



MEMORANDUM

Comfort Lake-Forest Lake Watershed District

Date: October 15, 2026
To: CLFLWD Board of Managers
From: Mike Kinney, District Administrator
Subject: Comfort Lake Carp Movement Study Grant Application



Comfort Lake
Management District

General Background:

This topic was discussed at the [April 9, 2026 regular board meeting](#) as part of the Lower St. Croix (LSC) Watershed Partnership Update. In spring 2026, then President Jackie Anderson attended the Watershed Based Implementation Funding (WBIF) metro convene meeting and requested direct funding in the amount of \$55,000 for the Comfort Lake Carp Movement Study and \$135,500 for the natural shoreline initiative. This request for direct funding was denied by a vote of the members present, but the District can still apply for funding through the LSC Partnership.

Watershed Based Implementation Funding (WBIF):

The District does not have funding for this study in the 2027 budget, and it would rely on obtaining grant funding to proceed. If the Board wishes to move forward with the study, the District may request funding for this study through the Lower St. Croix Watershed Partnership's WBIF process which was outlined in the [April memo](#).

The LSC Policy Committee will consider the draft biennial work plan, including FY27 WBIF grant budget, at its October 26th meeting. Partners will then bring the budget and work plan to their local boards for approval in November/December. As of now, the draft budget includes funding under the Planning and Assessment activity for work such as a carp movement study.

Partners may apply for FY27 WBIF funds starting in 2027. The application deadline for projects equal to or exceeding \$50,000 is March 31, 2027. The application deadlines for projects less than \$50,000 are January 27th, April 28th, and July 28th.

Carp Movement Study Background and Recommendation:

Carp are an aquatic invasive species (AIS) that can be detrimental to lake water quality by disturbing lake bottoms through their feeding behavior. Effective carp control requires a survey to determine population size, then a movement study to identify spawning areas, and finally barrier installation and actual fish removal.

In 2024, the Comfort Lakes Association (CLA) hired WSB, a consulting firm, to complete a survey (enclosed) to determine the population and biomass of carp in Comfort Lake. This survey was conducted using boat electrofishing, with the hourly capture rate used to model a pounds per



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acre of carp estimation. The generally held threshold value for detrimental carp populations is 89.9 lbs/acre.

Department of Natural Resources (DNR) fish surveys first report carp in 1990 but catch rates have remained low including the most recent in 2018. WSB visited Comfort Lake three times and Little Comfort Lake twice in 2024 and conducted electrofishing surveys which modeled carp populations for Comfort Lake as 109.4 +/- 26 lbs/acre and Little Comfort as 64.3 +/- 31.7 lbs/acre. Both modeled lake ranges contain population estimates that are above the harmful threshold. However, the error range is large for both estimates, and water quality trends have been positive for both lakes.

This survey completed the first step in effective carp control and provided estimated population. The next step would be a movement study to determine how the carp in Comfort Lake and Little Comfort Lake interact with the larger Sunrise River system and its associated wetlands. It is likely that the carp are exiting the lakes and spawning in the Sunrise system. Therefore, the next step would be a movement study, which would be accomplished by capturing carp, radio-tagging, releasing, and tracking. This data would then be used to create an integrated pest management plan (IPM) which would create the blueprint for carp control if the population reached a detrimental level. Due to the number of inlets/outlets the IPM would likely need a combination of barriers and removal to be effective.

Staff have met with companies and partners to discuss strategies and costs for a movement study. Estimated costs ranged from \$33,000-\$60,000, divided equally between two years. While carp populations do not appear to be detrimental to either lake, carp numbers can increase drastically if conditions are favorable to large recruitment. It would be proactive to acquire a LSC Grant to fund the movement study as proper management requires understanding the system which is a multi-year endeavor. Further barriers or removal efforts would require additional funds that would not be included in this grant application. Finally, staff have also met with MN DNR staff who have indicated that the DNR would not be supportive of new fish barrier installation in a natural river system like the Sunrise. Due to the seasonal nature of spawning, temporary barriers could be used but would represent a reoccurring cost.

Potential Motion:

Manager _____ moves to authorize the District Administrator to submit a grant application to the Lower St. Croix Watershed Based Implementation Funding grant and to execute the grant agreement, if awarded. Seconded by Manager _____.

