

# WATERSHED MANAGEMENT PLANNING CENTER HARBOR

*May 2024*

## **FB Environmental Associates**



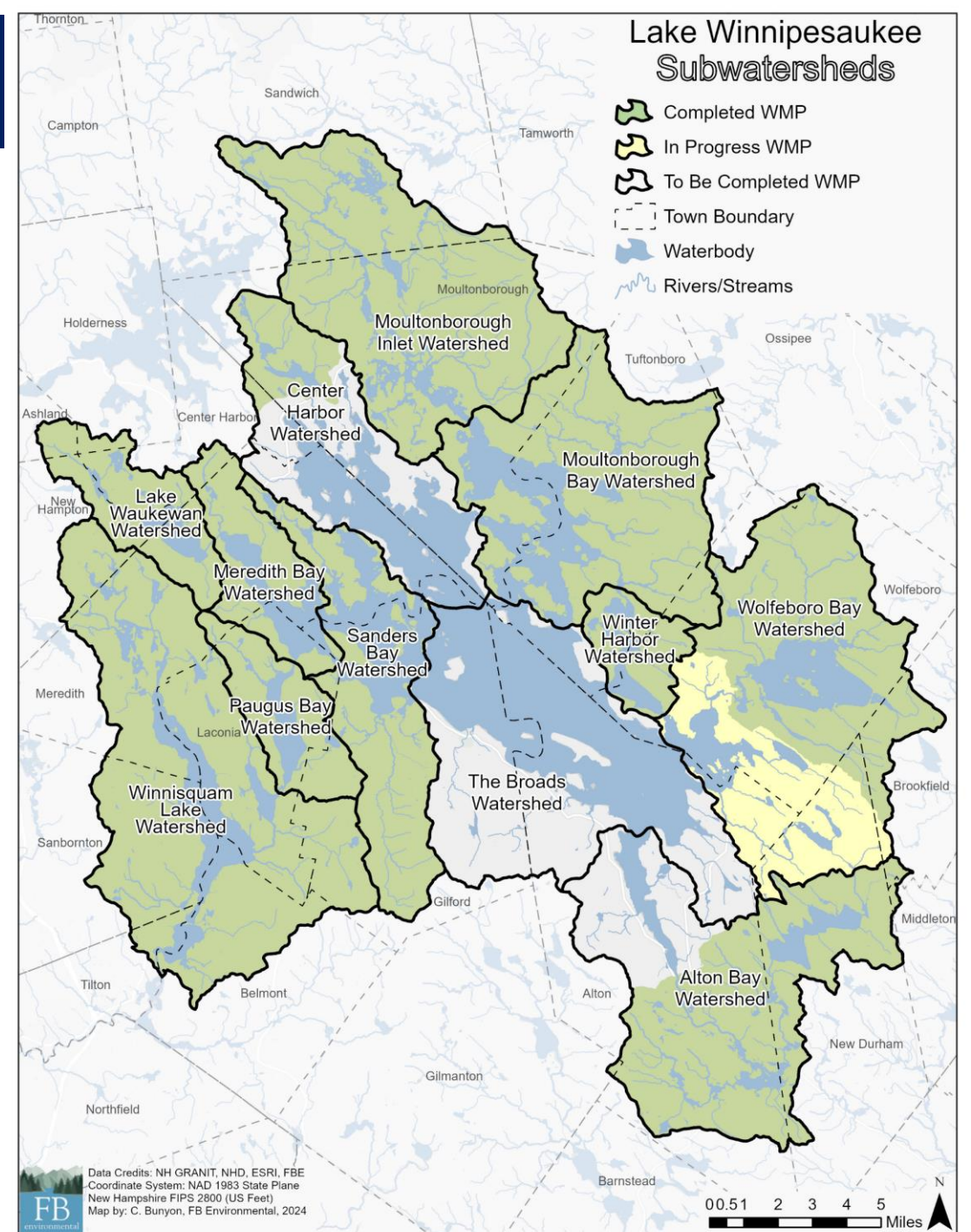
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