WATERSHED ACTION PLAN FOR LAKE GEORGE

DECEMBER 2023

Preparation of the Watershed Action Plan for Lake George was funded through a New York State Department of State Title 11 Environmental Protection Fund (EPF) Local Waterfront Revitalization Program (LWRP) grant to the Town of Queensbury

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Acronyms Use

ACOE	Army Corp of Engineers
AIS	Aquatic Invasive Species
ALLUP	Agency-approved Local Land Use Program
APA	Adirondack Park Agency
CO	Certificate of Occupancy
CSLAP	Citizens Science Lake
CWA	Clean Water Act
CWS	Community Water Systems
DO	Dissolved Oxygen
GIS	Geographic Information System
GML	General Municipal Law
HAB	Harmful Algal Bloom
HUC	Hydrologic Unit Code
HWA	Hemlock Wooly Adelgid
LCLGRPB	Lake Champlain Lake George Regional Planning Board
LGA	Lake George Association
LGLC	Lake George Land Conservancy
LGPC	Lake George Park Commission
LUD	Land Use Development
LWRP	Local Waterfront Revitalization Program
MS4	Municipal Separate Storm Sewer System
NLCD	National Land Cover Data Set
NRCS	Natural Resources Conservation Service
NTNCWS	Non-transient Non-community Water System
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy and Resource Development Authority
NYSDOH	New York State Department of Health
PWS	Public Water Supply
SEQRA	State Environmental Quality Review Act
TIS	Terrestrial Invasive Species
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TNCWS	Transient Non-community Water System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WAC	Watershed Advisory Committee
ZBA	Zoning Board of Appeals

Executive Summary

Known as the Queen of American Lakes, Lake George is a major environmental, recreational, and economic asset for the Southern Adirondack Region. Spanning portions of three New York counties and 12 municipalities, the factors that impact the lake and its watershed are wide and many. Equally as broad and varying are the strategies and solutions to manage, mitigate, and protect the water quality and the natural resources of Lake George and its watershed included in this plan.

The Watershed Action Plan for Lake George focuses on the 32 surface miles of Lake George along with its 300 square mile watershed. This plan was prepared with broad public input from stakeholders throughout the watershed and an advisory committee comprised of local officials, municipal employees, representatives of the non-profit and business communities, and lake association members.

Through the planning process, five priority threats and emerging issues were identified including non-point source pollution, invasive species, road salt usage and other impacts from roadways, wastewater treatment and disposal, and climate change. These broad categories represent existing and emerging trends throughout the watershed that threaten the area's natural resources and water quality. To address the threats and emerging issues for the watershed, nearly 100 strategies and recommendations are identified in **Section 9. Implementation Strategy and Timeline** of this document, the implementation of which will aid in achieving the vision and goals set forth in this plan. The projects and programs identified in this plan to protect and manage the natural resources of the Lake George Watershed **total approximately $75,000,000 in funding needs for the lake and its watershed.**

Photo 1: Lake George as seen from the Tongue Mountain Range.

What is a Watershed?

A watershed is the land area, delineated by high topographic points of land, such as hills or slopes, within which water collects and drains to a common stream or river and eventually to a larger body of water.

Water in a watershed flows downhill unaware of municipal boundaries, therefore planning at the watershed level provides an appropriate scale to manage water resources as it can better capture all contributing factors to water quality.

Section 1. Introduction

The importance of keeping the waters of Lake George clean has long been understood and documented by scientists, planners, residents, and municipal officials. Scientific investigations in the 1960s indicated that nutrient loading into the lake had doubled over natural background levels. This research continues today with data collection and research conducted by the New York State Department of Environmental Conservation (NYSDEC), the Jefferson Project, Lake George Association (LGA), Darrin Freshwater Institute, and other watershed partners. The Watershed Action Plan for Lake George builds upon the previous plans and studies that have been conducted throughout the Lake George watershed including *The Plan for the Future of the Lake George Park* (1987), and *Lake George – Planning for the Future* (2001) and highlights the need to maintain and improve the water quality of Lake George. This plan examines the state of Lake George and its watershed and identifies goals and strategies that will manage, maintain, and improve the area's natural resources.

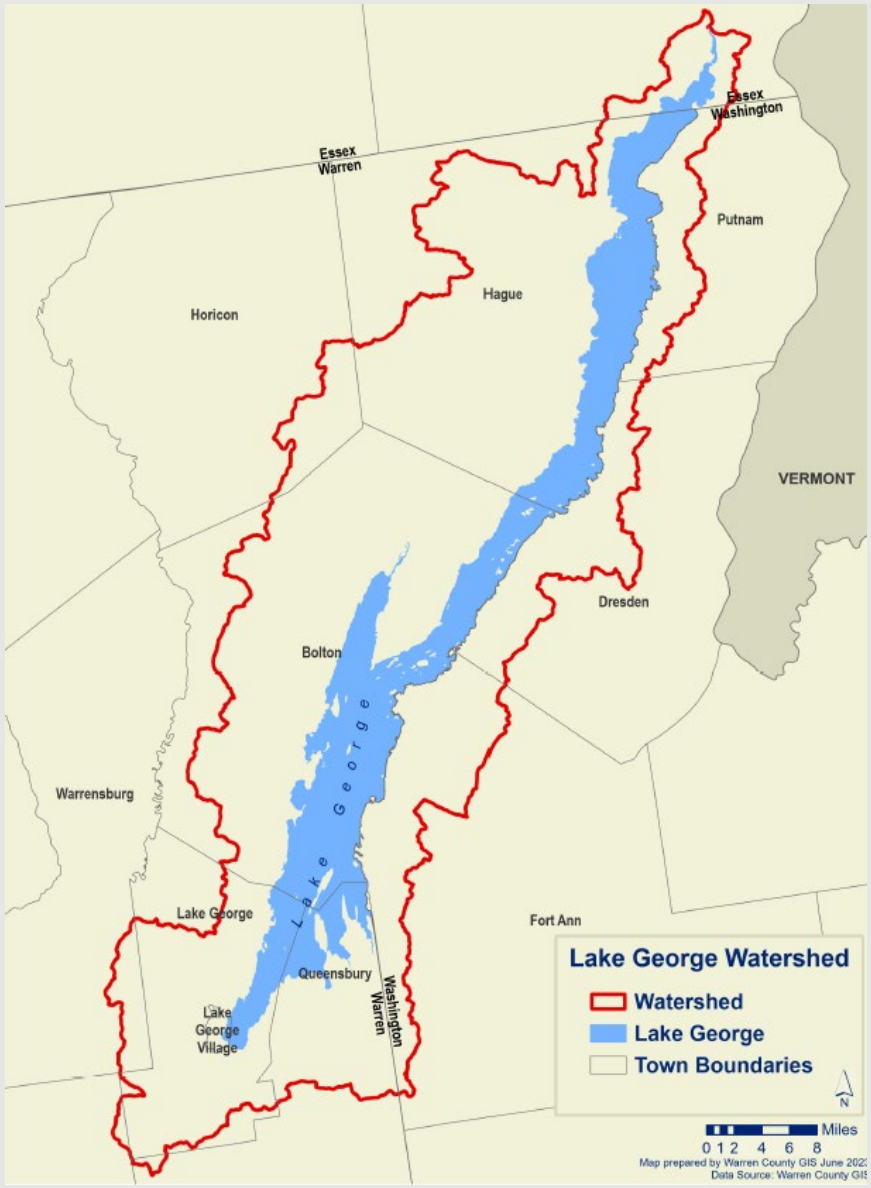


Figure 1: The Lake George Watershed drains 12 municipalities across two counties.

The Lake George Watershed spans portions of Warren, Washington, and Essex Counties in the Southern Adirondack Region of New York State. The watershed drains all or portions of 12 municipalities across those three counties. The lake flows north from its headwaters in Lake George Village to its outlet at the LaChute River in Ticonderoga which then empties into Lake Champlain **(Figure 1)**.

This plan focuses on the waters of the lake and its tributaries as well as the upland areas within the watershed that contribute to the health of its waters. The plan evaluates the current conditions within the watershed, highlights key issues impacting its natural resources and identifies strategies to mitigate and manage

these impacts. **One hundred projects identifying nearly $75,000,000** in water quality improvement projects and programs are in this plan that will result in the improved biological health of the watershed.

Preparation of this plan was facilitated by the Lake Champlain Lake George Regional Planning Board (LCLGRPB) and an advisory committee comprised of local officials, water quality professionals, lake association representatives, the New York State Department of State (NYSDOS), and the Town of Queensbury, which served as municipal grantee for this project.

The Watershed Action Plan for Lake George was funded through a NYSDOS Title 11 Environmental Protection Fund (EPF) Local Waterfront Revitalization Program (LWRP) to the Town of Queensbury Contract #C1000678 and represents a regional approach to watershed planning that involves representatives from a wide geographical area.

1.1 Watershed Advisory Committee

At the onset of this planning process, a Watershed Advisory Committee (WAC) was formed. Members of the WAC are tasked with guiding the overall planning process, reviewing all work products created and serving as facilitators between the involved local governments, State agencies, and other stakeholders essential to the preparation and implementation of the watershed plan. The WAC consists of representatives from watershed municipalities, county planning departments, county soil and water conservation districts, State agencies, local non-profit groups, lake associations, and community and business groups.

The Town of Queensbury and the Lake Champlain Lake George Regional Planning Board would like to thank the members of the Watershed Action Plan for Lake George WAC:

Watershed Advisory Committee

Stu Baker	Town of Queensbury
Dan Barusch	Town and Village of Lake George
Kathy Bozony	Queensbury Clean Energy Committee
Dr. Carol Collins	Assembly Point Water Quality Committee
Edna Frasier	Supervisor, Town of Hague
Ethan Gaddy	Warren County Planning Department
Lauren Generous	Washington County Soil and Water Conservation District
Joseph Giordano	Former Supervisor, Town of Ticonderoga
Alice Halloran	Essex County Soil and Water Conservation District
Mike Horn	Lake George Land Conservancy
Pamela Landi	Washington County Planning Department
Walt Lender	Lake George Association
Jim Lieberum	Warren County Soil and Water Conservation District
Gina Mitzner	Lake George Regional Chamber of Commerce
Chris Navitsky	Lake George Waterkeeper
Rosemary Pusateri	Lake Stewardship Group of Cleverdale
Randy Rath	Lake George Association
Dr. Lorraine Ruffing	Assembly Point Water Quality Committee
John Strough	Supervisor, Town of Queensbury
Josh Westfall	Town of Bolton

State Officials

Julie Berlinkski	NYS Department of Conservation
Kate Black	NYS Department of State
Max Gerjoi	NYS Department of Health
Joe Thouin	Lake George Park Commission
Stephanie Wojtowicz	NYS Department of State

Lake Champlain Lake George Regional Planning Board Staff

Allison Gaddy	Chris Belden
Beth Gilles	Sam Blake

1.2 Watershed Vision and Goals

With community input and guidance, the Watershed Action Plan advisory committee developed the following vision statement and goals to serve as the foundation for this plan.

Vision Statement:

The health and function of the natural resources of the Lake George Watershed are protected and improved by supporting sound policies and programs that promote and protect water quality, build climate resiliency, and preserve water-based uses for the future through best management practice and sustainable land use decisions.

Goals and Objectives:

Based on this vision, the following eight goals and associated objectives were developed for the watershed:

Goal 1: Maintain the Class AA status of Lake George

Objectives:

- Promote land use policies that are sustainable and protect the water and drinking water of Lake George
- Promote strategic land conservation throughout the watershed
- Encourage policies that minimize the impact of development on water quality
- Continue supporting organizations and programs that monitor water quality in Lake George and its tributaries
- Identify existing monitoring programs on Lake George and evaluate their compliance with NYSDEC 9 Element Plan data requirements

Goal 2: Reduce stormwater runoff and nutrient loading into Lake George and its tributaries

Objectives:

- Encourage land uses that reduce stormwater runoff and nutrient loading into Lake George, including chemicals and other pollutants of emerging concern
- Promote strategic land conservation throughout the watershed
- Promote reductions in fertilizer and pesticide use in the watershed
- Continue project planning and implementation throughout the watershed to reduce stormwater runoff

Goal 3: Support actions that reduce the water quality impacts of wastewater in the watershed

Objectives:

- Assist the development of policies and programs that promote sound septic system management and maintenance

- Support municipalities in pursuing funding to upgrade wastewater treatment facilities to include enhanced treatment systems to reduce nitrogen and phosphorus loads in finished discharges

Goal 4: Prevent future Harmful Algal Bloom occurrences

Objectives:

- Maintain localized monitoring and reporting clearinghouse for HABs occurrences that coordinates with NYSDEC
- Support and implement actions identified in the Harmful Algal Bloom Action Plan for Lake George (NYSDEC, 2022)
- Support and implement the goals of this plan that reduce nutrient loading to Lake George that may contribute to HABs (Goals 2 and 3)

Goal 5: Monitor, control and eradicate invasive species in the Lake George Watershed

Objectives:

- Continue to support programs that monitor, control, and eradicate invasive species
- Maintain funding for mandatory boat wash and inspection stations throughout the watershed
- Secure all boat launches, both public and private, from launching when no inspection is available

Goal 6: Promote practices that reduce erosion in the watershed

Objectives:

- Promote actions that foster stream stabilization and riparian buffer zones protective of water quality
- Encourage conservation of critical areas of the watershed
- Facilitate the use of the New York State best management practices for forestry including construction and maintenance of erosion and sediment controls and final site stabilization
- Assist municipalities in right-sizing road stream crossings to reduce erosion, increase flood resiliency and provide optimal aquatic organism passage

Goal 7: Reduce water quality impacts associated with road and highway systems

Objectives:

- Assist municipalities with implementing best management practices and sustainable winter management to reduce road salt usage in the watershed on public and private roads and parking lots
- Encourage best management practices for stormwater and erosion control on county, state, municipal and private roads

Goal 8: Increase awareness of water quality issues through education and outreach to all user groups

Objectives:

- Create education and outreach materials aimed at individualized user groups: homeowners, visitors, forestland owners, and business owners based on the goals and objectives of this plan
- Support and expand existing education and outreach programs in the watershed

1.3 The Watershed Planning Process and Community Outreach

The Lake George Watershed Action Plan was developed over a four-year period, from 2020 to 2023. From the onset, an Advisory and Steering Committee was established to help guide the planning process and to facilitate communication and cooperation with watershed communities and other stakeholders vital to the preparation and implementation of this plan.

Watershed planning is an ongoing and flexible process that is a result of collaboration between all who live in and use the watershed. This process cannot be achieved without broad public participation. As such, all Advisory and Steering Committee meetings were open to the public and held at public facilities or on Zoom and live streamed on the LCLGRPB YouTube channel. To engage participation from around the watershed, outreach events were held at various locations throughout the study area. Community workshops were held in the Town of Bolton on September 2, 2021, in the Town of Ticonderoga on September 25, 2021, and in the Town of Queensbury on February 17, 2022. During these events, posters were provided for participant input and an online survey was promoted for additional feedback. Event summaries and a summary of survey responses can be found in **Appendix A** of this plan.

Photo 2: Community outreach event at the Bolton Farmer's Market.

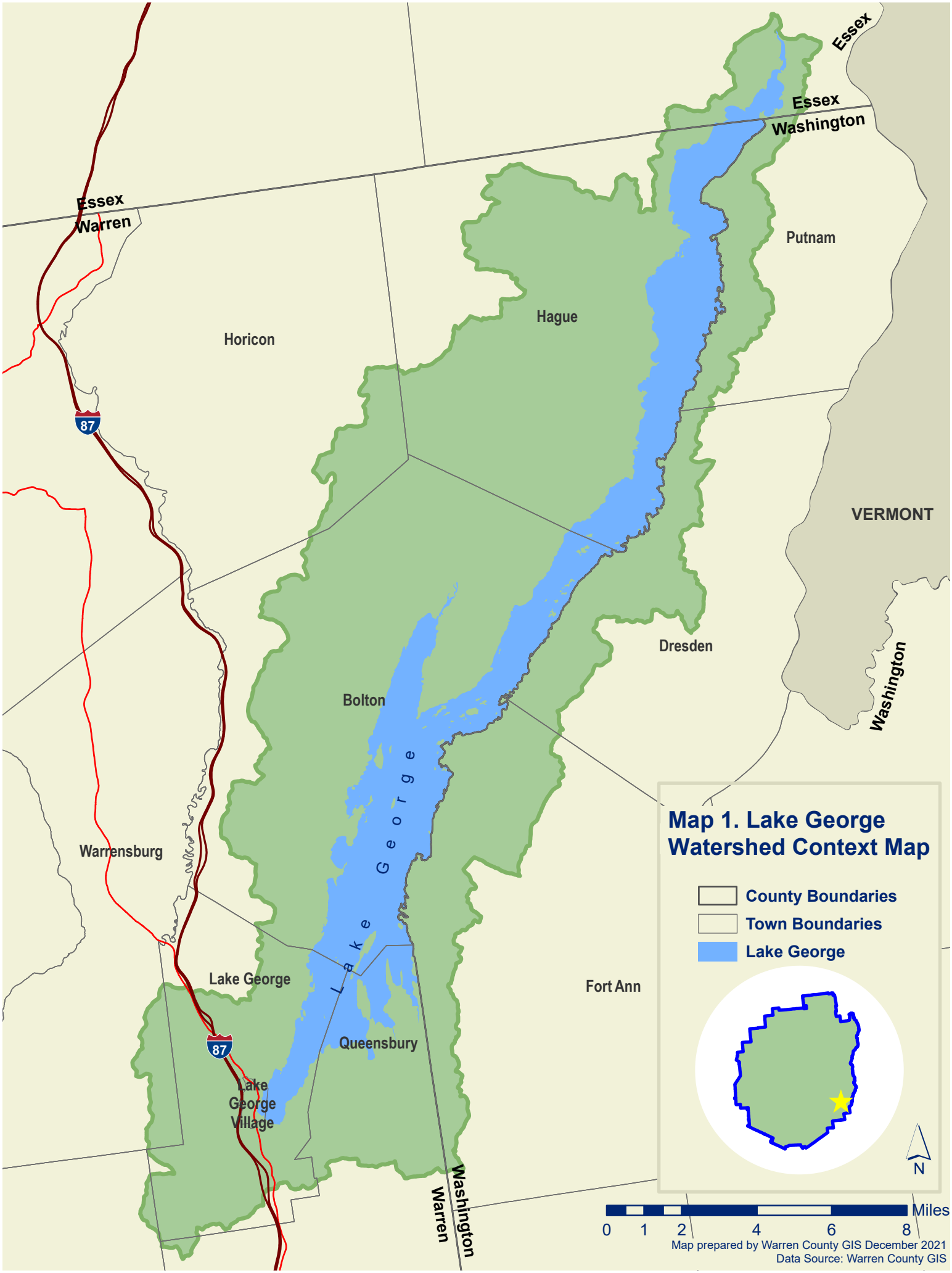
Section 2. Characterization of Lake George and its Watershed

Lake George is a long, narrow, oligotrophic lake located in the southern Adirondack Region of New York State and is part of the greater Lake Champlain Basin. The lake is characterized by high water clarity readings, lower levels of plant growth, and higher levels of dissolved oxygen. Lake George is rated by New York State as a Class AA Special drinking water source. It is the second largest lake within the Lake Champlain Basin and is encompassed by the Lake George Park, a 300 square mile area of public and private land lying wholly within the Adirondack State Park.

Photo 3: The waters of Lake George, looking north.

Lake George is approximately 32 miles long and flows south to north, emptying into the La Chute River in the Town of Ticonderoga and then into Lake Champlain. The lake has an average width of 1.33 miles, an average depth of 70 feet, nearly 45 square miles of surface water with over 170 islands and 180 miles of irregular and varied shoreline **(Map 1. Watershed Context Map)**.

The water quality of Lake George is influenced by the environmental conditions of its watershed such as topography, soils, land cover, and climate; as well as the lake's physical features such as depth and water residence time. Development patterns, recreational use, wastewater, the presence of invasive species, and many other human activities that occur within the watershed also impact the lake and its environmental features. This chapter serves as a snapshot of the current conditions within the Lake George Watershed.


Essex
Essex
Washington
Essex
Warren
Putnam
Hague
Horicon
87
VERMONT
Dresden
Washington
Bolton
Lake George
Warrensburg
Lake George
Fort Ann
Queensbury
87
Lake George Village
Washington
Warren
Map 1. Lake George Watershed Context Map
County Boundaries
Town Boundaries
Lake George
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS December 2021
Data Source: Warren County GIS

2.1 Geology and Soils

Sharing geologic characteristics with both the Adirondacks and the adjacent lowlands to the east, the Lake George Watershed consists predominately of pre-Cambrian rock, with small patches of Cambrian bedrock at the southern end (Shuster, 1994). Most of the watershed is covered with shallow sandy till overlaying bedrock with numerous granite outcrops and large boulders. The sandy tills have high hydraulic conductivities and rapid groundwater infiltration rates meaning that water is absorbed by the ground quickly and does not have much of an opportunity to runoff. The northern portion of the watershed has more fine silts and clays associated with deposition from seasonally melting glaciers. These overburdens have lower levels of hydraulic conductivities resulting in greater opportunities for stormwater runoff to occur (McClellan, 1986, and Shuster, 1994).

Hydraulic conductivity describes the ease with which a fluid (usually water) can move through pore spaces or fractures in rocks.

Groundwater infiltration rate is the speed at which water enters the soil.

The bottom sediments of Lake George include three major units, defined as undifferentiated till, glaciolacustrine clay and Holocene Lake deposits (Hutchinson et al., 1981). Glacially deposited sand and gravel are found mostly on the west side of the lake and in the deep bedrock basins. Glaciolacustrine clay formed deposits up to 30 meters thick in the deepest basins, but erode in water depths less than 20 meters. Holocene muds which are rich in organic matter accumulate in water depths greater than 30 meters and form thick layers, up to 15 meters, in the deep basins (Boylen, 2014) **(Map 2. Bedrock/Surficial Geology)**.

2.2 Soil Types and Classification

The soil types in the Lake George Watershed are variable due to the geological complexity of the region and the various depositional environments that have occurred over time. Glacial till is the most prevalent soil type in the watershed and is characterized as sandy with moderate infiltration rates (Stearns & Wheler, 2001).

Soil texture and infiltration rates are very important when managing runoff and erosion. Soil infiltration rate refers to the ability of the soil to allow water to absorb into and move through the soil profile. Infiltration allows the soil to temporarily store water, making it available to plants and soil organisms. In areas with high infiltration rates, there is less opportunity for runoff to occur because water is absorbed into the soil quickly, while areas with slower infiltration rates are more prone to runoff.

Soil types are classified by the United States Department of Agriculture Natural Resource Conservation Service (NRCS) into four hydrologic soils groups, listed below in **Table 1**:

Table 1: Hydrologic Soil Group Definitions Source: United States Department of Agriculture, 2007			
Hydrologic Soil Group	Characteristics	Infiltration Rate (inches/hr.)	Relative Runoff Potential
A	Sand, loamy sand or sandy loam. High infiltration rates even when wet. Well drained. Coarse textured.	>0.30	Low
B	Silt loam or loam. Moderate infiltration rate when wet. Moderately well drained. Moderately coarse texture.	0.15-0.30	Moderate
C	Sandy clay loam. Low infiltration rate when wet. Impede draining. Moderately fine to fine textured.	0.05-0.15	High
D	Clay loam, silty clay load, sand clay, silty clay, or clay. Very low infiltration when wet. High swelling potential. Fine textured.	0-0.05	Very High
A/D, B/D, and C/D	*Dual hydrological soil groups* – Certain wet soils are placed in group D based solely on the presence of a water table within 24 inches of the surface even if the texture of the soil is favorable for water transmission and infiltration. If these soils can be adequately drained, then they are assigned to dual hydrological groups. The first letter applies to the drained condition and the second to the undrained condition.		

