

Technical Memo

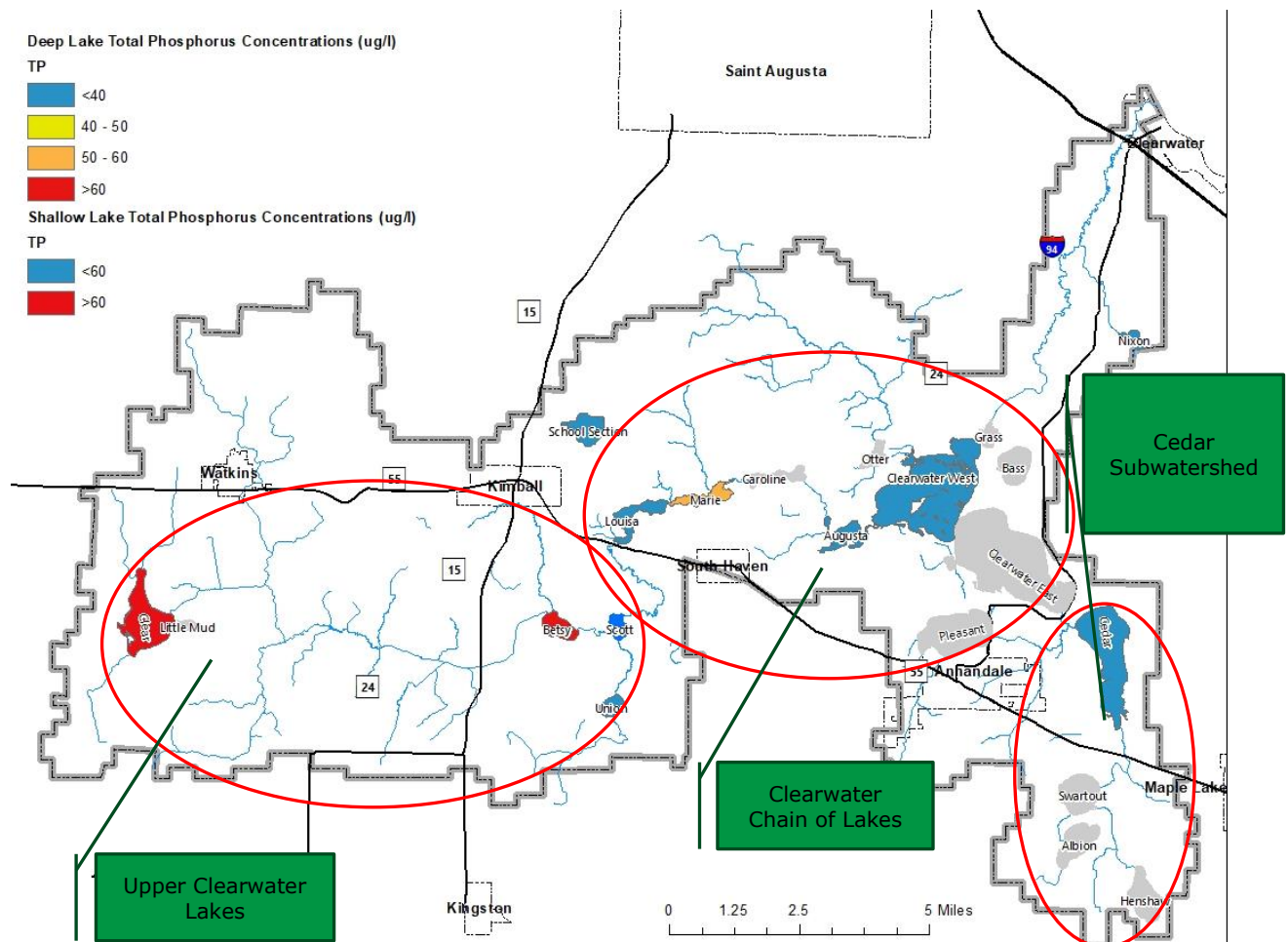


Resilience
RESOURCES LLC

To: Carp Solutions
From: Rebecca Carlson, P.E. (MN)
Date: November 1, 2022
Subject: Carp Management

Purpose:

Informal summary of existing rough fish management in the Clearwater River Watershed District to develop a scope and obtain quote for carp population evaluation and population management strategies in Cedar Subwatershed, the upper chain of lakes and the Clearwater Chain of Lakes.