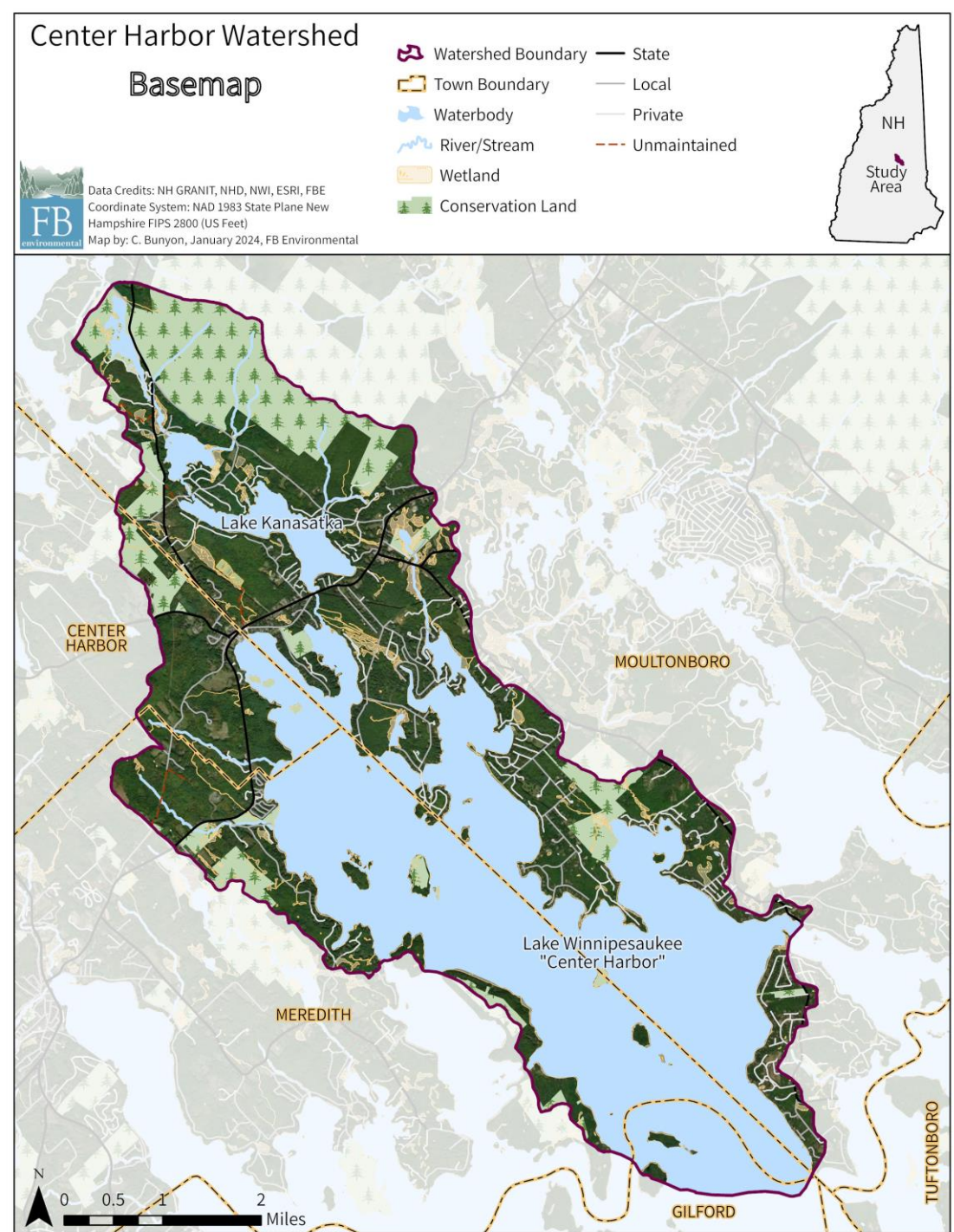
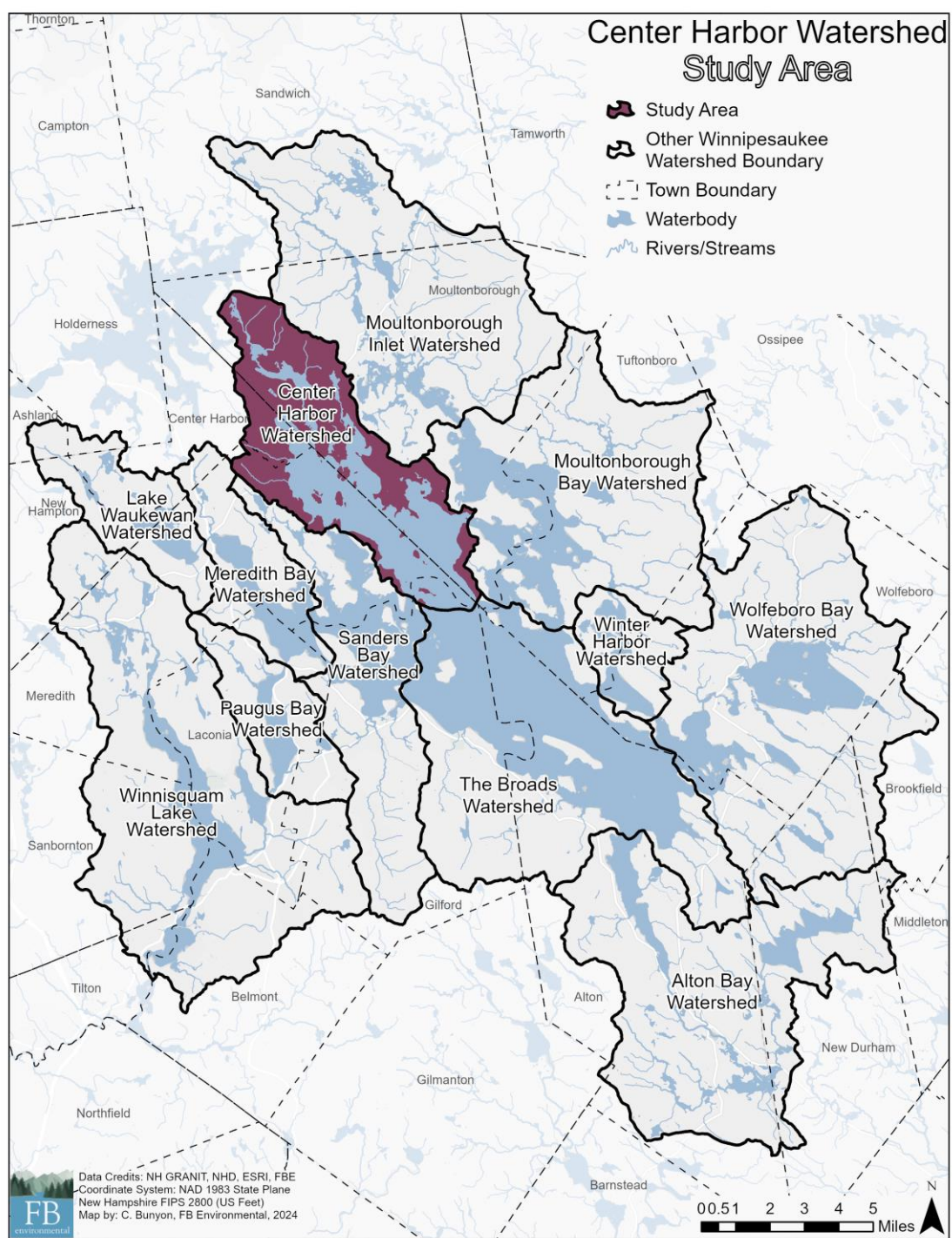
Forrest Bell, Senior Project  
Manager/Principal-in-Charge

