

WATERSHED MANAGEMENT PLANNING **THE BROADS**

May 2024

FB Environmental Associates

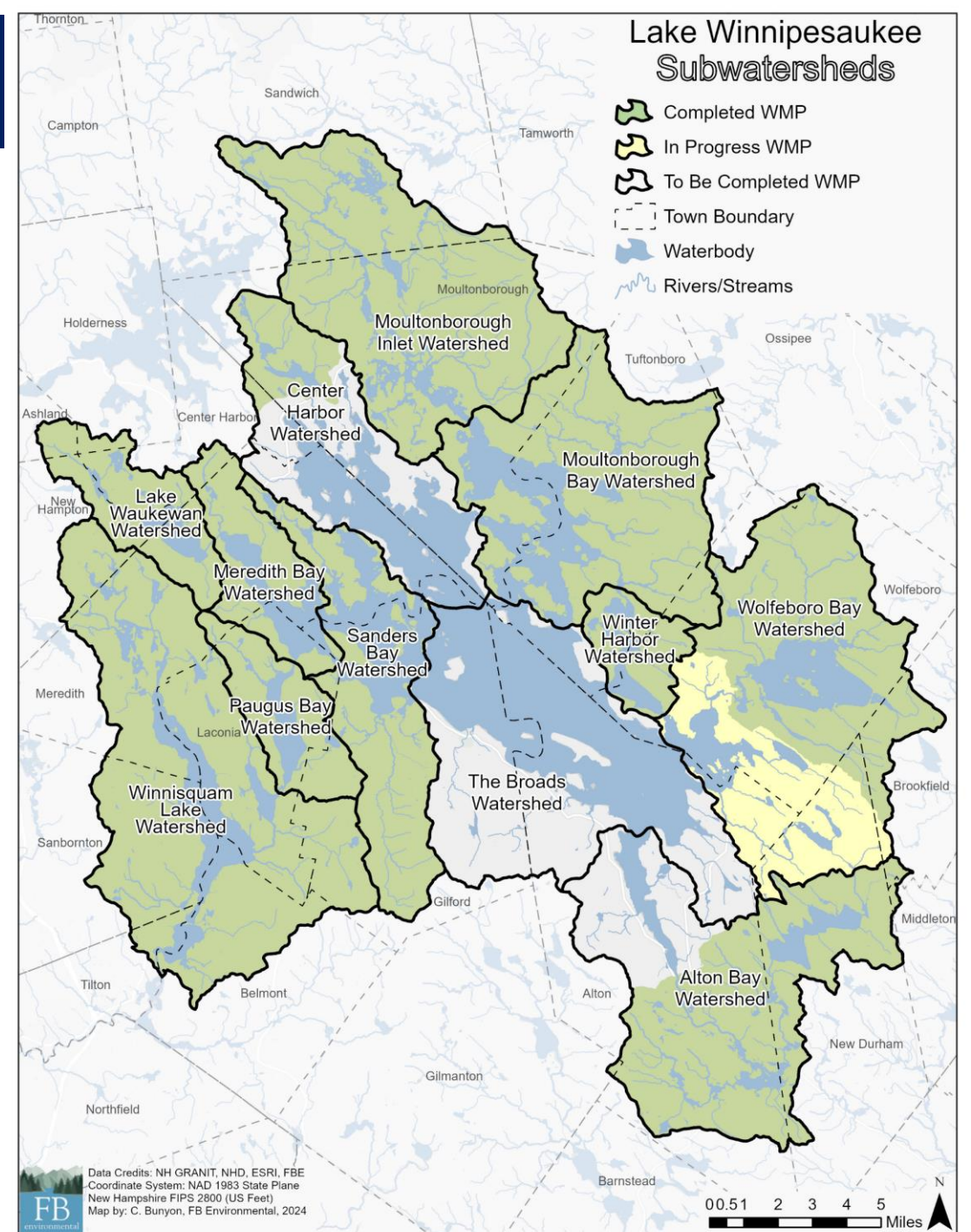


Forrest Bell, Senior Project
