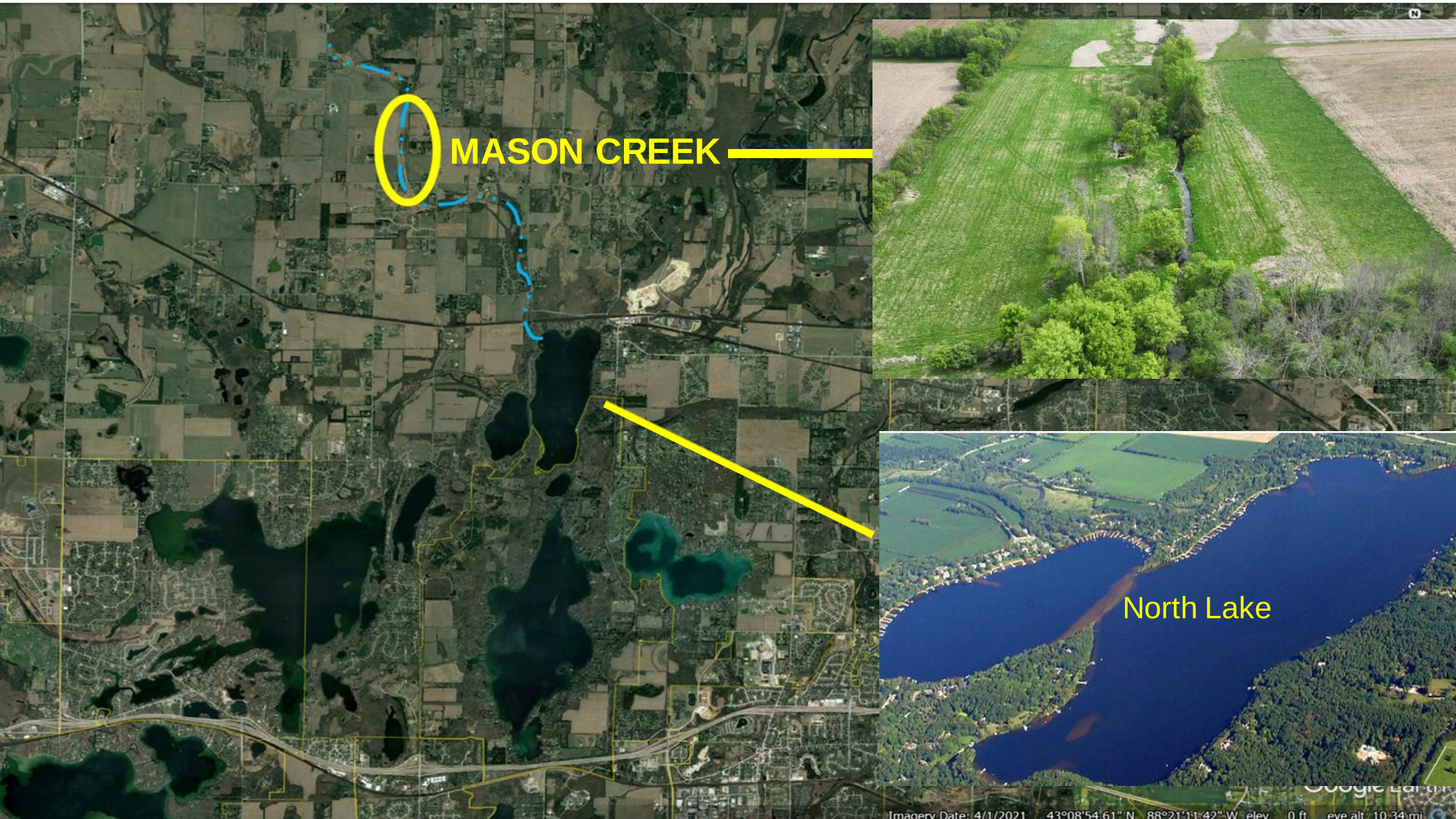
A Watershed Approach for Water Quality Improvement in Wisconsin's Lakes and Rivers