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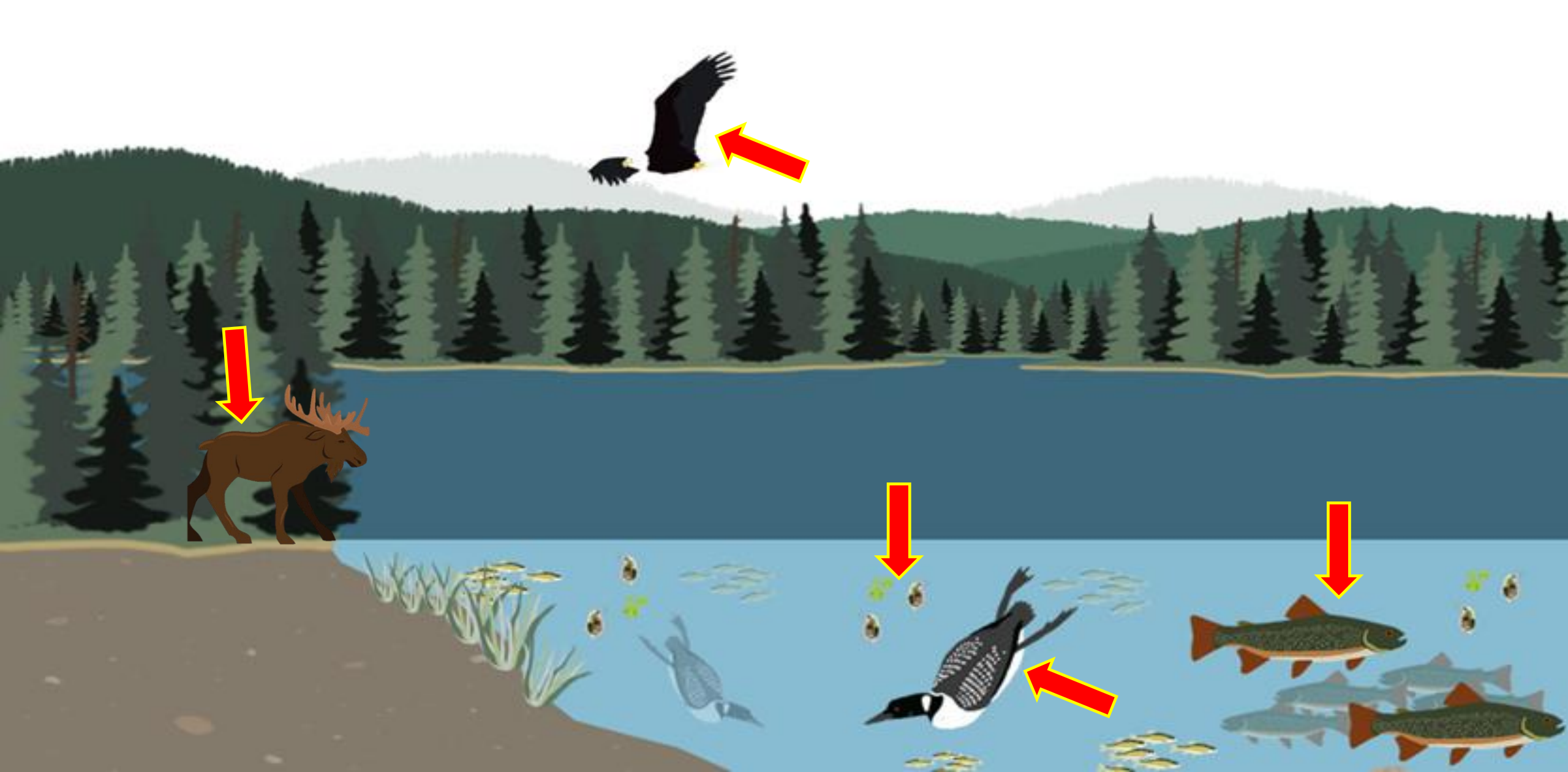
# Lake Winnepesaukee WMPs

**A Watershed Management Plan (WMP):** Provides an analytical framework to restore water quality in impaired waters and to protect water quality in other waters adversely affected or threatened by point source and nonpoint source pollution (EPA, 2008).