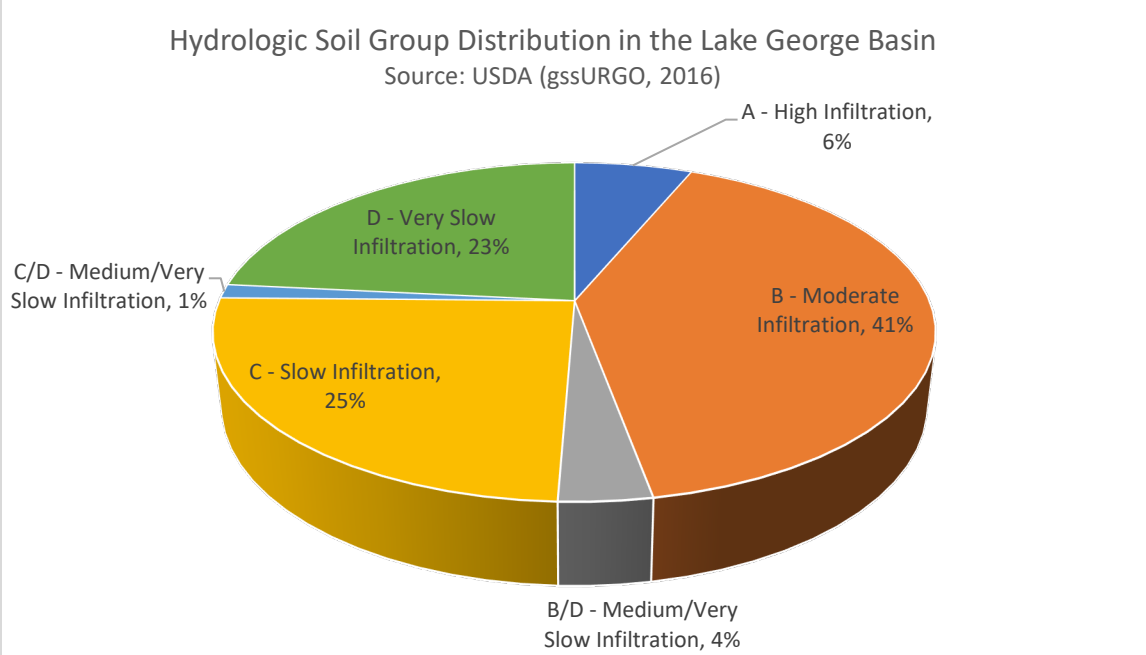
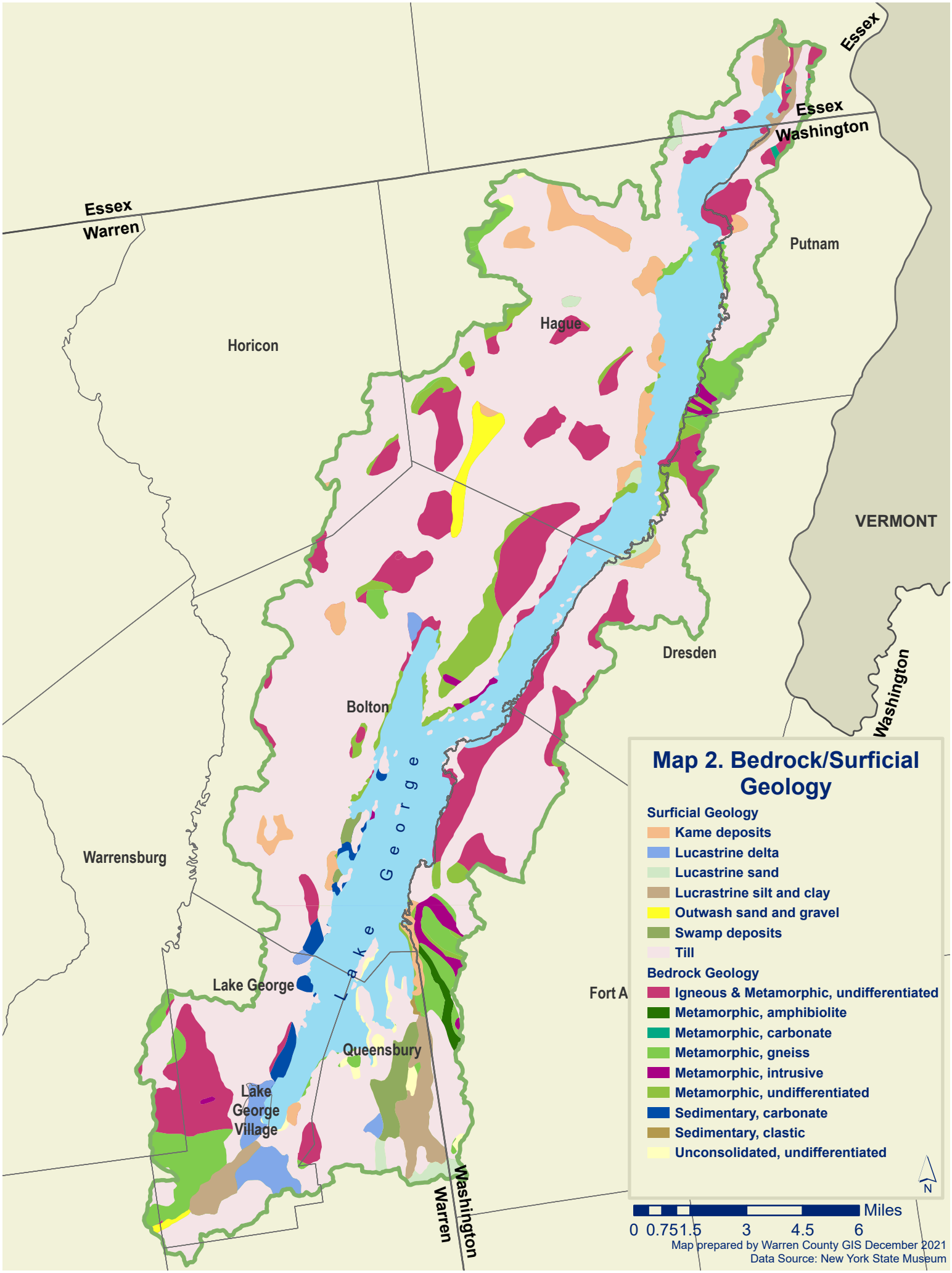


Figure 2: Hydrologic Soil Group Distribution by Percentage. Source: USDA (modelmywatershed.org)

The soils of this watershed are dominated by Soil Group B (41%), characterized by moderate infiltration rates followed by C soils (25%) and D soils (23%) **(Figure 2)** which exhibit slow and very slow infiltration rates. There is a small percentage of dual hydrologic soil groups B/D and C/D meaning there are some areas of wet soils that have moderate to slow infiltration rates. The composition of the soils in the watershed indicates a relatively high runoff potential in most areas **(Map 3. Hydrologic Soils)**.

2.3 Steep Slopes

Another factor influencing erosion and runoff is the location of steep slopes. Slopes with impervious surfaces, or slopes lacking vegetation are more likely to erode. Steep slopes present challenges to water quality management because of the difficulties of stabilizing steep soils and safely managing runoff. Unvegetated or developed slopes allow water to move downhill faster, carrying debris and sometimes washing out roads and trails. For development purposes, a 15% grade is considered steep and requires extra attention to slope stability and drainage issues. A 25% grade should be left undisturbed if possible. Slopes greater than 15% are found on the eastern shoreline of Lake George in the Towns of Fort Ann and Dresden as well as on Tongue Mountain Point in the Town of Bolton and north into the Town of Hague. Most of these areas are owned by New York State and will not be developed. Additional steep slopes are also found in the upland areas of the watershed in the Town/Village of Lake George, and the Town of Bolton and Hague **(Map 4. Steep Slopes)**.


Essex
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Hague
Horicon
VERMONT
Dresden
Washington
Bolton
Lake George
Warrensburg
Lake George
Fort A
Queensbury
Lake George Village
Washington
Warren
Map 2. Bedrock/Surficial Geology
Surficial Geology
Kame deposits
Lucastrine delta
Lucastrine sand
Lucrastrine silt and clay
Outwash sand and gravel
Swamp deposits
Till
Bedrock Geology
Igneous & Metamorphic, undifferentiated
Metamorphic, amphibiolite
Metamorphic, carbonate
Metamorphic, gneiss
Metamorphic, intrusive
Metamorphic, undifferentiated
Sedimentary, carbonate
Sedimentary, clastic
Unconsolidated, undifferentiated
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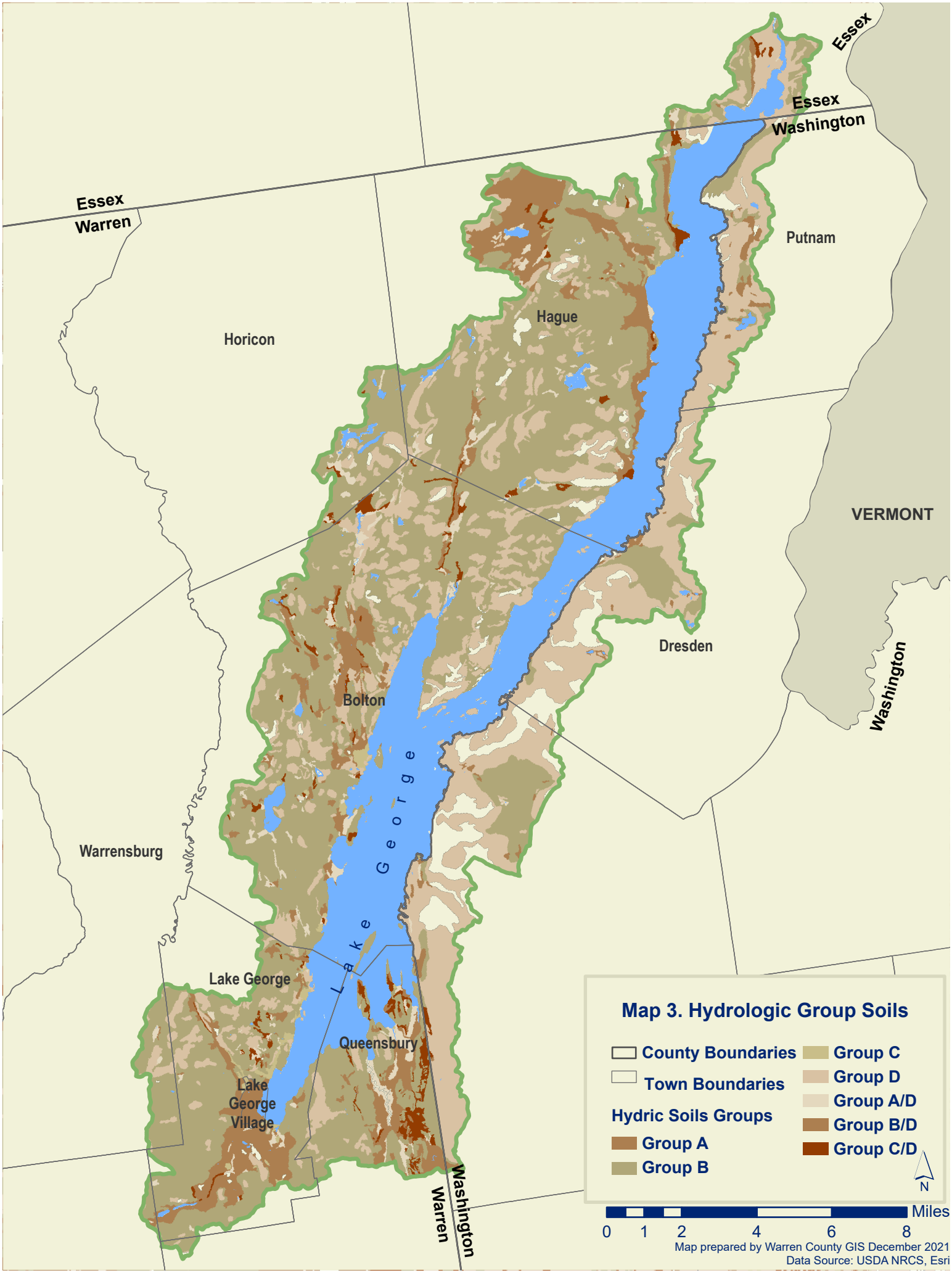
0 0.751.5 3 4.5 6
Map prepared by Warren County GIS December 2021
Data Source: New York State Museum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Hague
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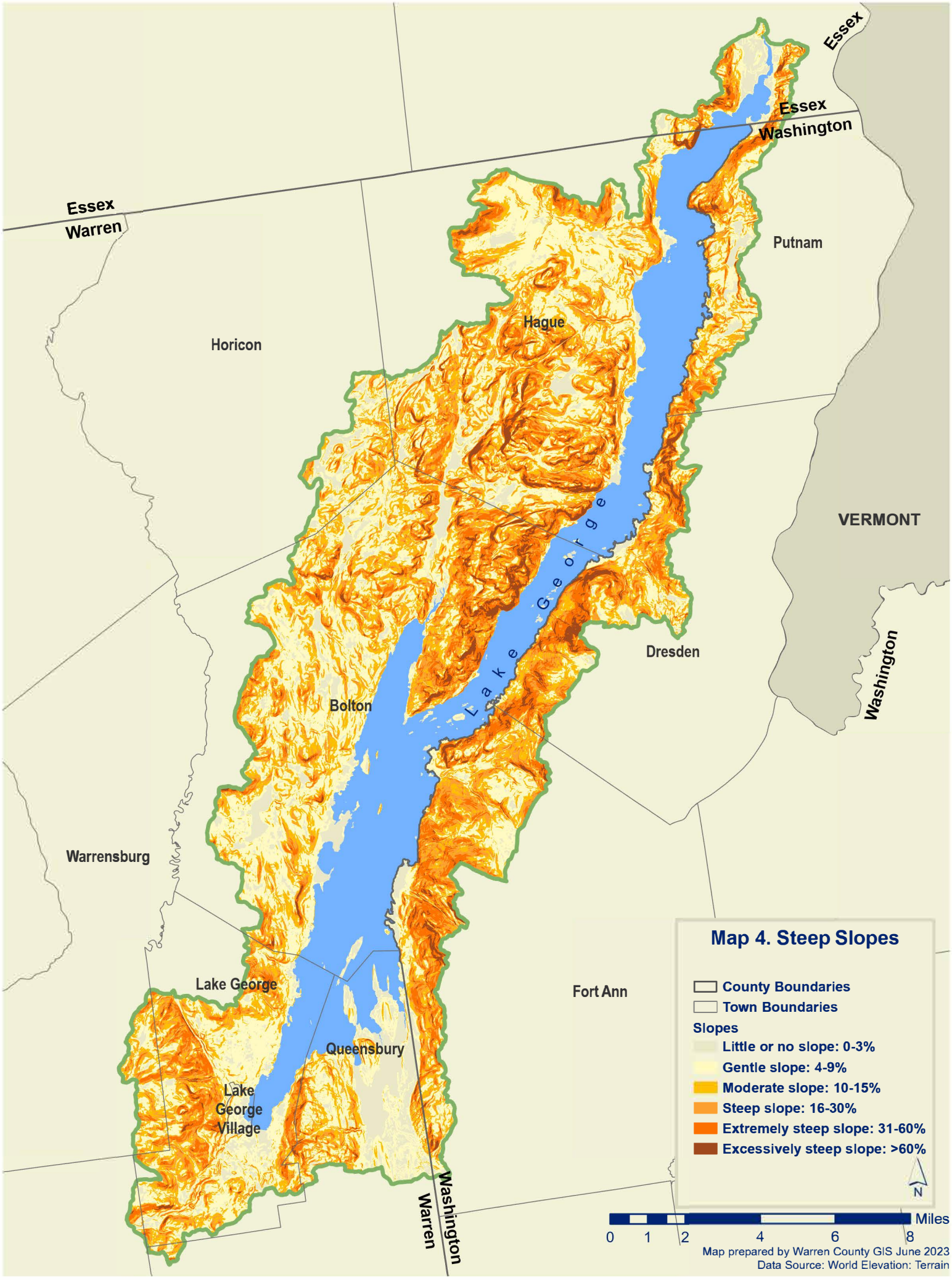
VERMONT
Dresden
Washington
Bolton
Lake George
Warrensburg
Lake George
Queensbury
Lake George Village
Washington
Warren
Map 3. Hydrologic Group Soils
County Boundaries
Town Boundaries
Hydric Soils Groups
Group A
Group B
Group C
Group D
Group A/D
Group B/D
Group C/D
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS December 2021
Data Source: USDA NRCS, Esri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Horicon
VERMONT
Lake George
Dresden
Washington
Bolton
Warrensburg
Lake George
Fort Ann
Queensbury
Lake George Village
Washington
Warren
Map 4. Steep Slopes
County Boundaries
Town Boundaries
Slopes
Little or no slope: 0-3%
Gentle slope: 4-9%
Moderate slope: 10-15%
Steep slope: 16-30%
Extremely steep slope: 31-60%
Excessively steep slope: >60%
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS June 2023
Data Source: World Elevation: Terrain

2.4 Surface Water

Lake George itself contains 550 billion gallons of water, has a surface area of 45 square miles, a length of 32 miles, an average width of 1.33 miles, and a maximum depth of 196 feet. The retention time of water in the lake is between five and eight years, a very long time compared with nearby lakes of comparable size. Eight streams serve as major tributaries for the lake: West Brook, East Brook, English Brook, Northwest Bay Brook, Finkle Brook, Indian Brook, Hague Brook, and Shelving Rock Brook with many additional minor streams contributing surface water to the lake **(Table 2)**. Outflow occurs primarily at the dam and hydroelectric plant on the LaChute River in Ticonderoga at the northern end of the lake **(Map 5. Major Tributaries)**.

Photo 4: Indian Brook is the second largest tributary to Lake George. Photo Courtesy of The Lake George Association.

Surface water inflow is the major water contributor to Lake George, providing approximately 57% of water entering the lake (Shuster, 1994, as cited in Boylen, 2014). Precipitation accounts for 25% of water entering the lake, approximately one quarter of which is attributed to snowmelt.

Because surface water is a major contributor to the lake's water quantity, the health of the lake is largely a reflection of these tributaries and surrounding watershed. The watershed's eight largest streams drain nearly 46% of the lake's watershed (Boylen, 2014).

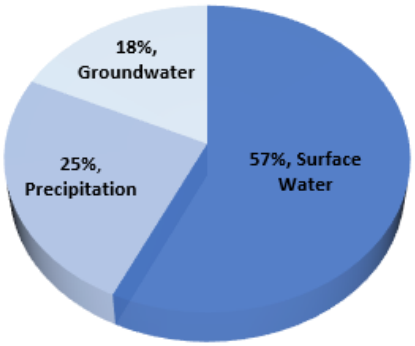


Figure 3: Water source contributors by percentage

Table 2: Eight Largest Tributaries to Lake George by Watershed Area
Source: Lake George Association, as cited in Boylen, 2014

Stream Name	Watershed Area (acres)	Percent of Lake Watershed
Northwest Bay Brook	20,814	17.2%
Indian Brook	7,443	6.2%
Hague Brook	6,830	5.7%
West Brook	5,545	4.6%
English Brook	5,169	4.3%
Shelving Rock Brook	4,668	3.9%
Finkle Brook	2,743	2.3%
East Brook	2,147	1.8%
Total	55,359	45.7%

2.4 Groundwater

Groundwater accounts for approximately 18% of the water that enters Lake George and is fed to the lake through underground springs. Groundwater contribution peaks in the late spring and early summer and during this time, groundwater contribution to the lake exceeds that of precipitation (Stearns & Wheler, 2001).

2.5 Lake Level

The Lake George Park Commission (LGPC) oversees the water level of Lake George by tracking the lake's surface elevation and ensuring that discharges occur in conformance with the targeted lake levels for each day of the year. The targets are based on State law and on historic operating guidelines that are designed to maintain the lake at levels that are optimum for navigation and recreation.

The target elevation for Lake George in the summertime is 3.5' at the Rogers Rock gage which is monitored by the United States Geological Survey (USGS). The daily recorded level is taken at 9:00 am each day and if the water level is higher than the targeted elevation, water is discharged from the lake. If it is lower, the discharge gates are closed until the target level is achieved (Lake George Park Commission, n.d.).

2.6 HUC-12 Subwatersheds

In the United States, there is a hierarchy of hydrological unit codes (HUCs) which divide the country into regions, subregions, basins, subbasins, watersheds, and subwatersheds. The number of HUC digits increases as the area that the code represents gets smaller. For the purpose of waterbody assessments, the New York State Department of Environmental Conservation (NYSDEC) uses HUC-10 subwatersheds to organize waterbodies in the Waterbody Inventory/Priority Waterbody List (WI/PWL). The Lake George Watershed itself is a HUC-10 subwatershed known as Lake George – La Chute and is part of the larger Lake Champlain Basin and is further delineated by five HUC-12 subwatersheds. HUC-12 subwatersheds are identified for each site specific management recommendation listed in **Section 9.2** of this plan.

Lake George is divided into four distinct in-lake direct HUC-12 subwatersheds and one upland HUC-12 subwatershed **(Table 3)**, listed from south to north: Headwater - Lake George which stretches from the southern end of the watershed in Lake George Village to Diamond Point in the Town of Lake George, Indian Brook – Lake George reaching from Diamond Point to Tongue Mountain Point and encompassing Northwest Bay, Sabbath Day Point – Lake George from Tongue Mountain Point in Bolton to Sabbath Day Point in Hague, and Outlet – Lake George from Sabbath Day Point to the northern reaches of the watershed near Ticonderoga with the Northwest Bay Brook HUC-12 draining the area of the Tongue Mountain Range **(Map 6. HUC-12 Subwatershed Map)**.

Table 3: Lake George HUC-12 Subwatersheds	
HUC-12 Name	HUC-12 ID Code
Headwater Lake George	041504080201
Northwest Bay Brook	041504080202
Indian Brook – Lake George	041504080203
Sabbath Day Point – Lake George	041504080204
Outlet Lake George	041504080205

2.7 Wetlands

Wetlands are areas saturated by surface or ground water that support distinct vegetation and serve as natural habitat for many species of plants and animals. This biodiversity is needed for a healthy ecosystem. Wetlands offer many important ecological services to the environment and to the public including ground water storage, pollution reduction, providing habitat for wildlife, maintaining ecological productivity, mitigating impacts of storms and flooding, and providing recreational and educational opportunities. A study conducted in the Lake Champlain Watershed found that wetlands and floodplains reduced flood damage by up to 78% in a 10-year period, significantly limiting property damage and recovery costs (LCBP, 2021).

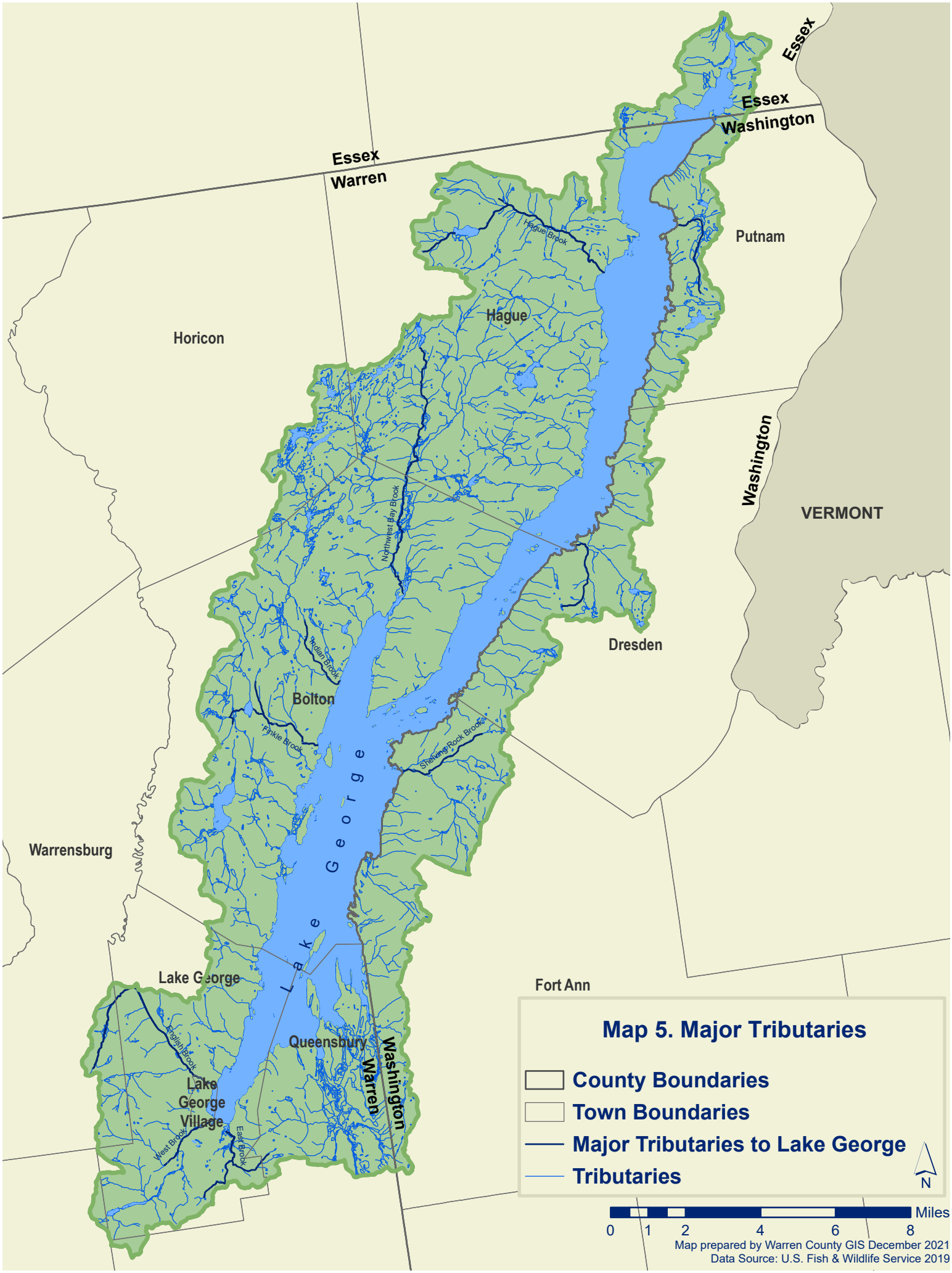
Photo 4: Paddlers in Northwest Bay Brook and wetlands.

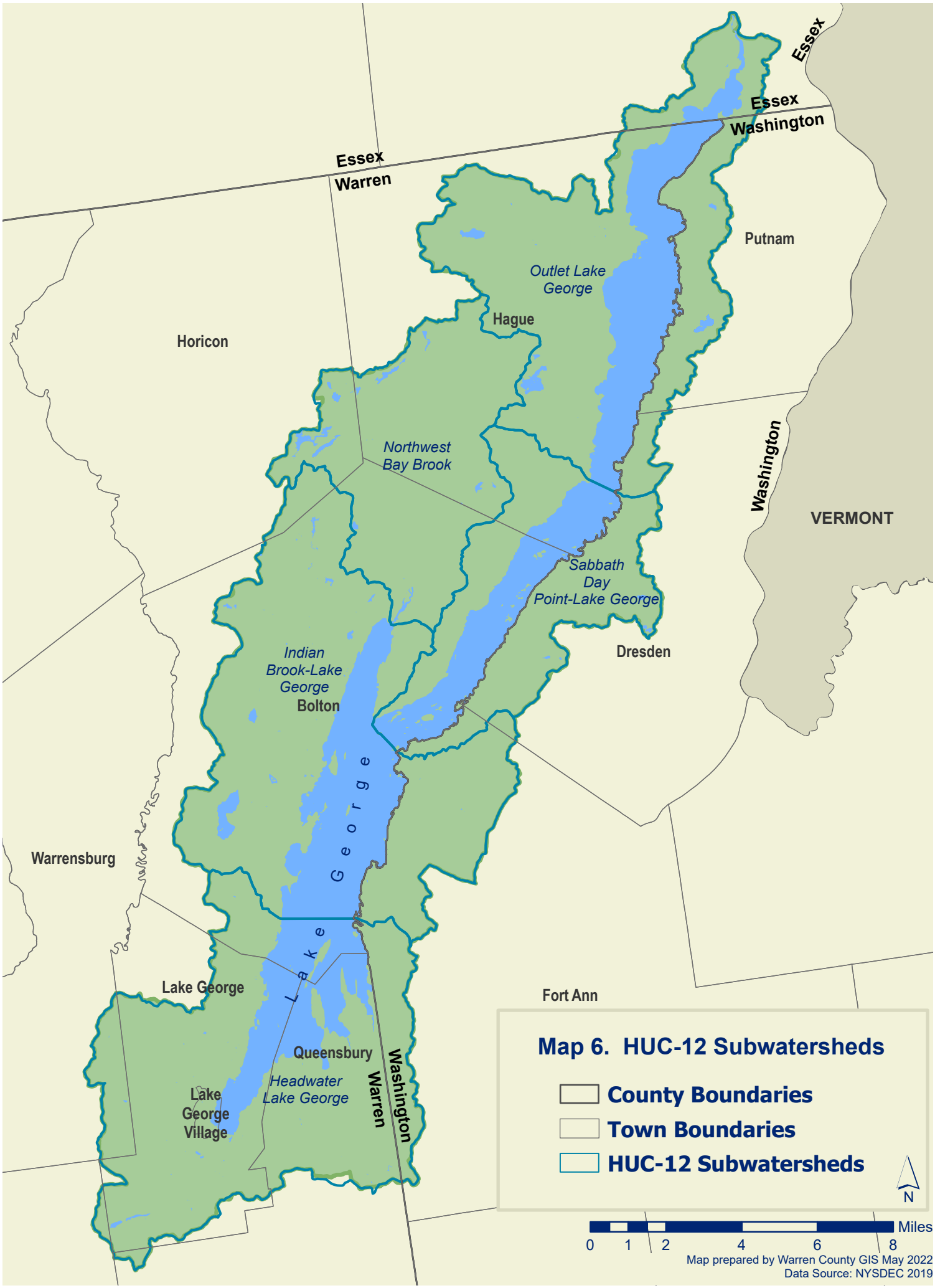
Wetlands are critical in helping to alleviate the nutrient and sediment loads that are flushed from upland slopes overland and into tributaries that eventually make their way into Lake George. Pollutants, like phosphorus and nitrogen are removed through a combination of physical, chemical, and biological processes. These naturally occurring processes absorb, transform, sequester, and remove the nutrients and other pollutants as water slowly flows through the wetland (Kostel, 2021). Additionally, wetlands provide important habitat for rare, threatened, or endangered species and provide other functional benefits associated with flood control and improved water quality.

