

Cedar Lake, Indiana Aquatic Ecosystem Restoration

Public Meeting
14 July 2016

Chicago District
Great Lakes and Ohio River Division



US Army Corps of Engineers
BUILDING STRONG[®]



Randy Niemeyer

Town of
Cedar Lake, Indiana



Christopher T. Drew

Colonel, U.S. Army

Chicago District Commander

U.S. Army Corps of Engineers

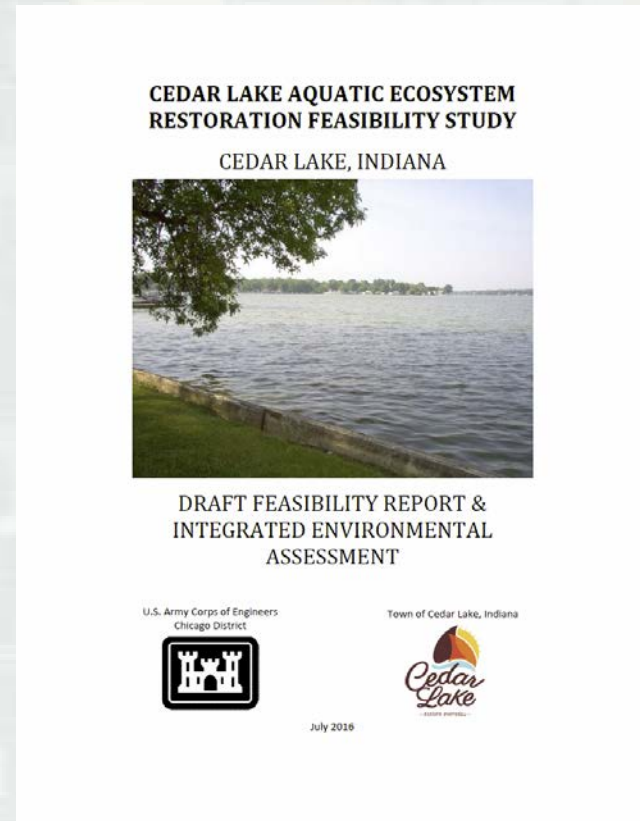


Imad Samara
Project Manager
Chicago District
U.S. Army Corps of Engineers



Agenda

- Study Overview
- Plan Formulation
- Proposed Plan
- Next Steps
- Comments



Study Overview

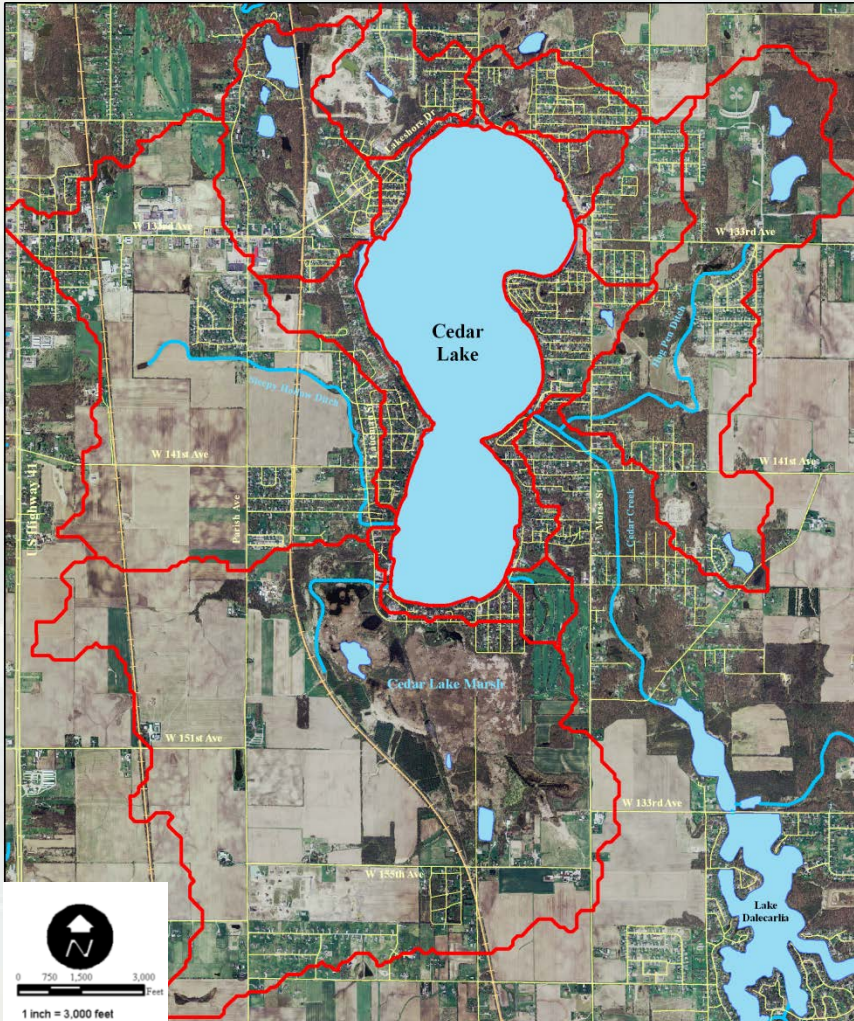
Collaborative Study Team

- Non-Federal Sponsor
 - ▶ Town of Cedar Lake, Indiana
- Agency Collaboration
 - ▶ Cedar Lake Enhancement Association
 - ▶ Indiana Department of Environmental Management
 - ▶ Indiana Department of Natural Resources
 - ▶ U.S. Fish & Wildlife Service
- Previous Public Engagements
 - ▶ NEPA scoping
 - ▶ Town Council meetings
 - ▶ CLEA fundraisers



Study Overview

Project Location



Study Overview

Background Information

■ Study Area

- ▶ 781-acre glacially-formed lake; 400-acre linked wetland
- ▶ 7.6 square-mile drainage area; seven tributaries
- ▶ Drains to the Kankakee River watershed

■ Authority

- ▶ Initiated under Section 206, WRDA 1996
- ▶ Later, specifically authorized by Section 3065, WRDA 2007
 - Planning, design, and construction of an aquatic ecosystem restoration project within Cedar Lake



David Bucaro, P.E.