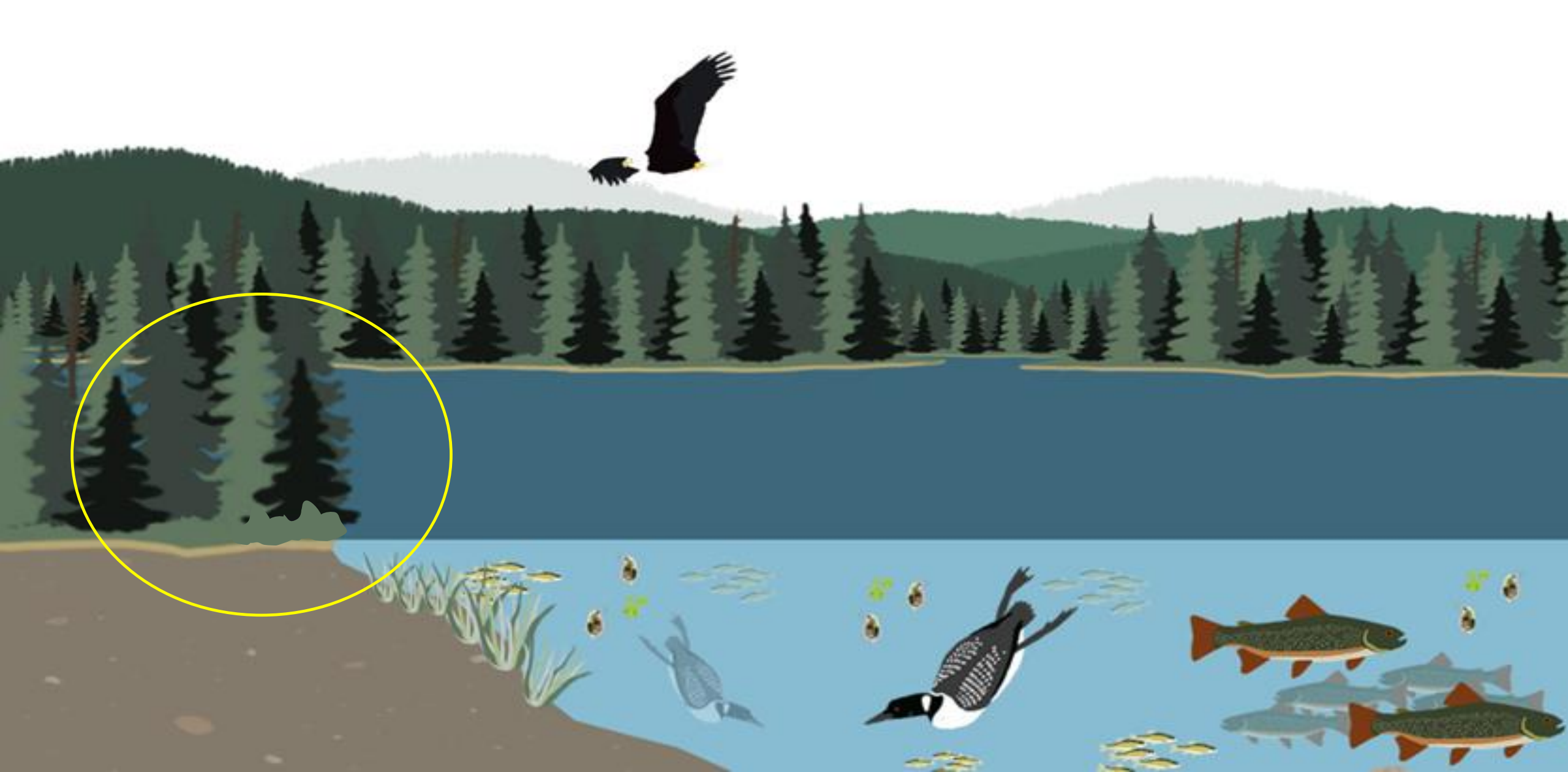




# Understanding the Lake Ecosystem



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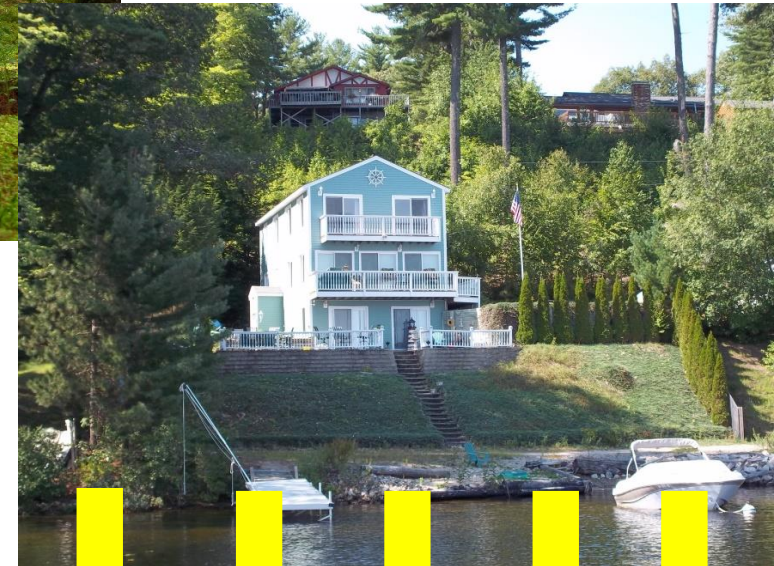
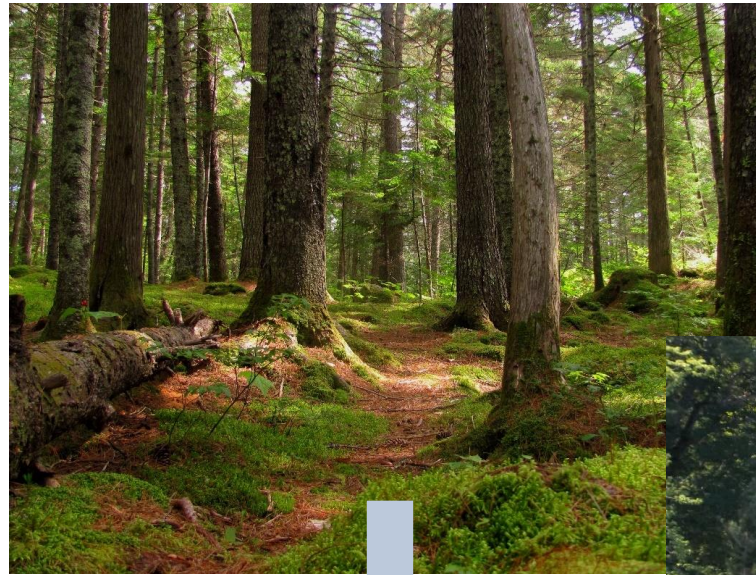
# Understanding the Lake Ecosystem