Due to the nature of the geomorphological processes that formed the lake, there are very few wetlands in Lake George. The steep slopes of the watershed provide for limited areas that are suitable for wetlands to form and many of the areas bordering the lake that once served as wetlands have been filled in for residential or commercials uses.

Lake George's largest in-lake wetland complex is located on the southeast margin of the lake in Dunham's Bay and spans 1,300-acres. An additional 400-acre wetland system is located at the northern reach of Northwest Bay. Smaller wetlands of varying sizes dot the shoreline in Warner Bay, Huddle Bay, East Brook, and the Shelving Rock area **(Map 7. Wetlands)**. Another important wetland type in the Lake George Watershed is a deep-water marsh, which is a permanently flooded area that does not exceed a seasonal water depth of six feet and is defined by free floating vegetation, rooted vegetation with floating leaves, or submerged vegetation (Boylen, 2014).

There are numerous additional upland wetland complexes in the watershed that play vital roles in the overall water quality of Lake George. In fact, a study conducted by LCLG reveals that approximately 40% of the Indian Brook catchment, a major tributary to Lake George, flows through the wetland complex at Amy's Park, a conserved area in the Town of Bolton.


Essex
Warren
Essex
Washington
Essex
Putnam
Horicon
Hague
Hague Brook
Washington
VERMONT
Northwest Bay Brook
Indian Brook
Dresden
Bolton
Finkle Brook
Shelving Rock Brook
Lake George
Warrensburg
Lake George
Fort Ann
English Brook
Queensbury
Warren
Washington
Lake George Village
West Brook
East Brook
Map 5. Major Tributaries
County Boundaries
Town Boundaries
Major Tributaries to Lake George
Tributaries
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS December 2021
Data Source: U.S. Fish & Wildlife Service 2019


Essex
Essex
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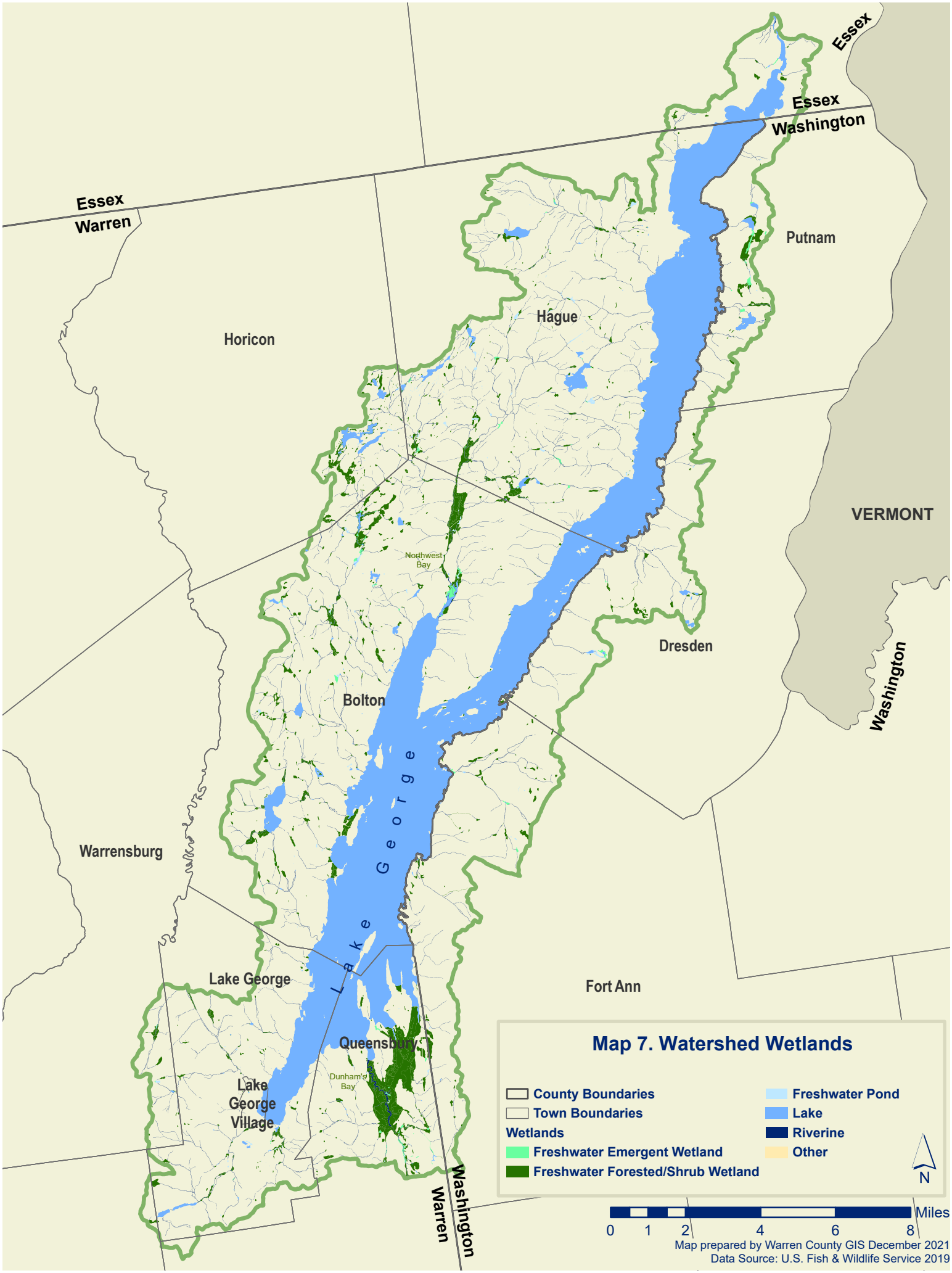
Essex
Warren
Putnam
Outlet Lake George
Hague
Horicon
Northwest Bay Brook
Washington
VERMONT
Sabbath Day Point-Lake George
Dresden
Indian Brook-Lake George
Bolton
Lake George
Warrensburg
Lake George
Fort Ann
Queensbury
Headwater Lake George
Lake George Village
Warren
Washington
Map 6. HUC-12 Subwatersheds
County Boundaries
Town Boundaries
HUC-12 Subwatersheds
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS May 2022
Data Source: NYSDEC 2019


Essex
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Hague
Horicon
VERMONT
Northwest Bay
Dresden
Washington
Bolton
Lake George
Warrensburg
Lake George
Fort Ann
Queensbury
Dunham's Bay
Lake George Village
Washington
Warren
Map 7. Watershed Wetlands
County Boundaries
Town Boundaries
Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine
Other
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS December 2021
Data Source: U.S. Fish & Wildlife Service 2019

2.8 Climate and Precipitation

The climate of northeastern New York is defined as Continental, consisting of long snowy winters and shorter growing seasons. Temperatures range from below zero in the winter months to the high nineties (degrees Fahrenheit) in the summer months with an average annual temperature of 45.9 degrees Fahrenheit. The average annual precipitation in the watershed is between 40 and 50 inches. In general, precipitation here reaches its highest levels in July and August and its lowest in February.

Over the last 20 years Warren County has spent 371 weeks under "abnormally dry" conditions and while the average annual precipitation has not changed substantially, reduced and extreme rainfall as well as reduced snow melt can have the effects of creating warmer streams and rising lake temperatures which create a more suitable habitat for invasive species to grow and threaten already stressed native water life. Stronger rain events coupled with longer periods of drought like conditions allow for higher nutrient loading from stormwater due to less time and ability for ground infiltration, thus creating the conditions for more frequent and longer lasting HAB events. Drought conditions and tree loss from invasive species increase the erosion of streambanks and bring higher sediment loads into the lake (IPCC, 2023).

2.9 Ecological Communities and Threatened and Endangered Species

The Lake George Watershed occupies two ecozones. The far northern portion of the basin is located within the Lake Champlain Valley and the remainder of the watershed is in the Eastern Adirondack foothills.

The Lake Champlain Valley ecological zone has a humid continental climate and has significantly lower precipitation than similar nearby regions due to rain shadow from the Adirondacks. This area is primarily underlain by limestone.	The Eastern Adirondack Foothills zone is underlain by limestone and anorthosite, both of which have a high acid neutralizing capacity. Rainfall amounts are lower here than in other portions of the Adirondacks.

Native plants in the Lake George watershed number in the thousands and are integral to the wellness of the lake's chemistry and ecosystem. Many bird species call Lake George home while many more use the lake as a stopover along migratory routes. Several species of turtle, salamander, frog, toads, and snakes live within the watershed (AE Commercial Diving Services, Inc., 2021).

There are nine species of birds, two species of butterflies and moths, two species of fish, two mammal, two reptiles, a variety of ferns and allies, and many flowering plants in the Lake George Watershed that are considered endangered or threatened. For a full list of endangered and threatened species in the Lake George Watershed, please see **Appendix B** of this document.

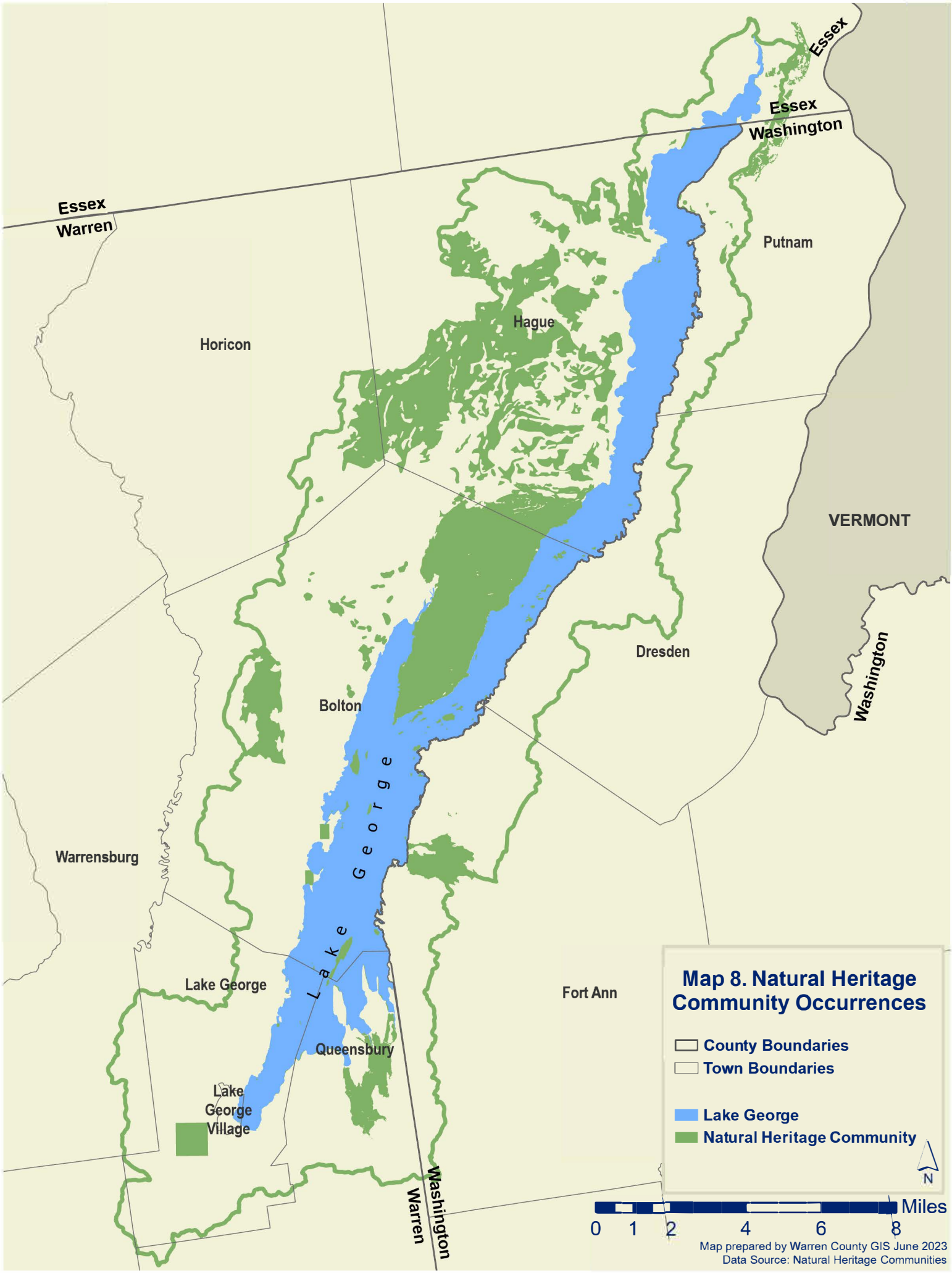
2.10 Natural Heritage Communities

A natural heritage community is an area with a grouping of rare or high-quality wetlands, forests, grasslands, ponds, streams, and other types of habitats, ecosystems, and ecological areas that are rare in New York State.

These communities represent an assemblage of interacting plant and animal populations that share a common environment and represent occurrences of significant natural communities and serve as habitat for a wide range of plants and animals, both rare and common, and provide ecological value and services. These areas are considered significant from a statewide perspective.

Photo 5: Looking south from the Tongue Mountain Range. The Tongue Mountain Range is home to one of the greatest concentrations of Natural Heritage Communities in the watershed.

Natural Heritage Communities are spread out around the Lake George Watershed, with the greatest concentration in the Town of Bolton on the Tongue Mountain Range and throughout the Town of Hague **(Map 8. Natural Heritage Community Occurrences)**.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Putnam
Hague
Horicon
VERMONT
Dresden
Washington
Bolton
Lake George
Warrensburg
Lake George
Fort Ann
Queensbury
Lake George Village
Washington
Warren
Map 8. Natural Heritage Community Occurrences
County Boundaries
Town Boundaries
Lake George
Natural Heritage Community
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS June 2023
Data Source: Natural Heritage Communities

Section 3. State of the Watershed

3.1 Population and Trends

The Lake George Watershed contains all or portions of eleven Towns and one Village across three counties **(Map 1. Lake George Watershed Context Map, Figure 4)**:

Warren County:

- Town of Bolton
- Town of Hague
- Town of Horicon
- Town of Lake George
- Town of Lake Luzerne
- Town of Queensbury
- Town of Warrensburg
- Village of Lake George

Washington County:

- Town of Dresden
- Town of Fort Ann
- Town of Putnam

Essex County

- Town of Ticonderoga

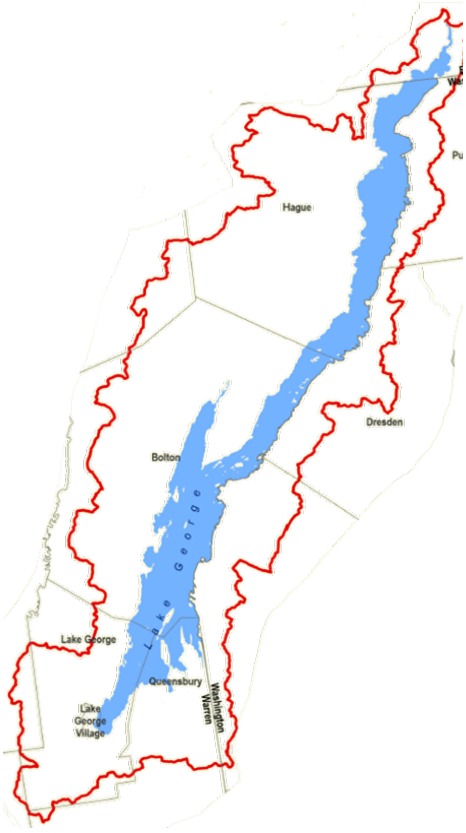
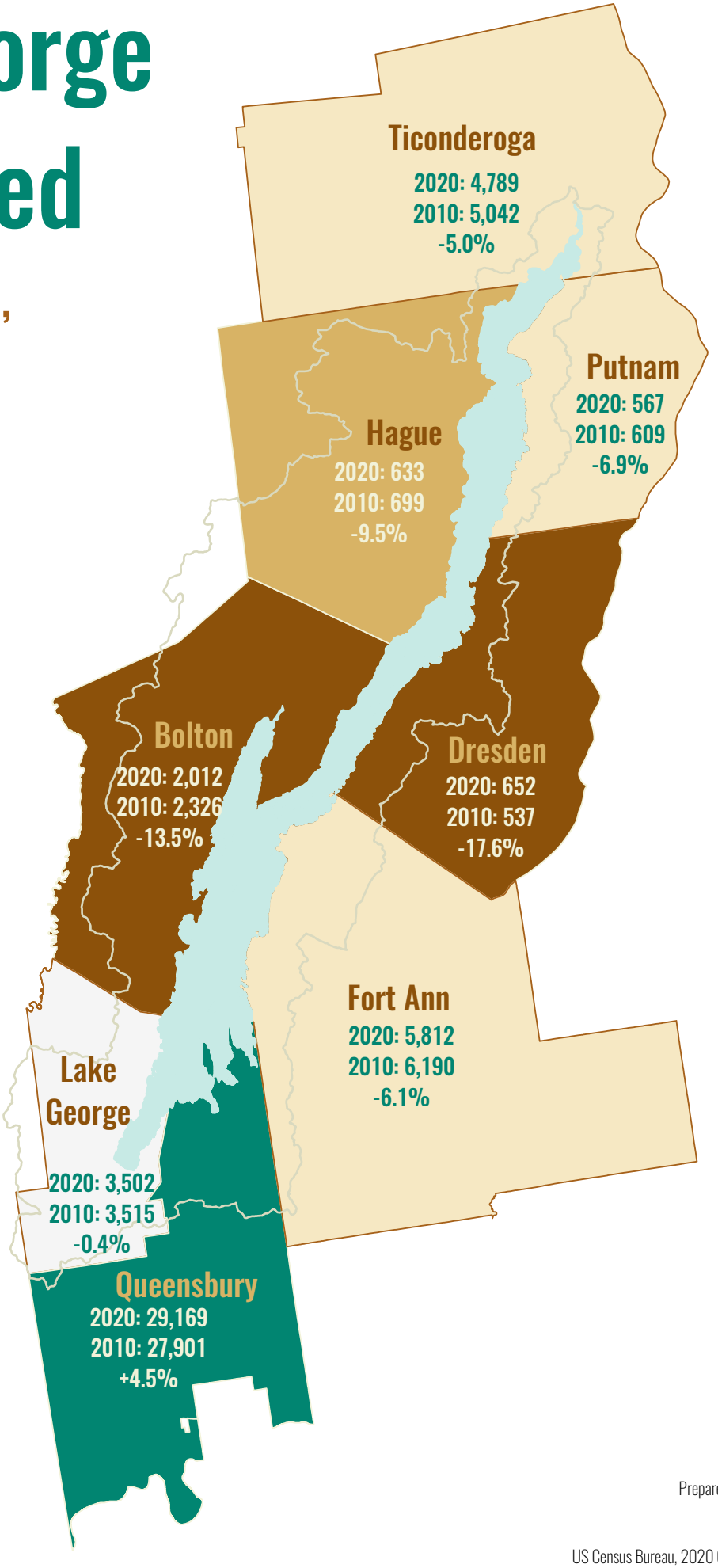


Figure 4: Lake George Watershed

The population within the watershed grew steadily between 1980 and 2010, increasing about 20%. The 2020 US Census reveals a decline in population in all watershed communities in Warren County except for Queensbury which grew approximately 4.5%. The Town of Lake George (including the Village) lost 0.4% of its population while Bolton and Hague shrunk by 13.5% and 9.5% respectively **(Map 9. Total Population % Change, 2010 – 2020)**. Despite these losses, there continues to be a trend of significant overall growth in the watershed. In addition to year-round residents, seasonal residents and vacationers have the potential to increase the watershed's population by more than 270% during the peak summer months.

Lake George Watershed

Population by Town, 2010 and 2020



Map 9. Total Population % Change 2010 - 2020

Percent Change in Population

- ≤-13%
- ≤-8%
- ≤-2%
- ≤2%
- ≤5%

Prepared by: Warren County GIS
January 2022
data source:
US Census Bureau, 2020 Census and 2010 Census

3.2 Build Out Analysis

Land development patterns have the potential to affect water quality through runoff caused by impervious surface levels and other impacts from human activities. The *Lake George Data Atlas* is a study commissioned by the LGA and the LCLGRPB in 2016 that compiled all available information on development and land use in the Lake George Watershed and created projections for land use and future growth within the watershed.

Build out refers to a hypothetical point in time when a municipality cannot accommodate any more development due to the lack of additional space based on current municipal land use regulations and environmental constraints.

An integral part of the *Lake George Data Atlas* is a buildout analysis of potential residential housing development, performed using Geographic Information Systems (GIS). A buildout analysis provides a theoretical visualization of the overall residential development potential of an area given local regulations, infrastructure, and environmental constraints including steep slopes, wetlands, streambanks, and other areas of environmental importance. The intent of the build out analysis is not to generalize development as positive or negative but rather to illustrate when and where development may occur in order to consider the possible effects and plan to manage these. The result of this analysis may indicate the need for local law review or revision to better guide development and protect local resources that are considered important.

According to the build out analysis, the watershed has a potential for over 8,600 new residences, 63% of which could be in the Towns of Bolton, Hague, and Lake George. Residential housing in the Washington County portion of the watershed could increase by 154% (The Lake George Association, 2016) **(Figure 5)**.

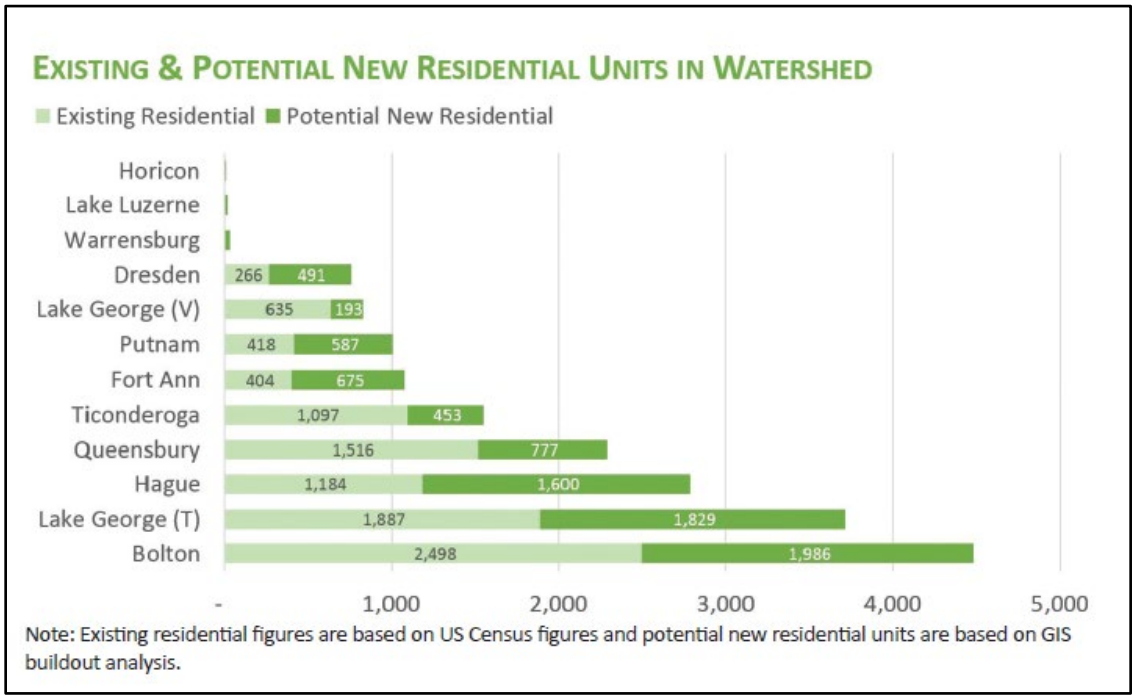
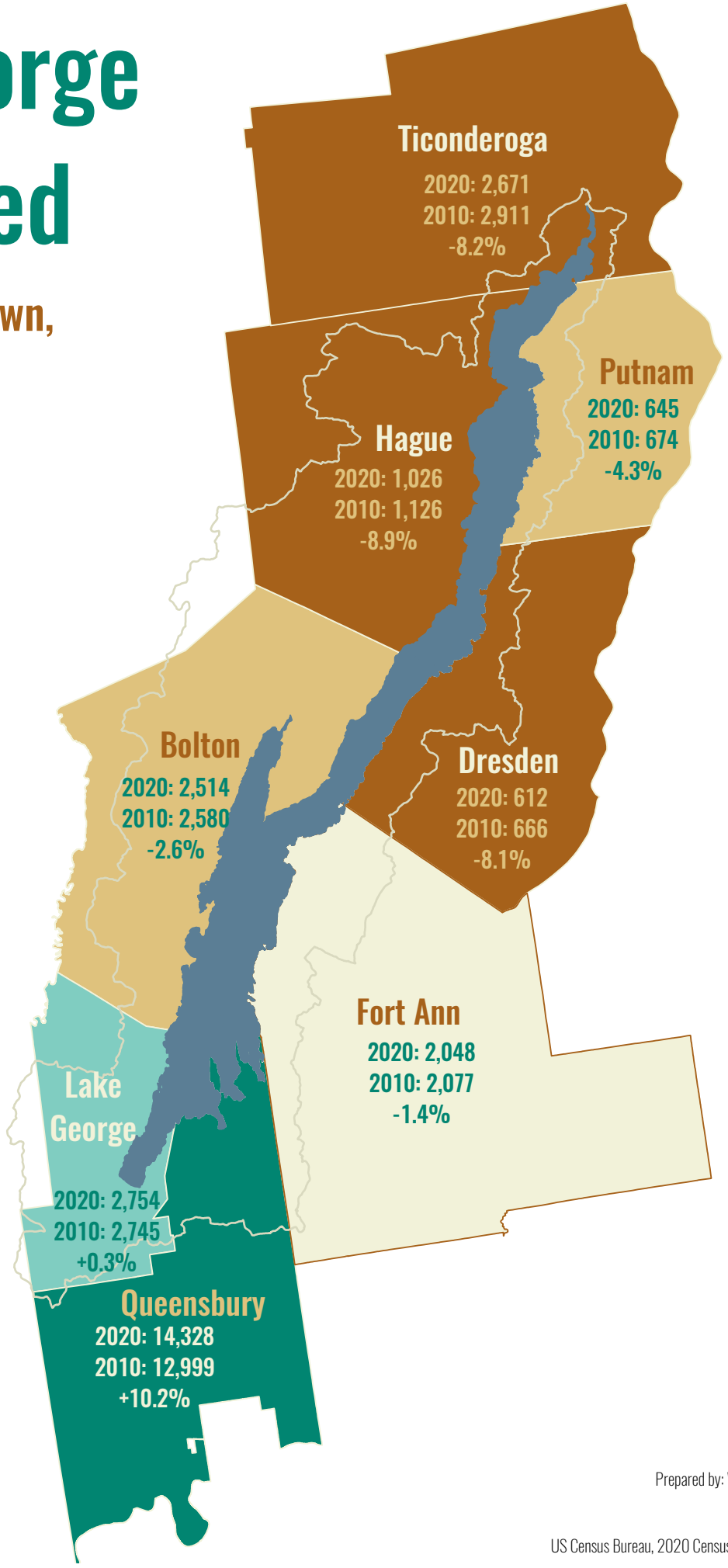


Figure 5: Existing and Potential New Residential Units. Source: Lake George Watershed Data Atlas, 2016.