Chief, Economic Formulation and Analysis

Chicago District

U.S. Army Corps of Engineers



Study Overview

Problems

► Unsuitable Sediments

- Silty soils from historic agricultural watershed loading
- Easily stirred up by wind, boats, and bottom-feeding fish
- Smothers aquatic plants and fish-spawning areas
- Excessive nutrients in sediments cause algal blooms



**Sediment Smothering
Aquatic Plants**



**Highly Mobile “Fluffy”
Sediments**



**Algal Coating on
Sediment Surface**



Study Overview

Problems (cont.)

▶ **Loss of Native and Desirable Species**

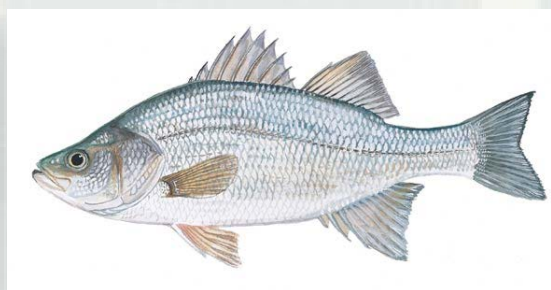
- Aquatic plants provide essential habitat structure
 - ▷ Only ~1% of littoral zone (<6-ft depth) currently has aquatic plants
- Loss of native fishes indicative of a glacial lake
 - ▷ Invasive common carp and white perch dominate & destroy plants

▶ **Disconnection of Tributary Streams**

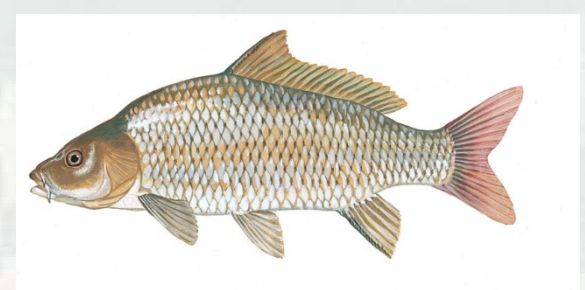
- Colonization and spawning habitat separated from lake



**Absence of Aquatic
Plants Along Shore**



**Invasive White Perch Benthic
Feeding Fish**



**Invasive Common Carp
Benthic Feeding Fish**

Study Overview

Historic Conditions



Note the abundance of aquatic plants present along shoreline

Study Overview

Overall Project Goal

Reestablish the habitat structure and function of a unique and highly-valued glacial lake in order to restore a diverse community of native fish, plants, birds, aquatic insects, and other wildlife