Manager/Principal-in-Charge

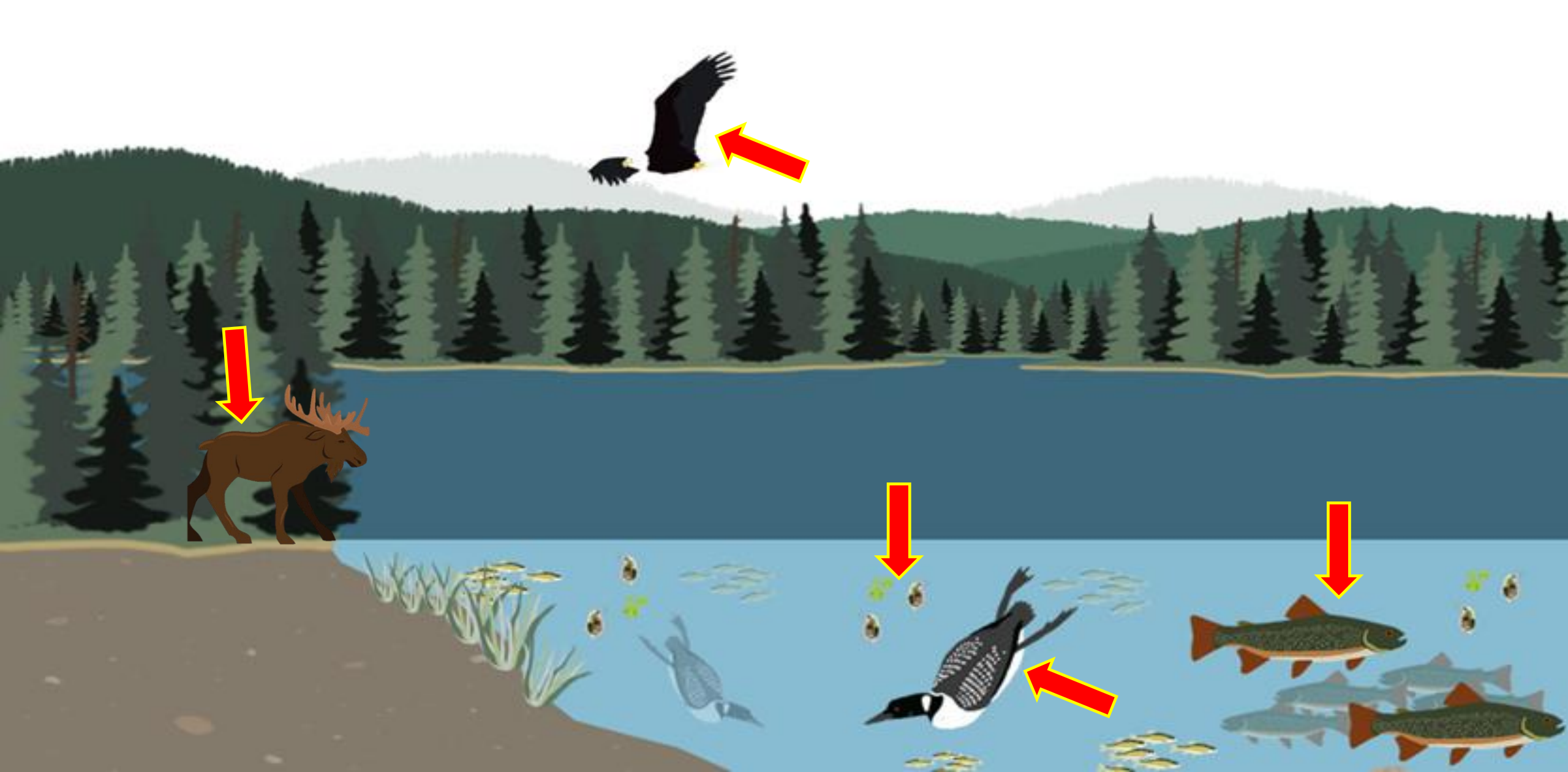
Christine Bunyon, Project Manager/
Water Resource Scientist/ GIS Specialist