Cedar Lake Subwatershed:

The Cedar Lake Restoration Study (2006) evaluated the sources of nutrients to Cedar Lake and three upstream shallow lakes tributary to Cedar: Swartout, Albion and Henshaw.

The Engineer recommended rough fish management in 2006 along with installation of multiple capital improvement projects which were implemented between 2007 and 2018 to filter out soluble phosphorous and reduce loads to all lakes.

The engineer's initial recommendation in 2006 surrounding rough fish was to improve water quality in Cedar Lake (and the upstream lakes) by managing shallow lake habitat in Swartout, Albion and Henshaw. Specifically, to reduce and manage carp populations in the upper watershed by:

- Lake drawdown (with rotenone if necessary) to establish winter kill
- Migration barriers to suppress recruitment
- Working actively with DNR to manage fisheries
- In-lake submergent vegetation surveys, fisheries surveys, and development of a shallow lakes management plan for each lake

Residents were not amenable to lake drawdowns or the use of rotenone in 2006. Drawdowns remain extremely unpopular, though a renewed interest in water quality improvements among residents of all the subwatershed lakes may ease some of the earlier barriers to management.

Inexpensive carp migration barriers and seining were evaluated as an alternative. At \$1,200 per fish barrier, and \$0.23/lb for rough fish harvesting, carp migration barriers and seining were selected. Five rough fish migration barriers which are intended to suppress recruitment were installed in 2007. The four upstream most barriers were maintained/ replaced 2019-2021.

Carp populations in Swartout, Albion and Henshaw, three shallow lakes that drain to Cedar Lake, were suspected of impacting in lake water quality and increasing P loads to Cedar Lake downstream.

Henshaw Lake and Swartout Lake have experienced winter kill and carp viral infections during the management period. Some seining has been performed. Higher macrophyte populations and significantly improved water clarity are correlated with fish kills.

No work has been done to establish populations or spawning areas. The last fisheries survey was conducted by DNR in 2010.

Macrophyte populations in Swartout are almost back to zero following a reported rebound in carp populations and an order of magnitude increase in the nesting bird populations on the Swartout Island

Cedar Lake Subwatershed History

- 2007 Fish barriers installed late spring; Segner Pond construction began in December
- 2008 Seining 57,000 lbs Feb; 4,760 lbs rough fish Dec from Swartout.
220 lbs from Henshaw
- 2009 Winter Kill- Swartout (but not Henshaw)
- 2010 Improved vegetative communities recorded in Swartout- April 2010 DNR survey
- 2015 IESF constructed upstream of Swartout Dec; Limestone filter constructed upstream of Cedar Jan
- 2016 Seining 200 lbs Albion, 120 lbs Swartout
- 2018 Carp virus detected in Swartout
- 2019 Henshaw outlet fish barrier replaced
- 2021 Fish migration barriers replaced at Swartout Inlet/ Outlet and Illsley Avenue



Swartout fish kill – spring 2010.