Study Overview

Objectives

- Restore glacial lake habitat structure and biological function
- Ensure sustainability by addressing systemic issues causing habitat degradation
- Restore historically connected streams
- Increase diversity and number of native fish, plants, birds, aquatic insects, and other wildlife



Study Overview

Constraints

- Minimize costs associated with acquiring lands
- Minimize impacts to existing recreational features and uses
- Avoid impacts to cultural and archeological resources



Plan Formulation

Restoration Measures

■ **Evaluated Restoration Measures**

▶ **Physical Substrate Restoration**

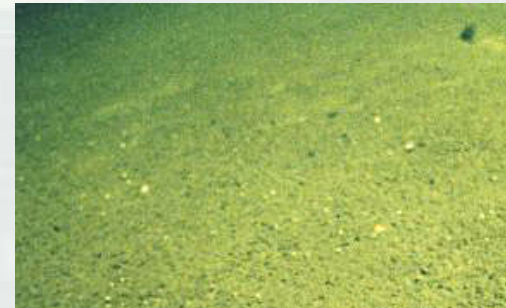
- Restore deep water habitat
- Create a lake bottom suitable for native aquatic plant growth

▶ **Chemical Substrate Restoration**

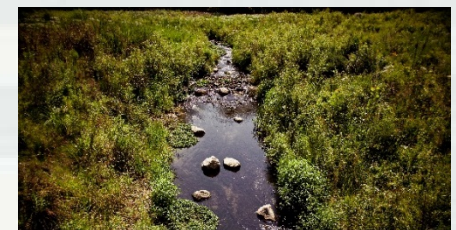
- Create a lake bottom suitable for native aquatic plant growth

▶ **Tributary Restoration**

- Reestablish connection between stream and lake habitats for native fish
- Provide additional fresh water inflow



Substrate Restoration



Tributary Restoration



Plan Formulation

Restoration Measures (cont.)

■ Evaluated Restoration Measures

▶ Creation of Habitat Islands

- Reduce wind-induced sediment resuspension

▶ Littoral Macrophyte Restoration

- Create a sustainable community of native aquatic plants within nearshore areas

▶ Institutional Controls

- Extend No Wake Zone to protect native aquatic plant growth

▶ Fish Community Management

- Reestablish a native fish community indicative of a glacial lake



Habitat Islands



Littoral Macrophyte Restoration



Institutional Controls



Fish Community Mgmt.



Plan Formulation

Alternatives Analysis

- Alternatives analysis required by National Environmental Policy Act (NEPA)
- Identified restoration measures were combined to generate numerous alternative plans
- Alternative plans were analyzed using a cost effective and incremental cost analysis
 - ▶ 10 Alternative plans identified as “best buy” plans having the greatest habitat benefits for the least increase in cost