**10**

TIMES THE AMOUNT OF  
**PHOSPHORUS**



Lake Kanasatka 10/29/23



Blackey Cove (Center Harbor) 10/29/23



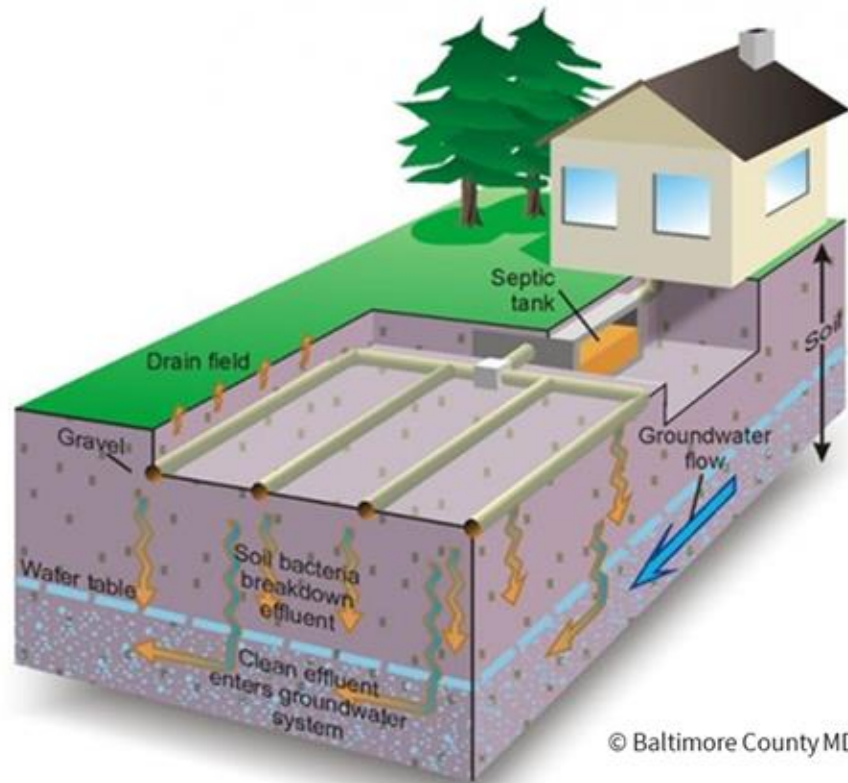


# Sources of Phosphorus



Photos not from Center Harbor

# Other Threats to Water Quality



# Other Threats to Water Quality

WE ARE IN A **NEW ERA** WITH ENHANCED EFFECTS OF CLIMATE CHANGE

**The world has surpassed a heat threshold that scientists have been warning about**

How is climate change affecting cyanobacteria in N.H. lakes, ponds and other waters?

New Hampshire Public Radio | By [Mara Hoplamazian](#), [Bol Nakdim](#)  
Published July 15, 2022 at 4:50 PM EDT



**NOAA says New England's temps are warming, sea levels rising faster than the global rate**

[Hadley Barndollar](#) USA TODAY NETWORK

CLIMATE CRISIS

CONNECT THE WORLD

**EXPERTS: GLOBAL TEMPERATURES BROKE RECORDS IN JULY**  
Findings from European Union's Copernicus Climate Change Service



# Center Harbor Water Quality Challenges

## 2020/2022 Impairments

### Aquatic Life Integrity

- Lake Winnepesaukee – pH and Non-native Aquatic Plants
- Camp Nokomis Beach – pH
- Camp Lawrence Beach– pH
- Levitt Park Beach– pH
- Moultonborough Town Beach– pH
- Town Beach (Center Harbor) – pH



Variable Milfoil  
(1965-present)

# Center Harbor Water Quality Challenges

## Primary Contact Recreation (2018)

- Lake Winnepesaukee – Cyanobacteria hepatotoxic microcystins

## Cyanobacteria Bloom History (2020-2023)

### 2023

- Blackey Cove – 2 advisories – 11 total days
- Lake Kanasatka – 3 advisories – 121 total days

### 2022

- Lake Winnepesaukee – 1 advisory – 8 total days
- Lake Kanasatka – 2 advisories – 20 total days

### 2021

- Lake Kanasatka – 2 advisories – 22 total days

### 2020

- Lake Kanasatka – 2 advisories – 24 total days



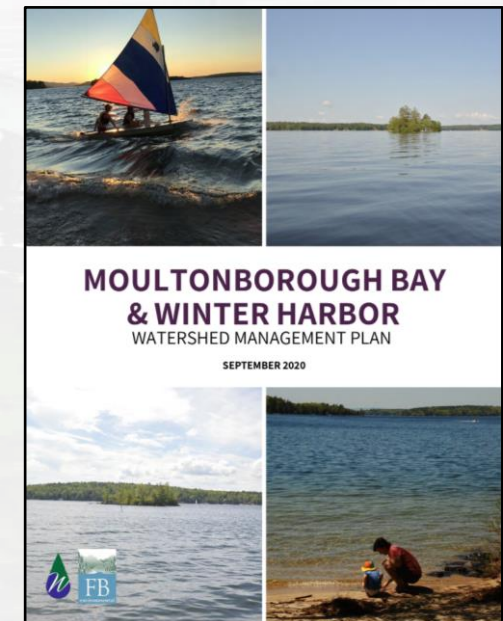
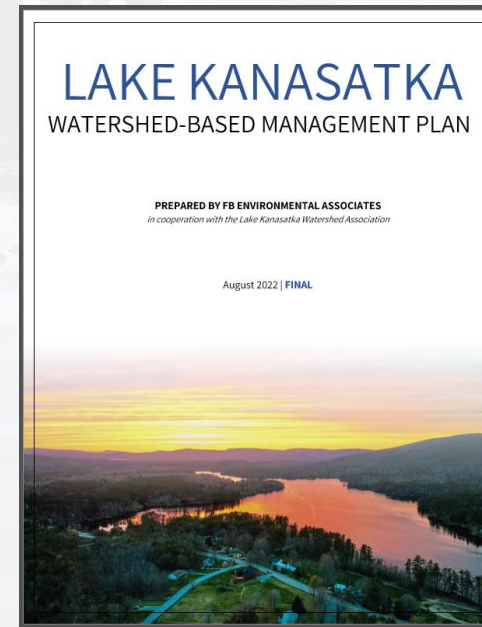
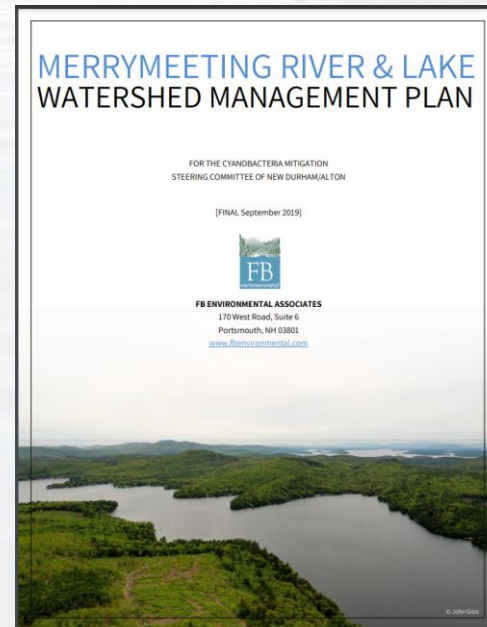
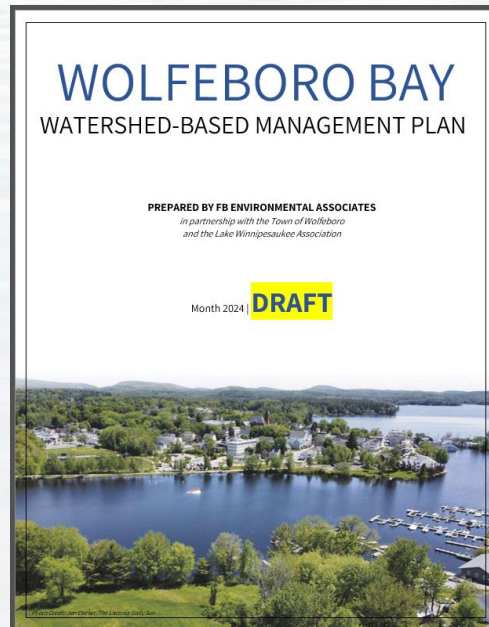
Dolichospermum



