

2. Introduction

For over 70 years Crooked Lake has been managed, like many lakes, in reaction to issues that have likely reached critical stages. Several agencies and users have jurisdiction or impact on the health of the lake. Yet, there has been no overarching plan or set of goals for the lake except perhaps for the game fishery.

To protect and enhance the health of the lake in the long term, Coon Creek Watershed District (CCWD) has advocated for long range comprehensive planning with the cooperation of the most vital stewards of the lake, the lakeshore residents. Development of this Crooked Lake Comprehensive Lake Management Plan started in the winter of 2007 when CCWD encouraged the Crooked Lake Area Association (CLAA) to consider lake issues comprehensively, and based on scientific information. The CLAA Board supported the development of a comprehensive plan as part of the CCWD 2008 Work Plan. The scope and purpose of the plan was presented to the CLAA membership at their winter meeting in February. In March a public input workshop was held to gain public perspectives and priorities. The workshop was attended in large part by CLAA members. Drafts of the Plan were reviewed by the CLAA Board and a Technical Advisory Committee. The completed plan will be presented to the CLAA membership winter 2009, and posted at the Coon Creek Watershed District website for the public.

2.1 Scope and Purpose of the Plan

The purpose for the Plan is to provide a comprehensive “picture” of the lake based on scientific and historical information. Therefore, this Plan addresses previous research and management actions, long-term goals, ways to achieve those goals, and ecological and economic consequences of those goals. To do this, the scope of the plan includes review and analysis of watershed hydrology, lake water quality, nutrient budgets, aquatic communities and ecology, and specific management and control of the invasive species: Eurasian water milfoil & curly leaf pondweed.

Two primary goals of this Plan are:

1. Understanding the water quality condition of Crooked Lake
2. Developing strategies for the protection and enhancement of water quality

2.2 Identification

Crooked Lake is located in the south central portion of Anoka County, straddling the border between the Cities of Andover to the north and Coon Rapids to the south. It is wholly contained within the Coon Creek Watershed District and designated as Public Water 02-84P by the Minnesota Department of Natural Resources (DNR).

Crooked Lake is a small lake (114 acres), elongated in the north-south direction. It is relatively shallow with an average depth of 9 feet and a large littoral zone comprising 73% of the total lake area. It contains one small (0.5-acre) island in the southwest bay of the lake.

Crooked Lake is sustained by a combination of ground water inputs and surface water runoff from a 260-acre watershed. The watershed includes inputs from the municipal storm sewer systems of both Andover and Coon Rapids. The lake has no natural surface water inlets and one outlet located at the southern end of the lake. The outlet is controlled by a culvert through an earthen dam built in 1935.

Crooked Lake is situated in a residential area where land use is mainly single-family homes. There is a public access to the lake via a DNR boat launch on the north shore in Andover and a city park on the east shore in Coon Rapids.