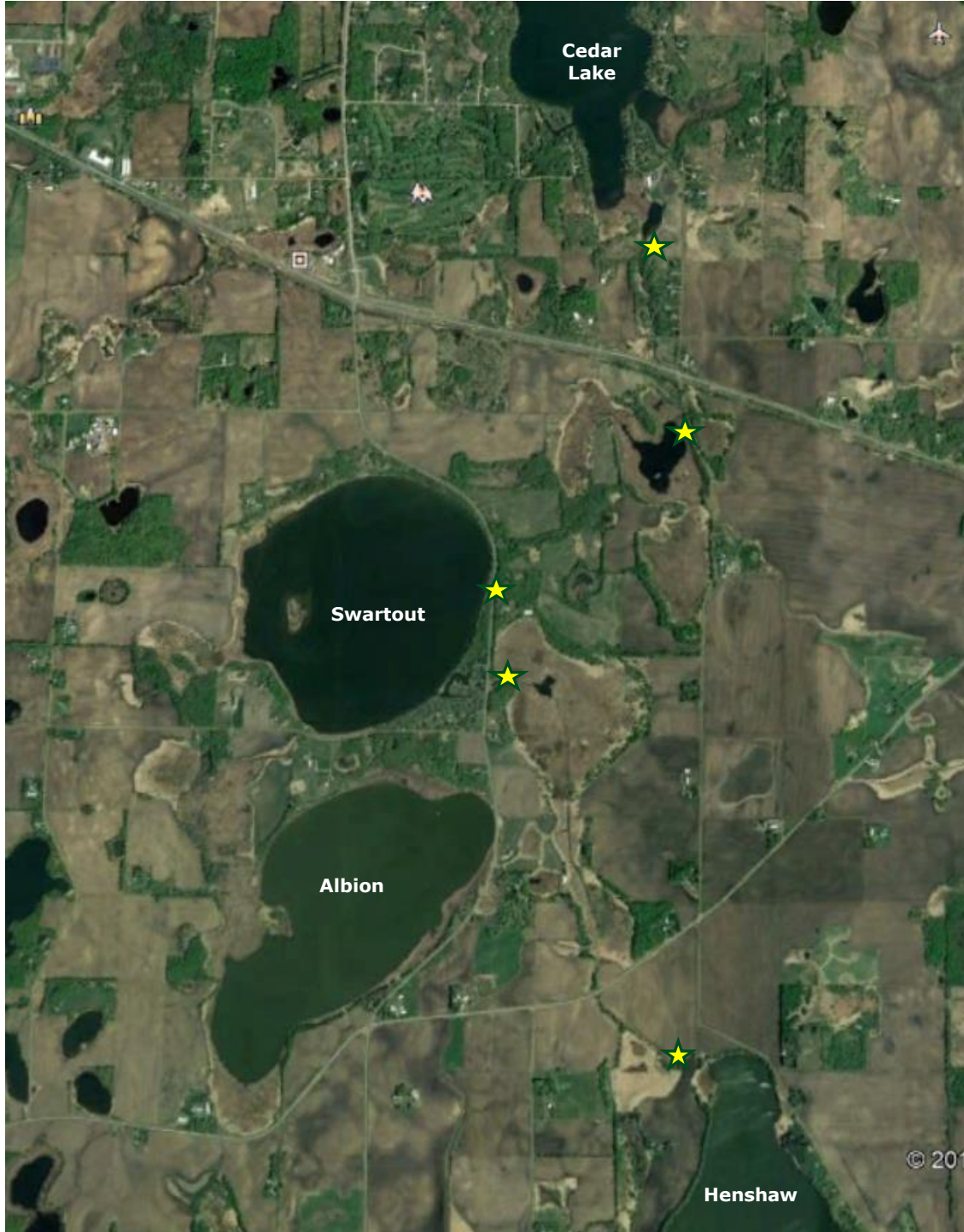
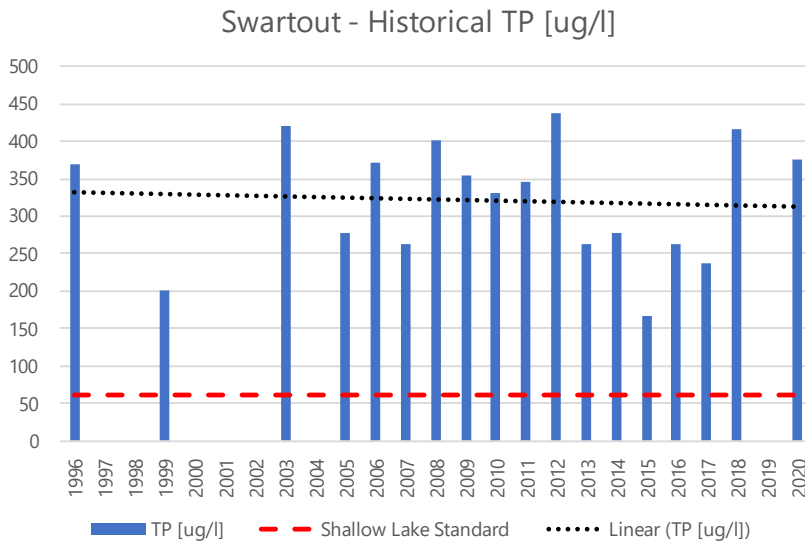
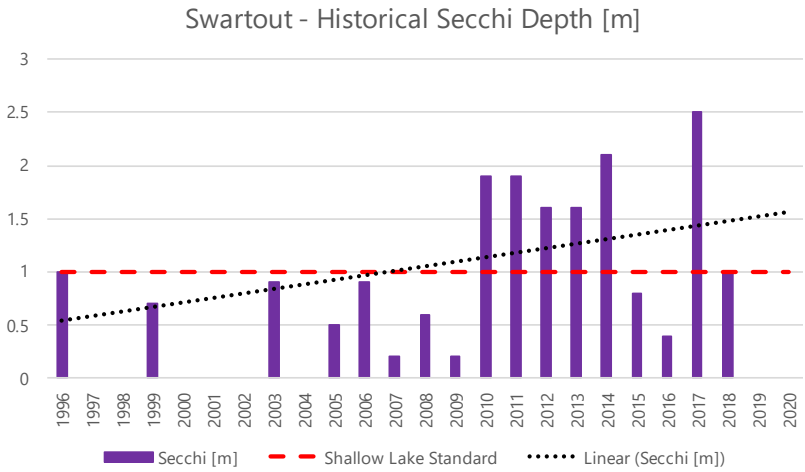
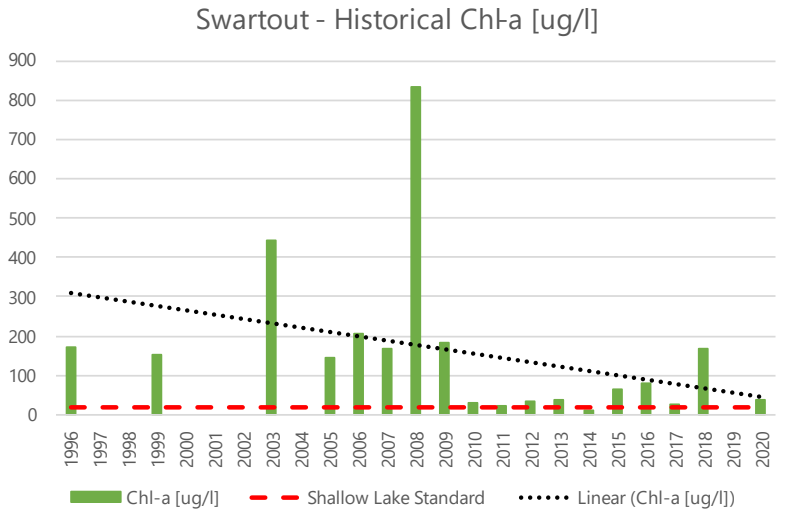


Figure 1. Existing fish migration barrier locations in the Cedar sub-watershed



Figures 2-4. Swartout Average Summer Surface Water Quality

Clearwater Chain of Lakes/ upper lakes:

Historical management of rough fish populations on the Clearwater Chain of Lakes has included limited seining in upper watershed lakes (80,000 lbs removed from Lake Betsy in 2008) and a migration barrier/fish trap at Highway 55 on the Clearwater River which was removed due to safety concerns in 2020.