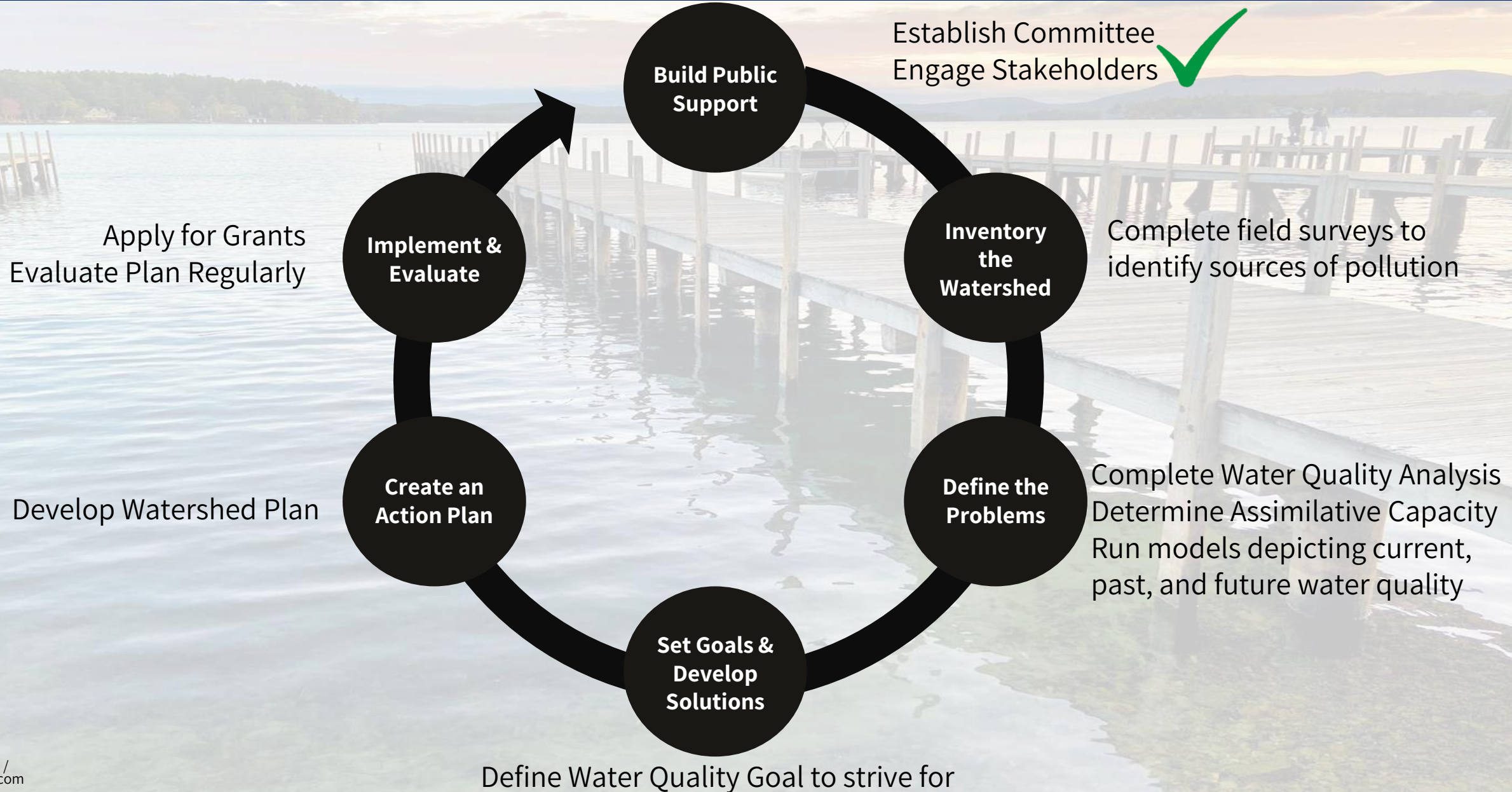
Gloeotrichia

# The Watershed Management Planning Process

**A Watershed Management Plan:** Provides an analytical framework to restore water quality in impaired waters and to protect water quality in other waters adversely affected or threatened by point source and nonpoint source pollution (EPA, 2008).



