open-space use, protecting natural resources, maintaining or enhancing air quality, or preserving the historical, architectural, archaeological, or cultural aspects of real property." (Minn. Stat. § 84C.01, subd. 1)

The State of Minnesota has many programs to purchase conservation easements for environmental protection. The Forest Legacy program, Metro Greenways, Scientific and Natural Areas, Native Prairie Bank, Aquatic Habitat/Trout Stream, Nongame Wildlife Fund, the Water Bank program are all examples of Department of Natural Resources' programs that use conservation easements as one method of land protection. The Board of Water and Soil Resources and the Army Compatible Use Buffer at Camp Ripley are also involved with the acquisition of conservation easements.

As much of the lakeshore is bought around Minnesota it remains to be seen whether more is done to include smaller tract owners in the larger land protection programs. Not a lot of information is available regarding the owner of the typical north shore inland lake owner who wants to preserve their land unless it is adjacent to a larger tract of desired land.

4. Lake Classification Study

The Lake Classification Study is being conducted by the Cook County Soil and Water Conservation District, with project team members from local lake associations. The new Alternative Shoreline Management Standards, adopted by the DNR in December 2005, allow reclassification of portions of lakes to a more

restrictive class, in an attempt to protect water quality, wildlife habitat, aesthetics, property values, and our quality of life. Caribou Lake has been selected to be included in the study. Extensive study of Caribou Lake's resources will be conducted to determine if we have any "Natural Environment" shorelines. The project's findings and recommendations for reclassifications will be made to the DNR and Cook County.

Current DNR classifications from most restrictive to least are:

- Special Natural Environment
- Natural Environment
- Special Recreational Development
- Recreational Development
- General Development

Caribou Lake is currently classified as "Recreational Development" in its entirety.

Minnesota's lakes are one of the state's most valuable resources. Caribou Lake provides various recreational opportunities and is home to numerous fish, wildlife, and plant species. Many of these fish and wildlife species, including species of greatest conservation need, depend on naturally vegetated shorelines as habitat for feeding, resting, mating and juvenile life stages. For example, loons avoid clear beaches and instead nest in sheltered areas of shallow water where nests are protected from wind and wave action. Mink frogs and green frogs are shoreline-dependent species that prefer quiet bays and protected areas with abundant aquatic plants.

Increased development pressure along our lakeshore has negative impacts on these species and water quality. However, intra-lake zoning can help protect ecologically sensitive sections of our lakeshore. Areas that are identified as sensitive, such as important bays or critical undeveloped sections of our shoreline, can be classified as sensitive shoreline that has conservation based standards for new development.

The first component of the study is to conduct field surveys to evaluate the distribution of high-priority plant, fish, and wildlife species. The team members will be utilizing the DNR's "Sensitive Lakeshore Identification Manual" and techniques in evaluating our lake's shorelines, including

- Aquatic habitat survey
- Near-shore vegetation study
- Citizen shoreline description
- Frog calling survey
- Near-shore fish and aquatic animal study
- Bird survey

The field surveys were started on Caribou Lake during the summer of 2008 and are expected to continue through the summer of 2009

The second component involves the development of an ecological model that objectively and consistently ranks our shorelines for sensitive area designation. The model is based on the results of the field surveys. Shorelines used by focal species, areas of high biodiversity, and critical and vulnerable habitats are important elements in the ecological model used to identify sensitive shorelines. Because the model is based on scientific data, it provides objective results that can be used as the basis for regulatory action.

The final component involves compiling and delivering information on our sensitive shorelines, along with recommendations, to the Cook County land and resource managers and the DNR who can use the information to reclassify specific shorelines to a more restrictive development class, thereby providing protection of Caribou Lake water quality and the lake environment.

5. Life Style and Waste Management

A 1995 report by the Minnesota Pollution Control Agency (MPCA) indicates that Caribou Lake is among the worst in water quality in Cook County. Caribou Lake is on the cusp of being a lake that could be lost to persistent and obnoxious algae blooms or one that can be redeemed by better stewardship.

While the water quality in Caribou Lake has not gotten worse since 1995 as indicated by sampling results reported earlier in this plan, simply maintaining it at the current level of variable quality would be unwise because it exposes the lake to a much higher vulnerability to serious water quality problems as the future unfolds. Fortunately there are a number of best management practices that we can undertake to protect the lake and enhance its water quality.

Analysis done in the Caribou Lake AUAR revealed failing septic systems as the largest threat to lake water quality on Caribou Lake. Between 2003 and 2006 an inspection of all septic systems within the shoreline area around Caribou Lake was completed by Cook County. Fifty percent of the systems failed the inspection according to Cook County and were ordered to be upgraded within two years. Data on upgrade compliance is not available at this time although it is generally believed that compliance has been the norm with a few exceptions. Recent water quality improvements, as indicated by this summer's sampling, also suggest that septic contamination has been reduced.

A strong and proactive County septic permitting and inspection program will ensure a level playing field related to upgrading and maintaining septic systems which will have a significant positive effect on Caribou Lake water quality. There are other best management practices that we can use as well to control runoff from our properties and limit pollutants. These include:

- Catch basins to collect and slow runoff from impervious areas
- Minimizing the amount of impervious surfaces on our properties
- Yard care to prevent contaminated runoff
- Rain gardens and native plantings
- Native buffer strips of at least 40 feet between mowed lawns and the lake
- Pet waste clean up
- Use of biodegradable (non phosphorous containing) cleaning materials
- Avoiding use of fertilizers, pesticides, and other chemicals near the lake
- No washing clothes or other objects in the lake.
- No bathing in the lake (biodegradable soaps only degrade in soil not in water).

Life style choices and practices influence the impact of properties—especially those on the shore—on lake water quality. Awareness, attention and use of best practices will afford the best protection of water quality in Caribou Lake.

6. Shore Land and Shoreline Protection

Human activities on the land surrounding lakes and along their shore have significant impacts on the health of a lake. The individual choices of many can have a cumulative effect on the lake and its ecosystem. In the long run, keeping the water clean can be far less expensive than cleaning up a damaged lake, and clean waters framed by natural vegetation often have the highest property values.

Runoff, which is excess water that comes from hard surfaces like roof tops, driveways (especially asphalt), parking areas, sidewalks, decks and compacted soils, is one particularly negative source of water pollution. Runoff water washes fertilizer, eroded soil, car fluids and other pollutants into lakes and streams. To reduce runoff, water must be allowed to soak into the ground. This can be accomplished by:

- reducing hard surfaces like rooftop and driveways;

- planting trees and shrubs and protecting wooded areas;
- protecting native shore land buffers;
- restoring native shore land buffers and avoiding the establishment of turf lawns; (a lawn planted to the water's edge can cause seven times the amount of phosphorous and 18 times the amount of sediment to enter the water compared to a native shoreline.)
- planting rain gardens.

The shallow aquatic zone consisting of emergent (partially out of the water), submerged (completely under the water) and floating leaf aquatic plants provides food and shelter for ducks, songbirds, and fish. Furthermore the taller plants such as bulrush, sedges and cattails can reduce the energy of wave and wake action to minimize erosion and reduce resulting sedimentation that is harmful to water quality and clarity.

Interception of water by tree canopies is highly researched and has shown time and time again the ability of tree cover to intercept and slow down falling water. Not only does development remove the canopy, but compacts and regrades the soil, and strips away litter. Each of these components acts as a sponge to intercept and slow water. Thus more runoff occurs, with more force to pick up and move minute particles of pollution. Another concern is redirecting falling water away from ground water replenishment, and off the landscape as runoff.

Visual screening by trees and shrubs growing along the shoreline is also a widely accepted basis for maximum retention of the natural screening available on the shore. It is of course also the argument for prohibitions on the removal of trees and shrubs as prescribed in the Cook County Local Water Management Plan. Such trees and shrubs also are most effective at stabilizing the shoreline, reducing erosion and commensurately preventing unwanted soil entry into the lake. Another consideration is the goal of this plan to protect and enhance the total natural lake experience which includes a shoreline lined with a variety of sizes and types of trees and shrubs.

7. Aquatic Vegetation

Caribou Lake is home to a number of submergent and emergent aquatic plants that comprise the aquatic plant community. These shallow or open water plant communities are important to the ecology of the lake in that they provide habitat for waterfowl, mammals, turtles, frogs, fish, and aquatic micro and macro invertebrates (bugs). When all of these organisms have an adequate habitat niche, they comprise the lake ecosystem and can produce all that we desire from our lake experience, e.g. catching trophy fish or watching a moose wade across the lake front. Healthy lakes of the Northern region of Minnesota are truly unique and beautiful.

There are a number of benefits for maintaining a healthy aquatic plant community. Submergent and emergent plant communities working in concert with wetlands comprise a diverse complex that acts as nature's sponge. This sponge can act as a buffer to minimize surface runoff, filter excess nutrients, and neutralize foreign or toxic materials. Caribou Lake is sensitive to the presence of aquatic plants because of its lack of wetlands connected directly to the lake basin. Because of the latter, a healthy aquatic plant community is needed to recover from nutrient loading caused by activities in the watershed.

Particularly important to Caribou Lake are aquatic plants with ability to bind nutrients such as nitrogen and phosphorus, thus limiting the nutrients available for algae blooms. Lake clarity and productivity impacts by algae blooms are serious threats to Caribou Lake. Aquatic plant species diversity and growth are important as a natural and healthy reaction of the lake to external influences.

To address the issue of species diversity, there currently are no formal vegetation surveys to guide as to which species are in Caribou Lake, if any are of greater value, or if there are any invasive or exotic plants trying to make a foothold. In the summer of 2008, the Cook County Soil and Water Conservation District sponsored the Lake Classification Study (see focus area above) and the first half of a formal vegetation survey was

completed. The survey is part of a larger project to identify environmentally sensitive areas of lakeshore on Caribou Lake.

Data from the field work of this summer and next will be used to produce detailed maps showing species distribution, areas of high diversity, and the presence or absence of rare and invasive exotic species.

The need to maintain a healthy aquatic plant community wherever it may occur is urgent. Such a plant community is critical to protect and improve Caribou Lake water quality. We should avoid disturbing the aquatic plant community and soils to help maintain a healthy shoreline buffer zone of native plants to prevent erosion and provide desirable shoreline habitat. It is most important for aquatic plants to respect their important role in the aquatic environment and avoid damaging them during the growing season. We must be conscious of our actions on the water and in the watershed, be active lake stewards, and reach out to educate others where needed.

8. Exotic and Invasive Species

Invasive species have become a serious threat to the ecosystem in which we live. Invasive species are non-indigenous organisms that become established in native communities and replace native species by utilizing their competitive advantages. The Caribou Lake area has suffered a variety of infestations over the past 70 years. Spruce bud worm, army worms, white pine blister rust to name a few have caused nuisance conditions and, in some cases, the loss of trees. Aquatic invasive species bring a whole host of different potential problems to aquatic vegetation or organisms, ranging across the spectrum of the aquatic food chain up to and including game fish.