Lake Winnepesaukee WMPs

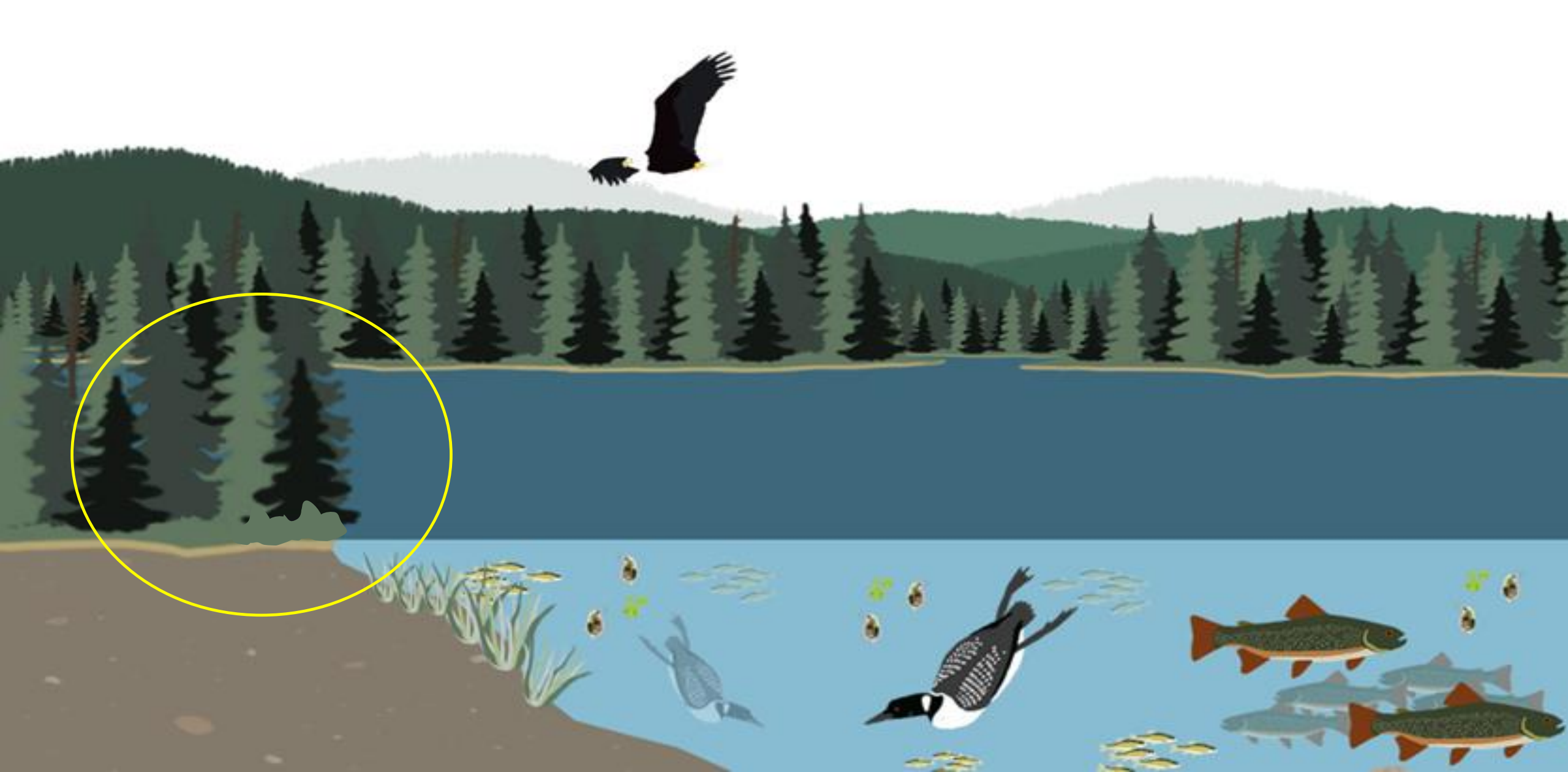
A Watershed Management Plan (WMP):
Provides an analytical framework to restore water quality in impaired waters and to protect water quality in other waters adversely affected or threatened by point source and nonpoint source pollution (EPA, 2008).