# The Watershed Management Planning Process



# The Watershed Management Planning Process

1

## Build Public Support and Engage Stakeholders

- Steering Committee
- Project development
- Public outreach





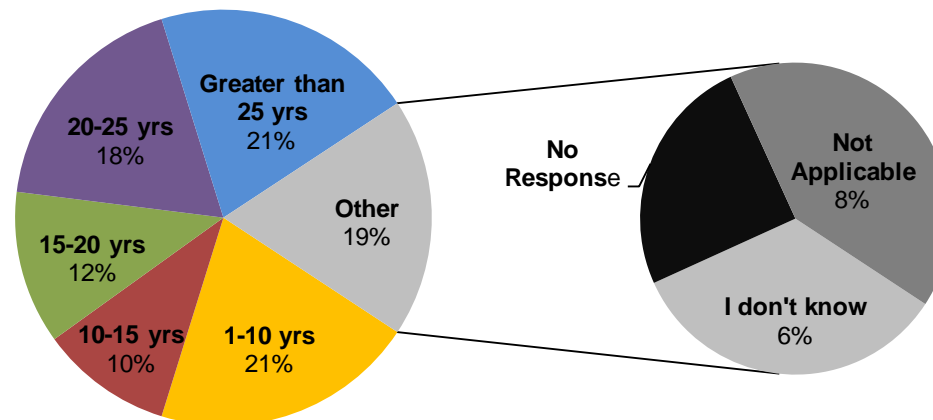
# The Watershed Management Planning Process

2

## Complete Field Surveys

- Watershed Survey
- Shoreline Survey
- Septic System Survey

How old is the septic system?



# The Watershed Management Planning Process

## 3

### Analyze Water Quality Data

- Analyze trophic indicators such as total phosphorus, chlorophyll-a, and dissolved oxygen
- Determine the assimilative capacity for the waterbody

Trophic State	TP (ppb)	Chl-a (ppb)
Oligotrophic	< 8.0	< 3.3
Mesotrophic	> 8.0 - 12.0	> 3.3 - 5.0
Eutrophic	> 12.0 - 28.0	> 5.0 - 11.0

