

# 2024 MN Watersheds Project & Program of the Year

## Detailed Award Information Form

**1) Award Category (check one)**

Project                                  Program          x

**2) MAWD Region (check one):**

One                                  Two                                  Three x

**3) Watershed District:** *Rice Creek Watershed District*

**4) Project/program name:** *Carp Management Program*

**5) Nominator (if different from above watershed district)**

**6) Project/Program Summary (Limit 150 words) to be read at the awards program during the annual meeting banquet:**

*The Rice Creek Watershed District (RCWD) developed a program to manage invasive common carp and improve water quality in the Long Lake / Lino Chain of Lakes system. Initial assessments revealed carp densities of 670 kg/ha, nearly seven times the ecological damage threshold, contributing to algae blooms and poor lake conditions. In collaboration with the Minnesota Aquatic Invasive Species Research Center and Carp Solutions, the RCWD used an integrated pest management approach and innovative technologies, including a low-voltage barrier and guidance system, previously unused in carp management worldwide. Through these efforts, over 400,000 pounds of carp were removed, densities were reduced by 88%, and the management goals were met. This led to improved water quality, with phosphorus concentrations in Long Lake reaching their lowest levels in 38 years. The program continues to deliver long-term water quality and recreational benefits for the watershed.*

**7) Define need:**

*The need for the RCWD carp management program arose from poor water quality conditions in the Long Lake / Lino Chain of Lakes system. Nutrients levels were high, algae blooms were common and occasionally severe, and healthy lake plants were absent. Poor water quality conditions negatively affected usage of the Long Lake Regional Park, and important regional resource. Poor water clarity in the Lino Chain limited usage by waterfowl, which depend on native plants (then absent) as a food source. A survey of common carp revealed exceptionally high densities – nearly 7 times the ecological damage threshold. At high densities, carp disturb lakebeds while feeding, resuspending phosphorus-laden sediments, which fuel frequent algae blooms and degrades water clarity. Without effective management, these invasive species would continue to exacerbate water pollution and prevent native aquatic plants and fish from thriving. Addressing this problem was critical for improving overall ecosystem*

health, reducing phosphorus levels, and enhancing the recreational value of the lakes for the surrounding communities.

#### **8) Goal/purpose of the project/program:**

The goal of the RCWD carp management program was twofold:

1. **Short-term goal:** To reduce invasive common carp densities in the Long Lake and Lino Chain of Lakes system to below 100 kg/ha, a critical threshold for minimizing their ecological damage. This reduction would help alleviate the immediate water quality issues caused by carp, including frequent algae blooms and poor water clarity.
2. **Long-term goal:** To improve water quality and lake health. This includes meeting state standards by addressing the root causes of water degradation. The program aimed to restore ecological balance and improve recreational opportunities for the local community.

The **purpose** of the program was to enhance water quality, restore native aquatic life, and improve lake health by managing the invasive carp population through innovative, adaptive management techniques. This effort aimed to create long-lasting ecological and recreational benefits for the watershed.

#### **9) Describe project/program:**

To address poor water conditions in Long Lake and the Lino Chain, the RCWD initiated several large projects and programs, including regional stormwater treatment, stream restoration, and a carp management program. The RCWD carp management program aimed to improve water quality in the Long Lake and Lino Chain of Lakes by carp densities. Without managing carp, water quality standards would not be met.

In collaboration with the University of Minnesota, the Minnesota Aquatic Invasive Species Research Center, and Carp Solutions, RCWD developed a detailed carp management plan, informed by Integrated Pest Management principles. The management plan included many inputs, including detailed data on carp seasonal migration, recruitment areas and rates, and a population model that could estimate future carp densities based on various management scenarios. A systematic, data-driven approach was used. Early data collection and management tool development was partially supported by a Clean Water Fund Grant. Several novel management tools were developed during program implementation. This included innovative tools like a low-voltage electric barrier and guidance system barrier from Poland. A system like this had never been used to manage carp, both in the United States and worldwide. Considerable research and development were needed to design and optimize the system. This resulted in several peer-reviewed research papers and at least a dozen conference presentations. This system, along with other tools like baited-box nets, led to the removal of 400,000 pounds of carp. Removal of carp was paired with migratory barriers, limiting carp reproduction. Overall, these efforts reduced their density by 88% to 90 kg/ha. Continuous refinement of the management approach is done, including tracking efficiency of management tools annually, and modifying the approach as needed.