Understanding the Lake Ecosystem



Understanding the Lake Ecosystem



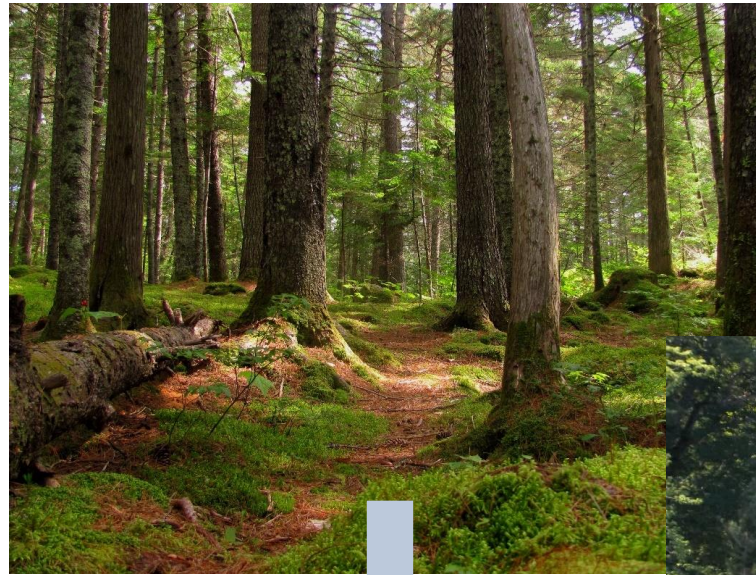
Understanding the Lake Ecosystem





10

TIMES THE AMOUNT OF
PHOSPHORUS



Lake Kanasatka 10/29/23



Blackey Cove (Center Harbor) 10/29/23

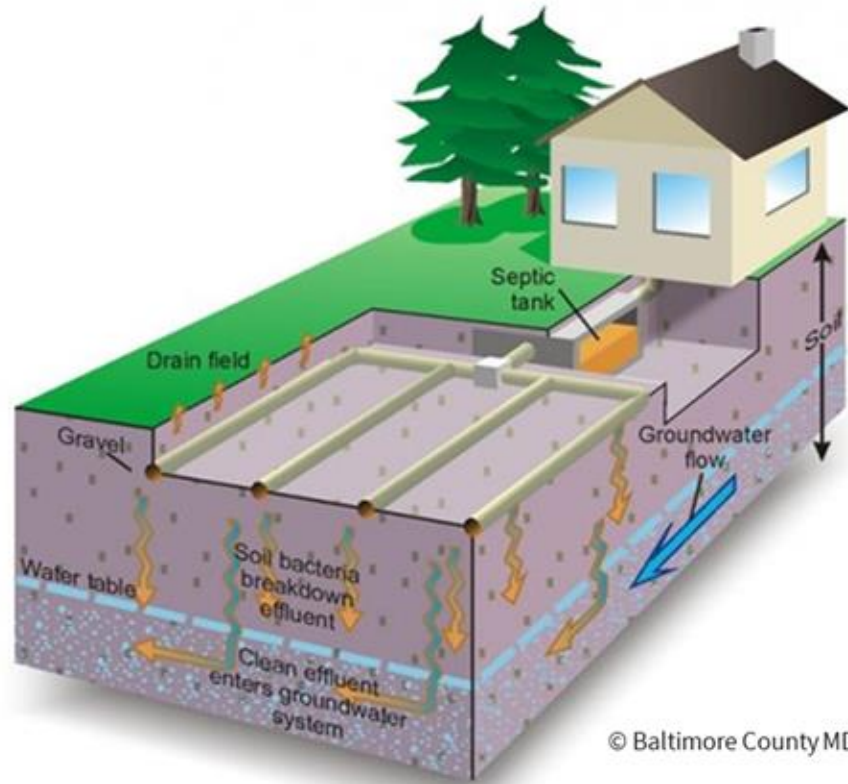


Sources of Phosphorus



Photos not from the Broads watershed

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



The Broads Water Quality Challenges

2020/2022 Impairments

Waterbody	Aquatic Life Integrity Impairment	Primary Contact Recreation Impairment
Lake Winnepesaukee	pH and Non-Native Aquatic Plants	
Elacoya State Park Beach	pH	<i>Escherichia coli</i>
Brookwood/Deer Run Beach	pH	
Camp Alton Beach	pH	
Camp Dewitt Beach	pH	
Camp Sandy Island Beach	pH	



Variable Milfoil (1965-present)

The Broads Water Quality Challenges

Primary Contact Recreation (2018)

- Lake Winnepesaukee – Cyanobacteria hepatotoxic microcystins

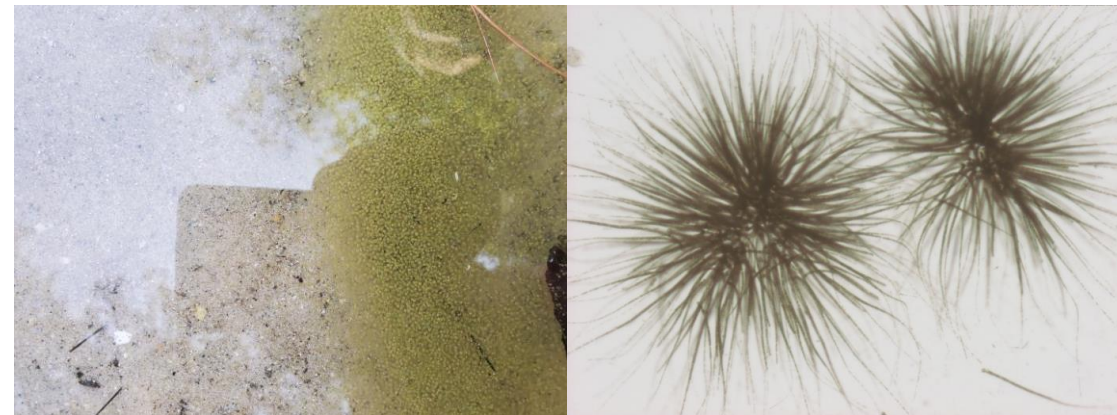
Cyanobacteria Bloom History (2020-2023)

2022

- Lake Winnepesaukee – 1 advisory – 8 total days
- Ellacoya State park – 1 advisory – 2 total days