Erik Joost
Watershed Manager
City of Oconomowoc

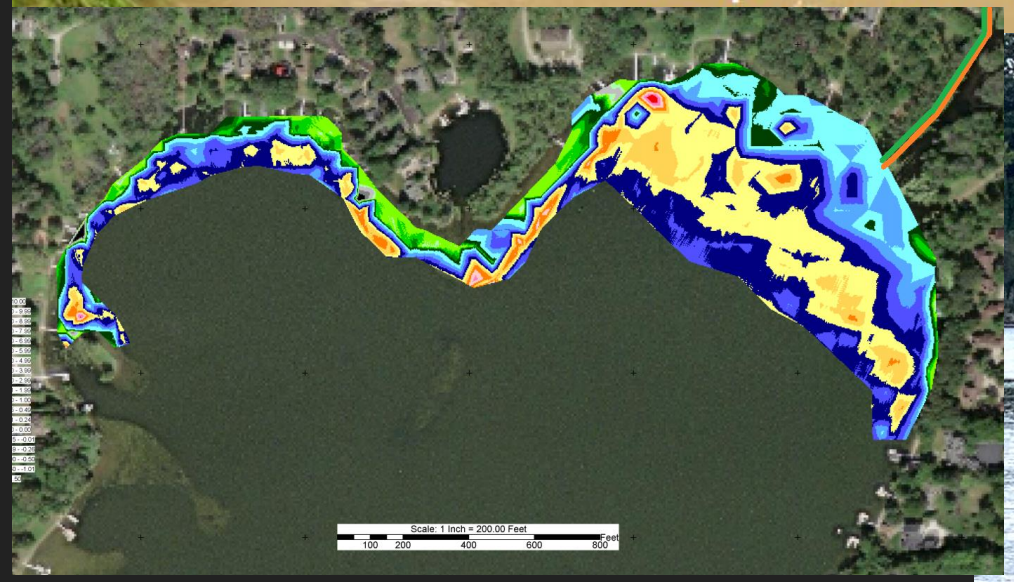
Sarah Majerus
Senior Scientist
Stantec

Partnerships Make It Happen

OCONOMOWOC
WATERSHED PROTECTION PROGRAM
TALL PINES
CONSERVANCY
north
management
district
lake
TROUT UNLIMITED
WISCONSIN
WISCONSIN
DEPT. OF NATURAL RESOURCES
FIELD&STREAM
RESTORATIONS
WONDRA
CONSTRUCTION, INC.
Stantec
TOWN OF
MERTON
EST. 1848


MASON CREEK
North Lake
Imagery Date: 4/1/2021 43°08'54.61" N 88°21'11.42" W elev 0 ft eye alt 10.34 mi

Excessive sediment load being
transported to North Lake

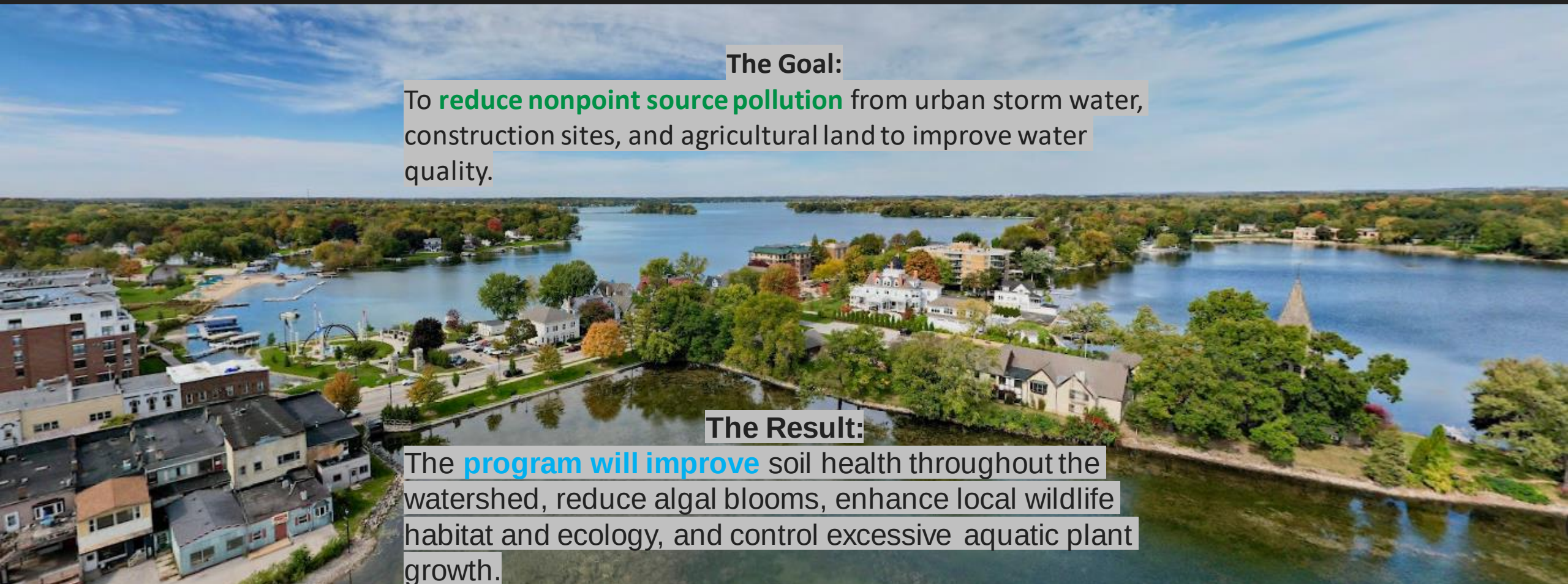

Scale: 1 Inch = 200.00 Feet
100 200 400 600 800 Feet

NICKELS

WISCONSIN
DEPT. OF NATURAL RESOURCES

Adaptive Management

City of Oconomowoc opting to participate in Adaptive Management created the Oconomowoc Watershed Protection Program