Competitive advantages include the absence of natural predators and diseases, the ability to occupy larger, more diverse ecological niches, a higher reproductive success and the ability to use more of the growing season. These advantages allow invasive species to disrupt the natural ecosystem often causing irreparable damage to waterways and lakes, natural areas, threatened and endangered species and property value.

Invasive species are now a major threat to Caribou Lake and its watershed. Many terrestrial invasive species have already invaded the seemingly pristine Caribou Lake watershed but countless more are at the doorstep. Many of the ecologically most disastrous species have only miles to travel. An estimated 87 invasive species have been found in the Lake Superior basin since 1883. However, hundreds have been found in the United States. To narrow the field, a list of invasive species can be accumulated based on proximity to Caribou Lake and severity of an invasion. A very short list of invasive species applicable to Caribou Lake and its watershed include both terrestrial and aquatic plants and animals—see Appendix B for this list which includes such animals as gypsy moth and earthworms, terrestrial plants such as Amur maple and Canada thistle, aquatic animals such as spiny water flea and zebra mussel and aquatic plants such as purple-loosestrife and Eurasian water-milfoil.

The control of non-native species is often called Integrated Pest Management (IPM) because it takes a number of management methods to control these hardy species. Generally, there are three types of control: mechanical, chemical, and biological. All controls are very costly and labor intensive. Full consideration should first be given to identification and education.

- Identification
- Monitoring
- Maintaining a healthy native community
- Control Method(s)—such as destruction, removal, poison, predatory control.
- Prevent reproduction
- Minimize disturbances by ATV, boat, construction, etc.

The most important step to prevent and control invasive species is education. Currently there is no master list of invasive species available for the area immediately surrounding or including Caribou Lake and its watershed. However, the Minnesota DNR and the U.S. Forest Service for the Superior National Forest do keep track of aquatic and terrestrial animals and aquatic plant infestations in Minnesota. This information can easily be found on the MNDNR web page (<http://www.dnr.state.mn.us/invasives/index.html>) along with identification pictures.

The Caribou Lake Property Owners Association has taken the lead to stay up to speed with present infestations and impending threats. Currently the only infestation in the Caribou Lake area being addressed with control methods is the Gypsy Moth. However, this last summer (2008) the lake was given a good scare when Caribou Lake was listed in the Minnesota DNR Published Fishing Regulation Synopsis as having a spiny water flea infestation. The infestation was in fact a different lake with the same name. The MN DNR publication failed to list the lake identification number and clarification was needed from the MN DNR website. A scare is reason enough to take all precautions necessary to avoid invasive species infestation. It is important for everyone to be the first line of defense against infestation.

Steps can be taken to prevent the spread of invasive species especially avoiding accidental or intentional transport into the area by any means. Knowing what plants or animals fit this category will help all in deciding what to avoid. Allowing any of these species to live and grow can cause a decline in biological diversity and crowding out of native species. Soil instability can result and fire regimes and other natural processes can be disrupted. However, the most irreparable damage invasive exotics can cause to an ecosystem is damage to the future. Restoration or duplication of the historical post-glaciation natural world could be lost. Minnesota's scientific natural areas can only serve as a template to the major communities that comprise the state while they are not infested with invasives themselves.

Education is vital. For more information visit the Minnesota Department of Natural Resources web site (<http://www.dnr.state.mn.us/invasives/index.html>) and be sure to view the Invasive Species of Aquatic Plants and Wild Animals in Minnesota annual report prepared by the MN DNR invasive species program members.

9. Fishery Management

All of the data cited in this section come from the surveys conducted by and the results reported by the Minnesota DNR. The number of walleye caught per gill net ranked in the middle of all assessments done on this lake, but was higher than three-fourths of the netting results for this class of lake. The average weight of walleye caught was below the average for the lake and the lake class. The most recent walleye stocking occurred in 2004 and 1990, but all walleye caught in gill nets were naturally produced. Ages of gill-netted walleye were from 2 to 7 years and 9 years. Growth rates had been close to the average for the lake class.

The number of Northern pike caught per gill net ranked above the middle for the lake historically and below the middle for the lake class. The average weight was above the middle value for the lake, and above three-fourths of the values recorded for the lake class. Northern pike caught by gill nets were between 1 and 5 years of age. Growth after the first year was found to be fast for this area.

The gill-net catch of smallmouth bass declined in 2005 compared to the two previous assessments (2003 and 1998), but was still the third highest for the lake. It was higher than three-fourths of the catches recorded for this class of lake. The 2005 trap-net catch was low for both the lake and the lake class. The growth rate of bass appeared to be somewhat slow for this area for the first two years, and then to increase. The number of yellow perch caught in gill nets was the third highest for the lake and among the higher values for the lake class. The average size was small, but a few larger fish were caught.

The number of white sucker caught per gill net ranked just above the middle value in assessments of both this lake and similar lakes. The average weight of white sucker was higher than roughly three-fourths of the

values recorded for the lake and the lake class. In addition to the standard gill nets and trap nets, small-mesh (0.25-inch) trap nets were set. These nets caught age-0 fish, including many smallmouth bass and yellow perch, several white sucker, a few black crappie and walleye, and one northern pike.

The fishery can be considered healthy but needing continued attention. For Cook County, the DNR Area Fisheries Office is located at 1356 Hwy 61 E. Grand Marais, MN 55604 and can be reached at tel. (218) 387-3056 or email <grandmarais.fisheries@dnr.state.mn.us>. The Fisheries Area Supervisor and staff prepared an extensive fisheries management plan for Caribou Lake in 2001; the narrative section of the DNR plan and the complete DNR plan is provided on the CLPOA web site. The 2001 fisheries management plan was set for revision following 2007 assessments but is now set for revisions following 2008 assessments. The Fisheries Area Supervisor and staff also conducted and released a fisheries survey of Caribou Lake in 2005 and is presented below.

The Fond du Lac Division of Resource Management and the 1854 Authority conducted Spring Adult and Fall Juvenile Walleye Population Surveys on Caribou Lake in 2003. This survey was published in 2004 but was unavailable at this time. The Fond du Lac Resource Management is located at 1720 Big Lake Road Cloquet, MN 55720 and can be reached at (218)-878-8004. 1854 Authority is located at Airpark Square 4428 Haines Road Duluth, MN 55811-1524 and can be reached at (218)-722-8907.

Name: Caribou

Fish Sampled up to the 2005 Survey Year

Species	Gear Used	Number of fish per net		Average Fish Weight (lbs)	Normal Range (lbs)
		Caught	Normal Range		
<u>Northern Pike</u>	Gill net	1.7	1.2 - 3.9	2.48	1.5 - 2.4
	Trap net	0.7	N/A - N/A	2.96	N/A - N/A
<u>Smallmouth Bass</u>	Gill net	1.6	0.2 - 0.7	ND	0.3 - 2.2
	Trap net	0.2	0.4 - 1.9	0.11	0.2 - 0.6
<u>Walleye</u>	Gill net	13.6	3.0 - 13.2	0.69	0.7 - 1.3
	Trap net	0.7	0.5 - 2.7	1.17	0.8 - 1.5
<i>White Sucker</i>	Gill net	7.7	2.6 - 11.7	2.37	1.7 - 2.4
	Trap net	0.1	0.7 - 2.3	3.01	1.4 - 2.8
<i>Yellow Perch</i>	Gill net	10.7	0.5 - 2.8	0.13	0.1 - 0.3

Normal Ranges represent typical catches for lakes with similar physical and chemical characteristics.

Length of Selected Species Sampled for All Gear for the 2005 Survey Year

Species	Number of fish caught in each category (inches)								
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	30+	Total
<u>Northern Pike</u>	0	0	1	0	6	9	4	1	21
<u>Smallmouth Bass</u>	1	3	6	2	1	0	0	0	13
<u>Walleye</u>	0	5	52	58	10	2	0	0	127
<i>Yellow Perch</i>	21	67	2	0	0	0	0	0	90

Fish Stocked by Species for the Last Five Years

Year	Species	Age	Number
2004	<u>Walleye</u>	Fry	440,000

Fish Consumption Guidelines

These **fish consumption guidelines** help people make choices about which fish to eat and how often. Following the guidelines enables people to reduce their exposure to contaminants while still enjoying the many benefits from fish.

Pregnant Women, Women who may become pregnant and Children under age 15

LAKE NAME County, DOWID	Species	Meal Advice				Contaminants
		Unrestricted	1 meal/week	1 meal/month	Do not eat	
CARIBOU Cook Co., 16036000	Northern Pike		shorter than 22"	22" or longer		Mercury
	Walleye		shorter than 18"	18" or longer		Mercury
	White Sucker	All sizes				
	Yellow Perch		All sizes			Mercury

General Population

LAKE NAME County, DOWID	Species	Meal Advice				Contaminants
		Unrestricted	1 meal/week	1 meal/month	Do not eat	
CARIBOU Cook Co., 16036000	Northern Pike		All sizes			Mercury
	Walleye		All sizes			Mercury
	White Sucker	All sizes				
	Yellow Perch	All sizes				

DOWID - MN DNR, Division of Waters' lake ID number.

Contaminants listed were measured at levels high enough to warrant a recommendation to limit consumption.

Listing of consumption guidelines do not imply the fish are legal to keep, MN DNR **fishing regulations** should be consulted.

10. Wildlife

This plan is intended to protect water quality and the experience of the natural environment of Caribou Lake. Forests and water account for 97% of the land cover in the watershed. These lakes and forests provide habitat for a wide range of wildlife species and this wildlife is an important aspect of the natural environment experience of Caribou Lake. The lake fishery is addressed separately in this plan.

Naturally waterfowl need good open water habitat, but they also depend upon shoreline habitat. Among waterfowl, the common loon is a species of great interest to land owners and lake users. Loons are a characteristic species of lakes in the Northern Region and Caribou Lake land owners and lake users probably value loons among the top attractions of their lake.

Caribou Lake has been home to a nesting pair of common loons for many years, usually producing one or two chicks each summer. However, the last three years the nests have failed. Nesting on the shoreline creates

potential for a variety of risks for successful nesting and chick production by loons. Predators, wave action, and heavy rain storms are major threats to successful nesting. There is no way to know for certain the reasons for the nesting failure of the last three years.

Other birds are present and of interest as well. Eagles have returned; osprey nest on the lake in spite of the eagles; grouse are a common game bird and the population of song birds varies with the seasons adding to the pleasures of the natural environment of Caribou Lake.

The surrounding forests bordering Caribou Lake are home to a great variety of animals from large game animals to small mammals, amphibians, etc. Some are of more interest for their presence in the wilderness and the opportunity to observe them. Others are rarely seen but have a role to play in the ecology of the area. Hunting of game birds and animals is an important recreational activity in this region which is another important reason for habitat protection. Appendix C provides a comprehensive description of wildlife in and around Caribou Lake based on 33 years of wildlife observation by a citizen volunteer cabin owner.