*The program's long-term goal was to lower phosphorus levels, which by 2022 reached their lowest in 38 years. Funded by a mix of state and local sources, the program also improved recreational opportunities on Long Lake and engaged new stakeholders in watershed management, providing lasting environmental and community benefits.*

**10) Describe public benefit:**

*The program improved water clarity and quality in Long Lake which directly benefits residents and visitors by creating a healthier ecosystem for recreational activities like swimming, fishing, and boating. Long Lake's improvement attracts more outdoor enthusiasts, increasing visitation and tourism to the area.*

*It also restored the natural balance of the lake's ecosystem. Healthier aquatic habitats support native fish and plant species, promoting biodiversity and enhancing the overall ecological integrity of the lake. It actively involved local stakeholders, including residents, lake association, and community organizations. It utilized a unique public-private partnership model, combining the expertise and resources of the RCWD, academic researchers, and private sector consultants. This collaboration enabled the development of innovative management tools, like the low-voltage barrier from Poland, showcasing new methods for addressing invasive species in freshwater systems.*

**11) Watershed plan reference** (where is the problem/solution identified in the watershed plan, does it address stated problems, objectives and goals):

*Section 3 of the RCWD's Watershed Management Plan identifies "Nutrient Enrichment, Algae, and Cultural Eutrophication" as a priority issue. Goal "WQ-4" (Section 3.2.5.4) calls for protecting and improving water quality conditions by managing nutrient loading and restoring aquatic ecosystems. The Plan specifically identifies Long Lake and the Lino Chain of Lakes as being impaired and requiring management.*

**12) Was project goal achieved? If so, how was the success measured?**

*Yes. The short-term program goal was to reduce carp densities below 100 kg/ha, and this was achieved. Carp densities are estimated annually with electrofishing and mark-recapture surveys. The long-term goals were also met, with improved water clarity and native plant converge and diversity. These were measured as part of the RCWD's water monitoring program; water chemistry and plant data were collected throughout the system. To maintain these gains, continued implementation of carp management is required. This responsibility is affirmed by the RCWD Board's adoption of along-term carp management plan, and annual budgeting for the program.*

**13) Watershed or water body name to be protected or improved by project or program** (if applicable)

*Long Lake (New Brighton, MN) and Lino Chain of Lakes (George Watch, Marshan, Rice, and Baldwin Lakes)*

**14) Watershed or water body information** (e.g., size, watershed area, classification, description):

*Long Lake is 173 sq acres in size and 27 feet at its deepest point. Long Lake is nutrients (phosphorus), and algae blooms have been frequent and occasionally severe in past years. Long Lake Regional Park, which includes multiple pavilions, trails, and a busy beach, is one of the most visited parks in Ramsey County, making Long Lake an important regional resource. Long Lake has a large watershed and is highly connected to many shallow lakes and wetlands. Long Lake is connected to the Lino Chain of Lakes by Rice Creek. The Lino Chain, which includes George Watch, Marshan, Rice, Baldwin, and Reshanau Lakes, are very shallow, with maximum depths of only about 6 feet. The Lino Chain also routinely experienced high nutrient levels and algae blooms, with nutrients and algae being transported downstream. The Lino Chain also routinely experienced high nutrient levels and algae blooms, with nutrients and algae being transported downstream to Long Lake.*

**15) Project partners** (financial or inkind support)

<u>Agency or organization</u>	<u>% Participation</u>
<i>Minnesota Aquatic Invasive Species Research Center (U of MN)</i>	20 %
<i>BWSR (Clean Water Fund Grant)</i>	10 %
<i>Rice Creek Watershed District</i>	70 %

**16) Start date: 1/1/2016**

**17) Project status:**

On-going Project/Program on going

Completed:                      Completion date:

**18) Project cost** (this can be provided as total cash cost or a breakdown can be provided to show the cost of various project elements and partners):

The total cost for program development and implementation over 10 years is approximately \$2,000,000. The project partner breakdown above indicates costs borne by each organization.

**19) Letters of support:**

Each application may have up to two letters of support. The letters can be from individuals, agencies, organizations, or local units of government. Letters from staff or managers of the sponsoring District will not be accepted. Attach letters to this application as a pdf document.

**20) Photos:**

As noted in the instructions, each nomination must be accompanied by **at least 4 (4) photos**, but no more than eight (8) of the project or program. The photos must be in a digital format.



October 23, 2024

Dear Minnesota Watersheds Award Committee,

On behalf of the Long Lake Improvement Association (LLIA), we offer this letter of support for the Rice Creek Watershed District's Carp Management Program, for consideration of the *Program of the Year* award.