Between 2010 and 2020, the number of household units decreased in all watershed municipalities with the exception of the Towns of Lake George (includes Lake George Village) and Queensbury which increased by 0.3% and 10.2% respectively **(Map 10. Percent Change in Housing Units 2010-2020).** It is important to note that an increase of a housing unit does not necessarily mean new construction. A new housing unit could be the result of a single-family home being converted into multiple living quarters, or a previously uninhabitable building being rehabilitated for occupancy. Similarly, a loss of a housing unit does not necessarily mean that a building was destroyed. In addition to demolition, a house that was previously split up into multiple living quarters reverting to a single-family home would result in a loss of a housing unit or units.

Lake George Watershed

Housing Units by Town, 2010 and 2020



Map 10. Percent Change in Housing Units

- -9% to -6%
- -6% to -2%
- -2% to 0%
- 0% to +6%
- +6% to +11%

Prepared by: Warren County GIS
January 2022
data source:
US Census Bureau, 2020 Census and 2010 Census

3.3 Land Use and Land Cover

Land use and land cover are tools used to evaluate the extent to which human populations and activities have shaped the natural landscape. Land cover is a classification which designates the location and extent of forests, wetland and open waters, grasslands, croplands, and developed areas within the watershed. Land use provides additional information related to how people use the landscape, whether for residential development, parks and recreational use, industrial uses, or commercial uses. Both land use and land cover can significantly affect water quality.

Each land use in a watershed impacts water quality in different and interconnected ways. Land use data illustrates how people use the land and is derived from land use codes assigned by the county assessor's office. Definitions of land use classifications as provided by the National Land Cover Dataset are supplied in **Table 4** below.

Table 4: Land Use Classifications Source: National Land Cover Dataset	
Agriculture	Property used to produce crops or livestock. Includes dairy farms, orchards, poultry farms, field crops, nurseries, fish, and game preserves.
Residential	Property used for human habitation. Includes single-family, two-family, and multi-family residences, mobile home parks and seasonal residences.
Vacant Land	Property that is not in use, is in temporary use or lacks permanent improvement. Includes vacant industrial, residential, commercial, rural, or public utility lands.
Commercial	Property used for the sale of goods and/or services. Includes hotels, restaurants, bars, auto service centers, storage facilities, gas stations, retail shopping, banks, and junkyards.
Recreation and Entertainment	Property used for groups for recreation, amusement, or entertainment. Includes fairgrounds, amusement parks, social clubs, campgrounds, stadiums, gyms, golf courses, ski resorts, beaches, and marinas.
Community Services	Property used for the well-being of the community. Includes libraries, schools, colleges, hospitals, civic buildings, museums, and cemeteries.
Public Services	Property used to provide services to the public. Includes water treatment, telecommunications, roads, railroads, airports, bridges, landfills, wastewater treatment, utilities, and transmission.
Wild, Forested, Conservation Lands and Public Parks	Reforested lands, preserves, and private hunting and fishing clubs. Includes forest lands, state owned land, wetlands, conservation easements, and special taxing districts for environmental purposes.

Land use within the Lake George Watershed primarily falls into one of three categories: protected, residential, or undeveloped. Approximately 43% of the watershed is State Forest land, categorized as protected, followed by residential (16%), vacant (14%), and private forest land (14%). The remainder of land uses within the watershed are conserved lands (7%) and community services, recreation, public services, and commercial uses each at less than 2% **(Figure 6)**.

While land use classification identifies how people are using the land, land cover indicates the physical attributes of the land such as forest or open water. Land cover in the Lake George watershed is dominated by forest. Combined, deciduous, evergreen, and mixed forest make up about 72% of the land area of the watershed, followed by open water which makes up 18% of the watershed **(Table 5 and Map 11. Land Cover)**.

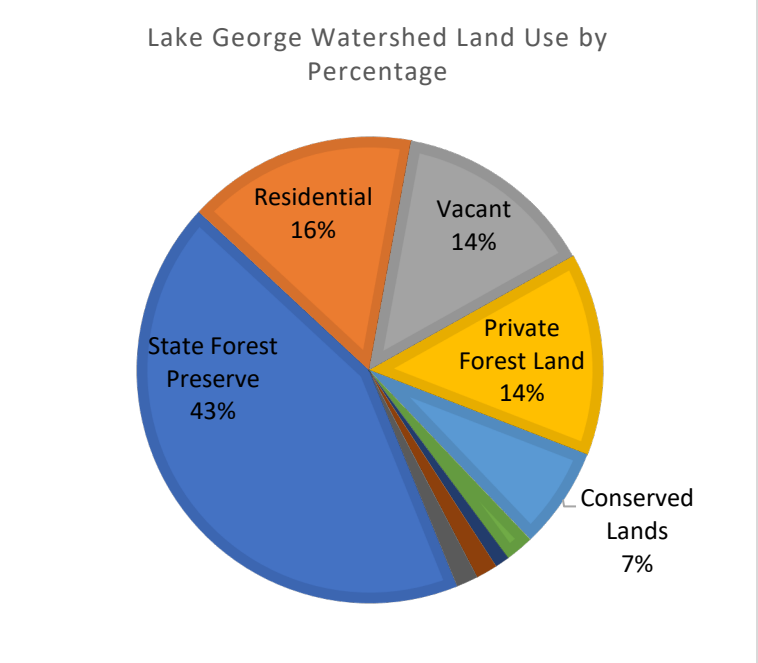


Figure 6: Watershed Land Use by Percentage. Source: National Land Use Dataset, 2019.

Table 5: Land Cover Distribution, Lake George Watershed
Source: National Land Cover Dataset (NLCD, 2019)

Type	Area (km²)	Coverage (%)
Deciduous, Evergreen, Mixed Forest	476.33	70.69%
Open Water	119.78	17.78%
Developed, Open Space	21.75	3.23%
Woody Wetlands	21.45	3.18%
Pasture/Hay	10.13	1.5%
Developed, Low Intensity	9.1	1.35%
Developed, Medium Intensity	4.61	0.68%
Grassland/Herbaceous	3.08	0.46%
Emergent Herbaceous Wetlands	2.75	0.41%
Shrub/Scrub	2.7	0.4%
Developed, High Intensity	1.11	0.16%
Barren Land (Rock/Sand/Clay)	0.62	0.09%
Cultivated Crops	0.46	0.07%

Water quality in a watershed can be greatly affected by the amount of developed or disturbed land. As impervious surfaces from development within a watershed increase, the hydrology of that watershed is altered, leading to a higher percentage of precipitation and snowmelt running off the land surface rather than infiltrating the soil and recharging the ground water. Even in heavily forested watershed like Lake George, studies indicate that as little as 20% urbanized land cover can result in significant changes resulting in decreased in water quality (Morse, 2018).

Pockets of medium to high intensity development are found in the southern portion of the watershed and along the western shore from the Village of Lake George to the Town of Bolton. Shoreline areas in the Town of Queensbury, particularly on the peninsulas, have areas of low to medium intensity development **(Figure 7)**. In the northern portion of the watershed, there is medium to high intensity development in the Towns of Hague and Ticonderoga and in the Hamlet of Huletts Landing (National Land Cover Dataset, 2019).

Figure 7: Pockets of medium to high intensity development are shown in red in the southern portion of the watershed. Source: NLCD 2019.

3.4 Land Use Planning

The comprehensive plan and zoning ordinance are two critical documents used by local governments when making land use and development decisions. These documents are used by the Town and Village Board, the Planning Board, the Zoning Board of Appeals, elected officials, and municipal staff who are involved in the planning and decision-making process. Comprehensive plans and zoning laws have been adopted by 75% of municipalities in the Lake George Watershed, representing 79% of the watershed area **(Map 12. Zoning Ordinances Map).**

A comprehensive plan is an important component for water resource protection at the local level and is the basis for sound land use decisions at the local level in New York State. The document serves to guide decisions about how the land is used and developed which can have significant water quality implications.

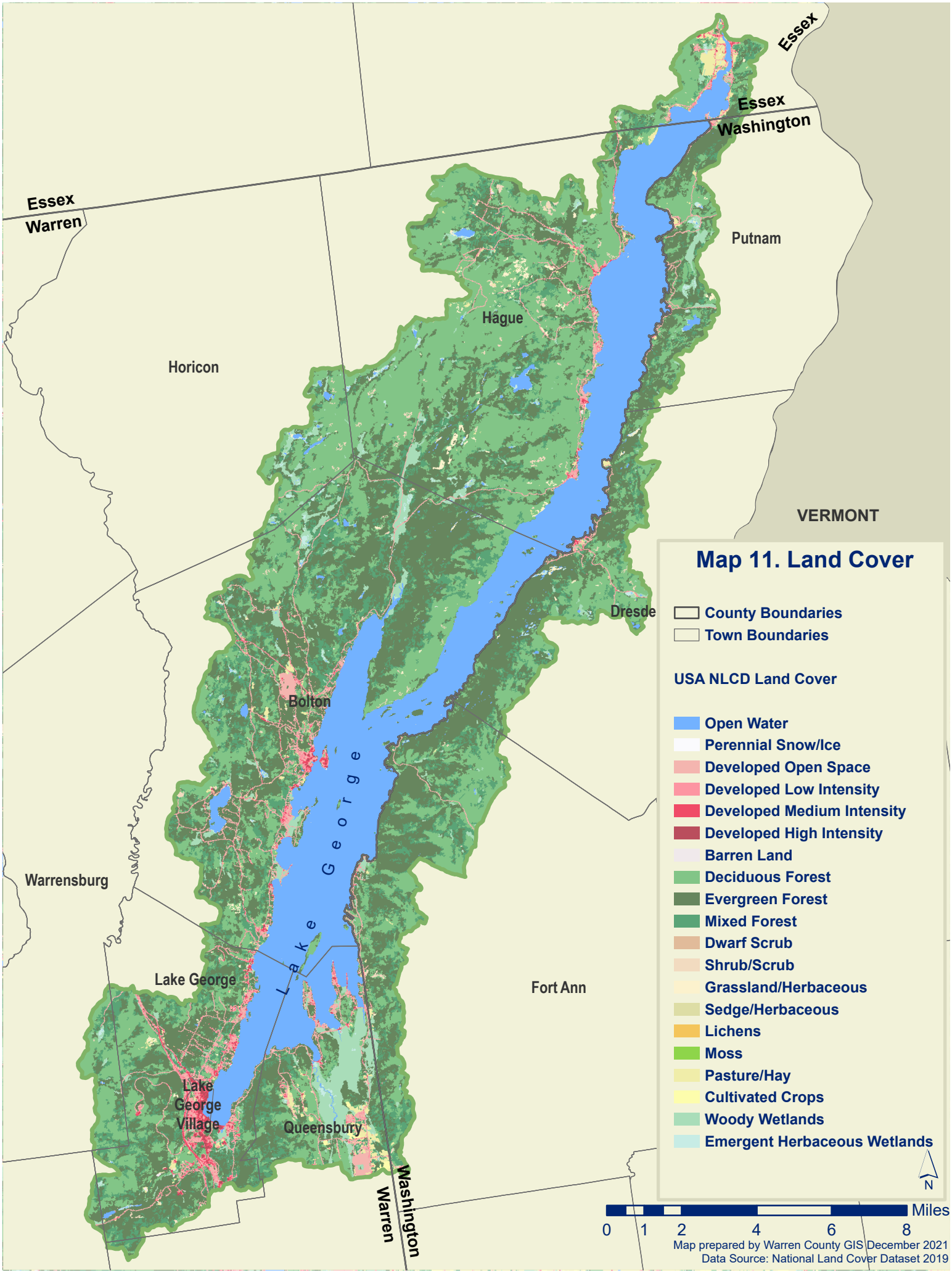
The zoning ordinance is the legal document that a municipality can use to regulate development and implement the goals and visions as expressed in its comprehensive plan and can identify areas where

special environmental considerations should be afforded. Like the comprehensive plan, zoning plays an important role in water resource protection at the local level.

In addition to local land use controls, the Adirondack Park Agency (APA) has oversight of development proposals on private lands in the Adirondack Park. APA land use review is based on a set of standards intended to protect the character of the park as a wild, natural, and diverse habitat while also allowing for economic development.

Local governments within the Adirondack Park may develop their own local land use program, known as an Agency-approved Local Land Use Program (ALLUP), which if approved by the APA may transfer some permitting authority from the APA to the local government's jurisdiction. To be approved by the APA, the local zoning ordinance must be as restrictive or more so than the APA's guidelines. Within the watershed, the Towns of Hague, Horicon, Bolton, Lake George, Queensbury, and the Village of Lake George have ALLUPS **(Map 13. APA Classification Map)**.

A full assessment of the regulatory and programmatic framework in the watershed as well as local ordinance assessments can be found in **Section 6** of this document.


Essex
Essex
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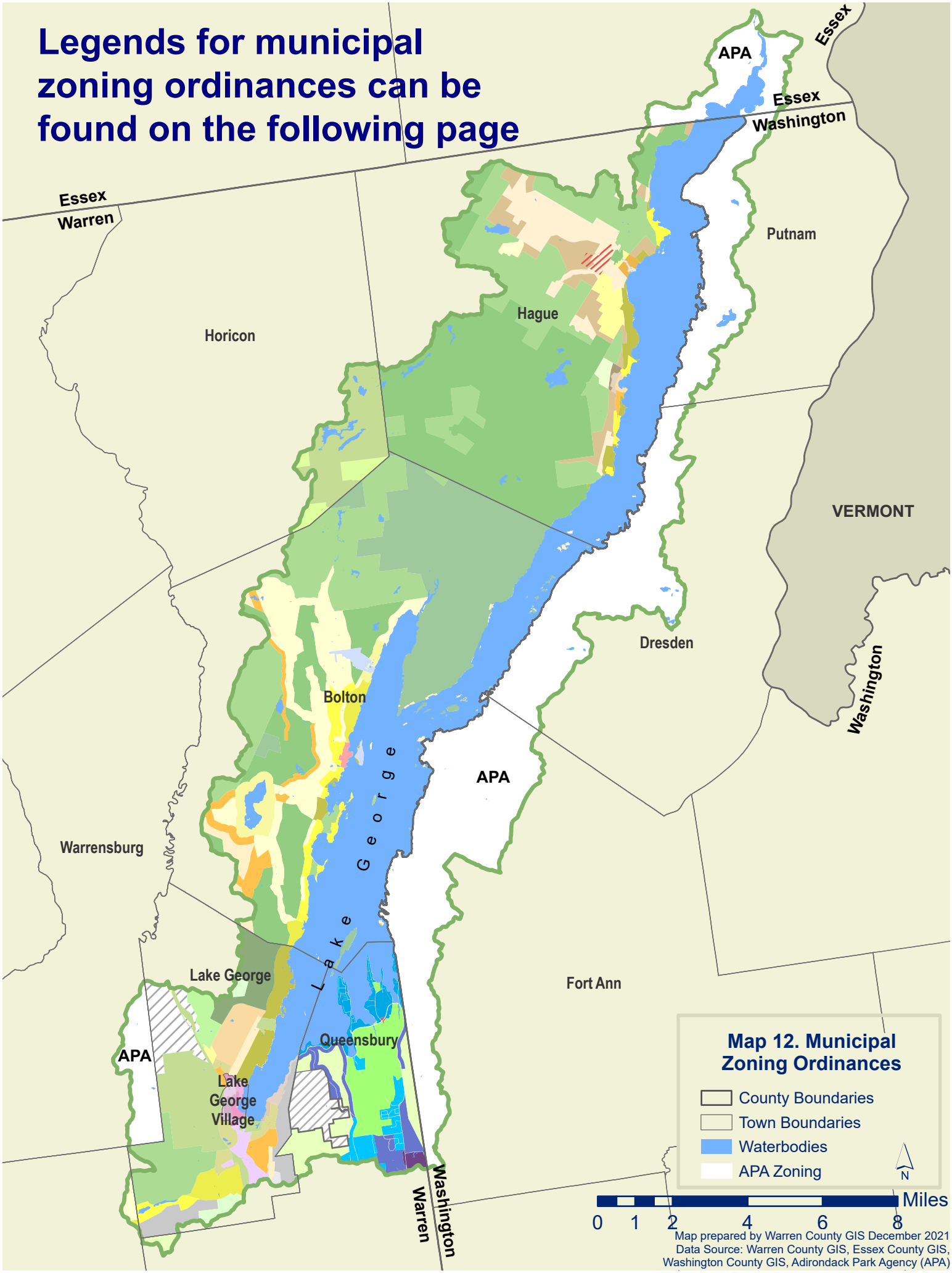
Essex
Warren
Putnam
Hague
Horicon
VERMONT
Dresde
Bolton
Lake George
Warrensburg
Lake George
Fort Ann
Lake George Village
Queensbury
Washington
Warren
Map 11. Land Cover
County Boundaries
Town Boundaries
USA NLCD Land Cover
Open Water
Perennial Snow/Ice
Developed Open Space
Developed Low Intensity
Developed Medium Intensity
Developed High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Dwarf Scrub
Shrub/Scrub
Grassland/Herbaceous
Sedge/Herbaceous
Lichens
Moss
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS December 2021
Data Source: National Land Cover Dataset 2019

Legends for municipal zoning ordinances can be found on the following page



Map prepared by Warren County GIS December 2021
Data Source: Warren County GIS, Essex County GIS, Washington County GIS, Adirondack Park Agency (APA)

Lake George Watershed
Municipal Zoning Legends

Lake George Zoning
- Land Conservation 25 (LC 25)
- Land Conservation 50 (LC 50)
- Land Conservation 8.5 (LC 8.5)
- Lake George Village
- Residential Commercial - High Density (RCH)
- Residential Commercial - High Density - Lakeshore (RCH LS)
- Residential Commercial - Medium Density 1 (RCM 1)
- Residential Commercial - Medium Density (RCM S2A)
- Residential Commercial - Medium Density (RCM S2B)
- Residential - High Density (RH)
- Residential - Medium Density 1 (RM 1)
- Residential - Medium Density 2 (RM 2)
- Residential Rural 10 (RR 10)
- Residential Rural 5 (RR 5)
- Residential Rural 7 (RR 7)
- Residential Rural 8.5 (RR 8.5)
- Residential - Special 1 (RS 1)
- Residential - Special - Hamlet (RSH)
- State Land (SL)
- Tourist Commercial A (TC A)
- Tourist Commercial B (TC B)

Bolton Zoning
- General Business (GB)
- Land Conservation 25 (LC 25)
- Land Conservation 45 (LC 45)
- New York State (NYS)
- Planned Unit Development (PUD)
- Residential - Commercial - Hamlet (RCH 5000)
- Residential - Commercial - Low Density (RCL 3)
- Residential - Commercial - Medium Density (RCM 1.3)
- Residential - Low Density (RL 3)
- Residential - Medium Density (RM 1.3)
- Rural Residential 10 (RR 10)
- Rural Residential 5 (RR 5)

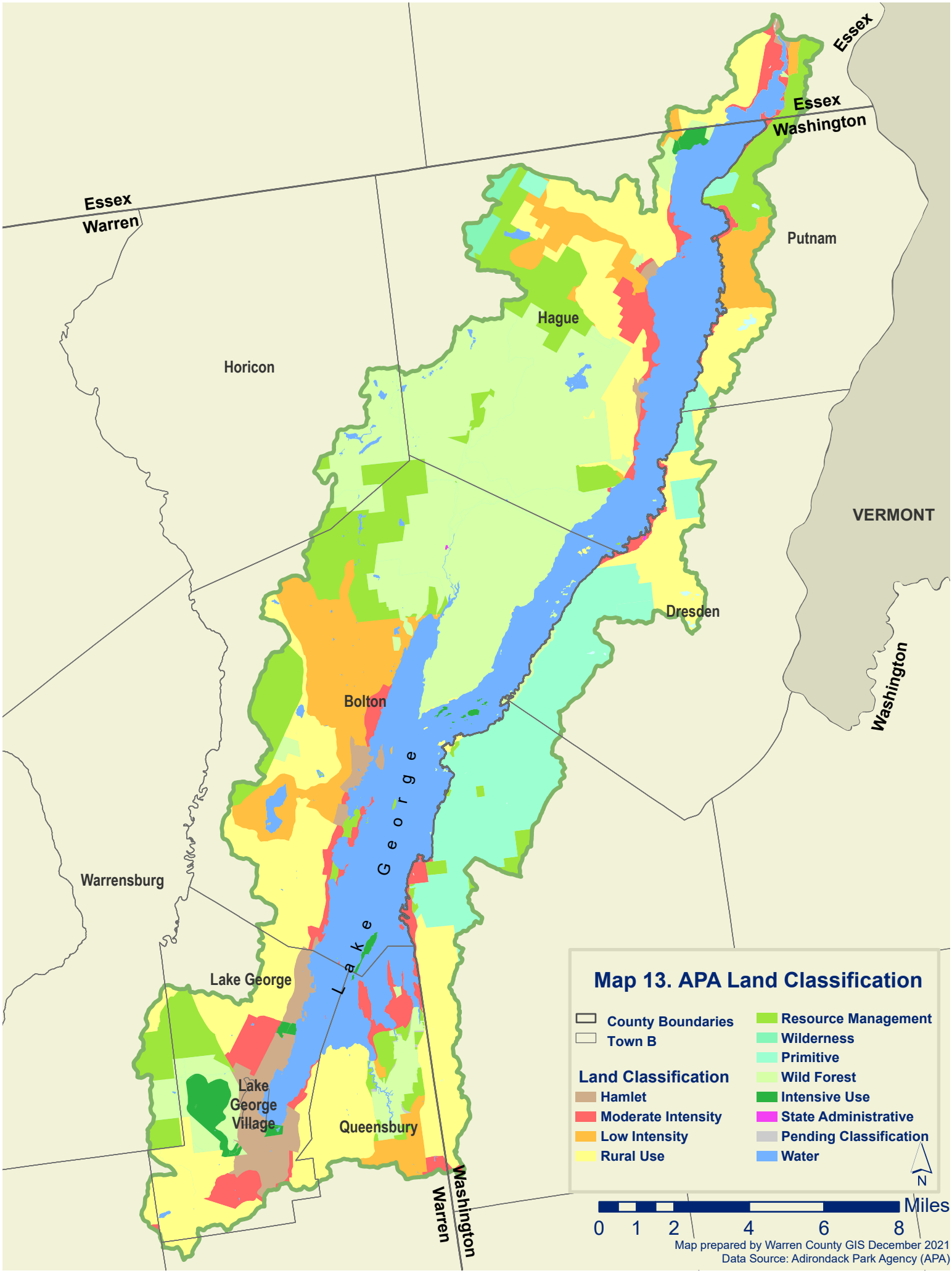
Horicon Zoning
- Land Conservation: 42.6 (LC-42.6)
- State Land (SL)

Hague Zoning
- Flood Hazard Fringe (FHF)
- Hamlet - Primary (HP)
- Hamlet - Secondary (HS)
- Hamlet - Secondary Residential (HS-R)
- Open Countryside I (OCI)
- Open Countryside1: Residential (OCI-R)
- Open Countryside II (OCII)
- Open Countryside II: Residential (OCII-R)
- Resource Conservation (RC)
- Resource Conservation: Residential (RC-R)
- Resource Conservation/State Land (RC/S)
- Special Commercial Use Zone (SCUZ)
- Town Residential 1 (TR 1)
- Town Residential 2 (TR 2)
- Town Residential 3 (TR 3)
- Town Residential 1: Residential (TR-1R)

Queensbury Zoning
- Land Conservation 10 Acre (LC-10A)
- Land Conservation 42 Acre (LC-42A)
- Neighborhood Commercial (NC)
- Planned Unit Development (PUD)
- Rural Residential 3 Acre (RR-3A)
- Rural Residential 5 Acre (RR-5A)
- Moderate Density Residential (MDR)
- Waterfront Residential (WR)

Lake George Village Zoning
- Single-Family Residential (R)
- Residential Mixed Use (RMU)
- Commercial Mixed Use (CMU)
- Commercial Resort (CR)

Lake Luzerne Zoning
- Open Space (OS)
- Residential Resort (R RE)
- Residential Countryside (RC)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Horicon
VERMONT
Dresden
Washington
Bolton
Lake George
Warrensburg
Lake George
Lake George Village
Queensbury
Washington
Warren
Map 13. APA Land Classification
County Boundaries
Town B
Land Classification
Hamlet
Moderate Intensity
Low Intensity
Rural Use
Resource Management
Wilderness
Primitive
Wild Forest
Intensive Use
State Administrative
Pending Classification
Water
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS December 2021
Data Source: Adirondack Park Agency (APA)

3.5 Waterfront Access, Parks, and Open Space Amenities

Numerous state and municipal parks and beaches offer physical and visual public access to Lake George. For those with boats, there are approximately 84 boat launch sites on Lake George, nearly half of which are associated with commercial marinas and motels, three are state run, and two are managed by municipalities. Most of the boat activity in the north segment of the lake is initiated at state-owned facilities at Mossy Point Boat Launch and Rogers Rock Campground while the state-owned launch at Million Dollar Beach and the municipal launch in the Town of Bolton generate high levels of boating activity in the southern portion of the lake (LGPC, 2015).

The Lake George Park Commission (LGPC) is responsible for registering boats and docks in Lake George and collecting data on these activities. Data provided for the years 2015 to 2022 reveal a moderate overall increase in annual boat registrations and dock registrations, with dock registrations increasing substantially between 2021 and 2022, and a substantial increase in temporary passes between 2015 and 2016 which has tapered off and stabilized to date **(Figure 8)**.