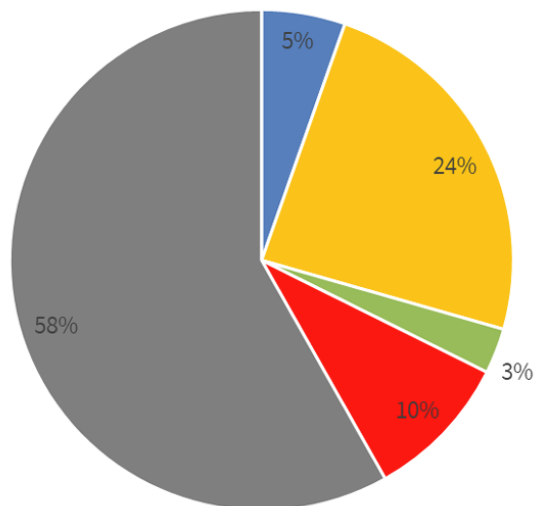


# The Watershed Management Planning Process

## 4

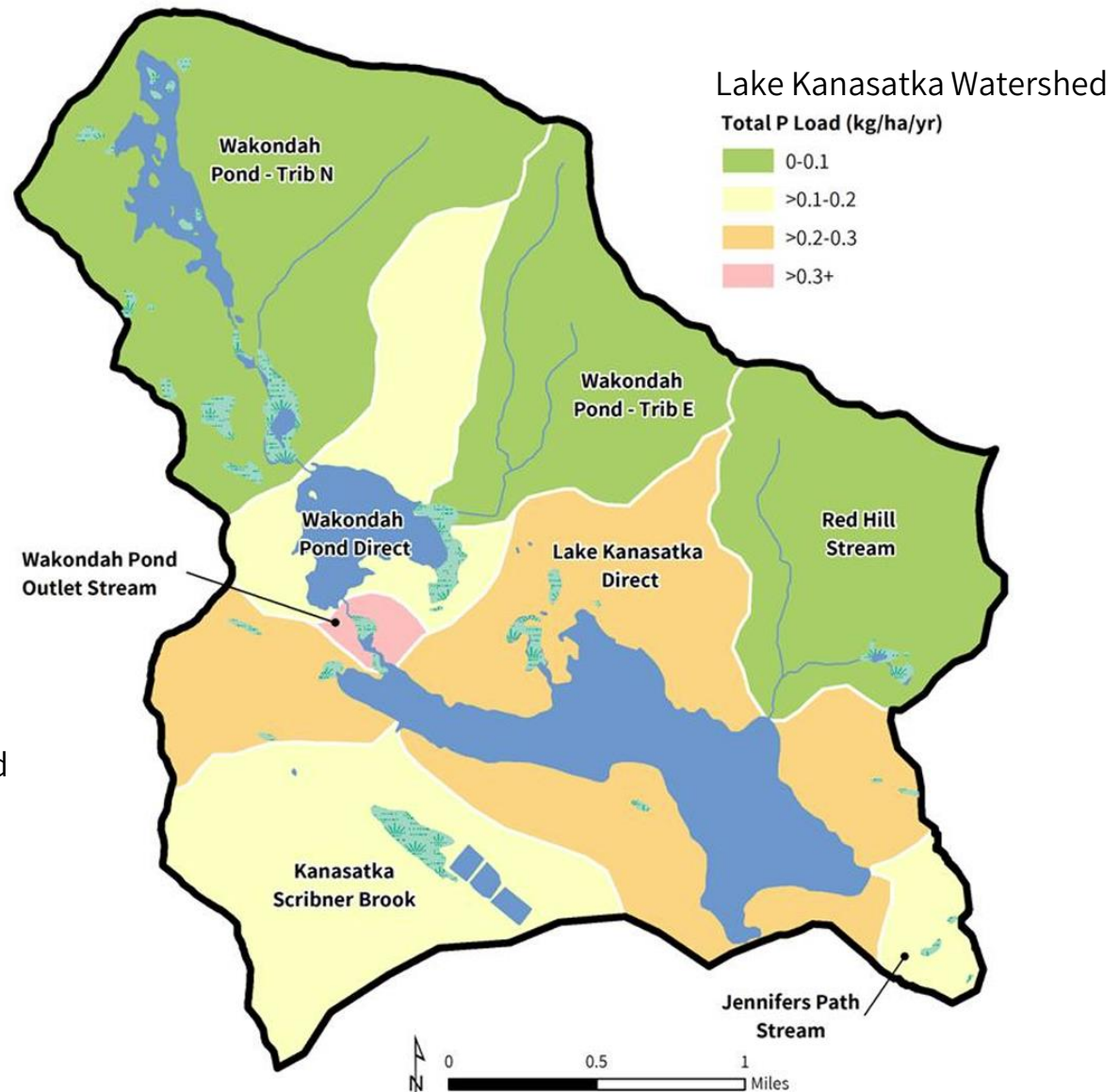
### Watershed and Lake Modeling

- To determine the nutrient and sediment loads to the waterbody under current, past and future conditions to help inform the water quality goal and target remediation efforts.



Lake Kanasatka Watershed

- ATMOSPHERIC DEPOSITION
- INTERNAL LOADING
- WATERFOWL
- SEPTIC SYSTEM
- WATERSHED LOAD



# The Watershed Management Planning Process

## 5

### Water Quality Goal

- To determine an attainable goal for future water quality parameters to improve water quality
- To determine the pollutant load reductions needed to achieve the water quality goal



# The Watershed Management Planning Process

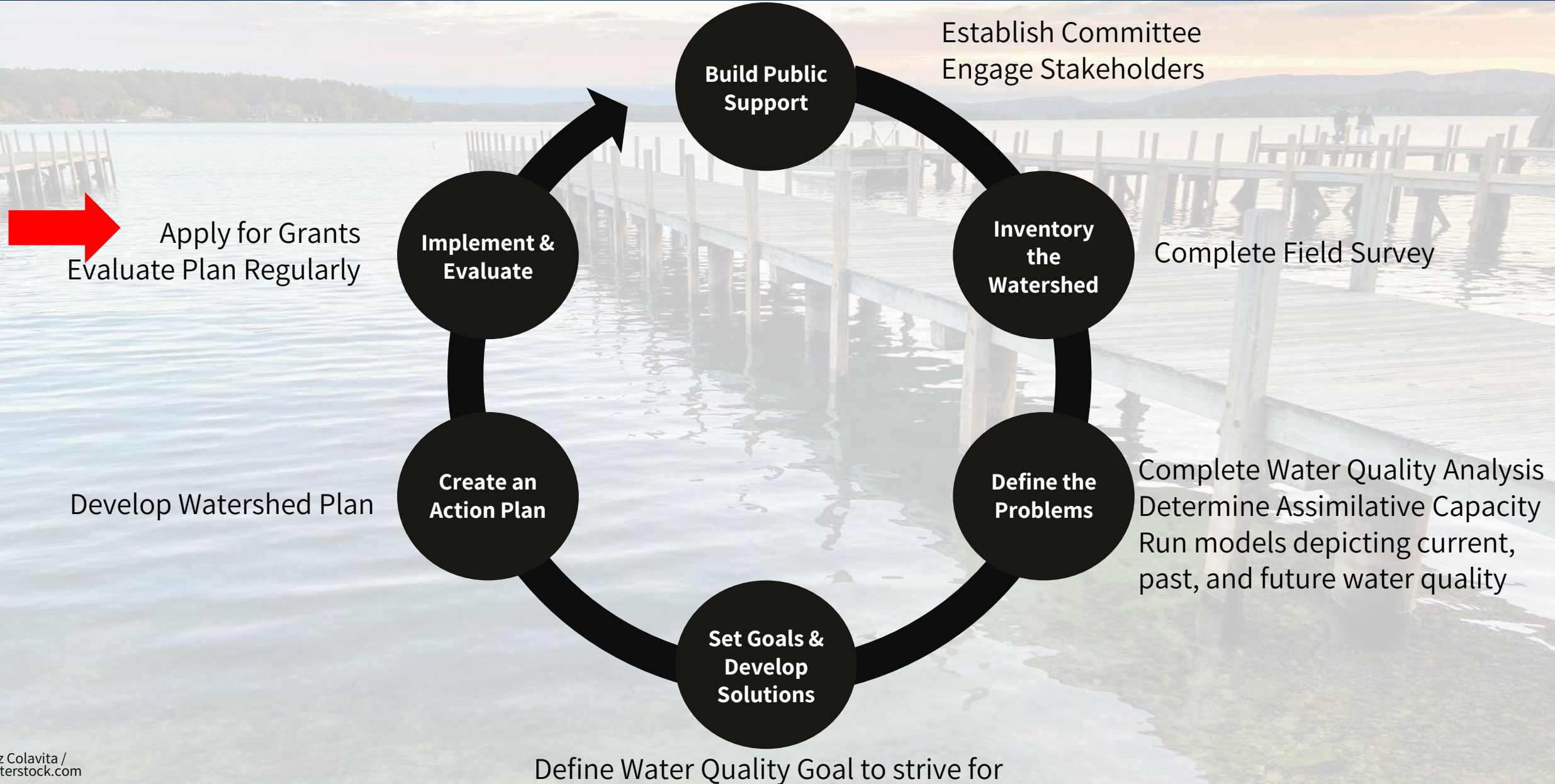
## 6

### Action Plan

- Identifies responsible parties, estimates costs to implement, suggests potential funding sources, and sets a schedule for each stage of plan implementation to reach the water quality goal



# The Watershed Management Planning Process



THANK YOU!  
QUESTIONS?

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