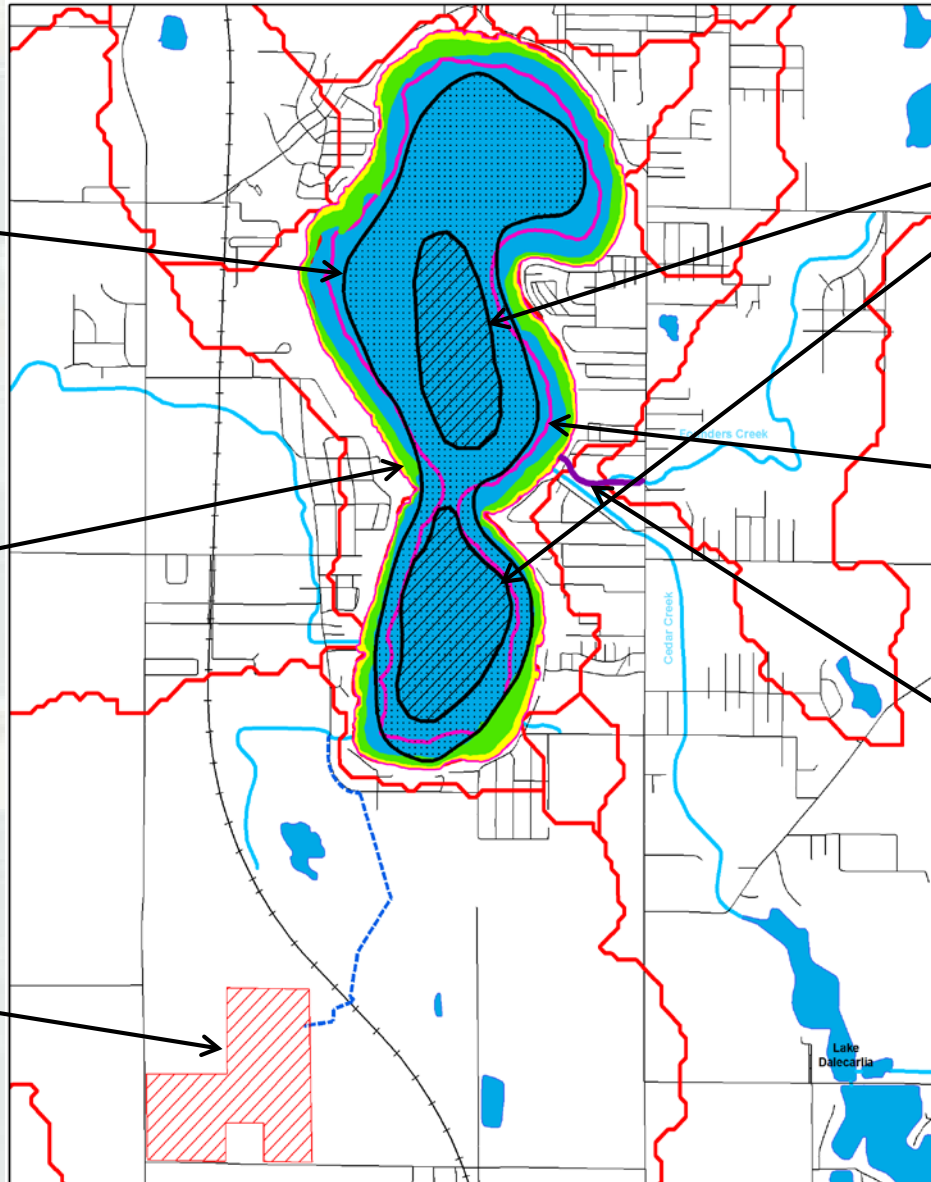


Proposed Plan

**Chemical
Substrate
Restoration**

**Littoral
Macrophyte
Restoration**

**Sediment
Dewatering
Facility**



**Physical
Substrate
Restoration**

**No Wake
Zone**

**Tributary
Restoration**

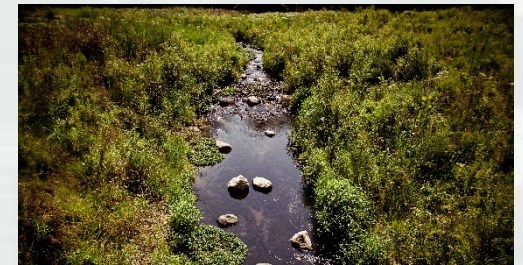


Proposed Plan

Project Features



Substrate Restoration



Tributary Restoration



Littoral Macrophyte Restoration



■ **Physical Substrate Restoration**

- ▶ Mechanically dredge 163 acres (263,000 cy)
- ▶ Hydraulically offload to Sediment Dewatering Facility

■ **Chemical Substrate Restoration**

- ▶ Treat 400 acres of lake with alum to an effective depth of 8 in

■ **Tributary Restoration**

- ▶ Reroute 950 feet of Founders Creek
- ▶ Restore hydraulic connection to Cedar Lake

■ **Littoral Macrophyte Restoration**

- ▶ 35 acres of emergent vegetation
- ▶ 95 acres of submergent vegetation

Proposed Plan

Project Features (cont.)

■ Institutional Controls

- ▶ Extend No Wake Zone from 200 to 400 ft along lake perimeter



Institutional Controls

■ Fish Community Management

- ▶ After removal of non-native fish and habitat improvements, reintroduce native fish species



Fish Community Mgmt.



Project Costs

Activity	Cost
Total Project Costs*	\$22,006,000
Total Federal Contribution**	\$10,666,000
Total Non-Federal Contribution***	\$11,340,000

* Total Project Cost includes the cost of Feasibility Study; Pre-Construction, Engineering and Design; Lands, Easements Rights-of-way, Relocations and Disposal areas (LERRDs); Construction; and Construction Management

** Available Federal funds will be used to complete Feasibility Phase. Federal funds are not available for construction and will have to be appropriated by Congress once the feasibility report is approved.