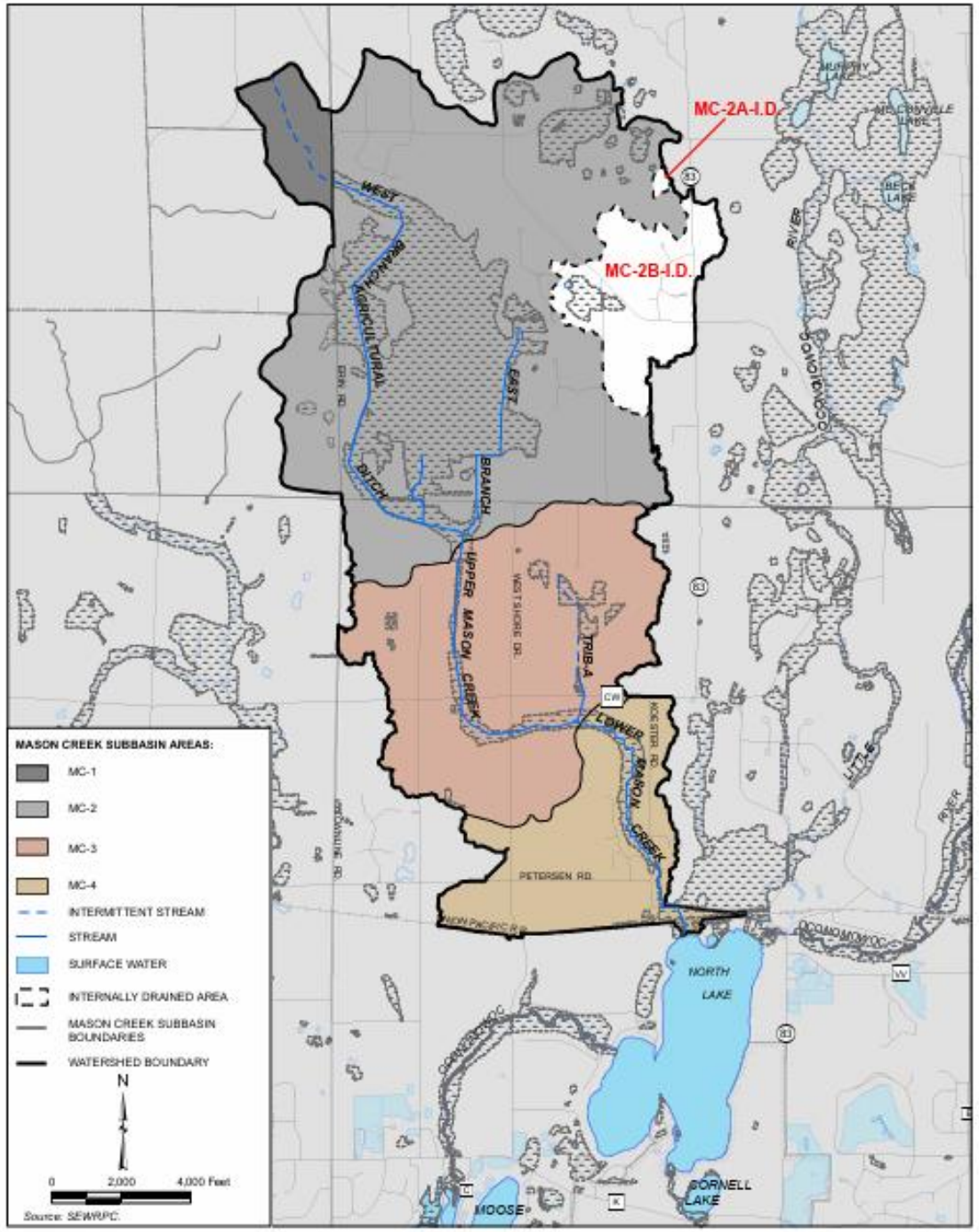
The Goal:

To **reduce nonpoint source pollution** from urban storm water, construction sites, and agricultural land to improve water quality.