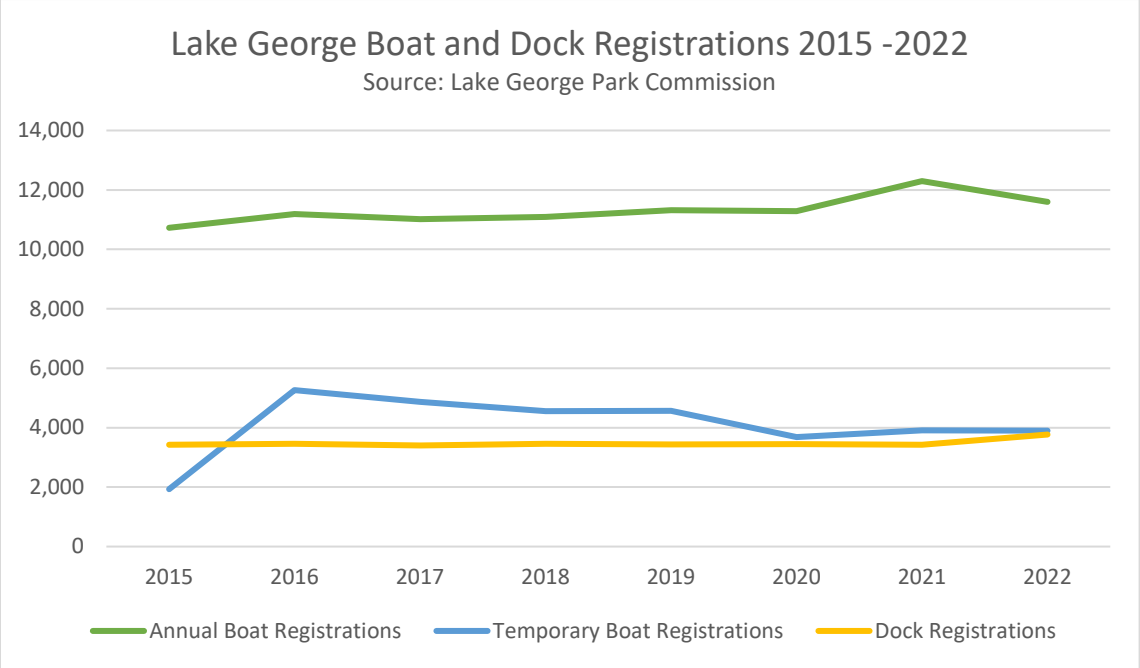


Figure 8: Change in Lake George Boat and Dock Registrations by type (2015-2022). Source: Lake George Park Commission.

Additional amenities include three-state run campgrounds, 365 overnight campsites and 116 day use, or picnic sites located on the 44 state-owned islands and the shorelines of Lake George (LGPC, 2015).

3.6 Conserved and Protected Lands

Adequate open space is a critical component to water quality protection, Open space provides numerous water quality benefits such as flood protection, increased infiltration, water filtering, and reduced erosion. In addition to the protected state land and the Lake George Forest land surrounding the lake, the Lake George Land Conservancy (LGLC) works to protect the water quality of Lake George by conserving land throughout the watershed. To date, the LGLC has preserved over 12,000 acres within the watershed, most of which is open to the public for recreational purposes. Additionally, The Nature Conservancy (TNC) has approximately 915 acres of conserved lands within the watershed.

Maintaining the existing forest cover of the Lake George watershed is perhaps one of the most important measures to maintain the water quality of the lake. There is a strong connection between protecting lands and the health of a watershed. A literature review conducted by the Open Space Institute (OSI) elicited broad agreement that a forest cover of 70-90% in a watershed is needed to retain good water quality in its streams. This finding points to a clear and elevated role for land protection. Approximately 80% of the Lake George watershed remains undeveloped, and either devoted to State forest preserve, conserved lands, private forestland, or other undeveloped uses **(Figure 6)**. Maintaining this land use distribution through conservation efforts has been shown to have meaningful impacts on water quality. In fact, according to OSI, forest protection mixed with smart land use decisions and planning may be the best approach for maintaining clean water (Morse, 2018).

3.7 Infrastructure

Development patterns are often influenced by the availability of infrastructure. The 2016 *Lake George Watershed Data Atlas* describes the nature of wastewater, water, and sewer infrastructure in the Lake George Watershed. Six areas are served by municipal sewers and three by municipal water. The Towns of Bolton, Dresden, Putnam, and Ticonderoga and the Village of Lake George all operate wastewater treatment facilities. Areas outside of the defined service areas for the wastewater treatment facilities utilize onsite wastewater systems or small community systems. The Towns of Lake George, Bolton, and Ticonderoga, and the Village of Lake George also offer municipal water service. Outside of these defined water districts, water is sourced from private on-site wells or drawn from Lake George itself **(Map 14. Sewer and Water Infrastructure Map)**.

Sewer Service.

Approximately 35% of residential development within the watershed is served by public sewer. Within the watershed, the Town and Village of Lake George has the greatest number of sewer connections, totaling 1,120 including residential and commercial. The Town of Putnam, a portion of which is serviced by Ticonderoga's sewer district, has expanded from just three connections in 2016 to 101 connections in 2021.

On-site Wastewater Systems.

Residential and commercial uses outside of established sewer districts rely on onsite septic systems or community wastewater systems to treat their wastewater. There are an estimated 6,000 residences in that watershed that utilize one of these systems.

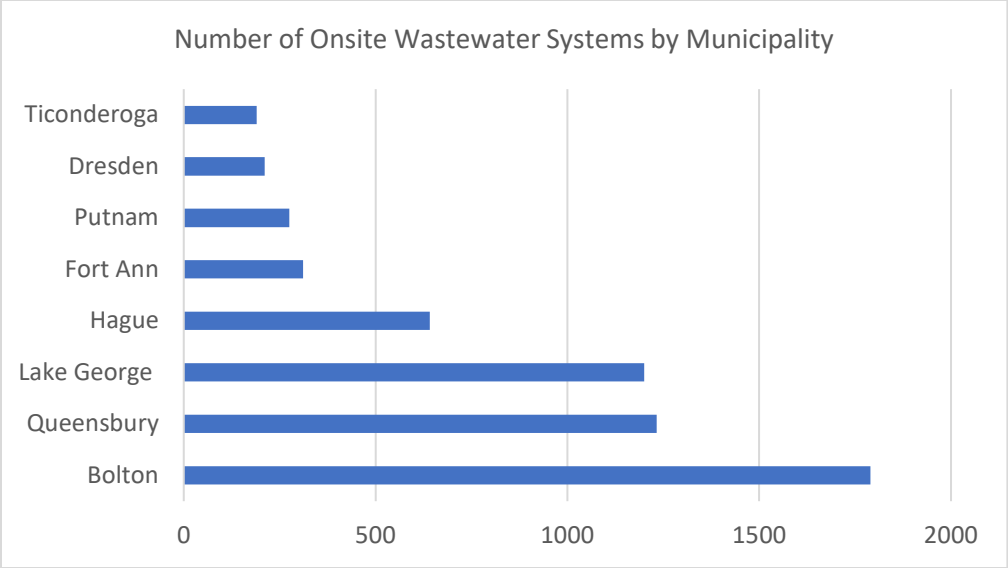


Figure 9: Onsite Wastewater Systems by Municipality. Source The Lake George Association, 2016.

Within the watershed, the Town of Bolton has the greatest number of onsite systems with 1,790 systems, followed by Queensbury and Lake George with approximately 1,200 systems each **(Figure 9)**. Lake Luzerne, Horicon, and Warrensburg have a very limited number of residences within the watershed and therefore have few onsite wastewater systems (The Lake George Association, 2016).

3.8 Water Services

A public water system (PWS) is defined by the New York State Department of Health (NYSDOH) as a public entity which provides water to the public for human consumption. In New York State, any system that has at least five service connections or that regularly serves an average of at least 25 people daily for at least 60 days out of the year is considered a PWS. PWS are further categorized as Community Water Systems (CWS) for residential systems and Non-Community (TNC) for non-residential systems.

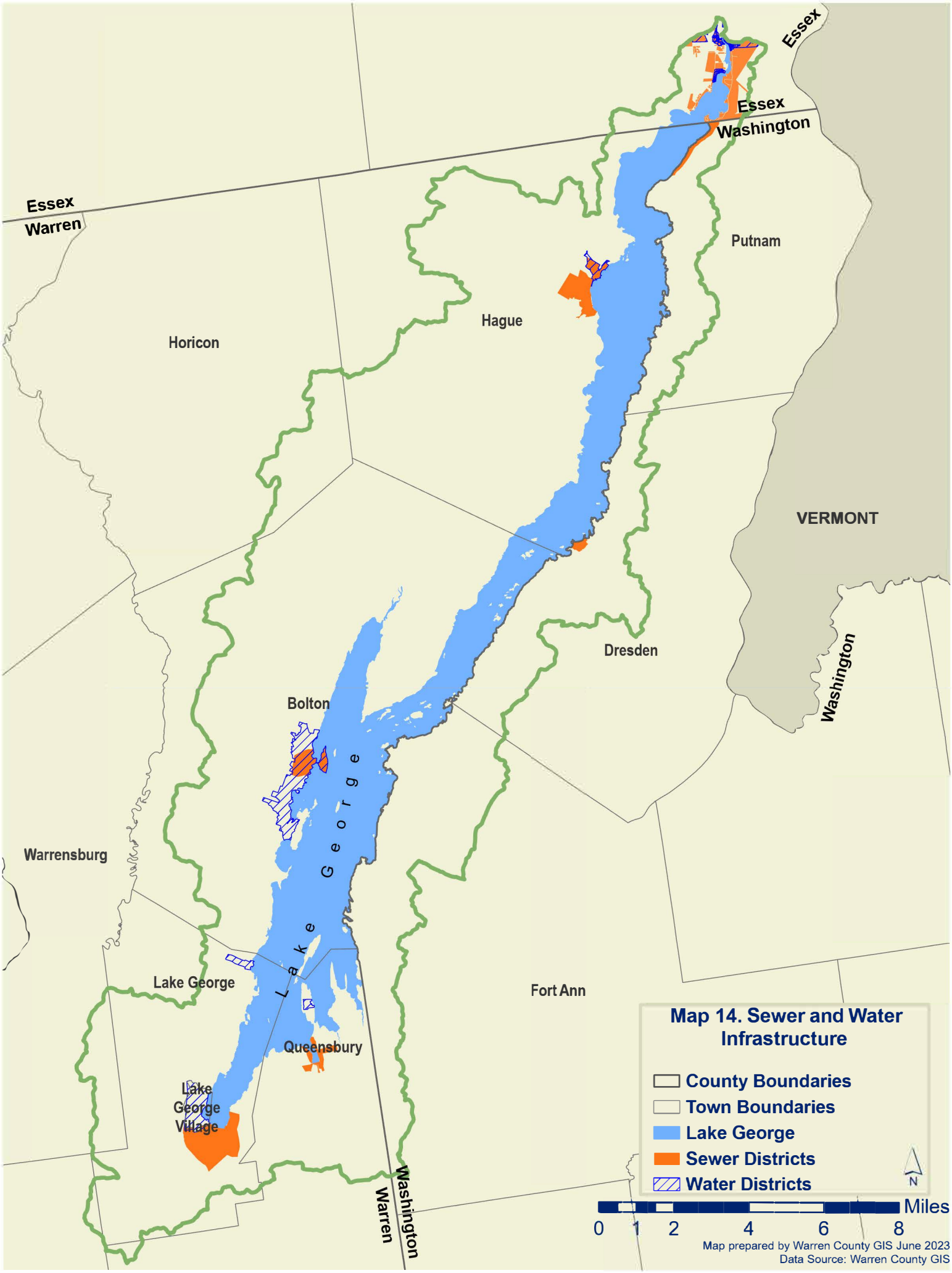
A CWS is defined by the New York State Department of Health as a public water system that serves the same population year-round. There are six CWS that utilize Lake George for drinking water: The Village of Lake George, Town of Ticonderoga, Cannon Point Condominiums, Antlers of Diamond Point, Arcady Bay Estates, and Lagoon Manor Homeowners Association.

There are two additional categories of non-residential water supplies that utilize Lake George, Transient Non-community Water System (TNCWS) and Non-transient Non-community Water Systems (NTNCWS). TNCWS are defined as non-community water systems that serve different people for more than six months out of the year. In the Lake George Watershed, TNCWS include Adirondack Camp, Adirondack Park Mobile Home, Bay Shore Court, Beckley's Lakeside Log Cabins and Marina, Blue Water Manor, Canoe Island Lodge, Cool Ledge Cottages, Hague Community Homeowners Association, Northern Lake George Resort, Porters Cottages, Rock Cove Association, San Souci of Cleverdale, Shore Colony, and Takundewide Homeowners. Silver Bay Association is the single NTNCWS in the watershed, this water system is a non-community system that serves the same people for more than six months a year, but not year-round.

Outside of a municipal water supply or PWS, properties throughout the watershed rely on onsite wells, or direct withdrawal from the lake. It is estimated that 75% of homes in the Lake George Watershed draw their drinking water directly from Lake George or private wells (The Lake George Association, 2016).

3.9 Road Network

Within the Lake George Watershed, there are approximately 396 miles of roadway, the majority of which are local roads. This number includes nearly 51 miles of county roads, 12 miles of interstate highway (I-87), 63 miles of state roads, and 270 miles of town and village roadways. The Town of Bolton has the greatest roadway miles, followed by the Town of Lake George and Hague **(Map 15. Watershed Road Network).**


Essex
Essex
Washington
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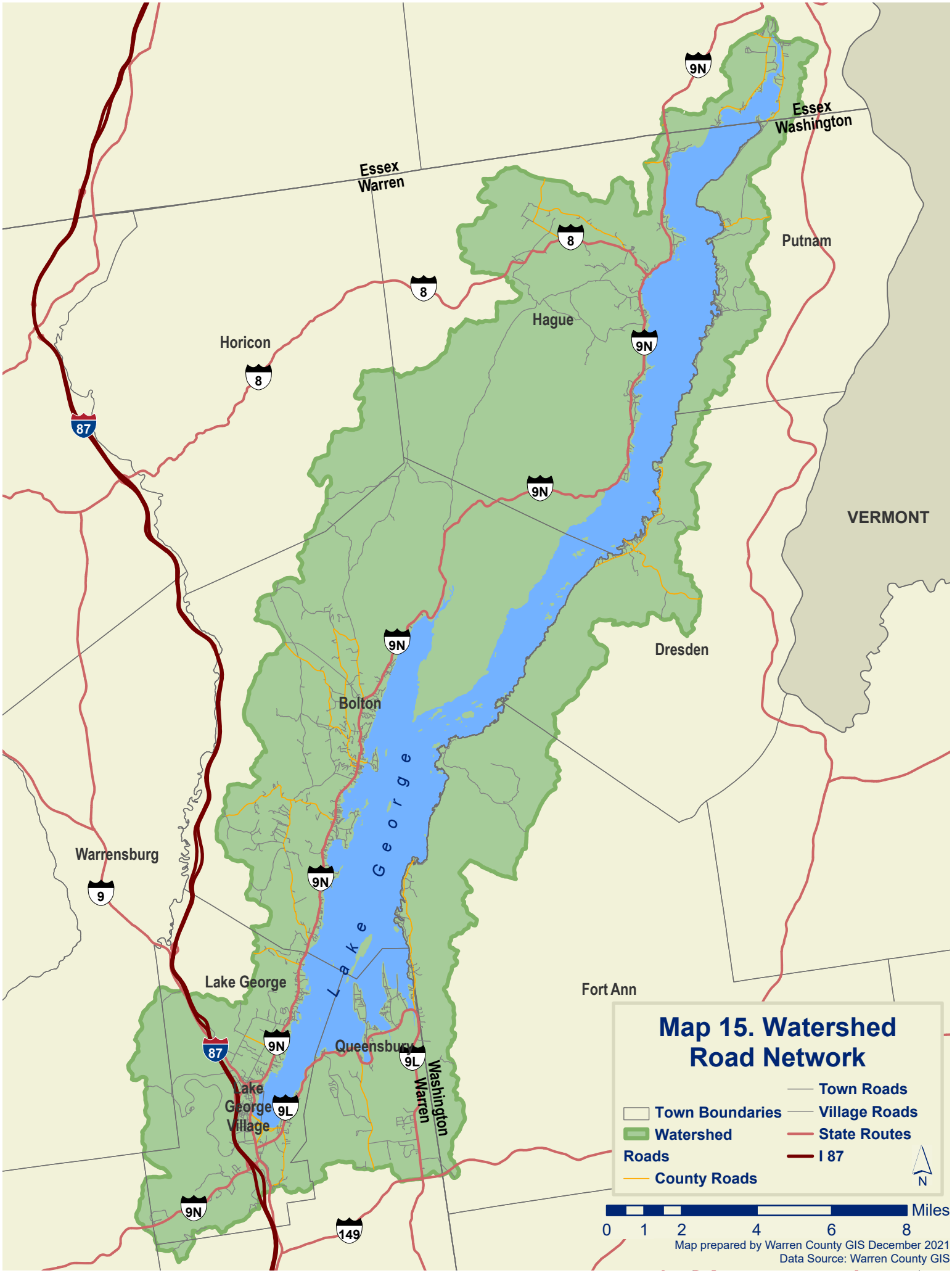
Horicon
VERMONT
Dresden
Washington
Bolton
Lake George
Warrensburg
Lake George
Fort Ann
Queensbury
Lake George Village
Washington
Warren
Map 14. Sewer and Water Infrastructure
County Boundaries
Town Boundaries
Lake George
Sewer Districts
Water Districts
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS June 2023
Data Source: Warren County GIS


Essex
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Horicon
VERMONT
Dresden
Bolton
Lake George
Warrensburg
Lake George
Fort Ann
Queensbury
Lake George Village
Washington
Warren
9N
8
87
9
9L
149
Map 15. Watershed Road Network
Town Boundaries
Watershed
Roads
County Roads
Town Roads
Village Roads
State Routes
I 87
N
Miles
0 1 2 4 6 8
Map prepared by Warren County GIS December 2021
Data Source: Warren County GIS

Section 4. Lake and Stream Assessments, Classification and Designated Use

The NYSDEC uses information gathered through its monitoring program to assess the health of New York State's waterbodies and the watershed draining to them. Classifications for surface waters range from Class AA to Class D depending on the expected best use of the water and whether additional treatment is required to meet that use. Waterbody classifications and their associated best uses are described in **Table 6** below:

Table 6: Waterbody Classifications and Best Use Designations
Source: NYSDEC

Class	Best Use
AA / A	Source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. Waters are suitable for fish propagation and survival.
B	Primary and secondary contact recreation and fishing. Suitable for fish propagation and survival.
C	Fishing and fish propagation and survival. Suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.
D	Fishing. Waters are suitable for fish survival but will not support fish propagation. Suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

Certain Class AA and Class A surface waters may be further designated as "Special", requiring additional controls on any discharges. Class B or C waters may be designated "T", indicating that water quality conditions must be adequate to support survival of trout, or "TS" meaning that water quality and habitat conditions must be adequate to support trout spawning.

Lake George is classified as Class AA Special, one of only five lakes in New York State with this classification, indicating that it is suitable for use as a drinking water supply source. All other waters in the Lake George Watershed, except for Ticonderoga Creek/ La Chute River (Class D), are classified as Class AA Special (NYSDEC, 2009).

The NYSDEC collects monitoring data on rivers, streams, lakes, estuaries, and coastal waters throughout New York State. These results are evaluated and shared with the public through the Waterbody Inventory/Priority Waterbody List (WI/PWL). During the evaluation process, the NYSDEC assigns waterbody impact levels of severity. Impacts are determined based on that waterbody's ability to support its designated best uses. The levels of waterbody impairment are precluded, impaired, stressed and threatened and are described in **Table 7** below:

Table 7: Descriptions of levels of waterbody impairments as assigned by NYSDEC.
Source: NYSDEC

Precluded	*Frequent/persistent* water quality, or quantity, conditions and/or associated habitat degradation *prevents all aspects* of a specific waterbody use.
Impaired	*Occasional* water quality, or quantity, conditions and/or habitat characteristics *periodically prevent* specific uses of the waterbody, or Waterbody uses are not precluded, but some aspects of the use are *limited or restricted,* or Waterbody uses are not precluded, but *frequent/persistent* water quality, or quantity, conditions and/or associated habitat degradation *discourage* the use of the waterbody,

	Support of the waterbody use requires *additional/advanced* measures or treatment.
Stressed	Waterbody uses are not significantly limited or restricted (i.e., uses are supported and water quality standards are met) but *occasional* water quality, or quantity, conditions and/or associated habitat degradation *periodically discourage* specific uses of the waterbody.
Threatened	Water quality supports waterbody uses, water quality standards are met, and ecosystem exhibits no obvious signs or significant stress (i.e., uses are *fully supported)* however: *Changing land use patterns* may result in restricted use or ecosystem disruption, or. *Worsening trends or sub-optimum water quality suggest* future impacts to uses, or *Support of a specific/distinctive use* (e.g., Class AA waters) make the water more susceptible to water quality threats.

Despite having generally good water quality, Lake George and many of its tributaries have previously been considered impaired by the NYSDEC based on evaluation of their designated uses, provided in **Table 8** below. However, in early 2022, the NYSDEC released an updated draft Clean Water Act (CWA) Section 303(d) List of Impaired/Total Maximum Daily Load (TMDL) Waters for 2020 - 2022. This list proposes removing waterbodies within the Lake George Watershed that were previously listed for Silt/Sediment pollution. This proposed change is due to potential flaws in the original data, including how turbidity (the water quality impact indicative of Silt/Sediment pollution) is evaluated.

Additionally, Halfway Creek, Lower, and tributaries are proposed to be listed for Iron pollution in 2022.

The information in **Table 8** is drawn from the NYSDEC 2009 Section 303(d) list. The waterbodies marked with an asterisk are proposed to be removed from the list due to potential flaws in the data.

Table 8: Assessed Waterbodies in the Lake George Watershed
Source: NYSDEC WI/PWL, 2009

Waterbody	Uses Impacted	Types of Pollutant	Source of Pollutant	Classification
Lake George	Water Supply, Public Bathing, Recreation, Habitat/Hydrology	Silt/Sediment, Restricted Passage	Erosion, Urban/Stormwater Runoff, Restricted Passage	Impaired*
Indian Brook and tribs	Water supply, Recreation, Habitat/Hydrology	Silt/Sediment, Restricted Passage	Streambank Erosion, Deicing, Road bank Erosion, Urban/Stormwater Runoff	Impaired*
Huddle/Finkle Brook	Water Supply, Recreation, Habitat/Hydrology	Silt/Sediment, Restricted Passage	Streambank Erosion, Deicing, Road bank Erosion, Urban/Stormwater Runoff, On-site Septic	Impaired*
Hague Brook and tribs	Water Supply, Recreation, Habitat/Hydrology	Silt/Sediment, Restricted Passage, Pathogens	Streambank Erosion, Urban/Stormwater Runoff, Deicing, Road bank Erosion	Impaired*
Tribs to Lake George, Village of Lake George	Water Supply, Recreation, Habitat/Hydrology	Silt/Sediment, Restricted Passage, Pathogens	Streambank Erosion, Urban/Stormwater Runoff, Deicing, Road bank Erosion, Municipal	Impaired*

Tribs to Lake George, Town of Lake George	Water Supply	Other Pollutants (Possible)	Other Source (Possible)	No Known Impact
Trout Lake	No Use Impairment			No Known Impact
Northwest Bay Brook and tribs	Water Supply	Other Pollutants (Possible)	Other Source (Possible)	No Known Impact
Tribs to Lake George, Town of Hague	Water Supply	Other Pollutants (Possible)	Other Source (Possible	No Known Impact
Jabe Pond	No Use Impairment			No Known Impact
Ticonderoga Creek/ La Chute River	Recreation, Aesthetics	Aesthetics, Nutrients, Pathogens	Urban/Stormwater Runoff, Private/Comm/Inst	Minor Impacts
Tribs to Lake George, East Shore	Water Supply, Recreation, Habitat/Hydrology	Silt/Sediment, Restricted Passage	Streambank Erosion, Deicing, Road bank Erosion	Impaired*
English Brook and tribs	Water Supply, Recreation, Habitat/Hydrology	Silt/Sediment, Restricted Passage, Pathogens	Streambank Erosion, Urban/Storm Runoff, Deicing, Road bank Erosion	Impaired*

4.1 Stream Monitoring Data

The LGA serves as a local coordinator for the NYSDEC Water Assessments by Volunteer Evaluators (WAVE), a program which trains and equips citizen scientists to collect valuable water quality data from New York streams and rivers. During the 2019 sampling season, 19 trained volunteers along with LGA staff sampled 17 tributaries around the Lake George Watershed, including the lake's eight major tributaries. The samples are examined for both pollution sensitive and pollution tolerant macroinvertebrates. The presence of pollution sensitive macroinvertebrates indicates a healthy stream while pollution tolerant organisms indicate the possibility of impaired water quality.

Macroinvertebrate samples are reviewed in conjunction with habitat assessments to classify each stream as "No Known Impact" or "No Conclusion". No Known Impact is the highest quality category assigned to stream segments in the NYSDEC Waterbody Inventory. For more information on this, and other community science programs, visit https://www.lakegeorgeassociation.org/science-protection/community-science.

Eleven of the 23 samples were determined to have no known impact, meaning at least six or more pollution sensitive organisms were found in these streams. The remaining 12 samples yielded no conclusion. A finding of no conclusion means that there was neither an abundance of pollutant sensitive nor pollutant tolerant organisms found at the sample sites (LGA, 2019).

4.2 Trophic State Assessment

The level of productivity of a lake is defined by three parameters: total phosphorus concentration, Secchi disk transparency, and chlorophyll-a concentration (a measure of algal abundance).

Lake George is classified as an oligotrophic lake meaning it has a low level of biological activity resulting in good water quality and a high level of transparency. While not a chemical property of lake water, transparency is used as a measurement of water quality related to chemical and physical properties and often indicates a lake's overall water quality.

Lake Productivity

The productivity of a lake refers to the quantity of algae and aquatic plants that the lake can support. Productivity is directly related to the availability of nutrients. Low productivity lakes which are low in nutrients, usually have clear water (oligotrophic). High productivity lakes are nutrient rich and are often murky and green due to algal growth (mesotrophic).

Transparency. Lake George's water clarity is much higher than most nearby lakes due to low algal levels. Secchi disc readings are used to measure a lake's transparency or clarity. The process involves lowering an 8-inch diameter weighted disk off a boat until it disappears and then raising it until it is just visible. The average of the two readings is recorded. Water clarity generally increases from South to North and variations in Secchi depth readings are expected throughout the summer as algal populations increase and decrease. Year to year changes may result from weather and nutrient accumulation. In 2019, Secchi depth transparency measured between five and eight meters, this is a reduction in the average transparency that is typically read in Lake George. Secchi depths readings recorded by the Darrin Fresh Water Institute dating back to 1980 reveals that the high levels of clarity in Lake George have not changed significantly over the past three decades (RPI, 2022) with other studies showing a lake wide decrease in clarity of just 6% over the past thirty years (Boylen, 2014).

Photo 6: Secchi Disks are used to measure water clarity. Source: USGS.

Chlorophyll-a. Chlorophyll-a concentration is a measure of the amount of algae present in the lake and is often inversely related to the Secchi depth reading of the lake. The concentration of chlorophyll-a in Lake George has increased by 32% since 1980 but continues to be much lower than many other lakes in the region.

Chlorophyll-a concentrations are estimated using a remote sensing model. The analysis provides an estimate of the spatial distribution of chlorophyll-a on a particular day and is intended to supplement the field measurement programs. Based on this model, most of Lake George generally has low chlorophyll-a concentrations with the highest chlorophyll-a concentrations typically at the north end of the lake, near the outlet where the depth is less than 16 feet and near the shore at Huletts Landing (New York State Department of Environmental Conservation, 2022).

Phosphorus. Phosphorus originates from a variety of sources, many of which are related to human activities. Major sources include animal waste, soil erosion, detergents, septic systems, and runoff from developed and undeveloped land. Municipal wastewater treatment facilities in the watershed may also contribute to phosphorus levels in Lake George.