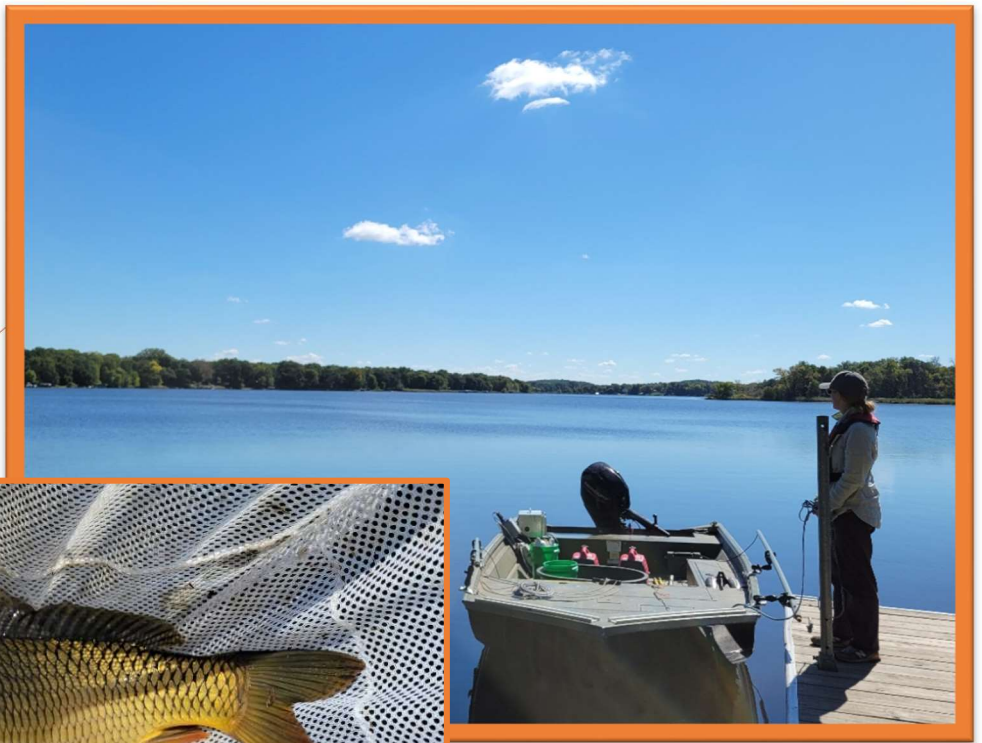
Attached

Comfort Lakes Carp Assessment 2024 WSB Report

3/17/2025

Comfort Lakes Carp Assessment 2024

Prepared for the Comfort Lakes
Association (CLA), Forest Lake,
Minnesota



Mary Newman

WSB SENIOR ENVIRONMENTAL SCIENTISTS

Introduction

In 2024 WSB was commissioned by the Comfort Lakes Association (CLA) to complete an assessment of the population of Common carp (*Cyprinus carpio*), in Big Comfort Lake and Little Comfort Lake located within the Comfort Lake Forest Lake Watershed District in the east central part of Minnesota near Forest Lake and in Chisago County. Anecdotal reports from lake residents suggest the presence of Common Carp and MN DNR surveys confirm their presence, but the density of the population and potential impact to in-lake water quality was unknown prior to the 2024 survey period. The Comfort Lakes Association is interested to know what the potential impact the carp population is having on water quality in the basin.

Carp may play a role in poor water quality as this species is a bottom feeder. This type of feeding behavior can accelerate phosphorus loading from the in-lake sediments as these sediments are disturbed. In some cases, phosphorus loading and the uprooting of nearshore plants leads to a system that is dominated by algae and does not support gamefish habitat due to low light conditions and the absence of aquatic plants. The severity of the impact is strongly correlated with the density of the carp population. In high abundance, carp can be considered an internal loading source of nutrients, namely Phosphorus.

Comfort Lake and Little Comfort Lake management areas are interconnected with streams and wetland areas. This environment is ideal for common carp reproduction as they often rely on connected shallow wetlands and waterbodies that are devoid of predators for spawning and recruitment. There may also be seasonal fluctuations of carp abundance based on migration, spawning, feeding, and overwintering patterns. Common carp can be managed to reduce or eliminate their impacts on water quality, native aquatic vegetation and indirect impacts to fisheries, waterfowl and overall ecological integrity.

This report includes results from the 2024 carp population and biomass survey in relation to lake water quality and provides recommendations for monitoring and managing the carp population in the future.

Background

Comfort Lake and Little Comfort Lake are neighboring basins in the Comfort Lake Forest Lake Watershed District and separated only by a culvert under a roadway. Water flows into Little Comfort from School Lake to the south and ultimately flows to the Saint Croix River through the Sunrise River as it leaves Comfort Lake to the north. The watershed upstream of Little Comfort and School Lake include a series of wetland areas Bone, Moody, and Birch Lakes. A second inlet enters Comfort Lake in the northwest portion of the lake that drains from Forest Lake, through the Sunrise River and a large wetland known as Shallow Pond. Land Use in the Comfort and Little Comfort Lake watersheds is dominated by wetland and cropland (~50%) followed by medium density development (~18%).