The Result:

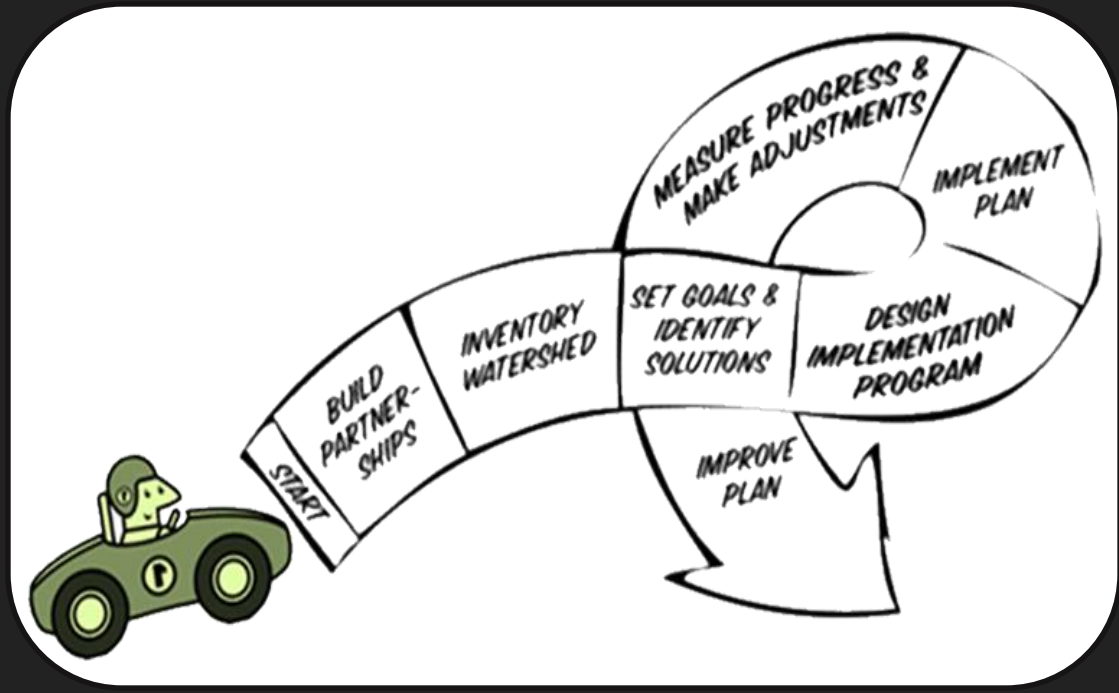
The **program will improve** soil health throughout the watershed, reduce algal blooms, enhance local wildlife habitat and ecology, and control excessive aquatic plant growth.