The watershed is residence to essentially all game animals and birds of the Northern Lakes and Forests Region—elk is the exception. Habitat must be protected for this great variety of wildlife to continue to flourish in the watershed. The critical characteristics of habitat vary for each species and are frequently found in the wilderness of the region. Some species have adapted to the more civilized environments in the developed areas of the watershed. However, it is known that many of the predators and large animals require large contiguous and undisturbed areas to thrive. There are large areas of state and national forests in the Caribou Lake watershed providing such habitat opportunities. The presence of wildlife around Caribou Lake confirms the sufficiency of necessary habitat. It is incumbent in this plan to call upon responsible government bodies to make the protection and retention of habitat among the primary considerations in future development decisions.

11. Public Access

The primary agency responsible for public water accesses in Minnesota is the Minnesota Department of Natural Resources Trails and Waters Unit. The DNR is responsible for the acquisition, development, and management of public water sites. The goal of the public water access program is free and adequate public access to all of Minnesota's lake and river resources consistent with recreational demand and resource capabilities to provide recreation opportunities.

Unfortunately, public accesses also provide a gateway for the introduction of exotic species such as Eurasian milfoil into the lake. Fortunately, there is no evidence presently of its presence in Caribou Lake.

Although some of our neighboring lakes such as Ward Lake and Deer Yard Lake have carry-in only accesses, Caribou Lake can be accessed by motor vehicles. In fact, because of its proximity to nearby transportation corridors and because of increased development in the area, the Caribou public access is a high use access with a large parking lot and an outhouse.

Boat landings like the one at Caribou Lake pose a unique problem due to the presence of a gravel road that slopes directly toward the lake. Consequently, during times of heavy rains and melting, the runoff can carry sediment with it directly into the lake and lead to excessive sedimentation of the lake bottom near the access. This sedimentation may then negatively impact aquatic plants and invertebrates. In addition, runoff contains pollutants including phosphorus and mercury, which negatively influence lake water quality.

Noteworthy too is the presence of a "wooded swamp" wetland near the shore adjacent to the access. Shore land wetlands are a very important asset to the water quality and wildlife habitat of a lake and are strictly protected by the Minnesota Wetland Conservation Act.

12. Water Surface Use Conflicts

The number and size of boats on Minnesota's lakes continues to increase. According to the boating coordinator for the DNR, between 1980 and 2000 there was a 28% increase in registered motorboats and the boats registered were larger in size. In addition, the number of personal watercraft increased five fold from 6,298 registered in 1990 to 33,883 registered in the year 2000. Consequently, while the increase in registered motorboats was 27%, the increase in all types of boats was 40% for a total of 812,247.

The question therefore arises, how might more and larger motorized boats affect our lakes? According to a study done by the Wisconsin Department of Natural Resources and the University of Wisconsin Water Chemistry Program, boats interact with the lake community of plants and animals and the physical and chemical environment in which they exist by a variety of mechanisms. These can include emissions and exhaust, propeller contact, turbulence from the propeller system, waves produced by movement, noise and movement itself. In turn, sediment resuspension, water pollution, disturbance of fish and wildlife, destruction of aquatic plants and shoreline erosion are the major areas of impact.

Furthermore, most of the impacts of boats are felt in shallow waters less than 10 feet deep and along the shoreline, and the most important area of the lake to protect is the shallow-water, near-shore habitat known as the littoral zone.

Serious issues of water clarity, aquatic plant disturbance, and shoreline erosion can be accelerated by boat traffic. Therefore, these actions were recommended by the Wisconsin study:

- Establish no-wake zones. Because most impacts of boats are in shallow-water near-shore areas, no-wake zones would be the most effective way of reducing impacts.
- Educate boaters about the importance of plants, littoral zones, and natural shorelines and how their boating activities might affect the aquatic ecosystem.
- Establish buffer zones where human activity is restricted in the water along the shore outward for 200-300 feet.
- Promote the use of four-stroke rather than two-stroke engines. Four-stroke engines use fuel more efficiently, produce cleaner exhaust, and run more quietly than two-stroke engines.

These recommendations are considered in the Management Plan Recommendations section with the physical shape, size and depths of Caribou Lake given due attention. The 200-300 foot buffer seems unworkable considering Caribou Lake shore-to-shore distances, the difficulty of envisioning these buffer distances for boaters and the improbability of potential enforcement. The underlying reason is valid, i.e. minimize lake bottoms' disruption by boat operation, and definitely worth emphasizing to lake users.

Also pertinent is the 2005 adoption of the Cook County Local Water Management Plan by the county commissioners. In that plan it was specifically recommended that no-wake zones be established on the shallow bays of Caribou Lake during the first five years of the plan.

13. Public Lands Protection

When Minnesota became a state in 1858, the federal government granted it sections 16 and 36 of every township, or their equivalent, for the benefit of schools. The Minnesota Constitution established the Permanent School Fund (PSF) to ensure a long-term source of funds for public education in the state. The PSF consists of the accumulated revenues generated from the land. The state holds the land and accumulated revenues from the land in trust for the benefit of public schools in Minnesota. Ultimately income from the PSF is distributed to school districts on a per pupil basis throughout the state. (No revenues collected ever go directly to the coffers of the Cook County Schools.)

Currently the state of Minnesota owns 2.5 million acres of school trust land, which is managed by the DNR, plus an additional one million acres of mineral rights. Much of this land is concentrated in the northeast part of the state. Of school trust land 4.8% or 121,000 acres are located in Cook County. Twenty lakes and 35 watersheds are located among these acres.

Through the years, most of the revenue from these lands has come through mineral leases, timber sales, land sales, and some leasing activities. During the 1995-1996 school year, almost \$31 million (less than 1% of all state revenues to K-12 schools) was distributed to public schools throughout the state.

Recent legislation designed to generate greater revenue from these lands has charged the DNR to accelerate land exchanges, land sales and commercial leasing of school trust lands in order to "secure the maximum long-term economic return from the school trust lands consistent with fiduciary responsibilities imposed by the trust relationship established in the Minnesota constitution, with sound natural resource, conservation and management principles, and other specific policy provided in state law."

In response to this legislative change, the DNR auctioned slightly over an acre of land and 260 feet of Cook County's Caribou Lake shoreline in October 2007. (By law, all trust fund land for sale must be offered at a public auction.) A future auction is planned for parcels near Devil Track Lake.

Minnesota law is very clear about the disposition of school trust land, and any sale of school trust land in Cook County is the result of constitutional and legislative mandates. Yet, every sale of the land results in the loss of public land, a finite resource within the county. Furthermore, with each sale there are concomitant ecological consequences. Therefore, any lasting preservation of this land will require additional legislation or even a constitutional amendment.

Other states that hold school trust land face the same dilemma and either have passed or are attempting to pass legislation to preserve state school trust lands. In fact, in 1996 the voters of Colorado passed a constitutional amendment that did not change the purpose of the trust but instead created a new approach to management. Rather than securing the maximum possible revenue, the land would be managed "to produce reasonable and consistent income over time."

Nonetheless, a very significant amount of pristine Caribou Lake shoreline and shore land (section 36) is presently school trust land and consequently vulnerable to a future sale. Please refer to Figure 2 for the location of section 36.

These developments raise serious questions about the future of the public land of Cook County and section 36 of Caribou Lake in particular:

- How are we to be certain that the disposition of school trust land will be done with "sound natural resource, conservation and management principles?"
- What are the broad characteristics of the Cook County school trust lands such as wetland characteristics, management units (e.g., forests, parks SNAs, etc.), known mineral resources and proximity to transportation corridors.
- How closely will data collected from the various Caribou Lake studies be used in making decisions about Caribou Lake's trust land?
- What are the DNR's short- and long-term plans for Caribou Lake?
- How can organizations such as CLPOA be informed when a sale of state land may occur?
- What precisely should lake associations and similar organizations involvement be in this issue?

14. Wetlands Protection

There are numerous wetlands throughout the Caribou Lake watershed varying in size and relationship to water bodies including Caribou Lake. These wetlands serve several vital functions: runoff and stormwater holding and treatment facility, habitat for resident wildlife, habitat for vegetation. The challenge in this watershed, as in most, is to maintain the wetlands in their present state and numbers and protect them from destruction which usually results from new construction and associated construction activities.

The Minnesota legislature enacted the Minnesota Wetlands Protection Act which is an effective protector of wetlands throughout Minnesota. This act requires a vigorous and detailed investigation of wetland sites that will be impacted or eliminated by construction activity. It also set up a program to maintain the total acreage of wetlands in the state with a set-aside program for wetlands owners and purchase of wetlands credits from these owners by people eliminating wetlands through construction on their property.

In Cook County, a two-step process is involved when any activity results in disturbance or elimination of a wetland in whole or in part. The first step requires the survey of the proposed site by a certified professional who delineates and marks the extent of the wetland. Then a committee comprised of representatives from Minnesota DNR, Corps of Engineers, and County Planning and Zoning and Soil and Water Conservation departments conducts a thorough on-site investigation of the wetland as staked out by the professional. The approval of this committee with stipulations for wetland protection and minimizing elimination is required before the County will permit any construction. This is a rigorous and careful process in Cook County. The owner of these wetlands is then required to purchase wetland credits from others wetland owners in the state. When a credit is sold, that wetland owner sets aside the credit acreage of wetland in perpetuity. There are no wetland acres available in Cook County for credit purchase so wetlands in other parts of the state are involved in the set aside.

The value and functionality of wetlands is unique. By providing a holding time for runoff and stormwater, a wetland directly reduces the flow of such waters untreated into lakes and streams. Such runoff may contain any variety of contaminants and/or sediments that can pollute a receiving body of water. Secondly, a wetland can provide treatment of these waters through the action of vegetation in the wetland. Wetlands also provide unique habitat for both wildlife and vegetation requiring such an environment to survive and thrive.

Wetlands occur in all sizes from small plots to extensive areas we see as marsh. Wetlands do not always remain wet throughout a summer season (ephemeral wetlands). Thus a professional assessment is required to ascertain if a wetland exists and to delineate its boundaries. However, all wetlands serve similar functions and warrant the protection and attention Minnesota has deemed appropriate.

15. Stormwater Management

Stormwater management is a broad term that encompasses the control and treatment, if necessary, of runoff generated by any form of precipitation. This topic has been addressed in a number of the other focus areas. It is an important part of the measures shore land owners can take to protect lake water quality or exacerbate contaminant entry into the lake. Stormwater runoff originates from precipitation or snowmelt and contains any water soluble material that it contacts plus soil that is mobilized by the runoff.

Phosphorus is the primary problem for water quality as discussed in this plan. Runoff that contacts any source of phosphorus such as soils and fertilizers will dissolve the phosphorus and carry it into the receiving waters, adding to the contamination thereof. Other chemicals or contaminants can behave in the same manner or just be suspended and add to any problem chemistry the lake may be encountering. Soil or other insoluble materials may add to undesirable sediments affecting the lake bottoms.