Table 9: Lake George Trophic Lake Assessment	
Classification: Oligotrophic	
Transparency	Lake George enjoys a high level of transparency with Secchi Disk Readings of 5-8 Meters
Chlorophyll-a	Levels are increasing, but continue to be lower than other lakes in the region
Total Phosphorus	Levels have remained constant since 1980

Phosphorus provokes complex reactions in lakes and an analysis of phosphorus often includes both soluble reactive phosphorus and total phosphorus. Total phosphorus is considered a better indicator of a lake's nutrient status because its levels remain more stable. TP includes soluble phosphorus and the phosphorus in plant and animal fragments suspended in lake water (Shaw, 2004). Average total phosphorus in Lake George varies but is always below ten parts per million. Data displayed by the Jefferson Project reveals that total phosphorus (TP) has remained constant since 1980 (RPI, 2022).

Concentrations of TP declined by approximately 60% between 1960 and 1980. TP concentrations remained consistent from 1980 to 2009, suggesting that measures to reduce TP loading during the 1970s were effective. Concentrations of total nitrogen (TN) also declined during this period.

The average concentration of TP in Lake George is significantly less than the average concentration found throughout the Eastern Adirondack region. Further, the average TP concentration in Lake George is less than half the New York State water quality guidance value of 0.02 mg/L, which suggests that the average concentration to protect water quality as part of future management actions in Lake George should be targeted at concentrations lower than the State guidance value. The relative concentrations of nitrogen and phosphorus can influence algal community composition and the abundance of cyanobacteria (New York State Department of Environmental Conservation, 2022).

Dissolved oxygen (DO). The amount of DO in a waterbody is a strong indicator of its water quality and DO is critical for the ecological balance of lakes. Low levels DO can affect the survival of fish and lake organisms and cause chemical changes in lakes.

The depletion of oxygen from the deep waters creates a condition in which phosphorus separates from the sediments and becomes available, contributing to phosphorus levels in the water. This process is known as internal loading. This condition also poses a problem for aquatic life because the water temperature near the surface of the lake is too warm, while cooler water near the bottom has too little oxygen to survive. Algal blooms are also more likely to occur under these conditions (United State Geologic Survey, n.d.). Limited DO profile data are available for Lake George. Future monitoring efforts should be made to inform management planning and implementation of specific actions.

Lake George has high levels of DO with some variability throughout the year in different locations. The concentration of DO in a waterbody is inversely related to water temperature, so in the summer months when the water temperature is highest, DO levels are at their lowest. A seasonal hypoxic zone (dead zone) occurs in Caldwell Basin at depths ranging between 24 and 30 meters (Boylen, 2014). However,

hypoxia has only been recorded in less than 0.10% of samples collected in deep-water locations over 36 years (RPI, 2022).

4.3 Hydrologic budget

The hydrologic budget is the balance of how much water enters a body of water, how much is retained, and how much leaves the waterbody. Lake George is a drainage lake meaning that it is fed by streams, groundwater, precipitation, and runoff and is drained by a stream **(Figure 10)**. There are over 141 streams that flow into Lake George, making up 57% of the water that enters the lake. The remainder of the water entering the lake comes from precipitation (25%) and groundwater (18%) (Shuster, 1994). Because of the high contribution of water entering the lake from streams, the water quality of Lake George is heavily dependent on the quality and quantity of inflow from streams and on human activity in the watershed.

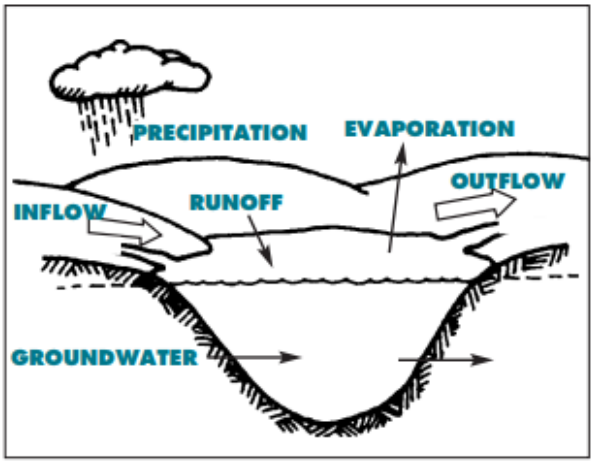


Figure 10: Lake George is a drainage lake, fed by streams, groundwater, and runoff and drained by a stream. Source: Shaw, 2004.

There are eight major streams that supply nearly half of the total amount of flow that comes from surface water sources: Northwest Bay Brook, Indian Brook, Hague Brook, West Brook, English Brook, Shelving Rock Brook, Finkle Brook, and East Brook **(Map 5. Major Tributaries of Lake George)**. The lake drains north to Lake Champlain via the La Chute River with a 230 foot vertical drop over 3.5 miles (Boylen, 2014). Two large basins make up Lake George and five major catchment sub-basins have been documented: Caldwell, Dome Island, Narrows, Sabbath Day, and Rogers Rock ((Boylen, 2014).

The hydraulic retention time of a lake is the average length of time it takes for water to pass through the lake. Lake size, water source, and watershed area are primary factors in determining retention time. The retention time of Lake George is 8.7 years (New York State Department of Environmental Conservation, 2022), a long time in relation to other comparable lakes. For example, the Great Sacandaga Lake has a retention time of 0.6 years while many other lakes in the Adirondacks are flushed in days or weeks (The Lake George Association, 2021). Lakes with longer retention times tend to have the best water quality as evidenced by lower levels of plant nutrient phosphorus. Better water quality often results from their greater depth and relatively smaller watersheds (Shaw, 2004).

4.4 Fish Community

Lake George is a two-tiered fishery that supports both cold water and warm water fish. There are a total of 36 fish species in Lake George and include cold-water salmonids like Lake trout, landlocked Atlantic salmon, Brown trout, and Brook trout which are found in the deep-water zone of the lake. These fish spawn in the fall in shallow water with rocky, cobble substrate. Smallmouth bass and largemouth bass are part of warm water fisheries and are found in the shallow areas around the lake. They spawn in clean, rocky shorelines in late May to June.

Other fish species found in Lake George include Northern pike, bullhead, chain pickerel, sunfish, smelt, trout, and yellow perch.

Photo 7: Lake trout are one of Lake George's cold-water fish species.

4.5 Plant Community

The Lake George plant community is comprised of approximately 47 aquatic plant species, eight of which are classified as endangered, threatened, or rare by New York State. The macrophyte community occupies the shallow water zone that extends from the shoreline to the water depth at which plants no longer grow. The maximum depth for rooted plants is 12 meters, but most plants are found between 0 – 6 meters (Ogden, 1976). The bays found along Lake George provide ideal conditions for aquatic plants which offer a variety of benefits for the lake, including oxygen production, nearshore energy reduction, nutrient absorption, and wildlife food and habitat (New York State Department of Environmental Conservation, 2022).

Section 5. Threats and Emerging Issues

Using information gathered through public meetings and surveys, as well as through the individual expertise and knowledge of the WAC, five threats and emerging issues impacting water quality in the Lake George Watershed were identified. Water quality threats to the Lake George Watershed include, in no order of prioritization, non-point source pollution, invasive species, road salt, wastewater treatment, and climate change. Each action project identified in **Section 9 Implementation Strategy and Timeline** is aimed at addressing one or more of these identified threats.

5.1 Non-Point Source Pollution

Pollutants that impact our waterways are categorized by their origin: point or non-point. Point source pollutants are inputs from a direct source such as wastewater treatment plants, operational wastes from industries, and combined sewer outfalls. Point source pollutants enter the environment at an identifiable location making them easier to monitor and regulate than their non-point source counterparts. Non-point source pollutants include runoff from rainwater and snowmelt that moves over developed areas and can pick up a wide array of contaminants.

Non-point source pollution is of great concern in the watershed and is more difficult to regulate because it originates from a much broader area and may travel long distances through the watershed. Within the watershed, nutrient loading from non-point source pollution, particularly phosphorus and nitrogen, is a threat which can lead to a wide range of water quality concerns including contributing to the occurrence of harmful algal blooms (HABs) and will require a broad array of policies and programs to mitigate.

Nitrogen and Phosphorus. Nitrogen and phosphorus are a natural part of the aquatic ecosystem and are essential for all forms of life. These nutrients support the growth of algae and aquatic plants, which provide food and habitat for fish, shellfish, and smaller organisms that live in water. However, human activities have rapidly increased the rate of these nutrients to Lake George and in elevated levels, nitrogen and phosphorus can have a devastating impact on water quality and can stimulate algae and plant growth.

Human activities increase phosphorus quantities in waterbodies. Impervious surfaces like roads, parking lots and buildings do not allow runoff to absorb into the ground, instead the water remains above the surface, accumulates, and runs off in large amounts transporting sediment and other materials from the watershed to the surface water network. Stearns and Wheeler (2001) conclude that most of the phosphorus loading into Lake George is from surface water runoff (83%), followed by atmospheric sources (13%), and groundwater (4%). Developed areas accounted for far more phosphorus loading than any other land use. The NYSDEC LENS tool is used to estimate annual phosphorus loading from specific land uses. The tool revealed that the watershed's natural areas contribute the highest percentage (84%) of yearly phosphorus to the lake. Developed land contributes approximately 10% and septic systems 6%. The varying loads are expected due to the large percentage of undeveloped, natural areas in the watershed (78%) while developed land is about 5.5% of the watershed. The relative contributions illustrate that developed land contributes a disproportionate amount of phosphorus compared to other land uses. While phosphorus remains a threat to the ecosystem of Lake George, total phosphorus in the lake has remained stable since 1980 (RPI, 2022). Samples of total nitrogen (TN) concentrations have shown a general seasonal trend of increased concentrations during mid-year sampling events. However,

long-term trends of average annual TN concentrations were not significantly different over time (New York State Department of Environmental Conservation, 2022).

TN:TP Ratio. The relative concentrations of nitrogen and phosphorus can influence algal community composition and the abundance of cyanobacteria. Rations of TN to TP (TN:TP) can be used as a suitable index to determine if algal growth is limited by the availability of nitrogen or phosphorus. Cyanobacteria are rare in lakes where mass-based TN:TP ratios are greater than 29:1, therefore knowing this ratio may be helpful in determining if a HABs will occur. The ratios of TN:TP at four sampling sites in Lake George typically ranged between 20 to 80, suggesting that algal biomass is likely not limited by nitrogen. There were no significant long-term trends in TN:TP at any of the four sampling locations (New York State Department of Environmental Conservation, 2022).

Lake Champlain Total Maximum Daily Load (TMDL). Lake George is part of the larger Lake Champlain Watershed, and as such is subject to the Lake Champlain TMDL for phosphorus. A TMDL is a federally approved document that outlines the estimated quantity of a specific pollutant that can be discharged to a waterbody without causing impairment to the receiving waters. The 2002 Lake Champlain TMDL, developed jointly by the States of New York and Vermont, establishes target phosphorus reduction goals for both point source and non-point source pollution sources.

The Lake Champlain Watershed is divided into 13 segments for phosphorus monitoring and reduction purposes and Lake George is in the South Lake A lake segment which also includes the La Chute River and Putnam Creek. Load allocations and reduction requirements were established by the New York State Department of Environmental Conservation (NYSDEC) in 2010 for each of the lake segments. The allocation for South Lake A was 11.2 mt/year and actual phosphorus load from the lake segment was 7.7 mt/year. Based on these allocations, South Lake A was the only lake segment in New York State that did not require any phosphorus load reductions in 2010 (Lake Champlain Lake George Regional Planning Board, 2018).

Harmful Algal Blooms (HABs). New York State created a HABs Action Plan for Lake George in 2018 with an update in 2022. The primary goal of the plan is to reduce nutrient loading into the lake. The plan also identifies a suite of priority actions to address water quality concerns in Lake George with the overall goal of decreasing the potential for HABs (New York State Department of Environmental Conservation, 2022). Lake George did not have a confirmed HABs incident until November 7, 2020, when staff from the LGA and the NYSDEC confirmed a HAB in the southern portion of the lake known as Harris Bay, on the northeast side of Assembly Point. Since then, numerous HABs have been confirmed at several locations between Bolton Landing and Harris Bay. To date, all sampling results from multiple events

Photo 8: Documented HABs occurrence on Lake George. Photo Courtesy of The Lake George Association

were consistent. The findings confirmed the presence of cyanobacteria, and the toxin results were below the detection limits in all cases (New York State Department of Environmental Conservation, 2022)

HABs occurrences are increasingly common in Adirondack lakes due to the introduction of nutrients from sources such as lawn care fertilizers, stormwater runoff, and failing septic systems, among others. Climate change and warming water temperatures compound the issue, lengthening the growing season for the algae and creating more favorable conditions for a HABs occurrence (De Socio, 2021). HABs in freshwater generally consist of visible patches of cyanobacteria, also known as blue-green algae. Cyanobacteria are naturally present in low numbers in most marine and freshwater systems. Under certain conditions, such as high nutrient concentrations and warm temperatures, cyanobacteria may multiply rapidly and form blooms (New York State Department of Environmental Conservation, 2022).

Unusual climate events, such as unseasonably warm temperatures, heavy precipitation events, and drought conditions, may contribute to the unique conditions that can lead to a HAB despite the implementation of management strategies to prevent them (Reichwaldt, 2012). Lake ecosystems can be resistant to change, therefore any mitigation measures implemented to prevent and reduce HABs must be viewed in the long term to see a reduction in the frequency, duration, and intensity of HABs in a waterbody (New York State Department of Environmental Conservation, 2022).

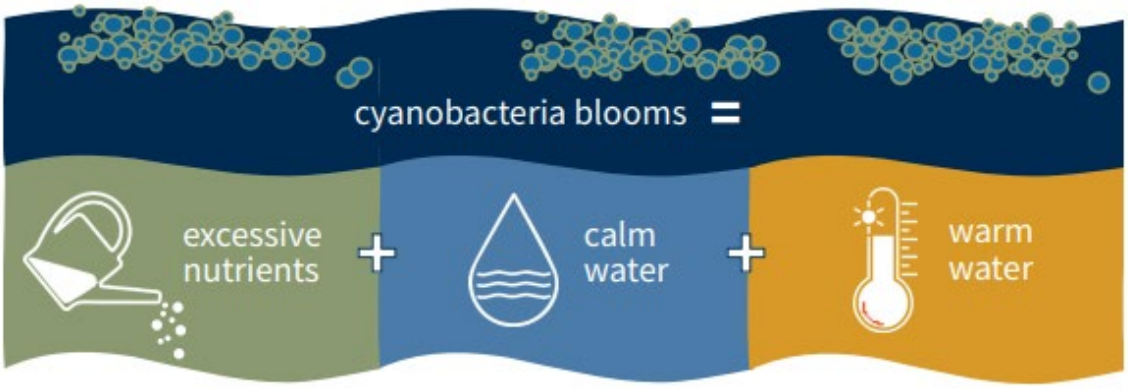


Figure 11: Lake Champlain Basin Program, 2021

Priority Projects. There is a total of 49 non-point source pollution projects identified in **Section 9.3** of this document, totaling approximately $40,000,000 in funding needs. Seven projects were identified as priority projects for implementation due to their project readiness and impact on water quality in the Lake George Watershed.

Non-Point Source Pollution – Priority Projects	
ID# N-01	Expand HABs program to include enhanced sampling and monitoring protocols to assess potential causes of algal blooms and HABs.
ID# N-02	Bolton Road Reconstruction Project: Reconstruction of Route 9N from Village boundary to Hearthstone Point Campground complete with new sewer district and infrastructure, realigned water and stormwater infrastructure, muti-use path, bicycle, and pedestrian amenities. The project will disconnect upwards of 500 on-site septic systems, approximately 150 of which are on the lake shore
ID# N-03	Design and implement green stormwater infrastructure improvements to Shepard's Park in Lake George Village
ID# N-04	Implement a Save the Rain Program in developed areas in the watershed
ID# N-05	Develop a Nine Element (9E) watershed plan for Lake George
ID# N-06	Create incentive program for homeowners to make enhanced stormwater management improvements to their properties, including streambank and shoreline buffers
ID# N-07	Identify forests in locations where significant soil erosion and nutrient loading occurs and target for forest management practices and conservation

5.2 Invasive Species

Invasive species are non-native species, both aquatic and terrestrial, that are introduced beyond the borders of their historic range, reproduce rapidly, and displace native species. Without the ecological checks and balances found in their native environment, invasive species can have negative economic and ecological impacts, and can be a threat to human health within a waterbody and its watershed. Invasive species can divert food resources from native species, reduce light penetration, change habitats, impair water quality, interfere with recreational opportunities, and reduce property values (LCBP, 2021).

Aquatic Invasive Species. Aquatic invasive species (AIS) that have been identified in Lake George include Asian clam, Eurasian watermilfoil, Chinese mystery snail, curly-leaf pondweed, spiny water flea, and zebra mussels. Each individual species poses a unique threat to the ecology of Lake George and requires a unique approach to prevention, maintenance, and eradication. LGPC and the LGA, along with Warren County and watershed municipalities have come together to advance an approach of advocacy, outreach, research, surveillance, monitoring, and remediation to prevent and manage AIS in Lake George.

Photo 9: Mandatory boat inspections on Lake George have helped to reduce the amount of AIS that is introduced to the lake. Source: Adirondack Almanack.

Once introduced, AIS are often impossible to eliminate and very costly to manage. The LGPC administers two invasive species programs in Lake George. The first is the Invasive Species Prevention Program which comprises mandatory boat inspections for boats utilizing the lake, with program costs running between $500,000 and $600,000 annually. The other, the milfoil control program, costs between $300,000 and $500,000 a year utilizing funds from the LGPC, the LGA, and grant funding from New York State (Wick, 2020).

Asian Clam. First detected in 2010, this AIS has been found in 27 locations, affecting more than 150 acres of the lake. Most of the affected areas are in the southern basin near the more developed western shoreline which has many sandy areas, which is the ideal habitat for the species. Asian clams can reproduce rapidly and cause negative ecological, and recreation impacts to a waterbody. The invasive species also pose a threat to the lake benthic community, as it can out compete native species and may reduce biodiversity.

As of 2019, there had not been any identified significant recreational or environmental impacts to Lake George because of the Asian clam, although populations have been expanding in recent years. There is evidence that the Asian clam population is becoming more tolerant to cold temperatures which could lead to increased populations in the long term (Lake George Park Commission, 2013). Management solutions for an Asian clam infestation includes the use of benthic barrier mats and suction harvesting. The use of the benthic barrier mats returned a 97%-99% mortality rate for the areas treated while suction harvesting treatments yielded less efficient results (Lake George Asian Clam Rapid Response Task Force, 2012).

Photo 10: Zebra Mussels have been found in Lake George. Source: Lake George Association.

Zebra Mussels. Adult stage zebra mussels were discovered in the southern basin on Lake George in December 1999. The presence of this AIS threatens outdoor recreation, tourism, property values, and municipal water supplies. Between 1999 and 2009, over 25,000 Zebra mussels were removed from Lake George. There is evidence to suggest that the waters of Lake George are not suitable for Zebra mussels to

thrive because calcium levels in the lake are generally lower than the organism prefers. However, monitoring indicates that calcium levels have been rising in the lake in recent years (Lake George Park Commission, 2013).

Eurasian Watermilfoil. There has been a constant effort to control Eurasian watermilfoil (EWM) in Lake George since 1986. EWM and was first identified in 1985 in three distinct locations and has since grown to over 200 sites. EWM spreads easily and rapidly and can crowd out native plants, reducing biodiversity, diminishing fish habitat, and negatively impacting wetland habitats. In 2016, a total of 216 EWM sites had been identified in Lake George. In the southern basin, there are high concentrations of milfoil sites around Lake George Village, Bolton Landing, Harris Bay, Warner Bay, Dunham's Bay, Huddle Bay and near Long Island. In the north basin, clusters have been found near Huletts Landing, Putnam, Hague, and Roger's Rock (Lake George Park Commission, 2013). In the Summer of 2022, nearly 64.22 tons of EWM was removed from 31 sites in Lake George using Diver Assisted Suction Harvesting (DASH), and hand harvesting techniques (Sheldon, 2022).

Curly-leaf pondweed. Curly-leaf pondweed has been found in Lake George since the 1970s. The plant is an AIS and although it is widespread throughout the lake, it grows marginally and has had minimal impact on the lake (Lake George Park Commission, 2013).

Spiny water flea. This aquatic invasive zooplankton was first discovered in Lake George in 2012. While posing no danger to humans or domestic animals, the rapid reproduction rates of Spiny water fleas can have a huge impact on aquatic life in lakes and ponds. During the summer months when the water is warm, Spiny water fleas reproduce rapidly and each Spiny water flea is able to produce up to 10 offspring in as little as two weeks. This rapid reproduction can have significant impact on waterbodies in by monopolizing the food supply, adversely impacting the growth and survival rate of young fish due to competition for food and through nuisance buildup (Lake George Association, 2021).

Additional fisheries impacts may occur when the phytoplankton and zooplankton population is disturbed by Spiny water flea and Spiny hook water flea. The impacts of the Spiny water flea on Lake George are not yet known, however in other lakes with a more complex mix of aquatic invasive species, spiny water flea contributed to the overall collapse of the salmon game fishery (Town of Bolton, 2016).

While there are many AIS that are of concern for the Lake George watershed, those listed above are actively being monitored and prioritized by watershed partners. AIS interfere with the natural ecology of the waterbody and also have the potential to negatively impact the local economy and even home values for residents. Monitoring, managing, and eradicating invasive species is a far-reaching goal in the Lake George watershed.

Photo 11: Hemlock woolly adelgid (HWA) are a terrestrial invasive species recently found throughout the Lake George watershed. Source: Adirondack Explorer

Terrestrial Invasive Species. There are numerous well established terrestrial invasive species (TIS) in the Lake George Watershed,

but only a few poses significant risks to the surrounding habitat and water quality including garlic mustard, purple loosestrife, Japanese knotweed, and hemlock woolly adelgid. The Lake George Land Conservancy monitors 60 acres of land for invasive plants and 35 miles of high-risk areas for the presence of hemlock wooly adelgid (HWA) (Lake George Land Conservancy, 2021). In addition to the TIS listed below, there are numerous other species that also serve impact the ecological services provided by the watershed's tree cover and forestland.

Hemlock Wooly Adelgid (HWA). The presence of HWA in the Lake George Watershed was confirmed by NYSDEC in 2020 on Forest Preserve lands in the Town of Dresden, Washington County and by the end of 2022 HWA infestations had been confirmed throughout the Lake George Watershed. **(Figure 12)** (Adirondack Park Invasive Plant Program, 2022).

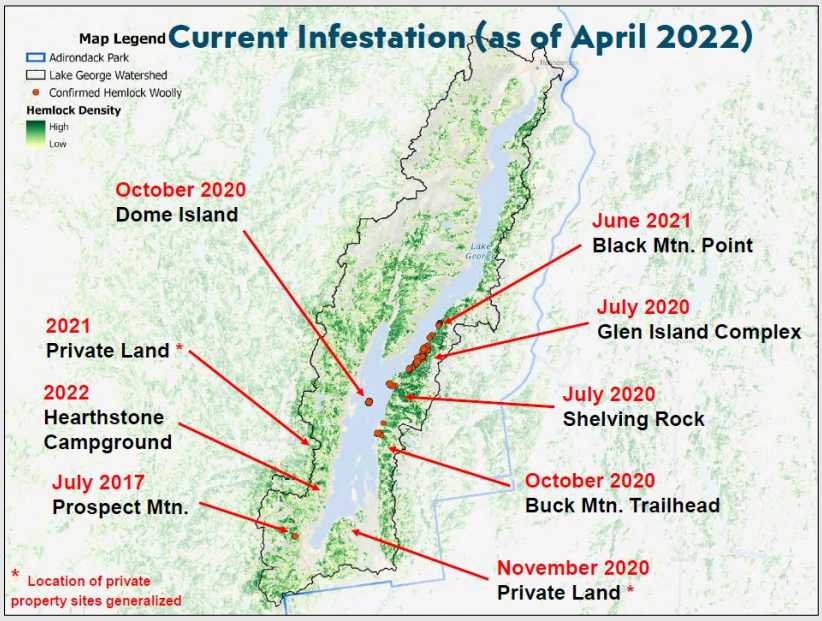


Figure 12: Confirmed HWA locations in the Lake George Watershed. Source: Adirondack Park Invasive Plant Program, 2022.

Hemlocks are the sixth most common tree in New York State and comprise an estimated 60% of the total tree cover of the Lake George Watershed. Hemlocks do not have any natural resistance to HWA infestations. Eastern hemlock trees are commonly found along streams and their roots help to prevent streambank erosion and reducing the amount of sedimentation that makes its way into the lake (Lake George Land Conservancy, 2021).

The loss of the eastern hemlock would have notable impacts on the water quality of Lake George due to a potential increase in runoff and sedimentation from areas where roots had previously assisted in stabilization. Eastern hemlocks also provide aesthetic value as well as habitat and shade cover for stream corridors, the loss of which could lead to an increase in water temperature and a further degradation of stream habitat.

It is critical to manage HWA populations to preserve the genetic diversity of hemlock trees and the ecosystem services that they provide. Management efforts include either a basal bark spray combination of imidacloprid and dinotefuran products or trunk injection of imidacloprid. Both methods have minimal off-target effects, and both may be used by waterways since minimal amounts of the basal bark spray product meets the ground and when injected, the product is contained within the tree (The Nature Conservancy, 2023). Trunk injections are best used in environmentally sensitive areas or in areas with the basal bark spray method is not approved. Additionally, the New York State Hemlock Initiative (NYSHI), a project sponsored by Cornell University, has introduced biocontrol options. This control option involves the release of certain types of insect predators that may limit the spread of HWA.

Biocontrol options remain in the research stage but appear to be a viable option when combined with traditional treatment methods to save hemlock trees in the Lake George Watershed (Cornell University, 2023).

Garlic Mustard. Garlic mustard is a biennial herb that is identified by its rosette of kidney-shaped leaves in the first year of growth followed in the second year by multiple stems that can grow up to four feet tall with triangular, sharply toothed leaves. The TIS thrives in deciduous forests and partially shaded, moist habitats. With an early spring jump on native plants, Garlic mustard releases chemicals harmful to soil fungus important to native trees. Sites invaded by garlic mustard tend to have low diversity of plants growing on the forest floor and it is widely believed that garlic mustard infestations displace native plants and alters habitat quality for several species including salamanders and mollusks through changes in forest litter layer depth and composition. Management techniques for this TIS recommend controlling the spread of the plant species on the margins of the infestation without digging or pulling. The plants will self-limit their populations after several years. Selective use of herbicide may also be an effective treatment (Adirondack Park Invasive Plant Program, 2022).