MN DNR data from trap net surveys in Comfort Lake. Adult carp did not begin to appear in MN DNR regular sampling until 1990 and in low numbers. Catch rates for common carp remained low in the standard gill net and trap net sampling in 1995, 2000, 2005, 2010, 2015, and 2018. Bluegill catch rates in the 2018 standard trap net survey were above normal range while body size remains small on average. Abundant bluegill populations should limit successful carp spawning, as they are known to predate on carp eggs and larvae.

A trap net survey of Little Comfort Lake was conducted by Blue Water Science in September of 2016 to determine if young carp were present. In the 2016 survey, 2 adult carp were sampled for an average of 0.3 carp/net and zero young carp were sampled. It is likely that carp can move back and forth from Comfort to Little Comfort through Highway 8 culvert. The number of bluegills caught per net of 84.4 bluegills per net was higher than the normal range of 6.5-59.6 for a lake like Little Comfort lake.

Efforts have been made to limit the population of carp in Bone Lake, upstream of Comfort and Little Comfort Lakes. A barrier exists on the outlet of Bone Lake that is maintained by the Watershed District. Bone Lake carp population is thought to be low as a result of this effort.

Carp that are downstream of the Bone Lake carp barrier may utilize the ponds and wetlands upstream of Comfort Lake to complete their life cycle. Several open connections exist downstream from Comfort Lake. This includes an outlet to the Sunrise River, which eventually drains to the Saint Croix River and an inlet from the Sunrise River connecting upstream Forest Lake. Management actions with upstream barrier at Bone Lake, may have changed the movement and utilization by carp of downstream lakes.

Both Comfort Lake and Little Comfort Lake are listed on the MPCA's Impaired Waters List for excess nutrients, having an impact on aquatic recreation. A total maximum daily load (TMDL) study was completed in 2010 followed by a TMDL implementation plan, approved by the MPCA in 2010. The report cites a 70% reduction to internal loading and a 67% reduction from upstream School Lake is needed to meet TMDL allocations in Little Comfort Lake. The report cites a 0% internal load reduction needed in Comfort Lake and a 21% reduction from loading coming from upstream Little Comfort Lake to meet TMDL allocations.

TMDL Implementation plan suggests rough fish management in Little Comfort Lake to reduce internal loading of nutrients. Other projects suggested to address internal loading of nutrients include alum treatments, and curly leaf pondweed management. To pursue rough fish management, the 2024 study aimed to quantify the population of carp in Little Comfort and Comfort Lakes. This is the first step in carp management.

The methods and results of this study are described in this report, followed by recommendations to begin a carp management program in the Comfort and Little Comfort Lake Management areas with the goal to reduce nutrient loading and improve water quality.

Methods & Results

1. Catch Per Unit Effort (CPUE) Survey for Common Carp

In 2024, a permit was acquired from the MN DNR to complete three (3) visits to the lakes with an electrofishing boat to survey the carp population. To complete an estimate of the carp population, WSB scientists use a boat electrofishing unit to capture carp and estimate the abundance using a catch per unit effort (CPUE) model. To do this, the number of carp captured per hour is combined with the average weight to calculate a pounds per acre estimation. This estimate gives managers a better idea about the severity (low-medium-high) by which these fish are impacting the ecological integrity of the lake and can manage resources accordingly.



Big Comfort Lake

Comfort Lake was visited on three dates in 2024 to fit the carp CPUE model of estimation. These dates were August 29, September 16, and September 25. At least three transects were traversed on each date and lasted approximately 20 minutes each and carp that were seen were netted. Length and weight were recorded along with time spent fishing to fit the data to a model of estimation.

The results of the 2024 CPUE estimate on Comfort Lake is 109.4 ± 26 lbs/acre (Table 1). This population estimate for carp can be compared to the threshold value that scientists have assigned where carp are known to be damaging to a system, this threshold value is 89.9 lbs/acre.

Date 2024	Transect	# Carp Captured	CPUE by Date	2024 CPUE (lbs/acre)	CPUE Threshold Value
August 29	1	4	128.5	109.4 +/- 26.0	89.9 lbs/acre
	2	0			
	3	8			
September 16	1	5	127.2		
	2	4			
	3	2			
September 25	1	1	72.6		
	2	5			
	3	1			

Table 1 Comfort Lake 2024 Carp CPUE results.

Sampling in Comfort Lake was typical of this lake type. Most shoreline areas were easy to traversed and carp were easily seen and netted when they entered the electric field. The average size of carp captured in this survey was 22 inches and average weight was 5 pounds. The length frequency is described on page 7.

Little Comfort Lake

Little Comfort Lake was visited on two dates in 2024 to fit the carp CPUE model of estimation. These dates were September 16, and September 25. At least three transects were traversed on each date and lasted approximately 20 minutes each and carp that were seen were netted. Length and weight were recorded along with time spent fishing to fit the data to a model of estimation.