As described in previous sections, the first thing to do is to minimize the generation of stormwater from our properties. This is done primarily by minimizing the impervious surfaces—any surface that will not permit precipitation to penetrate--on our property. All buildings create impervious surfaces, however the method of collection and dispersal of precipitation collected from roofs is one of the considerations land owners should bring to bear in stormwater management. Other impervious surfaces are generated by asphalt surfaces such as driveways or parking areas.

Often new developments can be required to have the same amount of runoff post-development as existed pre-development through the use of best management practices (BMP's). These BMP's include site preparation and configuration plans and practices as well as lot and structural designs and considerations to best minimize runoff generation and discharge from lots and the entire site. Some localities have adopted a maximum percentage of impervious surface on each parcel. For example, Cook County restricts lot coverage to 10% or less. This is especially effective in preventing high development densities and the related potential for stormwater generation and runoff.

The next step in stormwater management is treatment of that generated on our property. There are several simple methods of treatment based on the principles of dispersal, retention and/or treatment. The objective of these measures is to provide exposure of the runoff to some form of natural treatment medium, usually a soil profile and/or vegetation. Dispersal of runoff onto porous soil can be effective. Directing runoff to a rain garden or wetland is another effective approach. The former has been recently developed and demonstrated and the latter could be nature's invention of the rain garden technique. The important thing is to prevent the direct discharge of runoff into the lake. This of course also implies care and maintenance of the shoreline maximizing the protection afforded by the natural character of all shoreline.

16. Governance

Governance of a lake is a relatively new concept. Prior to 1854, the land around Caribou Lake was under tribal domain, essentially unchanged over thousands of years as the laws of nature and natural sustaining eco-systems and cultures prevailed. As white settlement occurred over the next 150+ years, the original governance model has by necessity changed dramatically.

There are a myriad of federal, state and local governmental organizations with responsibility for protection of the natural resources in the Caribou Lake watershed. Minnesota Department of Natural Resources (DNR), Minnesota Pollution Control Agency (MPCA), the Corps of Engineers (COE), the U.S. Forest Service are all actively involved in aspects of land use and development regulation, monitoring and enforcement actions, forest and lake use and management and many other facets of the environment. Cook County government and departments have a critical role in essentially all decisions impacting or related to natural resource topics including of course, water quality and environmental protection. Lutsen Township does not regulate land use; the County has retained that authority.

There are a variety of governance bodies and tools that are available through Minnesota statutes to help protect Caribou Lake water quality including the following: Soil and Water Conservation Districts, Watershed Districts, Lake Improvement Districts, Subordinate Service Districts, Joint Powers Organizations and Lake Conservation Districts all requiring government involvement or approval. Other options for governance involve land owners more directly, for example, in property owners' associations, coalitions of lake associations and sub-division covenants.

Caribou Lake has both a property owners' association and a subordinate service district (SSD) in place. The latter came about from the AUAR effort and the resulting Mitigation Plan that requires periodic review and renewal. The SSD also enables a funding mechanism for locally identified needs within the watershed through County approved taxing authority.

In Cook County, the Planning and Zoning Department and the Soil and Water Conservation District are two local government bodies heavily engaged in topics of concern in this plan. In executing their responsibilities, both have frequent interaction and cooperate with state and federal organizations including those named above.

There are also two specific Cook County documents that bear directly on several focus areas in this plan: Cook County Zoning Ordinance and Cook County Local Water Management Plan. Reference to excerpts from these documents provides a linkage of credibility for goals and actions presented later in this management plan. The mutual reliance between government bodies and citizens will also be evident. These documents provide County regulations or policy and action plans to address some focus areas. Goals and objectives in this plan that match with the County prescriptions should thereby be strengthened and amenable to County support and action.

Article 7 of the Zoning Ordinance addresses shore land management regulations. The ordinance topics relating to concerns in this plan include the following:

- Vegetation and topographic alterations
- Screening of roads and parking areas from view from public waters
- Vegetation screening and erosion controls at public access ramps
- Stormwater management and impervious surface limitations
- Shoreline setbacks
- Bluff area standards relevant to second and third tier developments at Caribou Lake
- Conditional uses evaluation criteria and requirements; etc.

The County Local Water Management Plan lists action items derived from five broad goals. Some of these items address Caribou Lake explicitly and others are relevant to needs across the County including Caribou Lake and thereby supportive of this plan. The following excerpts are taken from these action items:

Goal 1.1 Improve the water quality of degraded/impaired waters. Objective: Write and adopt ordinance to implement Caribou AUAR mitigation plan and enact required mitigation procedures. Action Items: 1) Require Caribou Lake phosphorus target be 20 ppb or lower summer average. 3) water quality Monitoring of Bigsby and Ward lakes; more density management options including zoning reclassifications; establish no wake zones on shallow bays of Caribou Lake.

Goal 3.1 Increase water quality monitoring of lakes especially those with development pressure, DNR fisheries concerns, etc. Objective: Assess trend data for total phosphorus, chlorophyll-a, temperature profiles and Secchi readings for Caribou, Ward, Agnes, etc. lakes. Action Items: 8) Provide educational focus on volunteerism, value of volunteer monitoring, data collection and lake association activities. Use multiple in-county resources for outreach.

Goal 4 Promote a better understanding of the critical link between land use, water quality and quantity.

Goal 4.1 Prevent water quality deterioration from land use activities. Objective: Improve ordinances with lake specific data based on known features of that lake, water quality reports, depth and size conditions, etc. Action Items: 2) Review ordinances for lake protection and propose improvements to county ordinance. 3) Increase consequences for county ordinance and MN statute/regs violators. Publish list of properties in violation.

Goal 5.1 Reduce undesirable water quality impacts associated with roads and other land activity managed and/or approved by Cook County. Goal 5.2 Within 5 years, effective stormwater management is standard practice in all county reviewed development proposals. Goal 5.3 Develop a septic system management plan for Cook County that eliminates sewage impacts to water quality and ensures permanent high quality water.

It will serve the interests of all who support this management plan if the cooperative nature of the inter-governmental decisions and actions continue or improve where it may be helpful to efficiency or efficacy in

executing their responsibilities. Action items are listed in the management plan section of this report. We believe that attention to these items and actions in response are important to the successful implementation of this plan and the consequent achievement of improved and consistently high water quality and effective protection of the natural environment in the Caribou Lake watershed. As the primary author of this plan, the CLPOA is an active organization committed to the goals of this plan for Caribou Lake and stands ready to work with any and all governmental bodies to support the successful achievement of these goals.

17. Local Area Amenities

It should be noted that Caribou Lake is one of the largest lakes in the County, closest to Hwy 61 and offers public access for motorized and non-motorized enjoyment of the lake environment. But, we believe it would be remiss to ignore the quality and range of local amenities available to Caribou Lake land owners and visitors. Water quality may, in rare instances, be affected by the use of some amenities but the total experience of the lake is generally enhanced by the wide range of amenities and opportunities including scenic, recreational, cultural, hospitality, entertainment, arts, crafts and education, and civic celebrations too.

Some examples are the Superior Hiking Trail with impressive vistas and overlooks, the state parks and rivers, skiing, biking-trail and mountain, golf, restaurants, resorts, cabins, campgrounds, retail services, the North House Folk School, Arrowhead Arts Center, Grand Marais offerings of great variety and many others. We also have a nearby hospital and local clinic which can be important amenities of a different sort.



Lake Management Plan Focus Area Recommendations

The following text describes the prescriptions developed in the course of preparing this plan document for each focus area which are viewed specifically and in total as important to the overall goal of the plan to protect Caribou Lake water quality and the total lake experience. The plan details are formatted as statements for each focus area addressing the **Goal**—answering the question, what—the **Objective**—answering the question, why—and the **Action Items**--answering the rest of the questions, how, where and who. Often the action items will not explicitly state the responsibility of individuals including land owners in the watershed and lake users. But in many items there is an implicit role for all individuals to become aware or educated or to conduct our lake lives in ways that will protect our self-interests, that is our lake water quality and the lake environment for tomorrow and for the future tomorrows of our children and grandchildren and so on.

1. Water Quality Plan

Goal: Improved and consistent Caribou Lake water quality in the near term and the long term future measured as follows:

Total phosphorus	--	15 ppb summer average
Chlorophyll-a	--	8ppb summer average
Secchi disk	--	6 ft summer average

Objective: Caribou Lake clarity, as measured by Secchi disk, will be at the best on average for optimum recreational use, that is relatively algae-free summer season, given the lake and watershed characteristics, especially the shoreline and lake bottoms.

Action Items:

- 1) Set the Caribou Lake water quality measures at the concentrations and depth indicated in the Goal statement above. Establish an “Alert Level” of 25 ppb summer average for total phosphorus; when it occurs, the CLPOA will send an “Alert Notice” to all watershed residents of a serious potential water

quality problem in Caribou Lake with suggestions as to actions and practices that can be employed to reduce phosphorus levels and protect water quality.

- 2) Inform and educate all who are connected with Caribou Lake of this plan and measures including land owners, lake users, contractors and business people, organizations, government decision-makers and other interested parties.
- 3) CLPOA will support County efforts on an educational focus on volunteerism, especially for lake monitoring activities and on training for lake monitoring.
- 4) Working with the Cook County water planner and other support staff, establish an annual program of citizen volunteer lake water monitoring on Caribou Lake. The CLPOA will seek funding through the existing Subordinate Service District for Caribou Lake watershed as a necessary and reliable source of funds for the annual water quality monitoring program. Grants, cooperative programs and other sources of funding will also be explored to augment the funding for this monitoring program.
- 5) The CLPOA will prepare annual reports on Caribou Lake water quality with data from the current monitoring season and comparisons with previous years to assess the current state and changes in water quality. This report will be posted on the CLPOA web site.
- 6) CLPOA will use this document—the Caribou Lake Management Plan—and encourage others to educate and motivate all those connected with Caribou Lake in any manner regarding all of the focus areas that influence water quality and the behavior and actions that will offer protection of water quality and the lake environment.
- 7) CLPOA will periodically issue single page reminders for wide distribution of things to do, or to avoid, to protect Caribou Lake water quality.

2. Land Use and Zoning Plan

Goal: Land use and zoning policies and decisions are made at the county level. The goal of this focus area is to urge Cook County policy and decision-makers to recognize the linkage of land use and water quality and reflect a greater emphasis and priority for protection of lake water quality and all facets of the natural lake experience in all land use and zoning decisions; and further to provide resources for monitoring and enforcement of these decisions by County staff.

Objective: Both water quality and the natural environment of Caribou lake are protected first and foremost by County decisions made about land use and zoning regulation at the beginning of any project or use within the watershed. Private property rights can be protected within the constraints of the established laws and regulations. Environmental protection of all resources shall be a priority for development along with economic considerations by Cook County.