*** The Non-Federal contribution includes additional sediment removal that was requested by the Town of Cedar Lake and will be funded at 100% Non-Federal.



Proposed Plan

Monitoring & Adaptive Management

- Water Quality, Plant Community, and Fish Community will be monitored for 5 years following completion of construction
- Adaptive Management will be used if project features are not meeting identified objectives
 - ▶ Response actions will be coordinated between USACE, local sponsor, and resource agencies



Imad Samara
Project Manager
Chicago District
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Next Steps

*Schedule**

- Public Review Summer 2016
- Feasibility Report Approved Spring 2017
- Design Agreement Execution Summer 2017
- Project Partnership Agreement Execution Winter 2018
- Contract Award Summer 2018
- Implementation Complete Fall 2020
- Monitoring & Adaptive Mgmt Complete Fall 2025

* Based on receipt of funds in accordance w/ project schedule



Next Steps

Public Comment Period

Comment period ends **August 8, 2016**.

Report available at:

<http://www.lrc.usace.army.mil/Missions/Civil-Works-Projects/Cedar-Lake/>

Ways to comment:

1. Via email to chicagodistrict.pao@usace.army.mil
2. Mailed to:

USACE, Chicago District
231 S. LaSalle St., Ste. 1500
Chicago, IL 60604
Attn: Cedar Lake Draft Report

Post marked by **August 8, 2016**.



The screenshot shows the US Army Corps of Engineers website for the Cedar Lake project. The header includes the USACE logo, "CHICAGO DISTRICT", and a search bar. The main navigation menu lists: HOME, ABOUT, BUSINESS WITH US, MISSIONS, LOCATIONS, CAREERS, MEDIA, LIBRARY, CONTACT. The breadcrumb trail is: HOME > MISSIONS > CIVIL WORKS PROJECTS > CEDAR LAKE. The page title is "Cedar Lake".

Project Manager: Imad Samara

Authority: Section 3065 Water Resources Development Act (WRDA) 2007 Section 206, WRDA 1996, as amended (Continuing Authority Program)

Project Description: Cedar Lake is a 781-acre glacially formed lake located within the Town of Cedar Lake in northwest Indiana. Historically, the lake supported a biologically diverse ecosystem typical of northern glacial lakes. Since the late nineteenth century, modifications to the lake and contributing watershed have resulted in adverse effects to the lake's fringe wetland habitat, littoral zone habitat, lake-bottom substrates, and aquatic species richness. Surrounding watershed practices have accelerated lacustrine succession resulting in an impaired aquatic ecosystem with shallower less diverse aquatic habitat.

Problems to be addressed by the proposed project include lack of suitable substrates for aquatic species, lack of submergent and emergent aquatic plants within the littoral zone, absence of native fish community, fragmentation of tributaries, dominance of non-native invasive species, and imbalance of physical matrix and chemical parameters of abiotic habitat. Features of the proposed project include restoration of 35 acres of emergent and 95 acres of submergent aquatic plants within the littoral (near-shore) zone, reestablishment of a native fish community, rerouting of Founder's Creek to its historic connection with Cedar Lake, physical substrate restoration through removal of 263,000 cubic yards of sediment, chemical substrate restoration through alum dosage over 400-acres of lake bottom, and implementation of institutional controls.

Costs: TBD

Current Status: The Corps has completed plan formulation and cost effectiveness and incremental cost analysis of the generated alternative plans to develop a tentatively selected plan. The local sponsor requested that the Corps pursue a locally-preferred plan (LPP) and acknowledged that the incremental cost would be borne by the local sponsor. The local sponsor has decided to pursue the LPP. An alternative formulation briefing with USACE Lakes and Rivers Division (LRD) and USACE Headquarters was conducted in Fiscal Year 2012 (FY12). An LPP waiver request was submitted to USACE Headquarters and was approved April 20, 2016.

Sponsors: The Town of Cedar Lake

Documents: Collapse All Expand All
Cedar Lake Draft Feasibility Report and Integrated Environmental Assessment



Questions

Contact:

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Thank You For Your Participation!