Purple Loosestrife. Purple loosestrife is an erect, herbaceous perennial that grows 3-7 feet. It is easily identified by its showy magenta flowers from July to September. Linear shaped leaves grow oppositely along square stems. This aggressive plant spreads both vegetatively and by abundant seed dispersal. Loosestrife invades both natural and disturbed wetlands and alters their ecological structure and function and crowds out native plants that wildlife use for food, nesting, and hiding places. The dense roots and leaves also choke waterways, slowing natural flows and promoting the deposit of silt. This process causes long term water quality degradation and requires costly maintenance. Manual pulling of individual plants can be effective as well as selective herbicide use for larger infestations. Biological controls including the release of Loosestrife beetles which suppress the plant's growth and reproduction by feeding heavily on the stems, leaves, and buds (Adirondack Park Invasive Plant Program, 2022).

Japanese knotweed. Fast-growing, herbaceous perennial shrubs with jointed, hollow stems. The leaves are characterized as leathery and broadly ovate. The plant produces a cascade of white flowers in August, and dormant reddish-brown stems in the winter. Japanese knotweed is found along forest edges and stream banks, as wells as in disturbed and open areas such as roadways. The TIS early emergence in the Spring and dense growth enable the plant to overtake large areas and its thick rhizomes can extend horizontally 60 feet or more through soils. Japanese knotweed destabilizes streambanks contributing to increased turbidity and a reduction in water quality In nearby waterways. Japanese knotweed is very difficult to control, however, a stem injection or foliar treatment with systemic herbicide can be effective (Adirondack Park Invasive Plant Program, 2022).

Priority Projects. There is a total of ten invasive species projects identified in **Section 9.3** of this document, totaling approximately $2,800,000 in funding needs. Four projects in this category were identified as priority projects for implementation due to their project readiness and impact on water quality in the Lake George Watershed.

Invasive Species - Priority Projects		
ID# I-01	Enhance HWA management program, utilizing chemical and biological controls. Provide outreach and training on BMPs for landowners with forested lands	$200,000

ID# I-02	Create a watershed wide HWA monitoring, assessment, loss, and succession plan to identify places in the watershed that are most vulnerable to hemlock species loss due to HWA. Create a plan to mitigate the impacts associated with this species loss	$250,000
ID# I-03	Develop a system to monitor the effectiveness of milfoil harvesting programs	$95,000
		Priority Projects Total: $545,000

5.3 Road Salt

Road salt has numerous long-term impacts on our ecosystems and waterbodies. Most road salt makes its way to nearby waterbodies by way of ditches, culverts, and streams, causing salinity spikes in affected waterbodies. Some of the salt that is applied to our roadways enters the soil and groundwater and can be retained by the local ecosystems for decades. When salt accumulates at the bottom of a lake, it can inhibit spring turnover and create an inhospitable environment for native plants and animals while potentially creating a suitable environment for non-native invasive species.

According to data from the Jefferson Project, sodium chloride concentrations from road salt applications remain relatively low compared to other lakes around the world, however, since 1980 chloride in Lake George has increased by 204% and sodium has increased by 218% (RPI, 2022). The primary source of chloride is road de-icing applications within the watershed during winter months.

New York State is among the highest users in the country of road salt. In fact, New York State public and private sectors combined are the largest purchasers of salt in North America. While best management practices for road salt application reductions exist, they are not consistently applied between public and private users throughout the region result in varying outcomes (Kelting, 2022).

Priority Projects. There is a total of six road salt projects identified in **Section 9.3** of this document, totaling approximately $3,165,000 in funding needs. Three projects in this category were identified as priority projects for implementation due to their project readiness and impact on water quality in the Lake George Watershed.

Road Salt – Priority Projects		
ID# S-01	Identify and implement road salt reduction targets to protect water resources	$200,000
ID# S-02	Provide pre- and mid-winter calibration training for local and county winter maintenance crews	$200,000
ID# S-03	Complete a comprehensive analysis of the effects of alternative de-icing products as they pertain to phosphorus inputs	$65,000
		Priority Projects Total: $465,000

5.4 Wastewater Treatment

On-site septic. Aging on-site septic systems and outdated technology can have significant impacts on water quality, public health, and the local economy. Approximately 23% of US households have on-site septic systems and the USEPA estimates that there is an average 20% failure rate for on-site systems nationwide (The US Environmental Protection Agency, 2017). Many homeowners rely on their septic

systems for safe and effective treatment of their wastewater before it filters into the soil. Recycled water from a septic system can help replenish groundwater supplies, but if the system is not working properly, it can contaminate nearby waterbodies and drinking water wells. Aging and antiquated septic systems are among the main sources of increasing nutrients in waterbodies in the United States (USEPA, 2023).

About 6,000 homes and businesses around Lake George rely on private septic systems and it is estimated that about 4,000 of those are at risk of contaminating the lake because they are old or neglected (The FUND for Lake George, 2020). Leaky septic systems contribute to nutrient loading into nearby waterbodies, including phosphorus, which contributes to an increased likelihood of nuisance algae and HABs. Additional effects include decreased water clarity, which can contribute to a reduction in recreational use of a waterbody and a decrease in property values around the lake.

SPDES. The State Pollution Discharge Elimination System (SPDES) is designed to eliminate the pollution of New York waters and to maintain the highest quality of water possible. SPDES permits are required for treatment systems that are designed to discharge over 1,000 gallons per day of wastewater. There are five sites with SPDES permits within the Lake George watershed, each of which is a municipal sewer district or wastewater treatment facility. SPDES are permitted, monitored, and enforced by the NYSDEC. Watershed municipalities should work with the NYSDEC to ensure compliance with the SPDES permit requirements.

Priority Projects. There is a total of 17 wastewater projects identified in **Section 9.3** of this document, totaling approximately $23,095,000 in funding needs. Four projects in this category were identified as priority projects for implementation due to their project readiness and impact on water quality in the Lake George Watershed.

Wastewater – Priority Projects		
ID# W-01	Continue and expand matching septic system replacement grant program including funding for homeowners to connect to municipal sewer in lieu of septic system replacements	$3,000,000
ID# W-02	Implement a watershed wide septic system inspection and management program for near-shore septic systems	$95,000
ID# W-03	Create Rockhurst Wastewater Management District for collection and treatment of residential wastewater for 52 residents	$75,000
ID# W-04	Implement Rockhurst Wastewater Collection and Treatment system	$6,000,000
		Priority Project Total: $9,170,000

5.5 Climate Change

New York State is experiencing impacts from climate change that will affect water resources in the Lake George Watershed. Risks associated with climate change include incidences of heat stress caused by more frequent and intense heat waves and greater incidences of heavy rainfall leading to increased threats associated with runoff. Changing weather patterns have the potential to affect the quality and quantity of water in the watershed, and rising temperatures can threaten the survival of some native species.

In addition to the inherent threat of climate change to Lake George and the Lake George Watershed, climate change is a threat multiplier. The impacts on the watershed as a result of climate change exacerbates many of the previously discussed threats to the waterbody. Reduced and extreme rainfall as well as reduced snow melt can have the effects of creating warmer streams and rising lake temperatures which create a more suitable habitat for invasive species to grow and threaten already stressed native water life. Stronger rain events coupled with longer periods of drought-like conditions allow for higher nutrient loading from stormwater due to less time and ability for ground infiltration, thus creating the conditions for more frequent and longer lasting HABs events. Drought conditions and tree loss from invasive species increase the erosion of streambanks and bring higher sediment loads into the lake (IPCC, 2023).

Changes in the Lake George watershed ecosystem have already been observed. Between 1980 and 2009 the lake has had a 1.8°C temperature increase, while in the last 20 years Warren County has spent 371 weeks under "abnormally dry" conditions. Multiplying the severity of these threats by climate change places the lake's status as a drinking water source, recreational resource, and native habitat at greater risk. The average air temperatures in New York State are anticipated to continue to increase by 4.1^{o}F to 6.1^{o}F by the 2080s (New York State Department of Environmental Conservation, 2021) with some projections as high 9^{o}F by 2080 (New York State Energy Research and Development Authority, 2011). These projections indicate that the water temperature of Lake George will continue rising along with average air temperatures. Water temperature directly increases with air temperature, up to a water temperature of 77^{o}F with a proportionality constant of 0.6-0.8. Thus, an increase in air temperature of 9^{o}F will result in a water temperature increase of 5-7^{o}F (NYSDEC, Climate Change Effects and Impacts, 2023).

Higher water temperatures will have direct impacts on certain elements of water quality like oxygen content and DO levels. Additionally, increases in water temperatures can directly stress aquatic biota, particularly cold water fish like trout and may lead to increased algal growth and increased dissolved organic matter being transported from soils and wetlands which can impact recreational use and normal ecosystem function (New York State Energy Research and Development Authority, 2011). Most cyanobacteria taxa grow better at higher temperatures than other phytoplankton, providing them a competitive advantage at higher temperatures (Pearl, 2008).

Priority Projects. There is a total of eight climate change projects identified in **Section 9.3** of this document, totaling at least $3,070,000 in funding needs. Three projects in this category were identified as priority projects for implementation due to their project readiness and impact on water quality in the Lake George Watershed.

Climate Change – Priority Projects		
ID# C-01	Conduct and promote municipal, county, and watershed wide climate mitigation and resiliency planning	$50,000 - $200,000
ID# C-02	Complete culvert assessments using NAACC protocol and create priority list for repairs and replacement	$500,000
ID #C-03	Replace undersized culverts in watershed with climate resilient culverts	$1,000,000
		Priority Projects Total: $1,700,000

Section 6. Regulatory and Programmatic Framework

6.1 Introduction

In New York State, municipalities have authority to regulate local land uses that can be used to address an array of environmental issues. There are many regulatory actions that can be enacted at the municipal level that may have a positive impact on the local water quality including comprehensive plans, zoning ordinances, subdivision and site plan review, and stormwater and erosion control regulations, each of which can be used separately or in combination to protect local water resources.

Within the Lake George Watershed there are numerous entities and organizations that work independently and together to ensure that land use and development is done in a way that meets the needs of the community while mitigating potential negative impacts to the environment. This section identifies each of these entities and their role in the watershed.

6.2 Municipal

One of the most impactful tools granted to local governments is the power to regulate the physical development of the municipality. This power is exercised through a variety of regulatory and programmatic mechanisms and authorizations.

In New York State, "Home Rule" affords municipalities significant land use powers that can be used to effectively address a wide variety of environmental issues. The comprehensive plan, zoning, and a host of tools such as site plan review, subdivision regulation, and erosion and sediment control ordinances can be used separately or in combination with one another to produce the desired environmental outcomes for a community. There are 12 municipalities within the Lake George Watershed each with their own ability to create and enforce rules and ordinances. This can create a challenge when working towards a shared goal of water quality improvement and requires inter-municipal cooperation that supports a watershed approach.

The Planning Board – Planning boards primarily make decisions on applications related to land use, including subdivision, site plan review and generally look to a municipality's Comprehensive Plan or comparable document for guidance. Additionally, planning boards can have an advisory role in preparing and amending comprehensive plans, zoning regulations, official maps, long-range capital programs, special purpose controls and compliance with the State Environmental Quality Review Action (SEQRA).

Where these and related functions are effectively administered, the local planning board can do much to advance the land use and development policies of the local legislative body.

The Zoning Board of Appeals (ZBA) – ZBAs are an essential part of zoning administration. The state zoning enabling statutes require ZBAs to be created when a municipality enacts zoning. ZBAs serve as "safety valves" to provide relief from overly restrictive zoning provisions. ZBAs hear two types of appeals: interpretation and variance. An interpretation is a claim by the applicant that the zoning enforcement officer misapplied the zoning map or regulations, or wrongly issued or denied a permit. By contrast, in an appeal for a variance, the applicant is seeking an exception to a particular zoning rule. ZBAs typically look to the municipal zoning ordinance, comprehensive plans and other comparable documents for guidance when making decisions.

Land Use Development (LUD) and Zoning Compliance – Towns are responsible for ensuring that certain practices are maintained throughout the development process, and they use the LUD and Zoning Compliance system to do so. Although the name of this may vary from one municipality to the next, the general process is the same. Once a project receives approval from the necessary boards and departments, the Town issues an LUD permit, and the County Department of Building Codes and Fire Prevention issues a Building Permit. Throughout the development process, the Town conducts site inspections to ensure compliance with erosion and sediment control regulations, stormwater management and general site cleanliness. At the same time, the County conducts building inspections to ensure that any structural development adheres to the Building Code.

Upon the completion of a project, the Town conducts a final visit to ensure that all aspects of the site development are completed as planned and approved. If the project meets the standards set forth by the Town, a Land Use Certificate of Compliance/Completion is issued. Once the Town has signed off, the County conducts a final inspection to ensure that all structures are compliant with the Uniform Building and Codes of New York State. If so, the County will issue a Certificate of Occupancy (CO) and the project is deemed complete.

In the Town of Queensbury, this process is completed by Town staff only.

The LUD and Zoning Compliance process offers the opportunity for the Town and County to ensure that a land development project is adhering to regulations that would prevent construction debris and runoff from entering nearby waterways. Additionally, the final site visit and inspection ensures that any stormwater or other conditions imposed upon the project at the time of approval are met before a CO can be granted.

6.3 County

Counties also affect land use regulation on a more limited basis through the review of certain municipal zoning and development actions. Referral to the county planning agency is an important aid to the local planning and zoning process. It provides local planning and zoning bodies with advice and assistance from professional county staff and can result in better coordination of zoning actions among municipalities by interjecting inter-community considerations.

Generally, a referral must be made where a proposed zoning matter or subdivision plat affects real property within 500 feet of one or more enumerated geographic features such as a municipal boundary.

Warren and Washington Counties: The Warren County Planning Department reviews county referrals in lieu of a County Planning Board or Agency. The Warren County Planning Department and the Washington County Planning Agency review project referrals in accordance with GML §239m requiring the referrals of the following proposed projects:

I. Adoption of amendment of a comprehensive plan
II. Adoption of amendment of a zoning ordinance or local law
III. Issuance of special use permits
IV. Approval of site plans
V. Granting of use or area variances
VI. Other authorizations which a referring body may issue under the provisions of any zoning ordinance or local law

If they are within 500 feet of the following:

I. A municipal boundary
II. The boundary of any existing or proposed county or state park or any other recreation area
III. The right-of-way of any existing or proposed county or state parkway, thruway, expressway, road, or highway
IV. Any county owned lands, building, or rights-of-way
V. The boundary of a farm operation located in an established agricultural district

Essex County: The Essex County Planning and Economic Development Committee reviews proposals in accordance with GML §239-n which differs from §GML 239-m in that it calls for the review of subdivision of land in addition to the previously listed project types.

6.4 Adirondack Park Agency (APA)

The APA is an independent, executive state agency responsible for developing long-range Park policy in a forum that balances statewide concerns and the interests of local governments in the Adirondack Park. It was created by New York State law in 1971. The APA regulates development on private land within the Adirondack Park.

Within the Adirondack Park, the APA administers the Adirondack Park Agency Act, the Adirondack Park Agency Rules and Regulations, the Freshwater Wetlands Act, and the Wild, Scenic and Recreational Rivers System Act.

The APA Act §810 defines different land uses and development as class A or class B regional projects based on their location, use, intensity, and other characteristics.

Local land use programs under the APA Act. Local governments within the Adirondack Park may develop their own local land use program, known as an Agency-approved Local Land Use Program (ALLUP), which if approved by the APA may transfer some permitting authority from the APA to the local government's jurisdiction. If a municipality has an APA Approved Local Land Use Program (ALLUP), review jurisdiction over class B regional projects and variances from shoreline restrictions transfers to local government and requires the Agency to apply certain of the standards and requirements of the local land use program in its review of class A regional projects.

If a municipality does not have an ALLUP, the APA is responsible for review of both class A and B regional projects in the municipality.

6.5 Lake George Park Commission (LGPC)

The Lake George Park Commission is charged by New York State to protect public health and the natural resources of Lake George to the best of its ability, within its granted authorities. Pursuant to NYS Environmental Conservation Law Article 43 and the Lake George Park Commission's regulations at 6NYCRR 645 & 646 the LGPC has regulatory authority and issues permits for certain activities and development within the Lake George Park. These authorities include oversight and permitting of all marinas, docks, moorings, and special recreational uses such as tour boats and parasails. Through its Marine Patrol Division, the Commission facilitates public safety through enforcement of NYS Navigation Law and special navigational rules for Lake George and provides emergency response on the lake. Water quality protections are provided through the enactment and administration of stormwater management and stream corridor regulations for land development activities, new (ca. 2023)

wastewater regulations including septic inspections in near shore areas, as well as through the enactment and administration of aquatic invasive species prevention regulations and the proactive management of invasive species in the lake.

Similar to the Adirondack Park Agency's Approved Local Land Use Program, the Commission may authorize municipalities to administer the stormwater management and stream corridor regulations in the basin. The Village of Lake George, Town of Lake George, Town of Bolton, and Town of Queensbury all have LGPC approved stormwater management programs.

6.6 State Environmental Quality Review Act (SEQRA)

SEQRA is an opportunity for municipal boards and other agencies to consider impacts to natural resources and water quality when reviewing land use and development projects. SEQRA provides a procedural framework that incorporates a balance of social, economic, and environmental factors into the community planning and decision-making process. The intent of SEQRA is to review the environmental impacts of a proposed project and to take those impacts into account when deciding whether to undertake or allow the project to proceed. Impacts that cannot be avoided through modification of the project should be mitigated by conditions imposed on it.

Section 7. Lake George Watershed Municipalities Local Ordinance Assessment

7.1 Introduction

This section presents an overview of local municipal laws, land use tools, programs and practices that are in place that can be used for managing water resources in the Lake George Watershed. This evaluation will be used to inform some of the recommendations of this plan. The following ordinances, tools, and programs were reviewed:

The Lake George Watershed encompasses 12 municipalities in three counties, including 11 towns and one village.

- Comprehensive/Land Use Plans
- Zoning
- Site Plan Review and Subdivision Regulations
- Stormwater and Erosion Control Regulations
- Stream Corridor Protections
- Fertilizer and Pesticide Runoff Control Regulations
- Wetland Protections
- Floodplain Regulations
- Ordinances related to logging activities
- Winter road maintenance provisions
- On-site septic system provisions
- Local staff capacity

In New York State, municipalities can utilize their "home rule" authority to regulate land uses and address a suite of environmental issues. Comprehensive plans, zoning ordinances, subdivision regulations, site plan review, and provisions for erosion and sediment control and logging oversight are among the regulatory actions that can be enacted at the municipal level that may have a positive impact on the local water quality. These regulations can be used separately or in conjunction with one another to protect local water resources.

The Lake George watershed is located entirely within the Adirondack Park where development on private land is subject to review by the APA. The level of review by the APA is dependent upon the land use ordinances that have been adopted at the local level. Further discussion on the APA and its role can be found on Page 56 of this document.

There are 12 municipalities located in 3 counties within the Lake George watershed. Warren County comprises most of the watershed with 76% of the land area, followed by Washington County (22%), and Essex County (2%) **(Table 10, Figure 13).**

Table 10: Municipal Land Area in the Lake George Watershed		
Municipality	**Acres**	**Percentage of Watershed**
Warren County	**91,560**	**76%**
Bolton	32,835	27%
Hague	29,728	25%
Lake George (town)	14,266	11%
Queensbury	8,632	7%
Horicon	3,633	3%
Warrensburg	1,864	2%
Lake George (village)	379	1%
Lake Luzerne	223	1%
Washington County	**26,321**	**22%**
Fort Ann	11,521	9%
Dresden	9,272	8%
Putnam	5,528	4%
Essex County	**2,979**	**2%**
Ticonderoga	2,979	2%

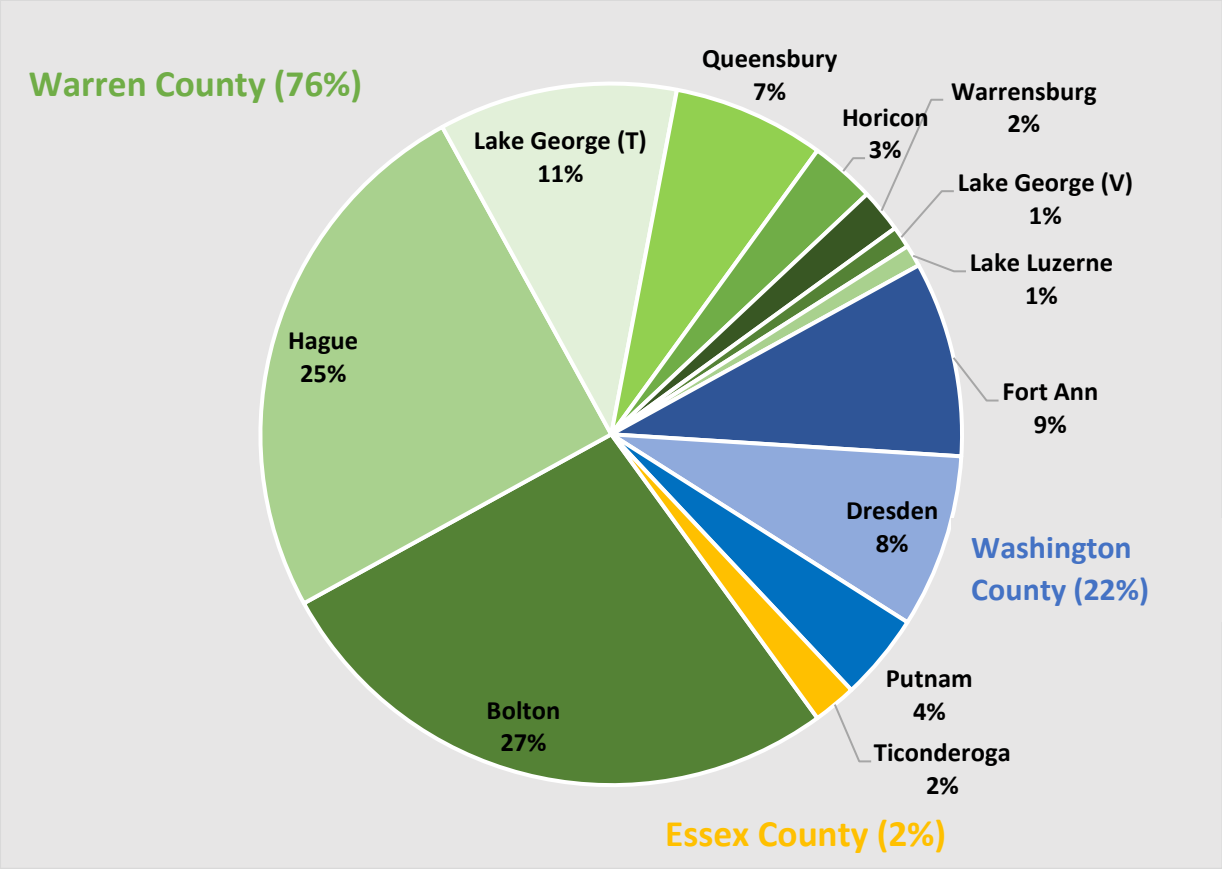


Figure 13: Lake George Municipalities and Counties Land Area as a Percentage of the Watershed

7.2 Overview of Findings

- **Comprehensive Plans** have been adopted by 75% (9/12) municipalities in the Lake George Watershed, representing 79% of the watershed area.

- **Zoning Laws** exist in 75% (9/12) of Lake George Watershed municipalities, representing 79% of the watershed area. Additionally, 50% of watershed municipalities have in place an Agency Approved Local Land Use Program (ALLUP), giving additional permitting authority to the municipalities rather than the Adirondack Park Agency (APA) in some situations. Municipalities with an ALLUP represent 74% of the watershed area.

- **Subdivision and Site Plan Review** are required by 92% (11/12) watershed municipalities, representing 92% of the watershed area.

- **Planning Boards** exist in 92% (11/12) municipalities in the watershed.

- **Zoning Board and Appeals (ZBA)** are active in 75% (9/12) municipalities in the Lake George Watershed, representing 79% of the watershed area.

- **Stormwater Regulations** are followed in 100% of watershed municipalities. Local stormwater programs are administered in 33% (4/12) watershed municipalities, representing 46% of the land area in the watershed and the LGPC administers regulations in the remaining watershed municipalities (Hague, Ticonderoga, Dresden, and Fort Ann).

- **MS4 Regulations** have been adopted by 17% (2/12) municipalities in the watershed, representing 12% of the watershed area. Within the watershed, the Town and Village of Lake George are designated MS4 communities. The Town of Queensbury is an MS4 community although its urbanized areas are outside the watershed. Additionally, Warren and Washington Counties are designated MS4 communities. MS4 designations are determined based on the population and density counts of the decennial US Census.

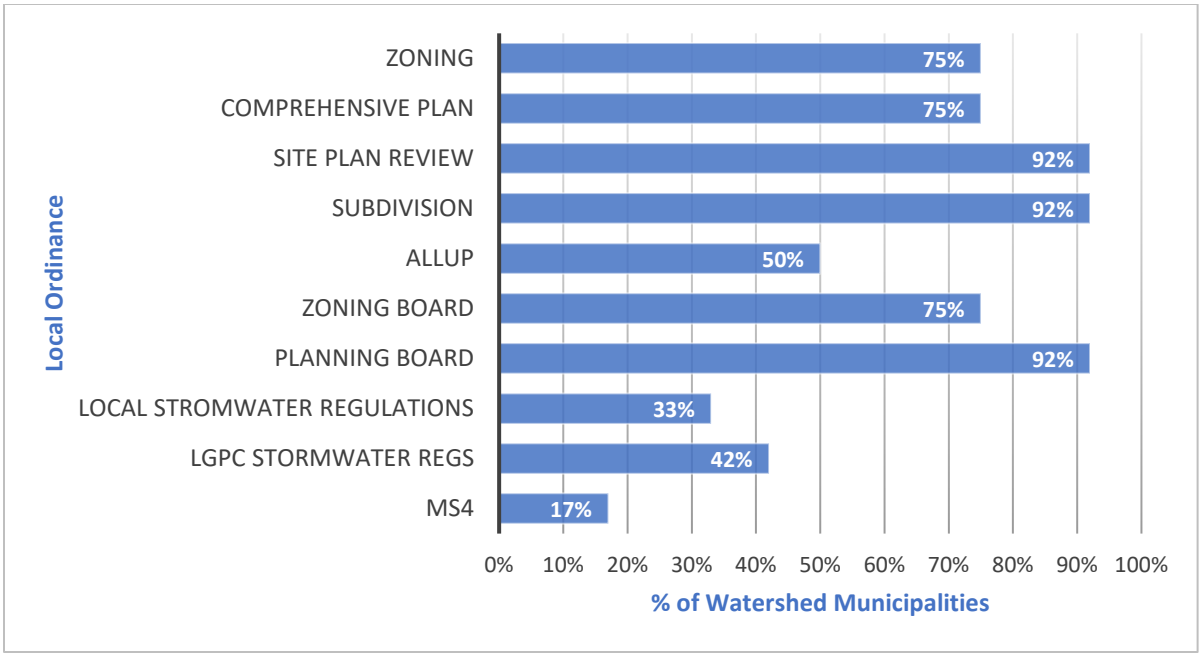


Figure 14: Percentage of Watershed Municipalities with Adopted Ordinances and Regulations

7.3. Comprehensive Plans

Comprehensive plans are strategic documents that define a community's goals and vision for the future. A comprehensive plan is used to inform land use and development decisions in a community. Incorporating water quality objectives into the plan is an effective way to ensure that these objectives are considered in future land use decisions. Comprehensive plans create an opportunity for a community to prioritize issues related to water quality, however these plans are policy documents, not laws and are insufficient in protecting water resources without supporting regulations.

