



April 19, 2018

Ms. Cassy Ordway, President
Long Lake Waters Association
PO BOX 195
Long Lake, MN 55356

Re: Proposal to Provide Obstruction Removal and Carp Management Services – Long Lake
Long Lake Creek Subwatershed Partnership

Dear Ms. Ordway:

I am pleased to offer this proposal to provide lake bottom obstruction removal, carp removal, and carp management services to the Long Lake Creek Subwatershed Partnership, which includes the City of Long Lake, City of Medina, City of Orono, Long Lake Waters Association, and the Minnehaha Creek Watershed District.

Carp management is identified in the Long Lake Total Maximum Daily Load (TMDL), and other planning documents, as an implementation activity to improve water quality in Long Lake and the greater subwatershed.

To address the issue of an overabundant carp population in Long Lake and the greater subwatershed, WSB will partner with JR Commercial Fish to:

- 1) Remove items that may be obstacles when netting Long Lake,
- 2) Quantify the carp population,
- 3) Track and identify carp aggregations,
- 4) Remove a portion of the carp population,
- 5) Complete ageing of a subsample of the carp population.

This proposal combines two (2) previous proposals dated December 12, 2017 and March 1, 2018 and adds an ageing component as well as one additional fall electrofishing survey.

SCOPE OF SERVICES

This proposal provides a basic approach that blends data collection with project implementation. Discussion with commercial fishing crews, that would be tasked with carp removal operations, indicate that collecting data on carp abundance and location is critical to successful project implementation.

Prior to beginning any field work, WSB staff will secure a MN DNR fisheries research permit.

Anecdotal information suggests that carp biomass is elevated in Long Lake and the greater watershed. To definitively confirm this, we propose to complete both an electrofishing catch per unit effort (CPUE), and a mark-recapture population estimate. These activities can be completed simultaneously and will provide both project partners and the commercial fishing crews with an estimate of the amount of carp biomass in Long Lake. To develop the mark-recapture estimate, carp captured during the spring and fall electrofishing surveys will be fin clipped and released for recapture.

One (1) electrofishing survey will be completed in the spring of 2018. During this survey, we will measure and weigh a subsample of carp to be used for calculating biomass and length-frequency. Seven (7) carp will be implanted with high frequency radio transmitters. The remaining carp will be marked with a fin clip for developing the mark-recapture population estimate.

Radio tagged carp will be tracked ~1-2 weeks after surgical implant via telemetry surveys to document position within the subwatershed. We anticipate completing four (4) spring/summer telemetry surveys. Radio tag locations will be recorded and added to an internal geodatabase used to produce survey maps for each telemetry survey.

Long Lake has a number of obstructions on the bottom of the lake that currently prevent the lake from being seined. To address this, JR Commercial Fish proposes to remove the obstructions. This will involve pulling a net through the areas where carp are assumed to aggregate. The net will allow commercial fishing crews to locate the obstructions. Once obstructions are located, a diver will attach a line to each of the obstructions and the obstruction will be pulled from the lake. WSB will provide an update to the partnership on where, what type, and how many obstructions were located before being removed. Under this proposal, it is assumed that the City of Long Lake will dispose of the obstructions. We anticipate this work being completed in late spring/early summer 2018.

Starting in late summer/fall 2018, we will complete three (3) electrofishing surveys on Long Lake. These surveys will allow us to create a catch per unit effort (CPUE) model to calculate the number of individual adult carp per acre, carp biomass per acre, and total biomass for Long Lake. Additional carp will be measured for length, weighed, fin clipped, released, and the remaining three (3) radio tags implanted. Three surveys should provide a reliable estimate over a range of environmental conditions and calendar period.

Telemetry surveys will be resumed in late fall/early winter 2018 to identify carp aggregations. This data will be provided to commercial fishing crews to facilitate a removal of a portion of the carp biomass.

After obstructions are removed, the carp population quantified, and carp are surgically implanted, WSB staff will work with JR Commercial Fish to identify when and where carp aggregations occur. This will be accomplished through a series of telemetry surveys.