Figure 2.2.1 Location Map

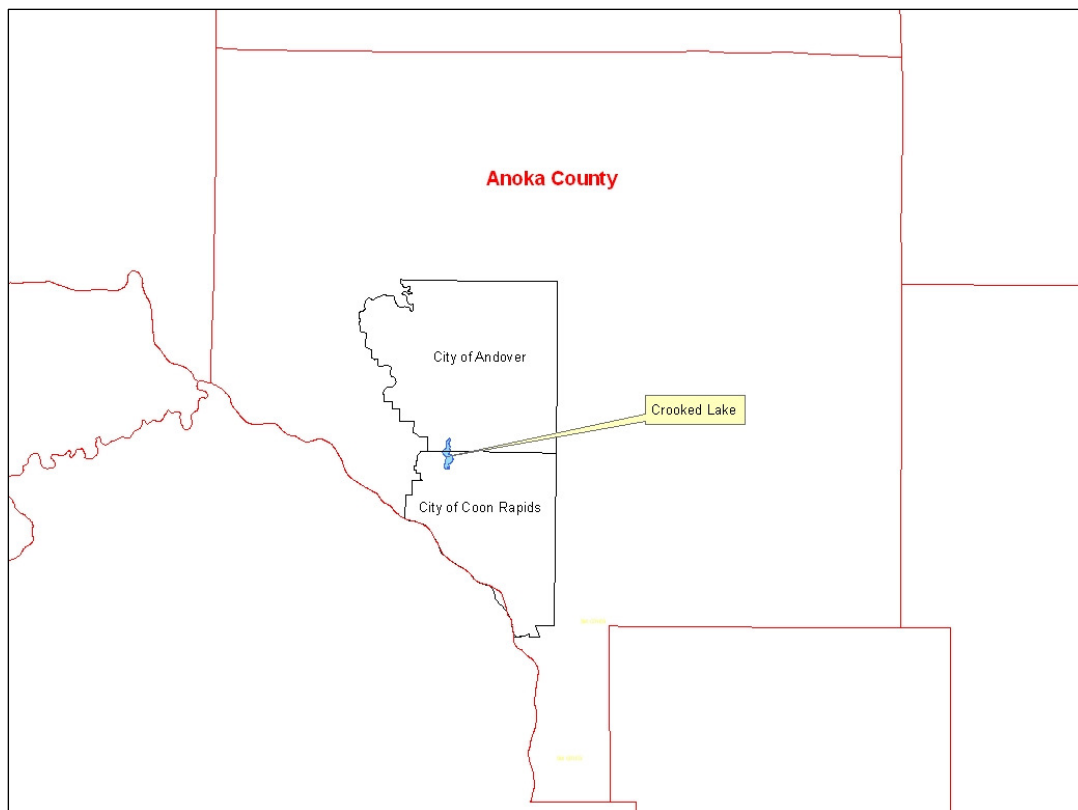


Figure 2.2.2 Crooked Lake Watershed



2.3 History of Use & Management

Crooked Lake has been “on the map” for a long time. It may have been one of two lakes shown connected to a stream on an early map by noted explorer Joseph Nicollet from his 1836-7 exploration of the Mississippi River region. This map shows the Dakota name, “Peterah,” (‘burning coals’ – burning peats) for Coon Creek. Peterah leads north where it connects with two lakes. Crooked Lake is probably one of those lakes. (source:oral history project, Coon Rapids Historical Commission & Anoka Ramsey Community College).



1843 Map by J. Nicollet based on explorations in 1836-37. Source: Anoka County Historical Society

The creek actually flows about 1/3 mile east of the lake. Before it was ditched in the late 1800s it meandered greatly. Nicollet could possibly have mischarted or misunderstood the creek as flowing to the lake.



By 1857 Anoka County was legally established and getting settled by Europeans. An 1874 map of Anoka County clearly shows the lake with the surrounding landscape, shown as timbered probably with oak. Nearby roads are also shown that became: Main Street which turns north, currently as Crooked Lake Boulevard, shown stopped at the Section line (current boundary between Coon Rapids and Andover), and Bunker Lake Boulevard just north of the lake.

Anoka County, 1874. source: [www.MNHS.org/True North](http://www.MNHS.org/TrueNorth) project

Crooked Lake was being used for community gatherings by the early 1900s. For example, annual picnics were held by Farmers clubs for social and educational purposes. Three sites were rotated annually: Crooked Lake, Lake George, and Camp Salie. In 1921, the Annual Farm Bureau-Farmers Club Picnic



Annual Farm Bureau Picnic at Crooked Lake, 1921. An estimated 2,500 people attended the event.³⁹ Photo: Anoka County Extension Service

was held at Crooked Lake and drew an estimated 2,500 farmers and town folk. The location was probably at Swick’s Resort which had a pavilion, store, and 10 cottages for rent. By 1927, there was an adjacent resort with a dancehall and cottages rented for the season, setting the stage for community activities by regularly-attending families from Minneapolis, 20 miles away. The dancehall later burned down.

The Crooked Lake Farmers Club was an active one. Farmers' Clubs had about one-third of all farmers as members, with 19 clubs in Anoka County. Crooked Lake residents were welcomed to join the local club, going to the old schoolhouse for sponsored oyster-stew suppers or to dances at the dancehall with live music. By 1929, though, the numbers dropped and several clubs shut down and by 1935, the Crooked Lake Farmers Club was one of only 5 or 6 clubs left (History of Agriculture: 1900-45, p. 57, Anoka County Historical Society).

1930s

By the 1930s, Crooked Lake was also used as a 4-H camp site for children. The lake provided the backdrop for teaching agricultural skills, and a place for an early dip and afternoon swimming (Appendix 'x'). During this decade, the southeast shore was split into cabin lots by the Cole/Sewell family, annual resorters who bought the 'dancehall' resort and sold the lots not needed by the family.