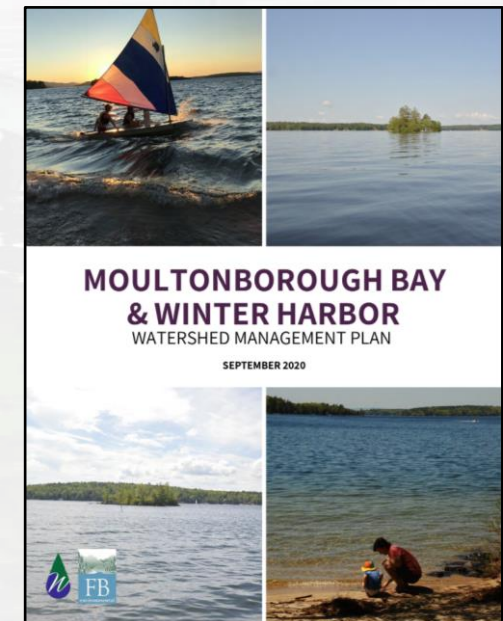
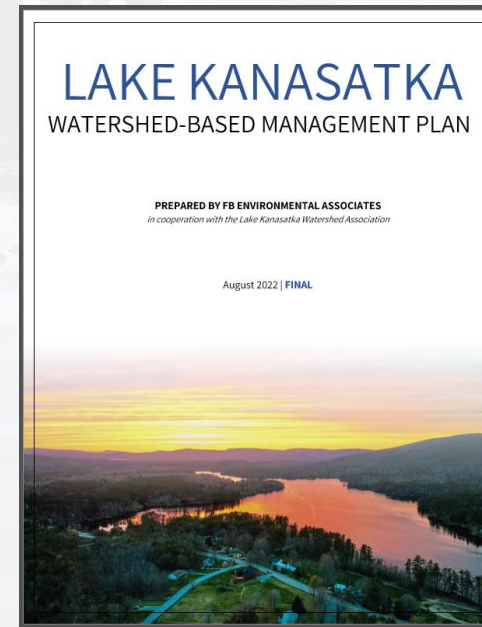
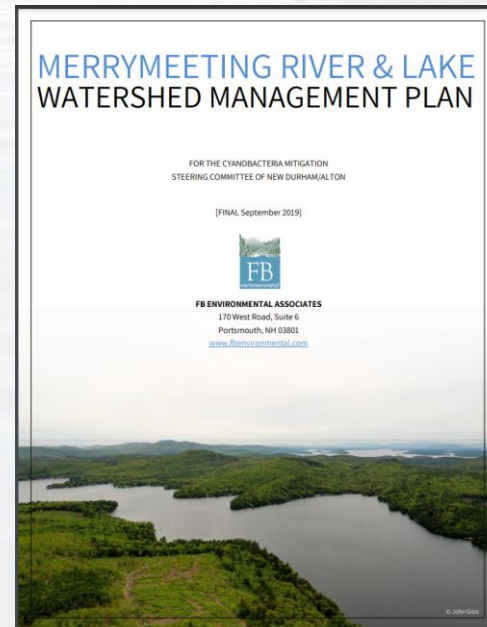
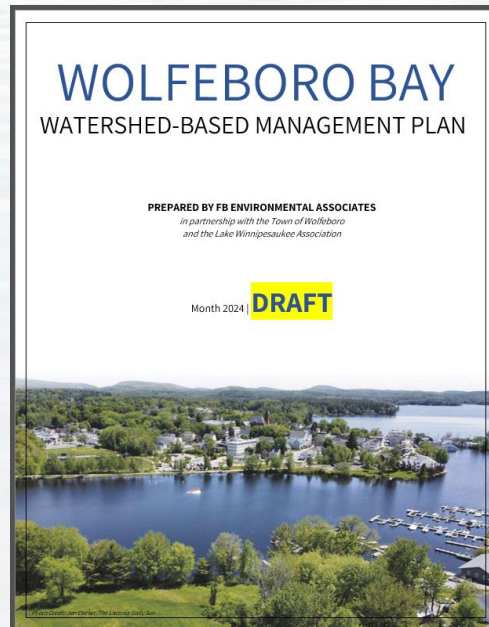
Dolichospermum