Stream Reaches and Subbasins Within the Mason Creek Watershed: 2015

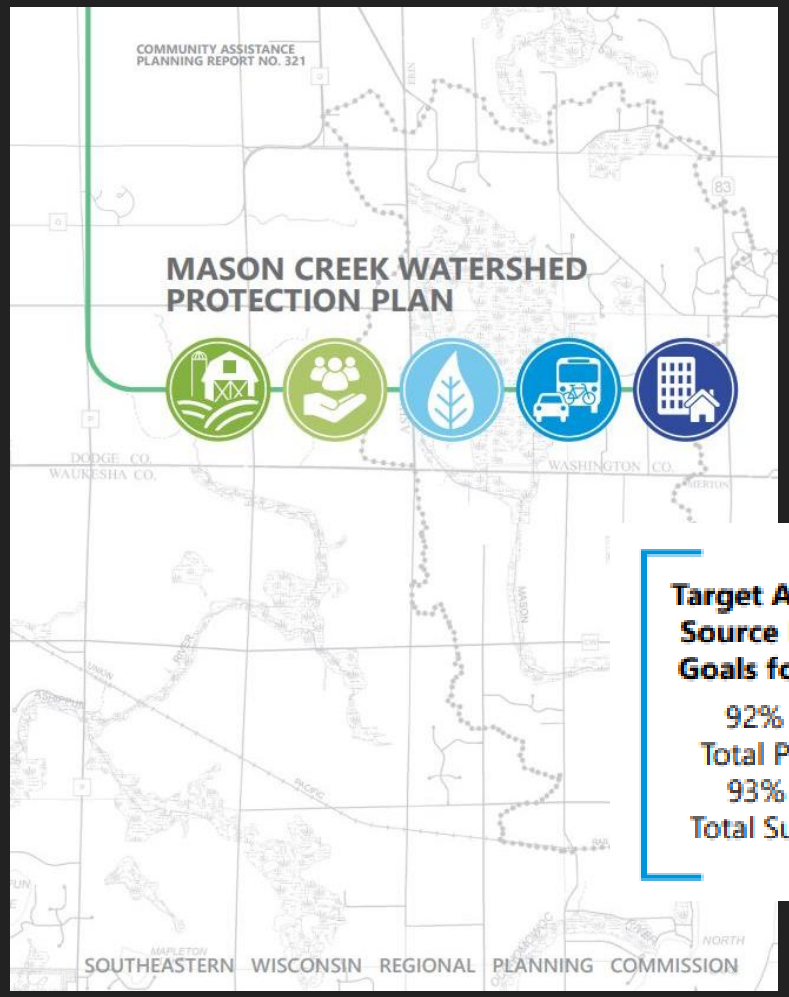


Mason Creek Watershed Protection Plan

- Southeastern Wisconsin Regional Planning Commission, 2018
- EPA 9-Key Element Plan



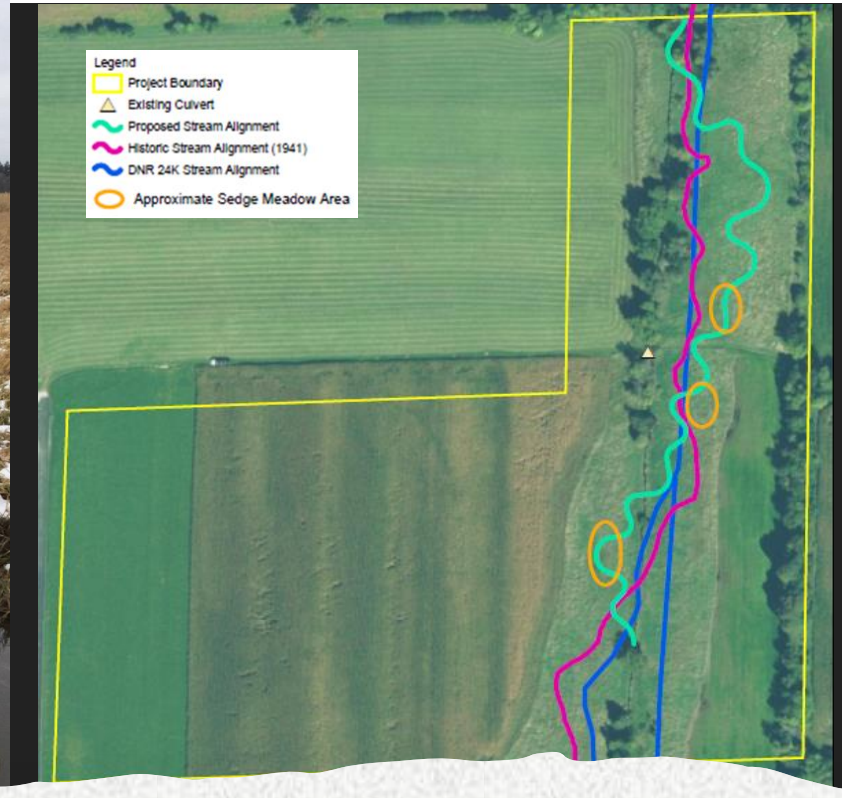
Mason Creek Project Goals



- Strengthen partnerships
- Reduce nutrient loading
- Improve floodplain connectivity
- Enhance fishery
- Restore degraded riparian habitat
- Remove barriers

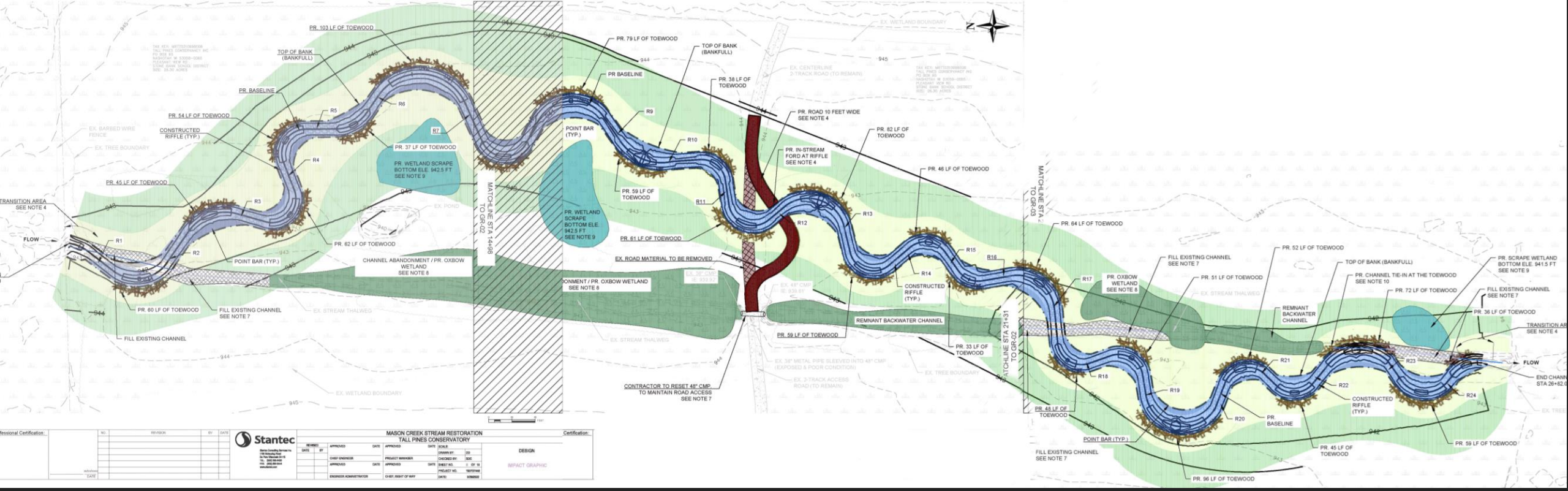
Target Annual Nonpoint Source Load Reduction Goals for Mason Creek:

92% or 5,355 (lbs) Total Phosphorus and 93% or 883 (tons) Total Suspended Solids



Mason Creek Pre-Construction

- High sediment & phosphorus loading
- Channelized stream reach, likely excavated
- Adjacent buffers in progress

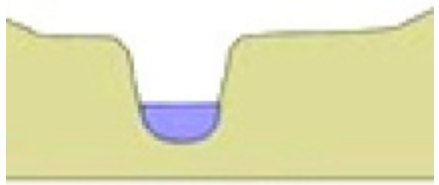


Design for Water Quality

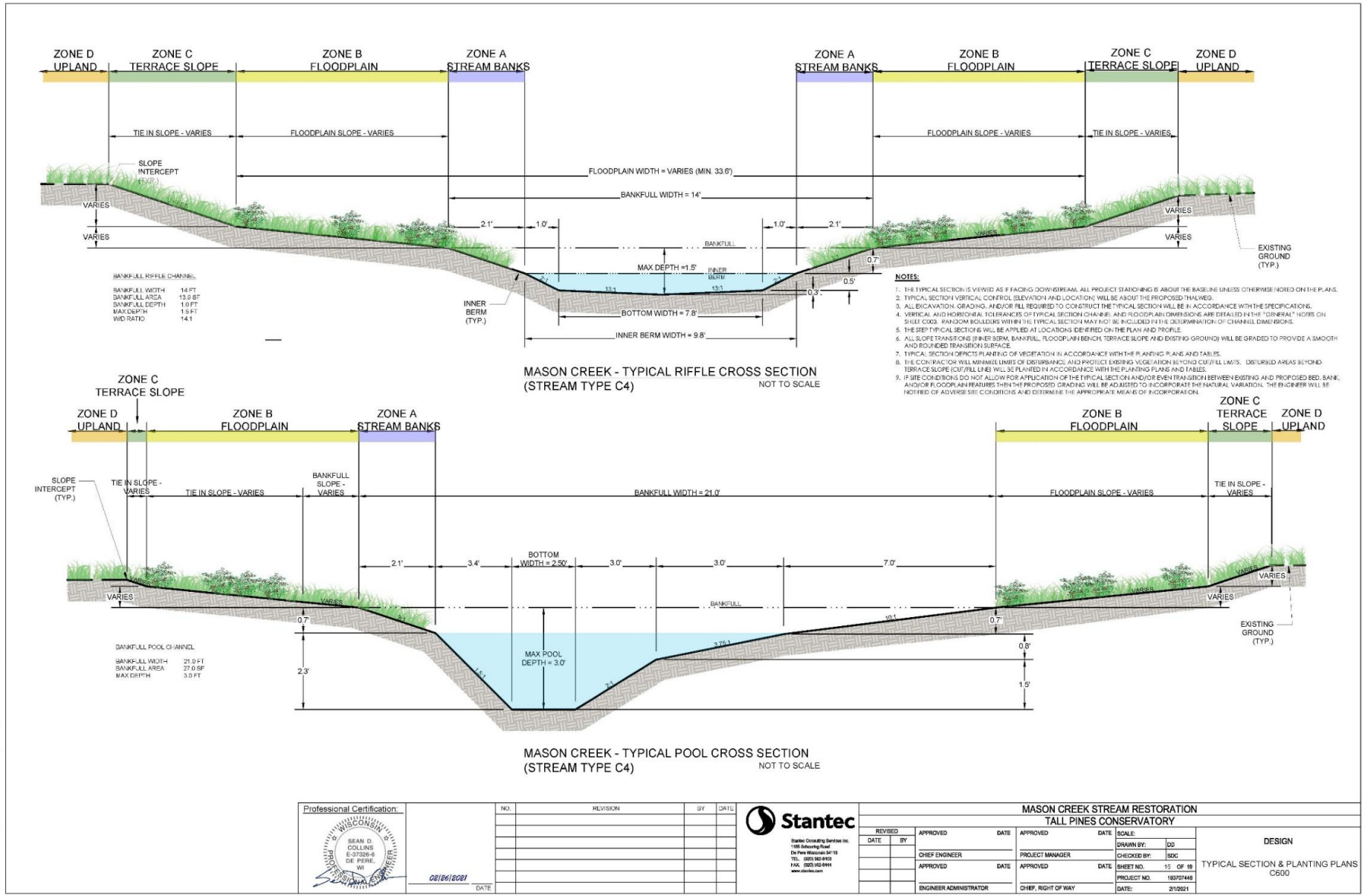
- Abandon existing channel
- Stream realignment to low-gradient, meandering, riffle-pool-run-glide stream
- Vegetated banks (toe wood and sod mats)
- Wetland scrapes
- Floodplain connectivity