Action Items:

- 1) CLPOA representatives will meet with Cook County Commissioners, Planning and Zoning Department and Soil and Water Conservation District staffs, state agencies and any other interested parties to present and discuss this lake management plan.
- 2) Support the County consideration of the following principles regarding development in the Caribou Lake watershed: undeveloped or remote areas not served by maintained roads or school bus services shall be zoned “no service zone”; incompatible adjacent land uses shall be buffered from one another; and redevelopment of already developed lands is preferred over development of undeveloped land.
- 3) Encourage the County to increase enforcement activities and the consequences for ordinance and MN statute/regulations violators.
- 4) Identify and encourage the preservation of unique or distinctive natural features and systems with scientific, natural history, or archaeological significance recognizing their irreplaceable character including ridgeline and bluff protection.

- 5) Per the County Local Water Management Plan, support the development of a plat review process that includes analysis and assessment from hydrologic modeling software, especially addressing cumulative effects analysis.
- 6) Encourage the County to amend County ordinance to include lake data of known water quality issues, depth and size conditions of the lake and current development issues.
- 7) The Cook County Board will continue the functions of the Caribou Lake Subordinate Service District Advisory Committee to the Board as a means of considering and debating issues that come to the Board and advising them as to Committee recommendations regarding development and protection of water quality and the natural environment in the Caribou Lake watershed.
- 8) CLPOA representatives will attempt to improve the communication to and education of all interested parties in the watershed of land use or zoning decisions coming before Cook County on a timely basis. The County has legal requirements for informing nearby land owners of such requests or decisions but we believe that concern and interest may often extend to a broader range of people in the watershed and that communication should extend to all interested parties.
- 9) CLPOA recognizes the continuing challenge of resource availability and allocation for the County Board. But considering the growing awareness and acknowledgement of the importance of water quality and the environment, the CLPOA urges the County Board to explore and consider options to increase resources provided to the Planning and Zoning Department to improve monitoring and enforcement of land use and zoning decisions. At a minimum, special consideration should be given to providing additional resources for preservation or restoration projects in the Caribou Lake area.
- 10) As described in another focus area, publicly owned lands, especially shore lands, shall be maintained in public ownership to the fullest extent possible; or an offset is provided elsewhere in the watershed.

3. Conservation Easements and Trusts

Goal: Create more shoreline conservation easements and/or trusts for set-aside of shoreline by land owners to maintain the high quality of the natural environment and water quality of Caribou Lake.

Objective: This is intended to inform Caribou Lake land owners of these opportunities for long term environmental protection which also enhances water quality protection objectives.

Action Items:

- 1) The CLPOA will make this focus section available as a separate information piece to inform and encourage Caribou Lake shoreline land owners of these opportunities. This can be included when other materials are distributed by CLPOA.
- 2) Develop more detailed information on easements and trusts especially for smaller properties and identify organizations that can facilitate such transactions for people with such an interest.
- 3) As stated in the AUAR Mitigation Plan, "Encourage the development of a private organization/land trust to recognize deed restrictions (i.e. reduce future density)."

4. Lake Classification Study

Goal: Complete the Lake Classification Study by the end of the summer of 2009 for consideration by the Cook County Board and the DNR. Both the Board and the DNR to then consider and decide on reclassifying segments of Caribou Lake shoreline to more restrictive development standards.

Objective: The results of this study are to be used to reclassify segments of Caribou Lake shoreline for revision of the shoreline standards that are zoning specific and more development restrictive. Such restrictions will limit development in some locations and require more careful development in others. The results can be highly effective in providing increased protection for lake water quality and the natural environment.

Action Items:

- 1) Cook County Soil and Water Conservation District (SWCD) will continue to conduct field surveys started in summer 2008 through the summer of 2009 with volunteer support to evaluate the distribution of high-priority plant, fish, and wildlife species. Survey team members will use the DNR's "Sensitive Lakeshore Identification Manual" in evaluating Caribou Lake shorelines, including:
 - Aquatic habitat survey
 - Near-shore vegetation study
 - Citizen shoreline description
 - Frog calling survey
 - Near-shore fish and aquatic animal study
 - Bird survey

Note: Timely completion of the field survey is critical to the work to be done on the next item.
- 2) The SWCD will develop an ecological model that objectively and consistently ranks shorelines for sensitive area designation. The model is based on the results of the field surveys. Shorelines used by focal species, areas of high biodiversity, and critical and vulnerable habitats are important elements in the ecological model used to identify sensitive shorelines. Because the model is based on scientific data, it provides objective results that can be used as the basis for regulatory action and decisions by the County and the DNR. Volunteer support will again be offered.
- 3) The final component involves compiling and delivering information on the sensitive shorelines, along with recommendations, to Cook County and the DNR who can use the information to enact rezoning of the designated lake shore segments to a more restrictive class.
- 4) Cook County will be encouraged to adopt a set of shoreline standards and zoning specific to each segment of Caribou Lake which will address issues of shoreline development and use such as: stormwater runoff, minimum lot size and water frontage, structure setbacks, alterations of land and vegetation.

5. Life Style and Waste Management

Goal: Caribou Lake land owners will adopt or continue to use environmentally friendly and lake protective practices and decisions in living in the Caribou Lake watershed and assure the effective operation of septics and other waste management facilities.

Objective: The practices, decisions and facilities employed by watershed residents are primary influences on water quality and can protect Caribou Lake by preventing contaminant generation and entry into the lake.

Action Items:**Septics**

- 1) Work to ensure County follow up on all currently non-compliant waste disposal systems in the Caribou Lake watershed.
- 2) Encourage County enactment of point-of-sale and building permits trigger of a compliance inspection and non-compliant septics be upgraded prior to sale or permit issue.
- 3) Work for passage of an ordinance requiring regular inspection of all septic systems as part of a septic system management ordinance or plan for the entire County that includes an administrative tracking system. Ensure that funding and staffing are provided by the County for this work.
- 4) CLPOA encourage the subordinate service district to ensure on-going pumping/maintenance and inspection of all septic systems.
- 5) Work with the County to continue distribution of the Property Owner's Resource Guide and other information about septic system use and maintenance to all Caribou Lake residents especially to new buyers of lakeshore and upland properties.
- 6) Provide regular informational updates to Association members via the CLPOA newsletter and the twice yearly membership meetings.

Lifestyle

- 1) CLPOA and the Coalition of Lake Associations encourage a County ordinance banning the use of all fertilizers next to lakes in Cook County.
- 2) Develop a demonstration rain garden on Caribou Lake.
- 3) CLPOA will develop a welcome packet for Caribou Lake land owners and new buyers that includes information about lake lifestyle choices.
- 4) CLPOA will develop a Caribou Lake "lifestyle" flier that includes information about products that can be safely used at the lake and distribute it to residents (via the welcome packet) and visitors. Work with nearby real estate offices, stores and resorts to make the information available to the public.
- 5) Encourage local merchants to stock and promote lake friendly products and home owners to purchase these products.
- 6) Provide updated life style information, speakers etc. at annual meetings.
- 7) Provide regular informational updates to CLPOA members via the CLPOA newsletter, website and membership meetings.

6. Shore Land and Shoreline Protection

Goal: Provide education and support to the land owners of Caribou Lake about the best management practices for protecting Caribou shore land and shoreline. Encourage best management practices when a land owner is making modifications to his/her property.

Objective: Protect the shore land and shoreline of Caribou Lake because it provides water quality protection, critical habitat for the fishery and wildlife and enhances the natural aspect of the lake experience.

Action Items:

- 1) The CLPOA board or action team will review requests for variances and recommend to the County whether they be issued or denied based on best management practices.
- 2) Educational materials delineating the do's and don'ts for proper management of Caribou Lake's shore land and shoreline will be distributed to all land owners on the lake.
- 3) A grant application will be explored and then written to request funding for land owners who wish to do a shore land or shoreline restoration project or plant a rain garden. Each project will become a demonstration project for other residents of the lake and watershed.
- 4) Existing exemplary landscape projects such as shore land restorations or rain gardens will be publicized in the newsletter and made available as models for other land owners.
- 5) The current CLPOA sponsored reforestation project along Caribou Trail above White Sky Trail #76 will be continued and additional areas along roads and water bodies should be evaluated.
- 6) The feasibility of reforesting the denuded slope on Caribou Trail above the outlet to Caribou Creek will be explored with the US Forest Service.

7. Aquatic Vegetation

Goal: Maintain aquatic vegetation throughout Caribou Lake wherever it flourishes.

Objective: Aquatic vegetation is a critical component of a healthy and vibrant lake environment. It provides essential functions including habitat for fish and other lake dwellers, contaminant removal, lake bottoms stabilization and protection of shorelines from erosion.

Action Items:

- 1) CLPOA will prepare and provide materials to educate land owners and lake users on the value and protection of aquatic vegetation.
- 2) CLPOA will use a variety of methods to disseminate the education materials to all who have an interest or need to know.

8. Exotic and Invasive Species

Goal: Prevent the entry or introduction of these species into Caribou Lake or the watershed.

Objective: These species can create serious problems or irreparable harm to existing species and the natural biodiversity of the area resulting in harm to lake water quality, habitat, the fishery and/or general use and enjoyment of Caribou Lake and its surroundings.

Action Items:

- 1) CLPOA will develop and/or use materials to educate all land owners and lake users on the identification of species of immediate concern in the watershed.
- 2) CLPOA will develop and/or use materials to educate all land owners and lake users on steps to prevent the introduction of these species into the watershed including all of the following plus others that become known:
 - No transporting of firewood into the area
 - No transplanting of non-local plants
 - No planting invasive species outright
 - Inspection of boats at the boat landing for aquatic plants.
 - Empty bilge water at the launch of the lake you are exiting
 - No transporting of soil or fill into the area
 - Make minimal disturbances to natural areas for construction, etc.
 - Do not throw fish bait or water into the lake
 - Respectful boating practices to limit lake bottom disturbance
 - Clean your boots, ATV's, truck tires, chainsaws, weed whips, etc. that can carry seeds, plant parts, eggs, animals, worms or any natural means of species reproduction.
- 3) CLPOA will explore and attempt a variety of means to disseminate the information developed in Items #1 and #2 to all who should be so informed including use of the internet and hard copy.

9. Fishery Management

Goal: Maintain and improve, where possible, the quality of the Caribou Lake fishery.

Objective: Recreational fishing is one of the major uses of Caribou Lake; management and protection of the fishery is important to a successful fishing experience, the related enjoyment of the lake and maintenance of property values. The quality of the fishing experience is one of the most common yet important characteristics of a lake and its reputation in an area.

Action Items:

- 1) Caribou Lake land owners and lake users will be encouraged to respect and protect the lake fishery by all actions that may influence the quality of the fishing experience on Caribou Lake, including the safety of all lake users and the enjoyment of the natural environment.
- 2) The Minnesota DNR is responsible for the management of the Caribou Lake fishery including monitoring the fish population and assessing the apparent productivity of the lake. Wherever and whenever the DNR is engaged in activities related to their responsibilities, all lake users will abide by any request or direction coming from DNR staff so engaged. There is no record of any problem for the DNR in this regard on Caribou Lake.
- 3) The local Native Americans have fishing rights on Caribou Lake and at times join the DNR in netting or other means of assessing the fish population. This activity is a legitimate part of their fishing rights and may continue as they choose.