Anoka County Agricultural Extension Agent, John L. Currell, gives a demonstration in fitting and blocking sheep during the 4-H Club Camp at Crooked Lake, 1937.⁶⁰
Photo: Anoka County Extension Service



Crooked Lake FERA project (circled), 1938 aerial, ACD.

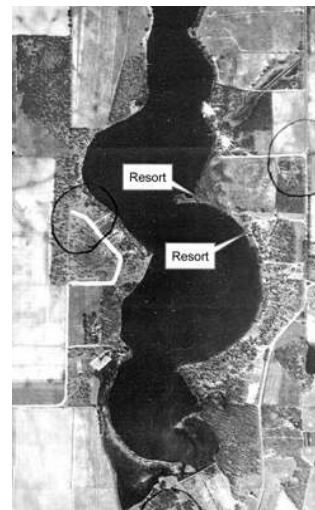
The drought of the 1930s

resulted in very low water levels for the shallow lake. As a result, in 1934 the first recorded management action occurred. The "Crooked Lake Restoration Project" was funded by the Federal Emergency Relief Administration (FERA) to control lake levels. This project consisted of an earthen dyke built at the outlet at the southern tip of the lake and a diversion project in the northeastern quadrant to bring in water from Coon Creek. The work was to be done by the State Emergency Relief Administration which coordinated unemployed workers for public projects, usually funded by the FERA. Due to

complications in management and funding and the project ran from 1934-1941 in Works Progress Administration.

1940s

In the 1940s the Crooked Lake community grew, mainly on the east side near the deepest part of the lake where it was more clear and less weedy. The southern resort in this photo was Swick's Resort, and just south of it was "Ted's" barbershop and gas pump with small store run by Ted & Millie Buzzelli once Ted's father died. This legacy lives on;



Crooked Lake, 1947 aerial, City of Coon Rapids.

Millie still runs the store (she died February 2009). The second resort may be mismarked on the photo according to local history, and would have been south of Swick’s Resort. The Cole-Sewell family community expanded with new lakefront lots and owners in this area. Gatherings were more family-oriented than for the public communities of the earlier 1900’s. Cabins were still rented out and primary access to the lake was through private, not public, property.



Ted’s store, 2008, CCWD

1950s

The 1950s brought change to the Crooked Lake landscape. The first report of fish surveys by the MN Department of Conservation began probably because of a noted fish kill during the winter of 1950-51. Post-World War II prosperity resulted in development in the village of Coon Rapids southeast of the lake. Then in 1959 Coon Rapids incorporated as a city with its northern boundary at the Section line so that approximately 60% of the lake is within the city boundary. This part of Coon Rapids developed slower than the area closer to Minneapolis, so use of the lake as a summer retreat continued. The community of cabin owners pooled resources to hire summer swimming instructors.

1960s

Then Coon Rapids grew into a Minneapolis suburb during the 1960s. The number of homes built in the Crooked Lake watershed more than doubled compared to the 1950s. In 1965 the city proposed an eight-acre park with swimming beach in the location of Swick’s resort. In response, the community of cabin owners reorganized into the Crooked Lake Civic Association (CLCA) and formally opposed the Beach Park; concerns were voiced for the additional “water pollution from possibly hundreds of swimmers.” Other concerns were low lake levels, weeds, and swimmers itch.



Crooked Lake Beach Park, recent aerial photo, City of Coon Rapids.

By 1966, the city of Coon Rapids established Crooked Lake Beach Park. The City also offered “free access” to the lake that same year. After voting down the access since neither the east nor west sides wanted the public access, the CLCA tabled the discussion until they knew what type of access was being considered. As a result, the lake association decided to forego fish stocking, including CLCA requests for walleye; the lake was now considered private and, therefore, not under DNR jurisdiction.

Meanwhile, in the previous fall of 1965 the DNR “reclaimed” the lake by poisoning out the rough fish and then in spring of 1966 stocking walleyes, followed by northern pike. None of the walleye was believed to survive, explained as possibly because “some

toxicity from fall treatment remained when they were stocked the following spring” (DNR letter, 11/21/69).