Typical Sections

Before →



After →



Riffle Section

(view during construction, prior to channel activation)

Watershed Approach to Construction

- Stakeholder Participation
- Weekly Meetings & Water Quality Monitoring
- Adaptive Erosion Control to Address Rain Events & Active Spring Activity

Construction Solutions

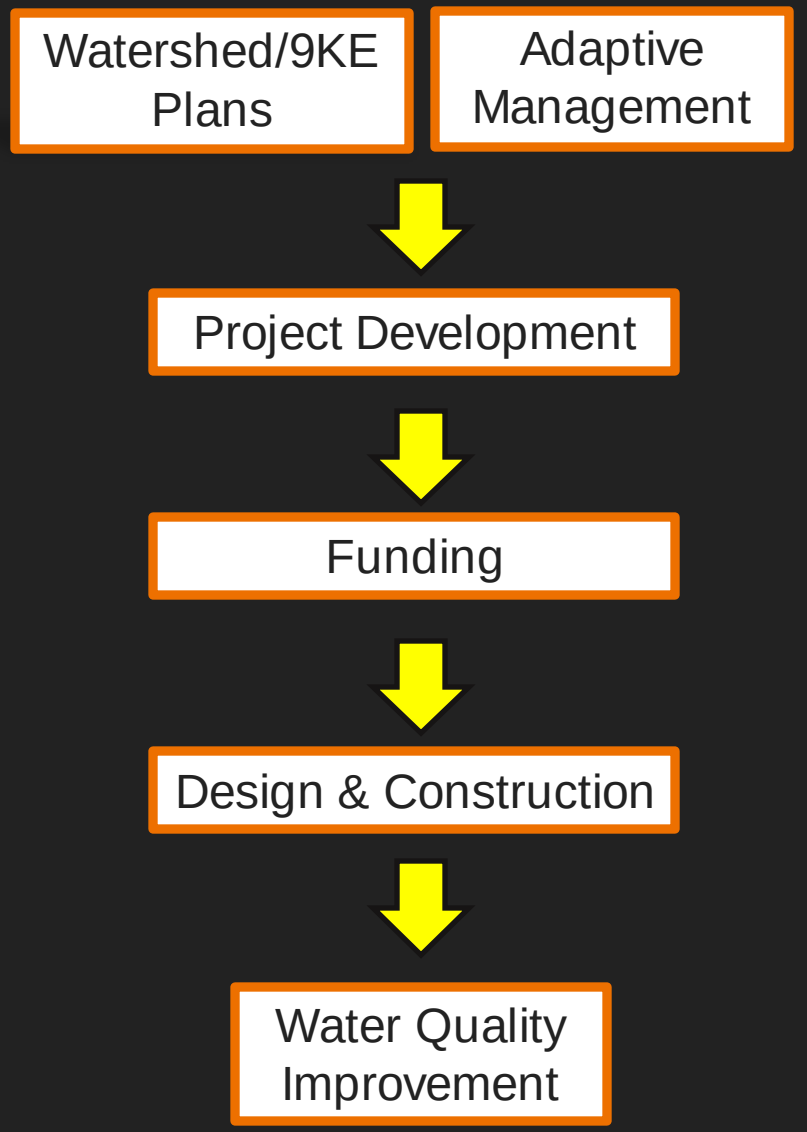
Lots of Water!