- 4) The DNR does tag some fish during the survey work on the lake. Fishermen are required to deposit any tags they get from fish they catch in a DNR container at the public landing. These tags provide important data to help the DNR in their management decisions re stocking, etc. of Caribou Lake.
- 5) DNR will be encouraged by CLPOA and other lake users to continue their attention and care of the fishery of Caribou Lake.

10. Wildlife

Goal: Provide conditions throughout the Caribou Lake watershed, along the shoreline and on the lake that protect habitat and foster a vital wildlife population.

Objective: Wildlife in all of its forms and both observed and hunted constitute an important part of the total natural lake experience shared by Caribou Lake land owners and lake users, thus it is critical that the wildlife population is sustained and the essential habitats are protected.

Action Items:

- 1) Loons are a big attraction on Caribou Lake. Nesting platforms will be constructed and located at a number of sites on the lake by CLPOA members to increase the number of nesting loons and improve the success of nesting in producing chicks.
- 2) CLPOA representatives will work with the DNR and others when called upon to assist on wildlife related activities.
- 3) Habitat protection will be identified as one of the leading reasons or goals in advocacy or other lake management activities to protect and enhance the wildlife population in the Caribou Lake watershed.

11. Public Access

Goal: Prevent and/or minimize the negative impacts of the design, amenities and use of the public access on Caribou Lake water quality or the lake experience.

Objective: Stormwater and other runoff from the public access and invasive species from boats using the public access can create serious negative impacts on Caribou Lake water quality and on the lake experience.

Actions Items:

- 1) Meet with local and state DNR officials to review policies for Caribou Lake and to communicate CLPOA concerns and action plans.
- 2) Request that the DNR not expand the public access to Caribou Lake.
- 3) Request that the DNR install water bars across the access to capture runoff from the road and parking lot and redirect it into a vegetated ditch or the surrounding woods where it can be treated by the vegetation; this could be done as part of the County program working with DNR to reduce erosion and runoff impacts to lake waters at public landings.
- 4) Determine, with the help of the Soil and Water Conservation District, whether the adjacent wetlands are being properly protected.
- 5) Review the signage at the access to see if it adequately educates users about the unique aspects of Caribou Lake such as its four shallow bays. Include also a list of desirable boating etiquette and the importance of clean boating practices. Modify signage accordingly or add hand out information.
- 6) Encourage watercraft users to use no-wake speeds when coming and going from the boat landing.
- 7) Determine whether the public access outhouse is in compliance with Cook County waste management regulations.
- 8) Form a group of volunteers to work at the public access on high traffic weekends such as Memorial Day, Fourth of July and Labor Day. Volunteers would pass out educational materials pertaining to clean boating practices and determine the extent of access usage during those busy weekends.

12. Water Surface Use Conflicts

Goal: A safe and pleasurable experience as well as enjoyment of the natural assets of Caribou Lake is assured for all users of the lake.

Objective: Motorized water craft on Caribou Lake will travel on the lake in a manner that is respectful of the ecology of the lake, of the rules of behavior on the lake and of the safety and enjoyment of other lake users.

Action Items:

- 1) As stated in the AUAR plan, request that the DNR complete a recreational use survey of Caribou Lake to establish baseline data.
- 2) Working with the DNR Trails and Waterways Division and the County, establish a no-wake zone on the public access bay. It is not only a shallow bay but also the bay that must absorb the considerable traffic from the boat landing.
- 3) Encourage slow speed in the other shallow bays of the lake. (Cathedral of the Pines Bay, Sawmill Bay, and Outlet Bay)
- 4) Educate and encourage all boat operators to restrain boat speed and acceleration near shorelines around the lake to minimize disturbance of lake bottoms and thereby help reduce lake water contamination.
- 5) Prepare educational materials for Caribou Lake land owners and also for boaters accessing the lake from the public landing. These materials would detail the unique characteristics of the lake such as its shallow bays and loon habitats. Also, the impact of boating activity on water quality would be explained, and boating practices that respect the ecology of the lake would be delineated and encouraged. Materials would be delivered to every resident and also distributed by volunteers at the public access on the Labor Day, Memorial Day and Fourth of July holidays.

13. Public Lands Protection

Goal: Preserve the public shoreline and shore lands of Caribou Lake.

Objective: Public ownership of shoreline and shore land has been and will be an important part of water quality protection for Caribou Lake by preventing additional development which is the primary source of contamination on this already fragile lake.

Actions Steps:

- 1) Present a motion to the CLPOA that calls for the association to take an official position that declares the necessity to preserve Caribou Lake public shoreline and shore land.
- 2) Form an action team that will develop a plan to preserve Caribou Lake's shoreline and shore land.
- 3) Establish a relationship with the regional DNR office in Two Harbors to determine the short- and long-term plans for the public lands of Caribou Lake.
- 4) Use data from the Lake Classification Study to assure that all Caribou state land be maintained with "sound natural resources, conservation and management practices."
- 5) Review recent and past legislation relating to the disposition of school trust lands.
- 6) Maintain a dialog with State Legislators about CLPOA's position regarding Caribou's public lands.
- 7) Investigate the feasibility of exchanging Caribou trust lands with other state land that could provide revenue to the Permanent School Fund through timber sales and leasing opportunities followed by conversion of Caribou school trust land to a wildlife management or other protected area.

14. Wetlands Protection

Goal: Provide lake water quality protection by maintaining wetlands as runoff and stormwater holding and natural treatment eco-systems and as habitat for resident wildlife.

Objective: Wetlands are a key part of the forest and lakes regional environment functioning as unique holding and treatment capability for runoff and stormwater prior to discharge into a lake. Small and large scale wetlands are found around Caribou Lake providing that very function.

Action Items:

- 1) Encourage the County to strictly enforce the prohibition on ditching, especially in wetlands.
- 2) Communicate support to Cook County for continuing vigorous enforcement of wetlands protection in all construction activities as required by the Minnesota Wetlands Protection Act.
- 3) Encourage County departments to reduce runoff impacts to wetlands and increase or improve measures to avoid wetland impacts.
- 4) Support County investigation of creating a County wetland “mitigation bank”.
- 5) As indicated in the County Local Water Management Plan, encourage the County addition to an ordinance of wetland buffer setbacks as a protection tool for wetlands.

15. Stormwater Management

Goal: Stormwater management addresses the measures and techniques that can be employed to prevent or minimize contamination of runoff or means to remove contaminants before entry into water bodies. Stormwater quite frequently contains contaminants from contact with surfaces and has the capacity to erode soils and other water soluble materials all of which may enter receiving water bodies. Many of the substances contained in the runoff are deleterious to water quality. Thus, stormwater management can minimize the entry of contaminants into Caribou Lake.

Objective: Many of the substances contained in stormwater are deleterious to water quality. The thin soils of the northern lakes and forests region are particularly vulnerable to erosion and the soils may then be washed into a lake such as Caribou. Management of the techniques and preventive measures and/or removal of the entrained or dissolved contaminants in stormwater is essential to protect water quality.

Action Items:

- 1) CLPOA will prepare or acquire educational materials regarding stormwater management principles and techniques focusing on prevention, minimization and treatment for shore land and other properties in the watershed where stormwater can originate and then enter Caribou Lake.
- 2) Per the County Local Water Management Plan, encourage the County to establish stormwater management review as standard practice for all development proposals of any size—single family to multiple lots.
- 3) Encourage the County to require best management practices and erosion control plans for all new private and public road construction and all other construction.
- 4) Support the County proposal to promote contractor workshop attendance and certification in erosion control and stormwater practices; plus promote and implement the “contractor of the year” award idea.
- 5) Also refer to the other numerous references to stormwater management opportunities and measures in other focus area management plan details.

16. Governance

Goal: The realization of maximum effectiveness and cooperation among the numerous government organizations involved in water quality and natural environment protection as well as within these same organizations.

Objective: In these times of limited financial and personnel resources, the responsibilities for water and resource protection by government organizations continue to grow in response to recognition of the importance and value of water quality and natural environments to land owners and lake users especially in Cook County

and specifically in the Caribou Lake area. Cooperative allocation and management of personnel resources may be helpful at this time. Volunteerism can accomplish only so much, even when maximized.

Action Items:

- 1) CLPOA will suggest this idea to the various government organizations as we meet to present this Lake Management Plan.
- 2) CLPOA will support the efforts of any and all organizations that explore and attempt this suggestion.

17. Local Area Amenities:

Goal: Recognize and acknowledge the existence of the many quality amenities available throughout the extended Caribou Lake neighborhood.

Objective: The residents of the Caribou Lake watershed and the users of the lake benefit greatly from the amenities available to them from the West End of Cook County to Grand Marais and beyond. A reminder of this is appropriate in this plan.

Action Items:

- 1) CLPOA will encourage its members and watershed residents to patronize the businesses and other amenities and acknowledge the benefits of the availability of the many services and other opportunities throughout our extended neighborhood.
- 2) CLPOA will encourage members, watershed residents and lake users to be good ambassadors and spread the good word of the quality of Caribou Lake and its extended environs including the natural, cultural, civic and commercial amenities.

Action Team Opportunities

As a reader will have observed, there are numerous actions called for in this management plan. We think one of the best ways to have these actions implemented is to involve a lot of people, especially those with a vested interest to protect and improve Caribou Lake water quality and the lake experience. We propose Action Teams be formed to address topics of limited scope to initiate and conduct specific action items. A Team can be one person or several, children or adults; in fact having children involved would be a bonus and a basis for a promising future for our lake. We have prepared the following list of opportunities for such Action Teams. We urge readers to survey this list—or add your own ideas—and take the initiative where your interest lies. You can go to the CLPOA website and indicate your interest or add your suggestions. The CLPOA board encourages and welcomes such initiative.

Action Team Possibilities

- 1) WQ Sampling Team
 - √ Lake water quality sampling to augment the current volunteer effort.
- 2) Information/Education Team
 - √ Prepare one or two page information sheets.
- 3) Distribution Team
 - √ Disseminate the information materials to targeted audiences, e.g. shore land owners, watershed owners, local businesses, etc.
- 4) Lake Access Team
 - √ Conduct activities at the public access or related to the public access to alert, educate, train, etc. lake users.
- 5) Shore Land Preservation Team
 - √ Develop a plan to preserve shoreline and shore land.
- 6) Local Business Contact Team
 - √ Establish and maintain contact with specific businesses/operators/owners including contractors, realtors, craftsmen, etc.
- 7) DNR Contact Team
 - √ Establish and maintain contact with responsible DNR office(s) on our concerns and their actions, plans, regulations, etc. that may affect Caribou Lake.
- 8) U.S. Forest Service Contact Team
 - √ Establish and maintain contact with responsible USFS office(s) on our concerns and their actions, plans etc. regarding Caribou Lake.
- 9) Cook County Contact Team
 - √ Establish and maintain contact with County offices and staff regarding our concerns and County actions, plans, decisions etc.
- 10) Legislative Contact Team
 - √ Establish and maintain contact with local legislators to address legislation of interest to Caribou Lake landowners.
- 11) Septic Systems Data Management Team
 - √ Work with County staff to develop and maintain a database on the status of septic systems in the watershed.
- 12) New Team(s)
 - √ There are many other issues that need our attention. Start your own “Action Team”.