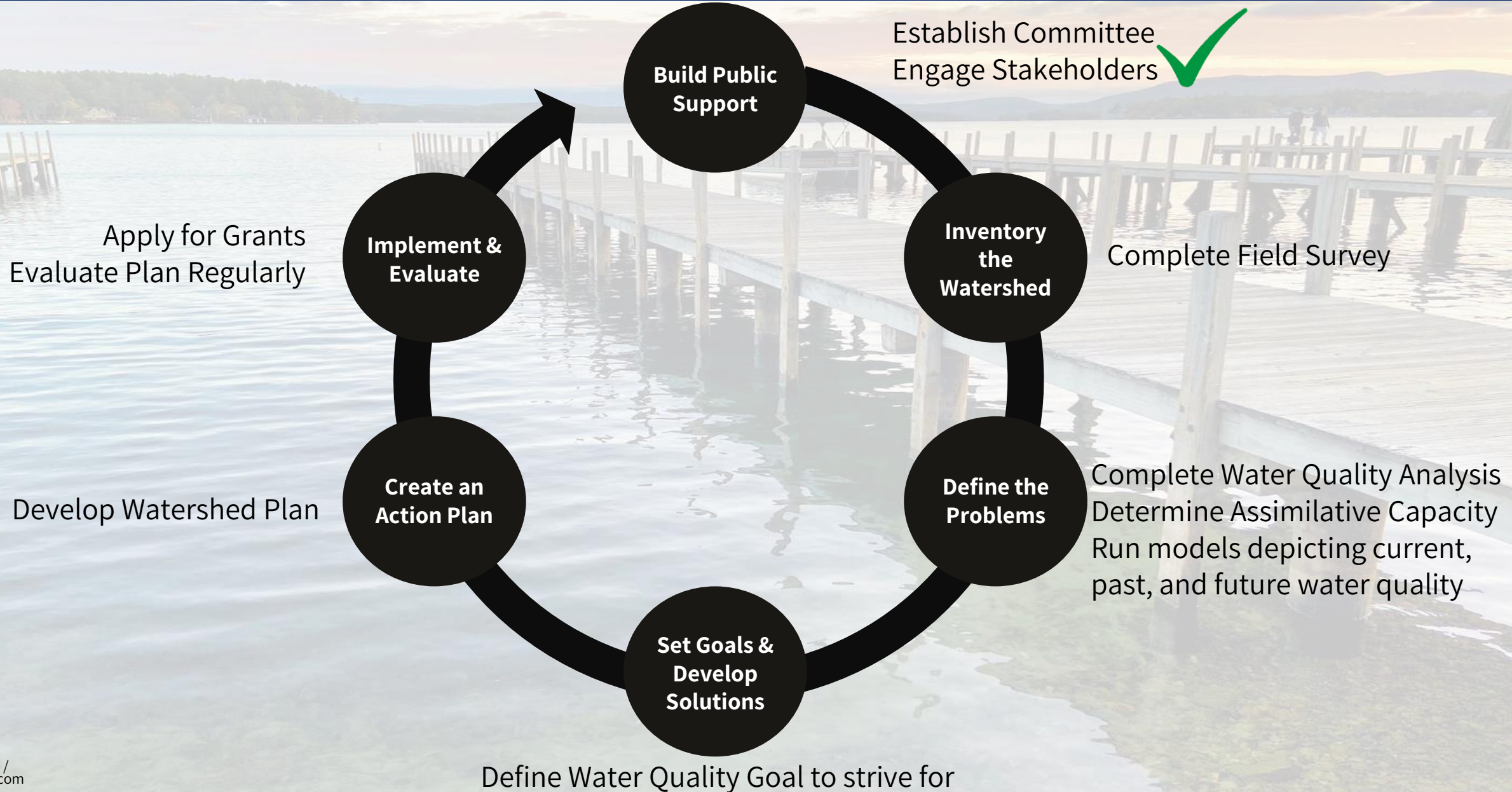
Gloeotrichia

The Watershed Management Planning Process

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The Watershed Management Planning Process



The Watershed Management Planning Process

1

Build Public Support and Engage Stakeholders

- Steering Committee
- Project development
- Public outreach



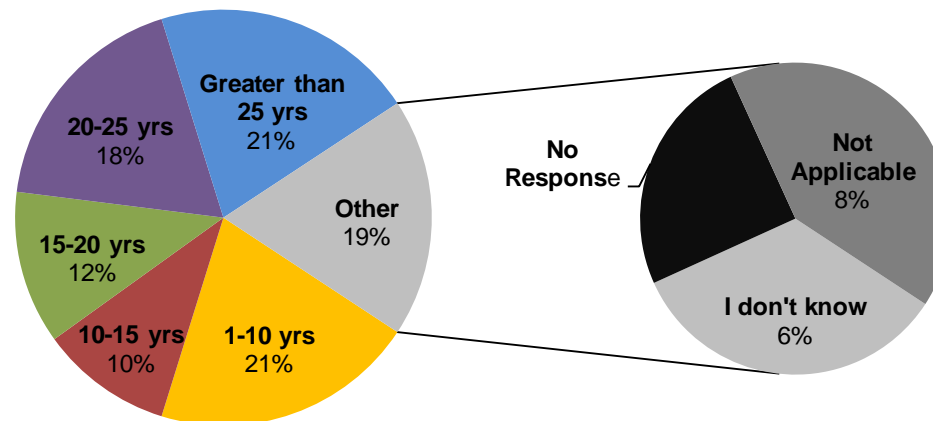
The Watershed Management Planning Process