Long Lake, located in New Brighton, MN, is considered a top recreational destination in the area. The LLIA represents 140 homeowners that live on Long Lake, as well as several easements that provide deeded access for multi-unit residential. We are an active association, hosting regular events throughout the year, and an annual meeting. Our organizational goals are to educate residents and the general public as to the natural resources in the community, to preserve those natural resources for community use, and to conserve wildlife for community enjoyment. Our membership cares about Long Lake, and is passionate about conservation!

The Rice Creek Watershed District (RCWD) has been an incredible partner for cleaning up the lake. Their Long Lake Targeted Watershed Project, which includes the carp management program, was a huge effort for our lake. RCWD regularly attends our annual meeting to provide project and program updates, and the LLIA shares in information on our website (<https://llia.wildapricot.org/Carp-Control>). The RCWD's carp management program has been an amazing success, decreasing our once large carp population down to a manageable amount. LLIA residents have noticed positive changes in the lake in recent years, including noticeably cleaner water.

Once again, we are pleased to offer our support for the Rice Creek Watershed District's Carp Management Program for consideration of MN Watershed's Program of the Year.

Sincerely,

A handwritten signature in cursive script that reads "John Broghammer".

John Broghammer

LLIA President



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3180 Ryan Ln, Little Canada, MN  
[www.CarpSolutionsMN.com](http://www.CarpSolutionsMN.com)

October 22, 2024

Minnesota Watersheds Awards Committee

Dear Committee Members,

It is a great pleasure to provide my strongest recommendation for Rice Creek Watershed District receiving the Program of the Year award for their common carp management program in the Long Lake/ Rice Creek system.

I have been working with RCWD for over a decade, first as a University of Minnesota researcher and then as the contractor who was involved in designing and conducting the carp management. Over that time, working closely with Matt Kocian and other members of RCWD, we were able to design and implement a highly innovative and successful program for managing common carp. As a result of this program, common carp biomass and abundance have been reduced from over 600 kg/ha to below 100 kg/ha, reaching the coveted goal for lake restoration. A roadmap for carp management in similar systems has also been developed because of this work.

This success is worth special recognition because Long Lake represents a unique case where adult carp have access to extensive nursery sites (six large nursery lakes) both upstream and downstream of the lake and historical data showed that hundreds of thousands of juveniles could be produced in those nurseries each year, if not for the management actions. While successful carp management efforts have been conducted in other lake systems in Minnesota in the past, none were as challenging and requiring such a systematic and effective approach as the one in Long Lake, in my experience.

Several attributes of the RCWD's Program deserve special recognition:

1. Systematic, data driven approach – RCWD collaborated with several UofM researchers and contractors to document key elements of carp's life history in the Long Lake system. This included initial carp abundance, biomass and age structure, seasonal spawning migrations, dispersal patterns of juveniles, recruitment and mortality rates, seasonal aggregations both natural and induced by bait. This data was critical in developing and executing the management program.
2. A true Integrated Pest Management Strategy – using the collected data, RCWD employed a cutting-edge, individual-based carp population model to run various

management scenarios to narrow down most likely combination of tools and strategies to achieve management success. This involved multi-pronged strategies that targeted multiple weaknesses in carp's life history. The backbone of the program was the use of low-Voltage fish guidance systems (below) and remotely controlled baited box nets to reduce the abundance of spawning adults.

3. Pioneering cutting-edge technologies for carp management – RCWD implemented the first ever (globally) application of the low-Voltage fish guidance and aggregation systems for removing common carp (or any fish for that matter) during their seasonal migrations. This system is truly unique because it allows for removal of large numbers of carp in a (largely) hands-free manner. Carp deterrence, guidance, crowding and trapping all occur autonomously, which reduces cost and increases efficacy. The applications of similar systems are now considered by multiple groups in North America for management of common carp and other invasive fish. The novelty and significance of this technology is also evidenced by three peer-reviewed publications on the subject coauthored by RCWD staff.
4. Scientific Contributions – at least five peer-reviewed publications have been published as a result of this program. While many carp management programs produce reports and presentations, publishing peer-reviewed papers places RCWD's work on an entirely different level of scientific rigor. These publications now serve the global community of researchers and managers working with common carp or other invasive fish, to which many findings of RCWD's program are applicable.

I have had the opportunity to participate in dozens of carp management efforts. The one conducted by RCWD stands out as one of the most data-driven, collaborative and systematic. Its success is the best testament to its quality. I believe RCWD's carp management program in Long Lake will serve as an example to others and for that I believe they deserve this award.

Sincerely,

Przemek Bajer

A handwritten signature in black ink, appearing to read 'Przemek Bajer', written in a cursive style.

CEO, Carp Solutions LLC  
Research Assistant Professor, University of Minnesota

















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