Appendices

Appendix A

Caribou Lake History

By James Pecore - born 1930
Originally written in 1988
Updated in 2005

To Whom it May Concern:

Some of which I relate here is word of mouth from my parents, Albert (Al) and Etta Pecore. Some is from my memories from being raised on Caribou Lake, year around from childhood. I hope this fall and winter to establish and pinpoint dates and names on tape from my mother who resides with me in Alaska.

My father worked for the US Forestry in Cook County before World War I and continued with them afterwards. His original job was cruising the interior with a partner (usually Mulligan from Grand Marais) for 30 days at a time. This was done by canoe, checking lakes and if finding timber burn area, estimate acres lost (prior to look-out days). He probably saw 90% of the lakes accessible by canoe from Lake Superior to the Canadian border. He said Caribou Lake was one of the prettiest he had seen and so he bought 55 acres on the south end with a sand beach. The sale was made with the timber company about 1919 or 1920. While courting my mother, a school teacher in Lutsen, they would hike from Lutsen, up the Caribou Road (which ended at the Lyght homestead), and then camp on his property. Then he cut a road or enlarged the trail from the corner near where John Lyght now lives (formerly the Andrew Kjedadahl homestead). This was also the site of the Caribou CCC Camp in the 1930's. He then built a cabin, or house, married my mother and moved to Caribou in 1923.

While employed by the Forest Service my father named White Sky Rock to honor White Sky Gesick (Ruth Parents' father). Jim Gesick, White Sky's father, use to winter at the mouth of Poplar River, prior to the CAA Nelsons. About the 1900s, 20 to 25 Indians came up the Poplar, to Caribou Creek, onto Caribou Lake and established a summer time camp to fish, pick blueberries, wild rice and do maple syrups. This was told to me by Alta McQuatters, Ruth's daughter, in September 2005. Alta heads the Cook County Historical Society.

In 1923, Albert Pecore started a boat rental business. He found remains of a Birch Canoe at the narrows going to Little Caribou about 1923 or 24. My parents started their resort by building their first cabin in 1923. They had some tent campers at this time as people were starting to drive the roads to this county. Carl Nelson became a silent partner in the boat rental business in 1925. Hosey and Stella Lyght begun the Northern Lights Resort in the area which is now the Cathedral of the Pines Camp. My father obtained a small tug boat in 1925-26 and made a barge to tow behind. This was used to haul material for the building of Portage Resort, which had no road; Dickinson's material, Mott's material, Brown and Biglow (Charles Ward and Foster's), Terry (McGrath) Cabin, Low (Nellis) cabin and others. In 1927, Portage Resort was begun by Carl Nelson on what is now the narrows on the peninsula.

Most original buildings on the lake were built by my father. I. Strand, who had a Milk Cow Barn, at the corner of the Caribou Lake Road across from the Lutsen School, did some building on Caribou Lake. He bought some lots across the bay from Caribou Cabins, later called the Strand Point, built a couple of log cabins and frame cabins in the early 1930s. Also, it is my understanding that the only places on the lake prior to the Al Pecore's place were possibly the Pennington's, Tom Homo Island, and John Kjedadahl's home on the west end. This was built for John's prospective bride. However, he never married and he refused to live in his new home. To my knowledge no none ever lived there. It was abandoned when I was a child. I also know the Pennington place was vacant and full of bats. The Dickinson's came and after just seeing the country once, purchased 160 acres from the timber company. This was mostly shoreline. In 1927-28 he had the small cabin built in the corner of the bay for his sister, Fan Dickinson. John Kjedadahl wintered in Fan's cabin and cut firewood for the Dickinson's. The Lyght family started a resort (now Cathedral of the Pines Church area) in the early 1930s. For some reason this was a growth period and much land was purchased by 1930.

In the early 1930s, my father cut the original trail from Little Caribou to Trout Lake. The trail cut over the ridge from Murmer Creek and ended up 2/3rds from the south end of Trout Lake. There were Northern Pike 2 to 2 ½ pounds when filleted and they came out Salmon color. Some said they crossed with Trout. About 1930-32, the road was extended by the county past Lyght's homestead and down to the Pecore resort. Just when the road went to Portage Resort, I don't know. I remember road improvements about 1936 and the building of the Honeymoon Trail. My father, working for the Forest Service as a superintendent or foreman in the CCC's, built the Popular River bridge and campgrounds on the Honeymoon Trail about this time.

Pecore, Mott, Dickinson and Foster's were all originally Timber Company land. The Lyght's bought most of their homestead from the government. The Lyght's resort was originally part of their homestead. Marilyn Stone Erickson can add many items to the lake history as her family can to Caribou in 1929-30. My father built a cabin especially for them in 1930-31 and leased it to them by the season until the resort was sold. Originally the Resort had a 32 volt light plant. In 1946 it was changed out with a 110 volt light plant. In 1947 the power line came through from Lutsen, which also allow us to get our first telephone. The Erickson's then bought next to the present Pecore cabin where they now spend their summers. John Lyght is also a very good reference. Bob Dunn said Dr. Dunn, his father, built their cabin in 1932. A beaver had a dam at the outlet of Caribou Lake in the 1940s. The beaver also had a house in the Little Caribou, also North Shore of the main lake.

The steam boiler was at Sawmill Bay until 1938. A man working for the WPA, with a dump truck, hauled it away for scrap. Remains of the buildings were there and the field was great for raspberries throughout my childhood. Al Pecore laid out new trail in 1938, Little Caribou from ½ way down lake to lessen the grade and brought in boat via the old look-out tower off Pike Lake Road. I went along because my father bought a new three horse-power Mercury the summer of 1939, so I could take people guiding to Trout Lake. About 1940 the roads were improved again and did no longer go as close to the Lyght home place.

I went to the Lutsen schoolhouse. It was located at the foot of the Caribou Road (the Fire Station now). My grandparent's was the 1st house to the right above the Fire Station on Caribou Road. My grandfather was the 1st janitor at the school. There were two room, first through fourth grade and firth through eighth grade. There were four children in my first grade class. I went to school in Lutsen through grade five. Then I went to school in Grand Marais for sixth and seventh grades, in Duluth for eighth, ninth, and tenth grades; then back to Grant Marais for eleventh and twelve grades where I graduated.

My grandparents came to the North shore in approximately 1918 and my father built their home for them. My father was the eldest in the family of nine kids, named Al, Walt, Joe, Don, Mary Phoebe, Estell, Emma and Belle.

I remember that my sister Fay and I would walk up to Lyght's homestead and ride in a horse pulled, an enclosed wagon with wheels in summer and skis in winter. H.P. Lyght had a contract with the school to haul the kids to school. He hauled his five youngest of 13 children (Dave, Jesse, Emma, John, and Bob), Fay and myself. After that I remember a 1930 Chevy school bus operated by Alex Bergstrom and then a 1938 International school bus.

Meryln Stone taught my sister and me to swim and drive a car at 9 or 10 years of age. My sister was three years older than me. I was licensed from age 12 with the provision that I would drive with an adult. I drove with my mother, as the adult, even though she did not know how to drive. I drive up from Duluth in the spring and fall and open the resort. My father went to Duluth to-work in the ship yards from 1942 through 1946. My mother, Faye and I opened the resort, ran it, and closed in the fall.

Trout Lake was state planted with walleye about 1950 and became about 1 to 1 ½ pounds with white meat. In the early 1950s the Caribou Lake's level was controlled by native beaver now completely trapped out.

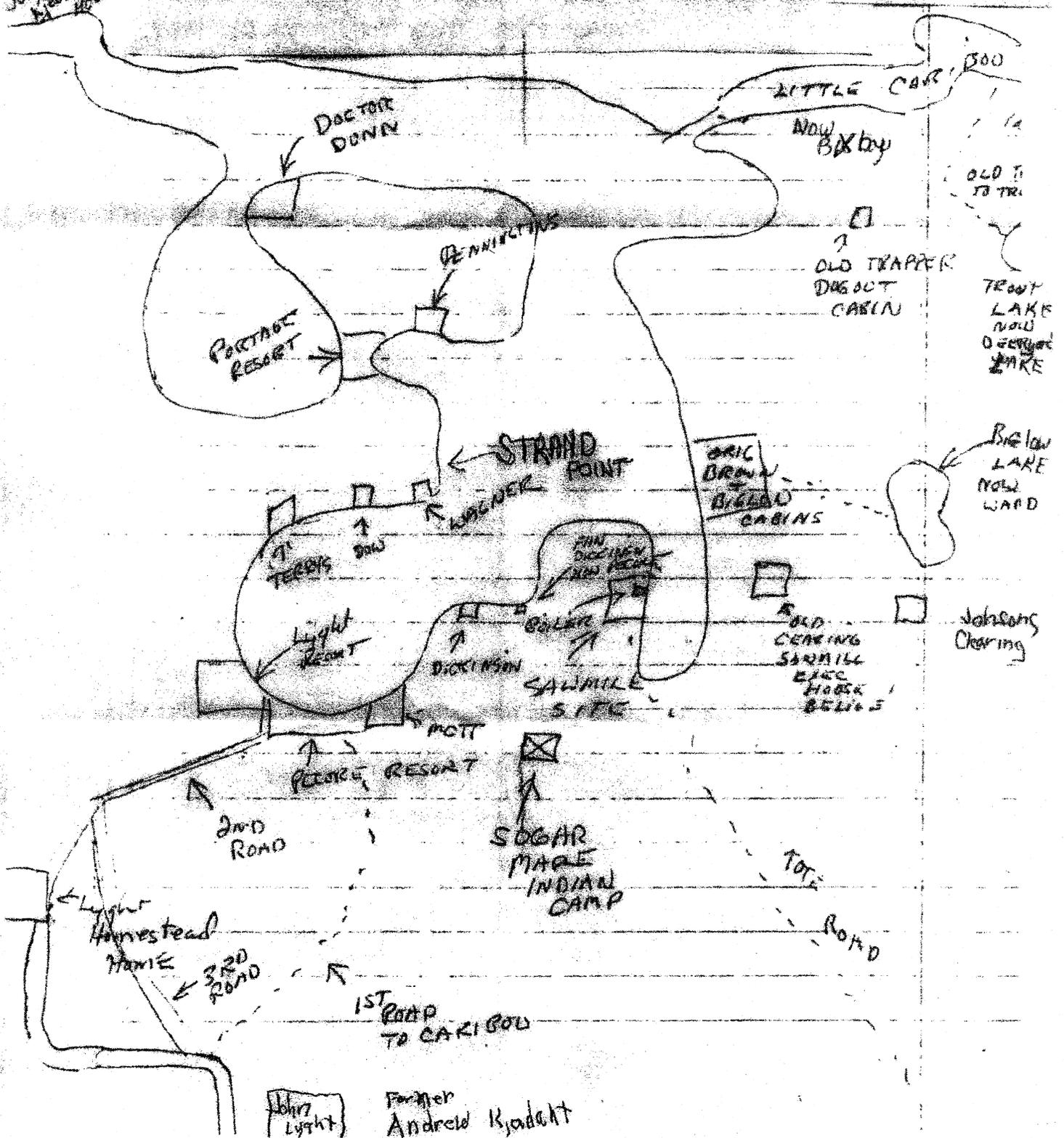
Our family was the only one on the lake year around. I worked for Herb Lozensky, the logger, in 1950-51, two winters. His camp was on Ward Lake about where the "Y" is. He was logging pulp, veneer, saw timber, and he has a mill about ½ mile down from the "Y" towards Little Caribou. That road went to Murmer Creek. The other way from the "Y" went to Trout Lake. The mill site, I believe, was the old dug out cabin and clearing. Brother Ed

Lozesky worked for Consolidated Paper. The original road passed through the east edge of the Johnson's clearing about ½ mile north off the "T" at Caribou Trail and Ward Lake.