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

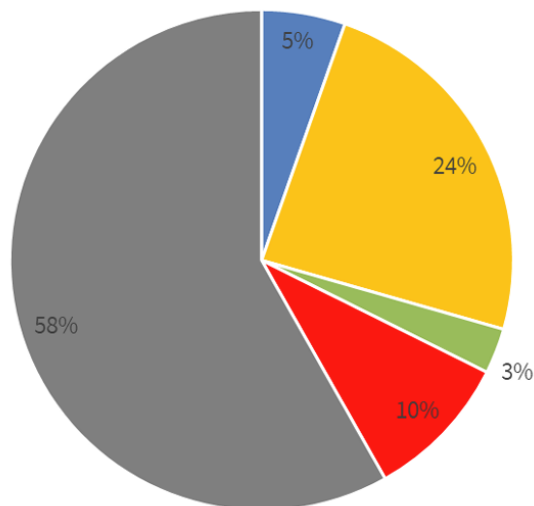


The Watershed Management Planning Process

4

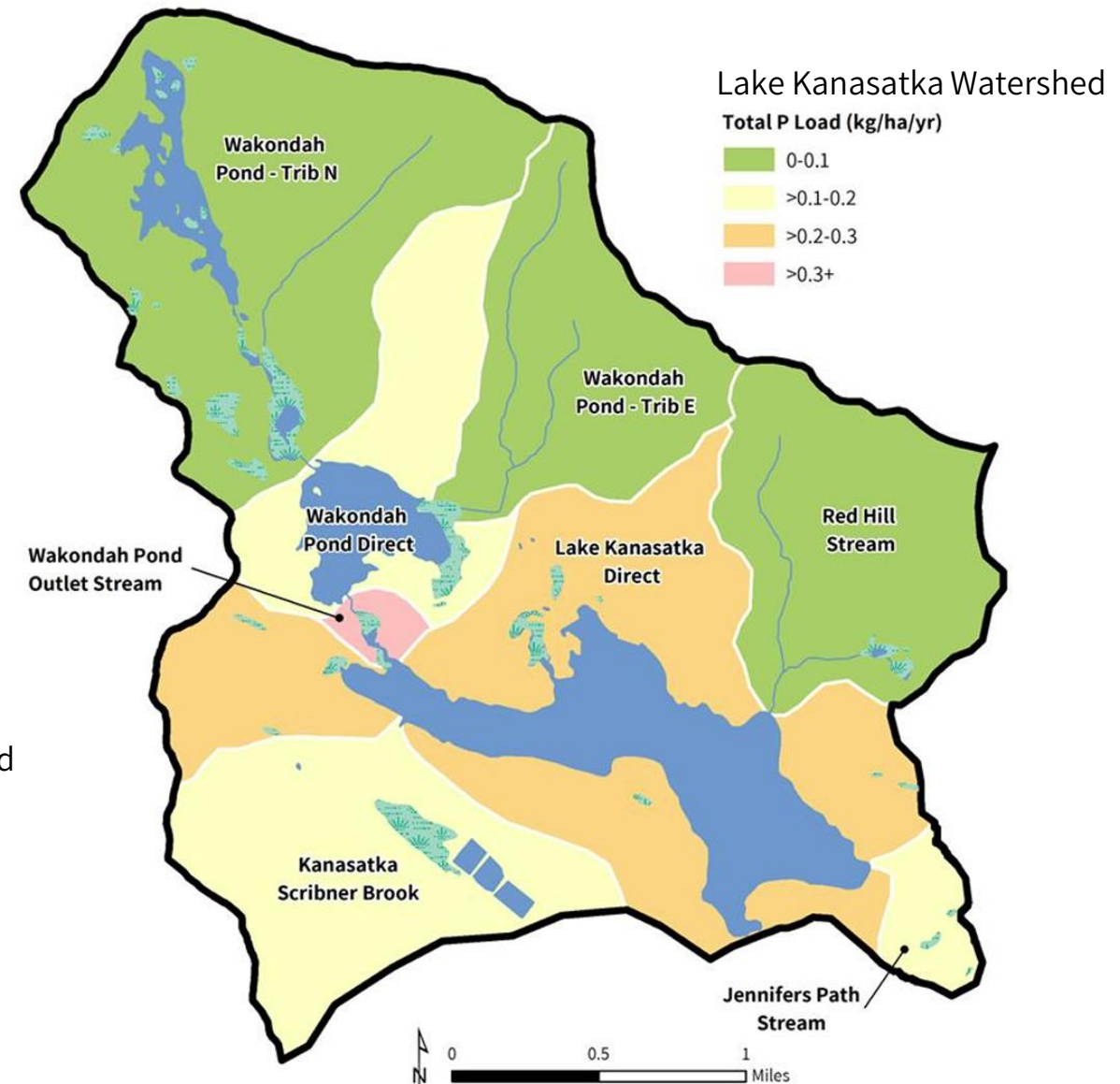
Watershed and Lake Modeling