Construction Solutions

Adaptive Approach to Erosion Control

Lessons Learned

- **Identify project goals for all partners**
- **Early engagement of technical advisors & funding agencies**
- **Maintain open communication with agency staff (County, Town, FEMA)**
- **Weekly construction meetings**
- **Water quality monitoring for community outreach**
- **Contingency plans for high water and erosion control**



Next Steps & Outcomes

- **Monitoring by TPC & OWPP**

IMPROVED BIOTICS

Return of Native Macroinvertebrates

Establishment of Native Macrophytes

Higher Oxygen Levels

IMPROVED WATER QUALITY

Water Clarity

Reduced Sedimentation

Reduced Phosphorous

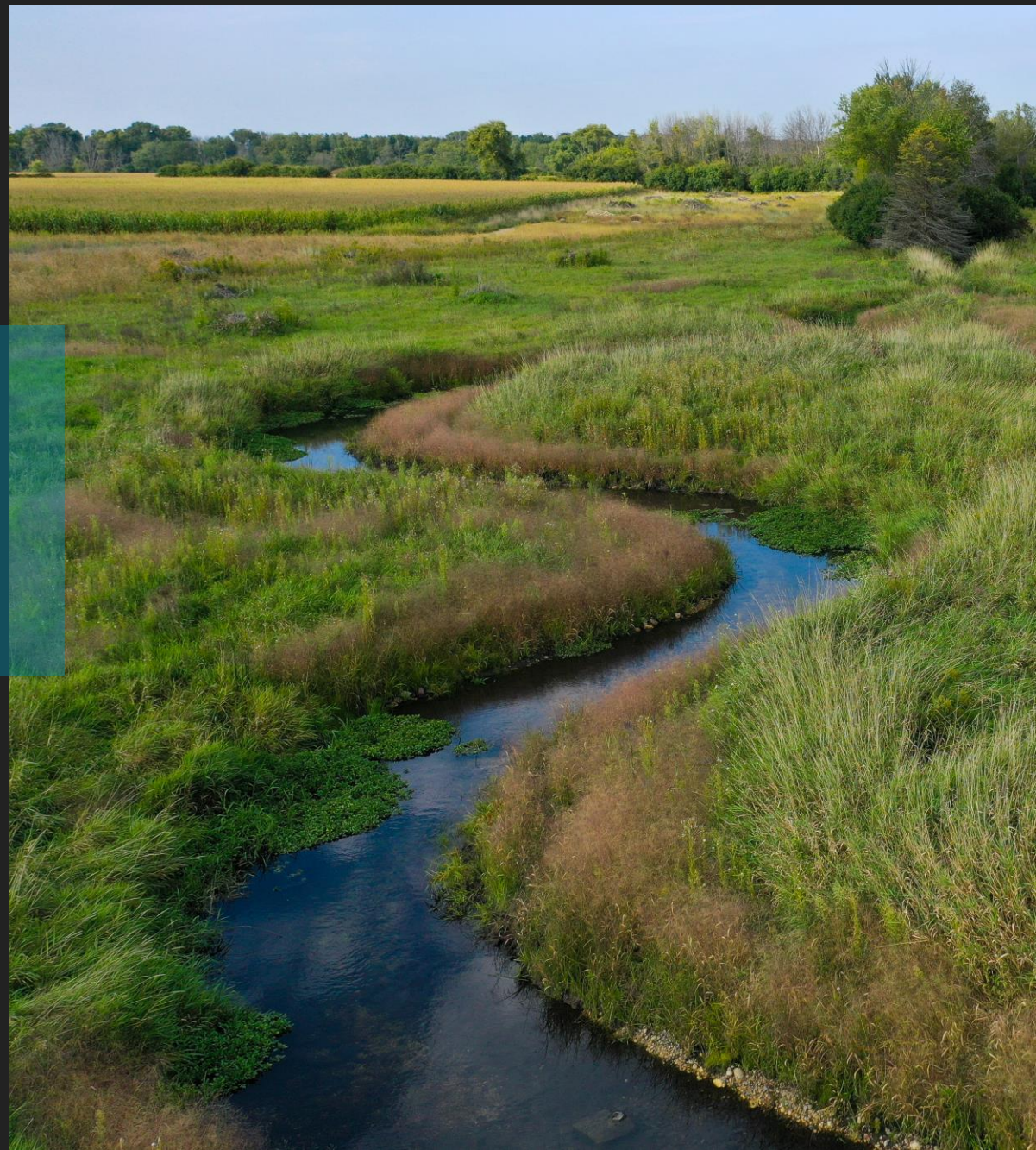
IMPROVED HABITAT

Improved Trout Habitat

Native Prairie and Wetland Restoration

Observed Fauna/Flora

- **Community Exposure**
- **Document & Share Success!**



THANK YOU

Sarah Majerus, PWS – Senior Scientist – Stantec
Sarah.majerus@stantec.com
Erik Joost – Watershed Manager - OWPP
ejoost@oconomowoc-wi.gov