Shirley and I took over the management of the resort in 1953. The early people who came: Wyle Stone and family, Loren and Carmen Kessler, Raleigh Kirks, Bob Waits, Ed Johnson, and McManns came yearly for many years. My children are Suzanne born in 1953 and Brian born in 1956. Carl Nelson married Phoebe Pecore, Al's sister. He had the land across highway 61 from Lutsen school house and also fished Lake Superior. My Father Al joined him and fished Lake Superior in the early 1920s. Carl and Phoebe had four children, Willard, Harold, Dorothy, and Tom.

Shirley Pecore and I sold the Pecore resort to the Cathedral of the Pines in 1963. The original Fan Dickinson cabin is now owned by Suzanne Pecore and her brother, Brian Pecore.

John Kradt's house



Appendix B

Exotic and Invasive Species

Terrestrial Animals

Gypsy Moth (*Lymantria dispar*), Emerald Ash Borer (*Agrilus planipennis* or *Agrilus marcopoli*), All Earthworms.

Terrestrial Plants

Garlic Mustard (*Alliaria petiolata*), Amur Maple (*Acer ginnala*), Canada Thistle (*Cirsium arvense*), Crown Vetch (*Coronilla varia*), Spotted Knapweed (*Centaurea biebersteinii*), Russian Olive (*Elaeagnus angustifolia*), Leafy Spurge (*Euphorbia esula*), Dame's Rocket (*Hesperis matronalis*), Orange Hawkweed (*Hieracium aurantiacum*), Creeping Charlie (*Glechoma hederacea*), Butter and eggs (*Linaria bulgaris*), Honeysuckle (*Lonicera spp.*), Bird's-foot Trefoil (*Lotus corniculata*), Reed Canary Grass (*Phalaris arundinacea*), Giant Reed Grass (*Phragmites australis*), White Sweet Clover (*Melilotus alba*), Common Buckthorn (*Rhamnus cathartica*), Yellow Sweet Clover (*Melilotus officinalis*), Glossy Buckthorn (*Rhamnus frangula*), Tansy (*Tanacetum vulgare*), Canada Goldenrod (*Solidago canadensis*).

Aquatic Animals

Spiny Water Flea (*Bythotrephes cederstroemi*), Zebra Mussel (*Dreissena polymorpha*), Rusty Crayfish (*Orconectes rusticus*), New Zealand Mudsnail (*Potamopyrgus antipodarum*), Round Goby (*Neogobius melanostomus*), Ruffe (*Gymnocephalus cernuus*), Sea lamprey (*Petromyzon marinus*), Grass Carp (*Ctenopharyngodon idella*), Silver Carp (*Hypophthalmichthys nobilis*), Big Head Carp (*Hypophthalmichthys molitrix*).

Aquatic Plants

Purple-loosestrife (*Lythrum salicaria*), Eurasian Water-milfoil (*Myriophyllum spicatum*), Curly Leaf Pondweed (*Potamogeton crispus*).

Appendix C

Wildlife In and Around Caribou Lake

**Note: All wildlife observed by me over 33 years on Caribou Lake
past 16 years as owner of a cabin on Caribou Lake**

Wildlife in the area surrounding Caribou Lake includes:

Bat, Beaver, Bird, Black Bear, Chipmunk, Coyote, Fox- Red and Grey, Duck, Loon, Eagle, Grouse, Hawk, Mink, Moose, Osprey, Otter, Owl, Pine Martin, Raccoons, Squirrel Red-Gray-Flying, Turkey Vulture, White Tail Deer, Wolf and many other species.

BAT

You may not see them but they are there and you know they are especially if they decide to set up housekeeping in your attic or in-between your roof and insulation. Mostly seen at dusk they are our friends as they eat thousands of bugs.

BEAVERS

In the past there was a beaver house/dam on the west side of the lake near Bigsby Lake, one at the end of Sawmill Bay and also one near in outlet. Two of these disappeared a few years ago but beaver can still be spotted in the lake.

BIRDS

Many, many birds are observed the most common being chickadees, dick-cissel, nut hatches, pine siskin, rose breasted, evening and pine grosbeaks; woodpeckers – downy, hairy, pileated. There was a spotting of indigo grosbeaks but that was rare and they apparently were passing through. Most amazing are the hummingbirds and the fact that they are extremely territorial. Also, when the snow buntings appear on the road snow is about 2 weeks away.

BLACK BEARS

There have been many spotting of black bears around Caribou – usually in the evening. If you feed birds especially hummingbirds they will use their acrobatic skills to obtain the small amount of juice or seeds in the feeders – hardly seems like a large enough treat for the size of the bears. When one bear wandered on to a deck in the evening a few years ago, the homeowner, fearing for the small children staying with them fired a shotgun into the air to scare the bear who ended up running into a propane tank and met his demise. So although they usually keep a low profile they are around.

CHIPMUNKS

This small “rodent” is probably the busiest and most favorite among children and dogs that chase them and provide many a day’s entertainment. Truly many “Chip and Dales” running and surprisingly few run over on the road.

COYOTES

“Two years ago saw coyote eating a dead deer out by the island and our neighbor’s “puppy” St. Bernard ran out thinking he had found a playmate, have not seen any recently.

DUCKS

There are a variety of ducks that live in and around the lake American Merganser, Buffleheads, Golden Eye and Hooded Mergansers with Golden Eye being the most plentiful. Every summer you can observe a duck with 6-10 babies following behind mom.

FOXES - RED AND GREY

There are red and grey fox around. They are quite tame and will actually come up to you if you are willing to let them get that close to feed them preferring meat. When they added a stretch of paving on the Caribou Trail they used the rocks from widening the road along side of the road for erosion. Above these rocks you can see fox dens and if you go by at the right time you can see the baby foxes peeking out of the holes waiting for mom to bring food and then sunning on the warm rocks after they apparently received a meal from mom.

GROUSE

They are around and go through years of being down and up this year only observed a couple so they are down around here this year.

LOONS

Loons are the most popular waterfowl observed on Caribou Lake. The past 12 years I have surveyed the Lake for loons as a volunteer for the DNR. Loons arrive on Lake Superior two weeks before ice out on Caribou. Ice usually goes out last week in April or first week in May. The loons fly over Caribou every evening about dusk to see if the ice is off. Loons concentrate on the island, the only nesting site I have observed on Caribou. The day ice is off several pairs of loons will fight for the right to nest on the island.

After several days the dominate pair will mate and nest on the west side or leeward side of the island. The nest is set very close to the lake because of their inability to walk on land, and has flooded out several times. Loons sit on nest for 30 days. Loons are one of the few species that the responsibility of nesting and raising the young are shared by the male and female.

The nests have failed the past three years. In 2006 after 21 days no re-nest. In 2007 failed by high water level – re-nested failed, predators. In 2008 high water re-nest failed, loons were observed 50 days on nest in 2008.

The last successful hatch was 4 years ago 2 chicks, which is the usual for loons. Once the chicks hatch success rate is very good. 2003-2006 two chicks hatched each year and all made it to adulthood.

Loons migrate earlier than other waterfowl and winter off Florida. Many residents of Florida do not realize the loons are there because of the drab brown feathers and no calling. Loons in winter waters do not call, warn other loons or have their summer black and white feathers.

The loon's well-being is threatened by various predators gulls, eagles, osprey and the most dangerous is the raccoon. Man also is a threat jet skis, lead sinkers, fishing line and humans disturbing the nests either intentionally or by curiosity.

In conclusion the loon's survival seems to be good as long as boaters respect the loon territorial nesting sites. Caribou Lake CLPOA can help the loons by establishing several floating nesting sites in protective bays on Caribou Lake.

EAGLES

Eagles are easy to spot all around the lake. When mating and later at the end of summer you can see them in groups of two or three but usually they are alone. Look up at the highest branch and you can spot them watching for prey.

HAWKS

Have not seen any this year – have seen them around area in the past.

MINK

Have not seen any this year - have seen them around area in the past.

MOOSE

Moose are not as prevalent as deer – usually not in the same area as deer they are found further north. Two yearlings were seen swimming out towards the island. Once in a while a moose will be seen around the lake – 2 of the last ones spotted died so whether they were lost due to “brain worm” disease, which they contract from deer, of natural causes it was not determined.

OSPREY

Seen flying often as the eagles there is a nest visible on the top of a flat white pine when on the lake to the right of Bigsby Lake.

OTTER

You can often view otters out in the lake playing for hours – they are also devious and have been known to open up a fish cage and have dinner on the dock of the un-fortunate fisherman leaving the fish skeleton as proof of their great dinner.

OWLS

Out at night you can often hear them “who-ing” back and forth to each other. While waiting in a deer stand a friend of ours was both delighted and frightened by the closeness of the owl that landed very near to him.

PINE MARTINS

Usually see one or two a year this summer one tried to come into the garage and had to shoo him away.

RACCOONS

This animal was not seen around this lake until about 4 years ago. Either due to the change in temperature or transplants coming in a hay bale or other transportation they are here probably here to stay. If you like to feed birds you are also going to be feeding the raccoons that are adept at getting at about any feeder.

SQUIRRELS Red-Gray-Flying

Red squirrels are abundant and very destructive when they get into your home. Flying squirrels appear at night and are very interesting to watch "flying" from tree to tree. Gray squirrels are very rare and the few spotted appear to be transplants that maybe were trucked up here due to being such a nuisance further south.

TURKEY VULTURES

Seen very often flying around can be mistaken for the more beautiful eagle or osprey but they do serve their purpose.

WHITE TAIL DEER

Many deer are found around the lake if you notice the finely pruned cedar at the edge of the lake you can tell how high the ice on the lake was in proportion to the height of the deer. They are not the favorites of many due to their voracious appetite for certain plants/trees. Put out some corn or apples and these beautiful animals will appear to the delight of young and old.

WOLF

Sadly it has been reported that the Lutsen wolf pack who hung around this area have disappeared. Many an evening one could hear that haunting sound hopefully another pack will form and take up residence in this area again.