1970s

By the early 1970s water pollution was confirmed in Crooked Lake. The biological and water quality conditions of the lake were degrading according to a 1971 “Final Report on Crooked Lake Water Quality Investigation” by Norman Wenck of Hickok & Associates. A benthic survey showed a predominance of pollution-tolerant organisms, Oligochaeta and Chironimidae, giving the lake a “semi-degraded” rating. And, phosphorus concentrations were sufficient to support “abundant algae and weed growth.”

The report noted water quality degrading not only in Crooked Lake, but in Coon Creek and the area shallow domestic wells. “The sources of contamination appear to be individual septic systems, both local and upstream along Coon Creek and agricultural runoff to Coon Creek.” A subsequent water quality survey of Coon Creek was done by the MN Pollution Control Agency (MPCA) for by CCWD. Results revealed high concentrations of fecal coliform bacteria and nutrients throughout the creek. The results also showed, however, that agricultural runoff had lower concentrations than the creek at the test station of a tributary at a Ham Lake sod farm.

The Hickok report also looked at the effect of lake level augmentation using the Coon Creek pump. The report concluded that the lake level is “mainly dependent on the elevation of the ground water table in the area,” and that “augmentation can be helpful in replacing the evaporation losses during the summer but cannot economically be used to substantially change the lake elevation.” If augmentation were to happen, “ground water in the deeper aquifers appears to be acceptable for the lake augmentation.” Water from Coon Creek, used before for augmentation, was no longer a viable source for lake level augmentation because of its water quality (non-swimmable).

The first Report recommendation was the installation of a municipal sanitary sewer system to prevent further degradation. A municipal water system was also recommended, as was augmenting the lake levels “from a deep groundwater aquifer” and the inclusion of stormwater recharge basins into any planned storm sewer design. Lake residents were also recommended to prevent organic deposits from entering the lake and to maintain septic systems in good working order. By July 1972, enforcement of new shoreland zoning ordinances regulating septic tanks, land use, shoreline alterations, and structure placement in accordance with the MN Shoreland Management Act of 1969.

The City of Coon Rapids then hired Hickok & Associates for a “Crooked Lake-Coon Creek Groundwater Investigation” into the feasibility of raising the groundwater table in the Crooked Lake area. The May 1972 report recommended moving the Coon Creek control structure to south of Crooked Lake at Main Street, thereby raising the level of the Creek to provide a corresponding rise in groundwater level. The structure could help maintain a stable water level, establish a “ground water contour at 861.0 in the vicinity of Crooked Lake” causing seasonal overflows that could release nutrients. The resulting 100-acre reservoir could also be an open space, recreational, and wildlife resource. In

1973 the City applied to the U.S. EPA for a grant. No known action was taken. In 1974 the CLCA wrote to Anoka County Commissioner, Ed Fields, for the preservation of the Coon Creek-Crooked Lake ditch for future lake level augmentation once the Creek was not polluted. The dam project was not implemented though it was discussed five years later at a CLCA meeting.

The 1970s was also the decade of the largest build-out of residential homes in the lake watershed, primarily from the development of the Peterson farm in the northwest quadrant. Cabins started getting remodeled or torn down for year-round homes. In 1974, the city of Andover was incorporated from Grow Township. By 1975 city sewer was going in from Coon Rapids (planned since 1969), and in 1976 Andover was making Master Storm Sewer plans. Water quality improved in Crooked Lake.

1980s

By the 1980s the build-out slowed down with few lots left in the watershed. Privacy of the lake changed when in 1981 a joint agreement was signed between the City of Andover and the DNR for a public boat ramp with trailer parking located on the north tip of the lake, on Bunker Lake Boulevard. The site was originally the Pearson home that had burnt down, was bought by Grow Township in 1972, and then used as



lake access but parking was across the road at Crooked Lake elementary school (built in 1968). By providing boat access, the lake changed to a public resource and so under the jurisdiction of the DNR again and eligible for fish management.