Under this proposal, JR Commercial Fish will complete one under ice or open water removal attempt using a large seine net.

Additional carp removals may be completed based on the percentage of biomass removed in the first removal. This percentage will be calculated using the population estimate developed as part of this proposal. We will require authorization from the City of Long Lake and the Long Lake Creek Subwatershed Partnership for additional removals.

Carp ageing has been added to provide additional data on carp population metrics and develop an initial understanding of the carp age structure in Long Lake. Budgetary constraints limit the ability to collect a large enough subsample to develop a holistic age structure for the Long Lake carp population, but under this proposal we will collect ageing structures (otoliths) from a subsample of 60 adult carp. These samples will be cross sectioned, mounted, and read. To reduce gear bias and provide a more representative sample, we may collect portions of the subsample during spring electrofishing, fall electrofishing, and netting operations. This ageing data can be paired with length frequency data to determine recruitment intervals and specific age classes associated with peaks identified in length-frequency data.

A final report will be drafted and submitted after carp removals and subsequent data collection have been completed. The report will include data from 2018 telemetry surveys, carp metric data, population/biomass estimates, biomass removal totals, and recommendations.

DELIVERABLES

- MN DNR Fisheries Research Permit
- Obstruction removal
- Technical Report of Carp biomass and population estimate, removal metrics, and residual biomass
- Map for each telemetry survey date in standardized format
- Seine netting attempt
- Long Lake carp ageing data

SCHEDULE AND FEES FOR PROFESSIONAL SERVICES

Schedule for Long Lake Carp Management

Task	2018							2019
	April	May	June	August	September	November	December	January
Secure MN DNR Permit								
Obstruction Removal								
Electrofishing Surveys								
Radio Tag implants								
Telemetry Surveys								
Carp Removal								
Report								

This timeline assumes that the permit is issued in April 2018, aggregations form in winter 2018/2019, and ice is safe for vehicle traffic by January 2019. Commercial fishermen have reported that an increase in ice spearing activity may limit the ability of seine netting in winter months. This will have to be addressed or monitored to facilitate removal operations. If spearing blocks and markers interfere, removals may need to be delayed until spring 2019.

Long Lake Carp Management Budget (WSB Fees)

Task	Total
Project Management	\$1,040
Secure MN DNR Fisheries Permit	\$430
Spring Electrofishing Survey (1)	\$2,030
Radio Tag Implants	Included above
Telemetry Surveys (spring and winter, 40 hours)	\$3,440
Fall Electrofishing Surveys (3)	\$3,498
Data Management/GIS	\$820
Removal Supervision	\$1,720
Reporting	\$903
High Frequency Radio Tags (10 @\$200)	\$2,000
Surgical Supplies	\$75
Ageing (structure extraction, prep, and reading; assumes 60 adults)	\$2,075
Total	\$18,031

Long Lake Carp Management Budget (JR Commercial Fish Fees)

Task	Total
Base Diving Fee	\$2,500
Obstruction Removal (\$3,000/day)	\$12,000
Under Ice Seining Contingency Fee	\$5,000
Total	\$19,500

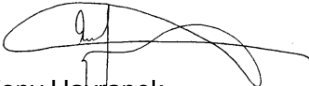
The under-ice seining contingency fee may not be charged if a commercial amount of carp biomass is captured (35,000 pounds). This project is to be billed monthly and charged on an hourly basis; not to exceed the amount specified in the WSB and JR Commercial Fish fee tables above.

Monthly updates will be provided to the partnership in written form.

If you wish to authorize this work, please sign below and return a copy to WSB. We are prepared to begin work in April 2018. Please contact me with any questions you may have at (612) 246-9346 or thavranek@wsbeng.com or Jeff Riedemann at (763)244-4122 or jnriedemann01@live.com.


Sincerely,

WSB & Associates, Inc.



Tony Havranek
Sr. Ecologist

JR Commercial Fish



Jeff Riedemann
Owner/Commercial Fisherman

ACCEPTED BY:

Entity _____

Signature _____

Printed Name _____

Date: _____