The results of the 2024 CPUE estimate on Little Comfort Lake is 64.3 ± 31.7 lbs/acre (Table 2). This population estimate for carp can be compared to the threshold value that scientists have assigned where carp are known to be damaging to a system, this threshold value is 89.9 lbs/acre.

Little Comfort Lake sampling was difficult due to the abundant aquatic vegetation that comprised mostly of coon tail. Thick mats of coon tail were hard to traverse with boat and motor and carp may have been hard to see through them. Shallow conditions on the south end of Little Comfort Lake proved hard to traverse, however carp were seen evading the boat through these shallow waters. These observations lead us to believe the carp population may be at the high end of the estimate of 32.6 to 96 pounds per acre (Table 2).

Date 2024	Transect	# Carp Captured	CPUE by Date	2024 CPUE (lbs/acre)	CPUE Threshold Value
September 16	1	1	32.6	64.3 +/- 31.7	89.9 lbs/acre
	2	0			
	3	2			
September 25	1	1	96		
	2	2			
	3	1			

Table 2 Little Comfort Lake 2024 Carp CPUE results. Observations in the field lead us to believe that the carp population may be at the high end of the estimate (96 lbs/acre).

Comfort and Little Comfort Lake Carp Length Frequency

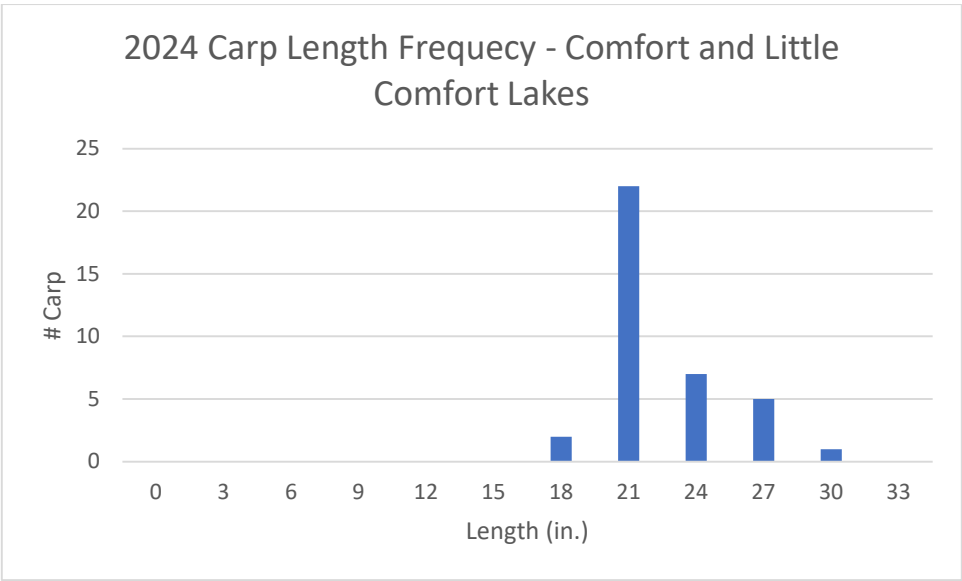


Figure 1 Comfort and Little Comfort Lakes Carp length frequency using carp captured in the CPUE survey on all survey dates.

In total, a small sample size of 37 carp were captured and measured for length (Figure 1). The smallest carp captured was 18 inches long and on average, carp were 21.5 inches. This range of lengths may represent one or two age classes and no young of the year carp were sampled. To better define the ages of carp and how often they recruit young to this system of lakes, an aging study could be pursued.

Carp were first sampled in MN DNR surveys in 1990. An aging study would determine if the age of this average length fish is 35 years old or if new carp are recruiting into the system. If removal of carp biomass is pursued, it is important to understand and control the frequency of recruitment.

Discussion and Recommendations

A typical management plan for common carp begins with a population estimate, which was pursued under this study in 2024. These survey results indicate that the population in Comfort Lake and Little Comfort Lake is slightly above the threshold to where carp are known to be damaging to water quality. It has also been noted that these basins are connected to a series of streams and wetlands within the Comfort Lake Forest Lake Watershed District. These connections likely play a vital role in the life history of common carp.

Because of the interconnected nature of the system, it is recommended that management be linked to an integrated pest management plan (IPM) for common carp. This type of plan is a living document that compiles data and plots a course of management actions to reduce the population and biomass of carp while incorporating strategies that keep the population suppressed. This type of document would give a roadmap for carp management and provide a way to track progress towards goals set for waterbodies throughout the Comfort Lake Forest Lake Watershed District.

A movement study may reveal that other large lakes in the district impact or are impacted by the carp population in Comfort Lake and Little Comfort Lake. A district wide study should be considered to understand how management actions have impacted the carp populations and to determine additional steps to suppress them. As spatial usage is studied, a reduction of the carp population could be pursued. We would be happy to discuss these and other management actions as a workplan is produced.