Winterkill of fish, and muck concerns mostly on the west side of the lake, prompted the CLCA to “re-activate” in 1984 and pursue lake aeration, possibly using a multiple inversion system proposed to also reduce muck. Dredging had already been researched in 1979, but considered expensive and problematic. In 1987, a “Diagnostic & Feasibility Study” by Wenck & Associates recommended winter aeration, and vegetation management only in selected areas since the presence of the existing well-balanced predator-prey fishery would be disrupted with extensive aquatic plant eradication. Winter aeration continued as a priority for the CLCA with the Minneapolis Star Tribune reporting a \$41,000 cost-share between the DNR, Coon Rapids and Andover, plus \$500 by the CLCA with maintenance by the Anoka County Parks. The aeration proved successful at eliminating fish winterkill, and the fishery was managed throughout the decade until Crooked Lake became known regionally for its bass fishing (a permanent aeration system was installed in 1997).

Meanwhile, other issues existed on the lake. By 1985 the public beach had become a magnet for teen delinquency so the city of Coon Rapids put up a fence and charged a \$1 user fee. This caused enough neighborhood controversy that it was reported in the Minneapolis Star-Tribune newspaper. The CLCA renamed itself its current name, the Crooked Lake Area Association (CLAA) in 1986 and boating issues surfaced with

increased recreational use. In 1990, the popular swimming beach was closed. The City cited public safety concerns from turbid water.

1990s

Though weed control had been ongoing since at least the 1960s and done primarily by individual lakeshore owners, the 1990s brought an “about face” to vegetation management by all stakeholders. Eurasian water milfoil (EWM), an invasive plant that thrives in waters with minimal native plant communities, appeared in the lake and quickly became overabundant. Within one year of discovery of EWM the Coon Rapids Herald newspaper reported fear of the lake “strangling to death.” Though bass could use the thick plant growth of EWM for ambush habitat, its impedance to boats and recreational activities plus rapid spread across the state resulted in a call for alarm. In 1992 an experimental whole-lake treatment cost nearly \$13,000. Approximately \$22,000 was raised: 64 property owners donated \$12, 526, CCWD - \$5000, Coon Rapids-\$2500, Andover -\$2000. The money was held in a fiduciary fund at CCWD until the CLAA formed into a non-profit corporation (2008).

2000s

As experience and research grew, both on Crooked Lake and across the state, so did the realization that management of invasive aquatic plants needed to shift from elimination to control. By 2002, the DNR made this EWM management revision statewide. In the meantime, another exotic species, curly leaf pondweed (CLP), started showing up in DNR aquatic plant surveys on Crooked Lake (2001-2005). It is currently being managed in conjunction with Eurasian water milfoil.

Meanwhile, the water quality in shallow, urban Crooked Lake is considered good. The management focus now turns to protection and improvement of water quality. In 2007, the boat landing was re-designed to divert stormwater runoff to pervious pavers and a rain garden. This Comprehensive Plan was initiated. And, the CLAA became a non-profit corporation for fundraising options primarily for ongoing EWM and CLP treatments.

Table 2.3 Summary of Management Activity

Known management of Crooked Lake dates back to 1934 with the construction of both the earthen dam at the south end of the lake and the diversion from Coon Creek for lake level augmentation. Since then eight issues have repeatedly surfaced for Crooked Lake:

Issue	First addressed	Last addressed
Lake Water levels	1934	2000
Fishery, winter kill	1951	2004
Swimming Beach	1966	1990
Water quality	1971	1999
Public Access	1981	2007
Curly Leaf Pondweed – Invasive Species	1982	2008
Water Clarity and Turbidity	1987	2003
Eurasian Water Milfoil – Invasive Species	1990	2008

2.4 Population and Economic Characteristics

Currently 133 parcels are characterized as lakefront property. The majority is single family residential homes but also includes the City of Andover boat launch area at the north of the lake, the Coon Rapids city park in the east, and a townhome complex in the southwest. In addition, 291 parcels are within the contributing lakeshed of Crooked Lake but have no direct lakeshore access.

Median family income in the lakeshed of Crooked Lake is in the \$70,001-\$200,000 range according to 1999 Census data available though the Minnesota Land Management Information Center (www.lmic.state.mn.us).

Table 2.4 Single family residential summary statistics (Anoka County, 2005)

Average lot size	0.62 acres
Average house size	1,373 sf
	3 bedrooms, 2 baths
Average lake frontage	ft
Average House Age	39 years (built in 1968)
Median House Age	35 years (built in 1973)
Oldest house	Built in 1893
Newest house	Built in 2005
Average home cost	\$239,817
Average land worth	\$106,430

Figure 2.4 Crooked Lake Watershed Development Patterns