- 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

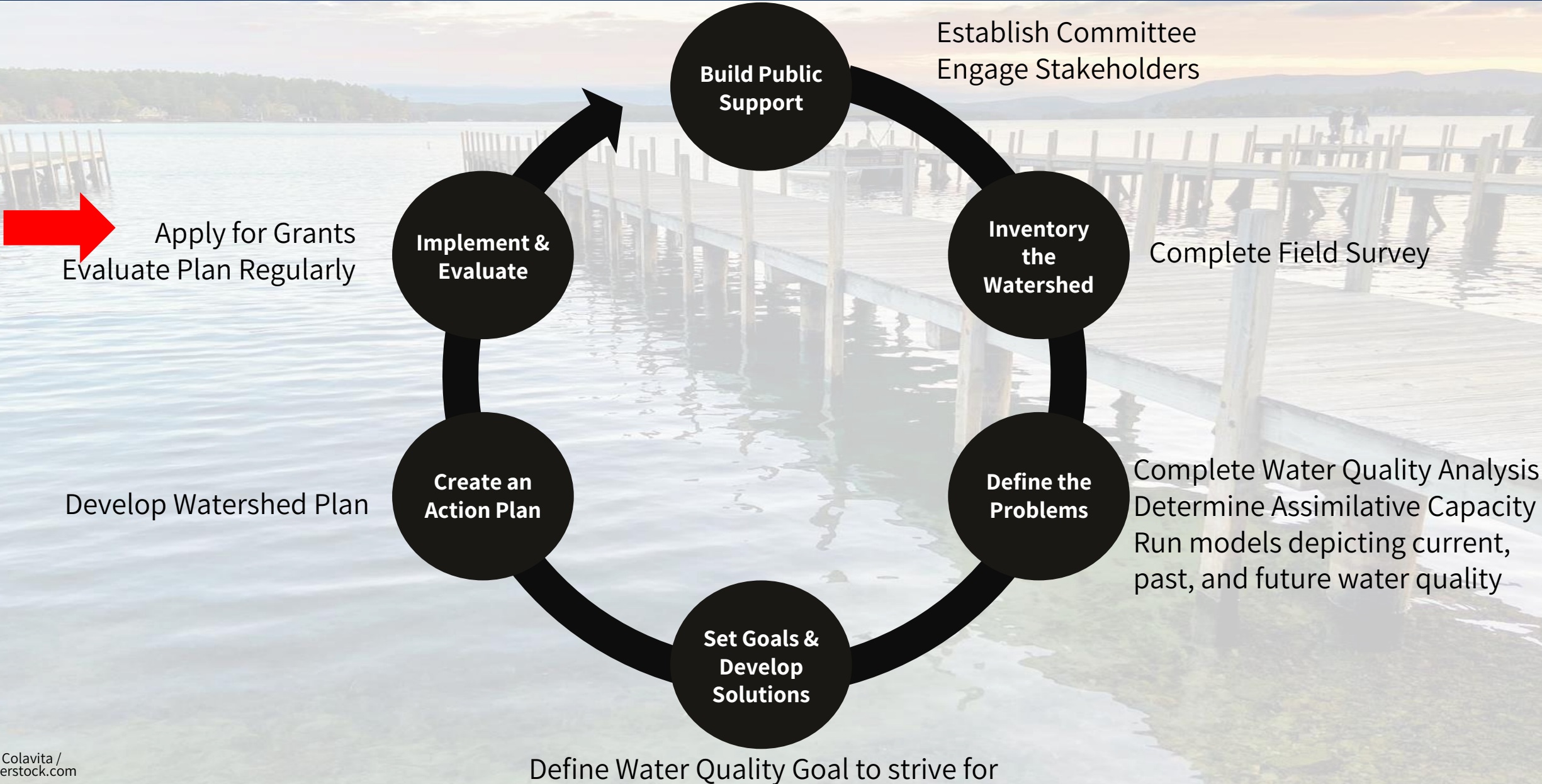
6

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



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THANK YOU!
QUESTIONS?