Table 11: Municipalities with Adopted Comprehensive Plans

Municipality	Adopted Plan?	Year Adopted
Bolton	Yes	2003
Hague	Yes	2001, 2017
Lake George (T)	Yes	2016
Fort Ann	No	
Dresden	No	
Queensbury	Yes	2007 †
Putnam	No	
Horicon	Yes	2010
Ticonderoga	Yes	2006
Warrensburg	Yes	2012
Lake George (V)	Yes	2004
Lake Luzerne	Yes	2010

† The Town of Queensbury began updating the Comprehensive Plan in 2021.

Based on the results of the local ordinance review, 75% of watershed municipalities have adopted comprehensive plans **(Figure 14, Table 11)**. However, many of these plans are over ten years old. It is recommended that comprehensive plans be updated every 5 to 10 years to maintain relevancy. Within the Lake George watershed, all communities should review their comprehensive plans, regardless of age, to ensure that water quality protection is incorporated into the plan. This will ensure that water

protection and water quality impacts are elevated in the conversation during the consideration of future land use and development decisions in the community. Additionally, comprehensive plans are only as effective as the tools by which they are implemented, so while they may articulate a community's vision to protect water quality or natural resources, zoning ordinances and other regulations must also be updated to align with the plan's goals and recommendations.

7.3. Local Waterfront Revitalization Program (LWRP)

A LWRP is a locally prepared, comprehensive land and water use plan for a Town's natural, public, and developed waterfront resources, which seeks to provide a balance of environmental, recreational, and economic development actions. LWRPs require the adoption of a Local Consistency Review Law, this local law provides a mechanism to determine whether the actions in the waterfront revitalization area directly undertaken, funded, or approved by the municipality are consistent with the policies and provisions of the LWRP and enables further review of how an individual development or proposal may impact water quality. The LWRP program is administered by the NYSDOS.NYSDOS has funding available for developing and implementing LWRPs.

Within the Lake George Watershed, only the Town of Bolton has an approved LWRP.

7.4 Zoning Laws

Zoning is a regulatory tool that enables communities to enforce land-use controls that support the goals and visions developed in the comprehensive plan. Zoning controls the use, density, siting, and form of development on individual land parcels, and is especially effective in preventing future issues with development of harmful uses.

80% of the Lake George Watershed has a local zoning ordinance in place.

Zoning regulations do not by default protect water quality. To achieve that, zoning regulations must consider existing natural features and sensitive areas. Including stream buffers, steep slope regulations, maximum impervious coverage limitations, and landscaping requirements in a zoning ordinance can have a great impact on local water quality. The effectiveness of a municipality's zoning law is contingent upon the skilled administration and enforcement personnel, as well as a trained and informed Zoning Board of Appeals (ZBA). In many watershed municipalities, there are one or two individuals tasked with the dual roles of enforcement, permitting, administration and board education (See Table 6). This reduced staff capacity may often lead to oversights in the enforcement of the code. Additionally, many municipalities rely on citizen volunteers to serve on the Board of Zoning Appeals (ZBA). The role of the ZBA is to make interpretations of the Zoning Law and to hear appeals to decisions made by the Code Enforcement or Zoning Enforcement Officers, known as variances. The ZBA will grant or deny variance requests based on a specific set of review criteria that balance the benefit received by the applicant against the potential negative impacts to the community. In New York State, Planning and Zoning Board members are required to complete four hours of training annually to serve on their respective boards. This training does not necessarily address issues specific to board member's community and may not address the role that zoning, and zoning enforcement can play in protecting water quality and natural resources.

Adirondack Park Agency (APA): The Adirondack Park Agency (APA) is a New York State government agency, created in 1971 to develop long-range public and private land use plans for the largest park in the continental United States.

APA and ALLUPs: Local governments within the Adirondack Park may develop their own local land use program, known as an Agency-approved Local Land Use Program (ALLUP), which if approved by the APA may transfer some permitting authority from the APA to the local government's jurisdiction. To be approved by the APA, the local zoning ordinance must be as restrictive or more so than the APA's guidelines. The following watershed municipalities have ALLUPs: Towns of Hague, Horicon, Bolton, Lake George, Queensbury, and the Village of Lake George.

Communities with ALLUPs are afforded greater authority over certain types of projects, which are otherwise reviewed by the APA. The APA retains the review authority over Class A projects; however, the APA is required to apply local provisions in its review of those projects (such as limiting uses and applying building setbacks). Having an ALLUP provides municipalities authority over shoreline restrictions and Class B regional projects which include most residential subdivisions and small commercial projects that do not involve wetlands.

75% of the watershed and 55% of watershed municipalities have an ALLUP.

Communities without an ALLUP are under the jurisdiction of the APA and projects are subject to the review and approval of the APA. These communities may choose to enact local zoning laws apart from the APA. Communities without an ALLUP but with a local zoning law include the Towns of Lake Luzerne, Warrensburg, and Ticonderoga. Communities without either an ALLUP or a local zoning law include the towns of Putnam, Dresden, and Fort Ann.

95% of the watershed is covered by local subdivision regulation.

7.5. Subdivision Regulations

There is probably no form of land use activity that has as much potential impact upon a municipality as the subdivision of land. Subdivision regulations dictate the way in which land can be divided into smaller parcels and can be used to ensure that parcels are adequately sized and shaped with appropriate infrastructure and open space. Subdivision regulations can limit the negative impacts on waterbodies before, during and after construction, and sometimes include specific provisions to preserve open space and vegetation, protect unique natural areas, minimize impervious surfaces, limit erosion and runoff, cluster buildings, and promote green infrastructure.

7.6 Site Plan Review

Site plan review is concerned with how a particular parcel is developed. Site Plan Review creates an opportunity for municipal decision makers to examine a development's potential impacts related to erosion, impervious surfaces, vegetation, and stormwater, and to require changes that will protect water quality and promote

95% of the watershed required site plan review for some applications.

environmental sustainability. Lack of site plan review limits the ability of the reviewing body to modify development on a site-specific basis and in ways that will protect water quality.

Table 12: Local Ordinances by Municipality						
Municipality	**Zoning**	**ALLUP**	**Subdivision**	**Site Plan Review**	**Planning Board**	**Zoning Board of Appeals**
Bolton	Yes	Yes	Yes	Yes	Yes	Yes
Hague	Yes	Yes	Yes	Yes	Yes	Yes
Lake George (T)	Yes*	Yes	Yes	Yes	Yes	Yes
Fort Ann	No **	No	Yes	Yes	Yes	No
Dresden	No**	No	No	No	No	No
Queensbury	Yes*	Yes	Yes	Yes	Yes	Yes
Putnam	No**	No	Yes	Yes	Yes	No
Horicon	Yes	Yes	Yes	Yes	Yes	Yes
Ticonderoga	Yes	No	Yes	Yes	Yes	Yes
Warrensburg	Yes	No	Yes	Yes	Yes	Yes
Lake George (V)	Yes	Yes	Yes	Yes	Yes	Yes
Lake Luzerne	Yes	No	Yes	Yes	Yes	Yes

***Additional waterfront regulations in zoning**

**** APA review only**

7.7 Stormwater and Erosion Control Regulations

The purpose of stormwater and erosion control regulations is to ensure that any increased runoff that results from an increase in development is mitigated to the greatest extent possible and does not impact surrounding land uses or local water quality.

47% of the watershed is covered by local stormwater/erosion and sediment control regulation and 13% of the watershed is within an MS4 community.

MS4 Communities: MS4 Communities are designated every ten years based on population and density counts conducted by the US Census. Any area that has at least 50,000 people and has an overall population density of at least 1,000 people per square mile becomes a designated MS4 urbanized area. In the United States, MS4 areas represent 4% of the country's land area and more than 80% of the population. There are two communities that meet this characteristic and have been designated MS4 areas by the New York State Department of Environmental Conservation (NYSDEC) in the Lake George Watershed, the Town of Lake George, and Village of Lake George. The Town of Queensbury is also an MS4 Community, however none of the urbanized area are within the watershed, however, the Town has enacted MS4 stormwater and erosion control ordinances that are applicable to the entire town. Additionally, Warren and Washington Counties are designated MS4 areas. MS4 communities must implement a six-point program and requires communities to develop a stormwater management program that will reduce the

quantity of pollutants carried by stormwater during storm events to waterbodies to the "maximum extent practicable." The goal of the program is to improve water quality and recreational use of waterways.

25% of watershed municipalities are designated MS4 Communities (municipal separated storm sewer system), and as such, are required to develop comprehensive stormwater management programs under the MS4 program. Warren and Washington Counties are also MS4 Communities which only applies to County owned municipal infrastructure within the designated urbanized areas.

Lake George Park Commission (LGPC): The purpose of the Lake George Park Commission is to preserve, protect, and enhance the unique natural, scenic, and recreational resources of the Lake George Park. The LGPC has specific regulatory and enforcement power relating to activities on the lake and in the watershed.

LGPC Stormwater Regulations. The LGPC's stormwater management regulations are designed to prevent any increase in stormwater runoff from any development to reduce flooding, siltation, and streambank erosion. They are also designed to prevent any increase in pollution caused by stormwater runoff from development which would otherwise degrade the quality of water in Lake George and its tributaries and render it unfit for human consumption, interfere with water-based recreation, or adversely affect aquatic life.

The LGPC administers stormwater regulations for projects that are within the Lake George Park and in the Towns of Ticonderoga, Dresden, Hague, Putnam, and Fort Ann. Stormwater Management Permits are required for projects involving certain land clearing and development activities, subdivision of land, or changes to a stormwater control measure. Many watershed municipalities have adopted regulations at least as stringent as the LGPC and therefore have local control. Local stormwater regulatory programs have been approved by the LCPG for the Towns of Queensbury, Lake George, Bolton, and the Village of Lake George. The LGPC provides technical assistance to these communities in administering their programs.

Table 13: Stormwater Regulations by Municipality in the Lake George Watershed

Municipality	Local Stormwater/ESC	MS4 Community	LGPC-managed Stormwater Regs
Bolton	Yes	No	No
Hague	No	No	Yes
Lake George (T)	Yes	Yes	No
Fort Ann	No	No	Yes
Dresden	No	No	Yes
Queensbury	Yes	Yes*	No
Putnam	No	No	Yes
Horicon	No	No	No
Ticonderoga	No	No	Yes
Warrensburg	No	No	No
Lake George (V)	Yes	Yes	No
Lake Luzerne	No	No	No

*Portions of the Town of Queensbury are within an MS4 district but are not within the Lake George watershed.

Stream Corridor Protections Regulations. In 2021, the Lake George Park Commission enacted stream corridor protection regulations for the expressed intent of protecting water quality in the Lake George Watershed. The updated regulations provide protection to stream corridors along AA-special perennial streams designated or mapped by the NYSDEC. The regulations establish a 35-foot stream buffer in which a permit program for any proposed development, land disturbance or land clearing is enforced. Additionally, within the buffer area, construction of impervious surfaces and vegetation removal is regulated, and stream channel modification is limited to preserve the stream and support trout and other aquatic species. These regulations apply throughout the Lake George watershed and limit construction activities within these areas.

100% of the watershed falls under the LGPC jurisdiction for stream corridor regulations.

7.8 Logging

The Towns of Bolton and Queensbury, and the Town and Village of Lake George regulate logging practices at a municipal level. The Lake George Park Commission requires logging activities within the Lake George Park to submit a "Notice of Intent" before undertaking any logging activities that involve the use or construction of a log landing, header, skid roads or trails. This form also helps to ensure that proper erosion and sediment controls are planned and in place. LGPC logging restrictions apply to the Towns of Ticonderoga, Dresden, Hague, Fort Ann, and Putnam.

100% of the Lake George Watershed has oversight of logging activities.

7.9 Winter Road Maintenance Policies

There is growing concern over the impact of winter road sand and salt impacting Lake George's water quality, and recent studies have shown increasing chloride and sodium levels in the lake over the past thirty years. Watershed municipalities including Warren County, the Towns of Lake George, Queensbury, Bolton, Hague, Ticonderoga, Dresden, Putnam, and the Village of Lake George have partnered to implement best management practices to reduce road salt pollution in Lake George. Practices include pre-wetting or brining roadways in advance of snow and utilizing new equipment technologies like live-edge plows that are more efficient in removing snow from the road's surface.

7.10 Wastewater

Regulation and enforcement of individual on-site wastewater disposal systems (septic systems) in the Lake George Watershed varies by community. Approximately 79% of communities in the watershed manage the regulation of septic systems at the municipal level, while the remaining 21% are managed by the county building department **(Table 14)**.

The LGPC wastewater management regulations (ca. 2023) require all properties with septic systems within 500 feet of the lake shoreline and 100 feet from all NYSDEC regulated streams flowing into Lake George to be inspected every five years, along with a pump out of the septic tank by a certified hauler. Under this program, septic systems that are found to be noncompliant with current design standards will be required to be upgraded before the next inspection period (Lake George Park Commission, 2023).

At the municipal level, the Towns of Bolton and Queensbury have adopted a Septic Inspection Upon Property Transfer Law. Under these laws, homeowners are required to have their septic system

inspected by a third-party inspector or the town building department prior to the transfer of a property deed.

Table 14: Regulation of Septic Systems by Municipality in the Lake George Watershed		
Municipality	**Enforcement of Septic Regulations**	**Septic Inspection upon Transfer Law**
Bolton	Local	Yes
Hague	Local	No
Lake George (T)	Local	No
Fort Ann	County	No
Dresden	County	No
Queensbury	Local	Yes
Putnam	County	No
Horicon	Local	No
Ticonderoga	Local	No
Warrensburg	Local	No
Lake George (V)	N/A	N/A
Lake Luzerne	Local	No

7.11 Wetlands

APA. The regulation of freshwater wetlands in the Lake George Watershed is under the responsibility of the Adirondack Park Agency. Under the APA Act and the NYS Freshwater Wetland Act, almost all land uses, such as draining, dredging, placing fill, structures, and subdivisions in, or involving wetlands require an APA permit.

Municipal. The Town of Queensbury requires the review and approval of development within 500 feet of an identified wetland. The protection of these natural resources allows for stormwater runoff to naturally filter pollutants and excessive nutrients.

Army Corps of Engineers (ACOE). ACOE also regulates federally defined wetlands. When a proposal is made which may impact a wetland falling within federal definitions, the ACOE will make a permit determination and impose appropriate conditions to protect the wetland.

7.12 Floodplains

Development within floodplains is regulated by local municipalities. Within the Lake George Watershed this is managed by each municipality, except for Dresden, Putnam, and Fort Ann, in which it is overseen by the Washington County Code Enforcement Department.

7.13 Fertilizer and Pesticide Runoff Control

The LGPC Fertilizer and Pesticide Runoff Control requirements apply to 100% of the watershed.

A major threat to water quality in Lake George is nutrient loading from fertilizers and pesticides. In the Lake George Watershed, only the Towns of Queensbury and Lake George, and the Village of Lake George prohibit the use of certain fertilizers and pesticides near the waterfront. All communities in the watershed are subject to the Lake George Park Commission's Fertilizer and Pesticide Runoff Control restrictions within the Stormwater Management Regulations, enacted in 2021. The regulations prohibit the application of lawn fertilizers within fifty feet of any waterbody, except in certain situations.

7.14 Local Staff Capacity

The diverse and complicated regulatory structure in the Lake George Watershed requires the provision of staff to effectively communicate the regulatory process and to ensure adequate enforcement of local laws. A review of staff capacity is provided in **Table 15** below.

Table 14: Local Staff Capacity by Municipality in the Lake George Watershed

Municipality	Permitting & Administration	Code Compliance & Enforcement	Building Codes	Clerical	Total	% of Watershed
Bolton	1	1	0	1	3	27%
Hague	1	0	0	0	1	25%
Lake George (T)	1	1	0	1	3	12%
Fort Ann*	0	1	0	0	1	10%
Dresden*	0	0	0	0	0	8%
Queensbury	1	2	4	4	11	7%
Putnam*	0	0	0	0	0	5%
Horicon	1	0	0	1	2	3%
Ticonderoga	2	0	1	1	4	2%
Warrensburg	1	1	0	0	2	2%
Lake George (V)	1	1	0	1	3	1%
Lake Luzerne	1	0	0	0	1	1%

*Washington County contracts with municipalities to provide code enforcement and compliance officers. The Towns of Fort Ann, Dresden and Putnam utilize a county appointed code enforcement officer as well as a compliance officer.

7.15 Enforcement

Municipal land use controls lack value unless there is adequate, fair, and consistent enforcement. Having enough resources for enforcement is probably the single largest gap in municipal law administration. Throughout the watershed, many communities are relying on one or two employees to fill three or four positions. Many municipalities do not have, or do not allocate enough resources to adequately do the job. With the required training, necessary knowledge of hundreds of pages of code, and dealing with property owners, the job of code enforcement is full time. In larger municipalities, it may require one or more full-time staff members. Many municipalities, however, fill this role with part time positions. Without rigorous enforcement, even the best written codes meant to protect water

quality are ineffective. Code enforcement can be a great opportunity for intermunicipal cooperation and sharing of services and provide a great degree of consistency within a region.

7.16 Education

Throughout the watershed, communities rely on volunteer discretionary boards to review development proposals and make decisions that represent the community's best interests. Without clear and updated comprehensive plans and zoning ordinances and guidance from municipal staff, many Planning and Zoning Boards are often left making land use and development decisions based on assumptions and best guesses of what the community wants.

In New York State municipal and county planning members and municipal zoning board of appeals members are required to undergo four hours of training annually. The law leaves broad interpretation of what topics count as training and allows for individual board members or entire boards to opt-out of training for a variety of reasons. Municipalities are also able to adopt requirements for board members to receive more than four hours of training annually.

Planning board and zoning board of appeals members make decisions of major importance to their communities. These decisions can affect the function and appearance of communities for decades. Watershed municipalities should consider requiring additional educational requirements for discretionary boards as well as tailoring specific educational opportunities to their own communities and the specific development challenges faced within the watershed.

Section 8. Model Regulations and Resources

The following section is meant to serve as a resource for municipalities interested in enacting regulations to protect water quality. It is not intended to be an exhaustive list of ordinances that exist within the Lake George Watershed and some ordinances included in this section are from municipalities outside the watershed. Municipalities seeking to adopt regulations to protect water resources should consider adopting this model ordinances or integrating elements of the regulations listed in this section.

On-Site Wastewater

Septic Inspection Upon Property Transfer Law – Town of Queensbury. The intent of this law is to better protect waterbodies from exposure to excess nutrients and pollutants. The law requires that prior to the sale of any property within the Town's Waterfront Residential (WR) Zone that utilizes an on-site wastewater treatment system, the system must undergo an inspection by the Town's Building and Codes Enforcement Officer. Any system found to be non-compliant must be repair prior to a property deed transfer. https://ecode360.com/33651710?highlight=septic&searchId=12723080342526994

Town of Bolton Septic Inspection Program (B-SIP) – Town of Bolton. Prior to the conveyance of developed real property in the Town of Bolton, where improved property utilizes an On-Site Wastewater Treatment System, that system must be inspected by a qualified inspector to ensure that the system conforms with all local and state requirements. https://www.boltonnewyork.com/wp-content/uploads/2021/10/36-Sanitary-Sewage-Desposal-Ordinance.pdf

Stormwater Management

Model Stormwater Management Ordinance- Lake George Park Commission. The objectives of this ordinance are to prevent any increase in stormwater runoff from any development to reduce flooding,

siltation, and streambank erosion; to prevent any increase in pollution caused by stormwater runoff from development; and to prevent any increase in total annual volume of surface water runoff. https://lgpc.ny.gov/stormwater-management

Model Local Laws to Increase Resilience – New York State Department of State. A guidebook for municipalities outlining a variety of land use tools to increase resiliency including zoning district designations, wetland and watercourse protection measures, management of floodplain development and stormwater control measures. https://dos.ny.gov/system/files/documents/2020/09/model_local_laws_to_increase_resilience.pdf

Riparian Management

Stream Corridor Protections – Lake George Park Commission. Establishes a 35-foot buffer along permanent, NYSDEC protected AA-Special streams that are tributaries to Lake George for the purpose of protecting the water quality and environmental characteristics of those tributaries and Lake George. This rule protects AA-Special perennial streams; establishes a permit program for any proposed development, land disturbance, or land clearing within 35 feet of a protected stream; limits construction of impervious surfaces and limits vegetation removal within 35 feet of a protected stream; and limits the modification of stream channels and provides design standards for culverts and crossings. https://lgpc.ny.gov/stream-corridor-protections-regulations

Aquatic Buffer Model Ordinance – United States Environmental Protection Agency. Suggested language to create the most effective stream buffer zones possible. https://www.epa.gov/sites/default/files/2015-12/documents/2002_09_19_nps_ordinanceuments_buffer_model_ordinance1.pdf

Winter Road Maintenance

Model Plan Snow and Ice Control – Town of Bolton. Provides written guidelines for the Town's winter road maintenance and the application of de-icing materials and level of service to be expected dependent on time of day and weather conditions. https://www.adkaction.org/wp-content/uploads/2019/02/Bolton-NY-Sample-Snow-Policy.pdf

Memorandum of Understanding of Municipal Governments in the Adirondacks Regarding the Application of Road Salt for Winter Maintenance and De-Icing – ADKAction. The purpose of this memorandum is to describe an agreement among the municipal governments in the Adirondack Park regarding a program to address the levels of chlorides in Adirondack ground and surface waters by reducing the application of road salt for winter road maintenance and de-icing practices. This MOU is not a binding commitment but is rather a pledge of intent of the municipalities signing this document to work in good faith to create an effective program to reduce the levels of road salt application. To date, the Towns of Queensbury, Lake George, Bolton, Hague, Ticonderoga, Putnam, Dresden, and the Village of Lake George have signed this pledge. https://www.adkaction.org/wp-content/uploads/2019/02/Pledge-to-reduce-road-salt-MOU.docx

Chloride Reduction Model Ordinance Language – Minnesota Pollution Control Agency. A guide for municipal officials seeking direction in regulating the use of deicers to protect water quality, animals, human health, and infrastructure. https://www.pca.state.mn.us/sites/default/files/p-tr1-54.pdf

Lawn and Fertilizer Reduction

Fertilizer Regulations – Town of Lake George. Prohibits the use of lawn fertilizer containing phosphorus or any other compound containing phosphorus. https://ecode360.com/14536568

Steep Slope Development

Steep Slopes Protection Ordinance – Town of Cortlandt. This ordinance regulates activities that create any disturbance of steep slopes and the cutting of any tree greater than four inches located on a steep slope. In granting or denying a permit, the board must consider alterations to trees and the slope and ensure that any disturbance will conform to certain standards including assurance of maximum structural safety and slope stability, use of the natural terrain, and replanting of vegetation. This is often incorporated into a municipality's site plan review. https://ecode360.com/7694792

Open Space Conservation

Community Preservation Funds (CPFs) – CPFs provide municipalities with the opportunity to generate open space funding without exceeding the real estate property tax cap, but implementing a modest real estate transfer tax, and can be established to only apply to properties that are above the median sale price of the region. Municipalities are given the ability to specify the rate and types of transfers included. The ability to create a CPF requires authorization by the NYS Legislature and is currently used in Long Island and the Hudson Valley to fund the preservation of open space, farmland, and other important natural resources. https://hudson.dnr.cals.cornell.edu/conservation-planning/conservation-financing

Local Conservation Easement Enabling Ordinance (Term Easement) – Town of Clifton Park. This law allows property owners of more than 15 acres to enter a 15 - 25-year long commitment to not develop their land in exchange for a reduction in property tax assessment for the length of the easement. https://ecode360.com/6712460

Low Impact Development (LID)

LID is a management approach and set of principles that can reduce runoff and pollutant loadings by managing runoff as close to its source as possible. LID includes overall site design approaches and individual small scale stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration and the harvesting and use of rainwater. https://www.epa.gov/sites/default/files/2021-06/documents/lid_fact_sheet_codes_june_2021_508.pdf

Section 9. Implementation Strategy and Timeline

The purpose of the Watershed Action Plan for Lake George is to assess the current state of the lake and identify ways to improve the overall conditions of the watershed based on six threats and emerging issues related to water quality in the Lake George Watershed. Projects were provided by representatives throughout the watershed based on the defined water quality priorities of their communities and organizations. This plan identifies **100 projects totaling nearly $75,000,000 in funding needs** for water quality improvement projects throughout the Lake George Watershed. Projects are organized by HUC-12 watershed and further categorized by water quality threat and priority.

Each identified project aims to achieve one or more of the eight overarching goals of this plan. Measures taken to achieve these goals will not only improve the environmental health and vitality of the watershed but will also improve the economic health and vitality of the communities within the watershed that rely on the natural resources provided by Lake George. As set forth previously in this document, the goals of the Watershed Action Plan for Lake George are:

Goal 1: Maintain the Class AA status of Lake George

Goal 2: Reduce stormwater runoff and nutrient loading into Lake George and its tributaries

Goal 3: Support actions that reduce the water quality impacts of wastewater in the watershed

Goal 4: Prevent future Harmful Algal Bloom occurrences

Goal 5: Monitor, control and eradicate invasive species in the Lake George Watershed

Goal 6: Promote practices that reduce erosion in the watershed

Goal 7: Reduce water quality impacts associated with road and highway systems

Goal 8: Increase awareness of water quality issues through education and outreach to all user groups

Implementation. Each project is assigned an implementation timeframe of short term (1-2 years), medium term (3-5 years), or long term (6 or more years). Implementation of priority and short term projects should begin first, followed by medium term and long term projects, as appropriate. In addition to a time frame, each project lists potential funding sources and project partners for implementation.

9.1 Recommendations and Management Strategies

The Watershed Action Plan for Lake George provides numerous strategic projects and programs, the implementation of which will aid in achieving the vision and goals for the watershed. More than 100 projects and programs are listed in the tables below. Eight overarching management strategies have been identified and are meant to address the threats and emerging issues identified in **Section 5** of this

plan. The management strategies include stormwater runoff, erosion control, infrastructure, water quality monitoring, education and outreach, climate resiliency, planning, and land acquisition.

Non-Point Source Pollution

Non-point source pollution is management through techniques that mitigate stormwater runoff and erosion. Stormwater runoff reduction projects include the implementation of green stormwater infrastructure practices, roadside stabilization projects, and upgrades to municipal facilities.

Erosion control projects include streambank and roadside stabilization, green stormwater infrastructure implementation, planning and maintenance of municipal facilities. Implementation of these projects will reduce the amount of nutrients that are transported into Lake George and its tributaries.

Infrastructure

Ensuring that municipal infrastructure like wastewater treatment facilities, stormwater conveyance systems, sewers, culverts, and salt storage facilities are up to date and operating properly is a primary recommendation to ensure that any externalities from these facilities do not negatively impact the lake. Infrastructure projects identified in this plan include expanding and update existing systems, implementing initiatives and programs for septic inspections and maintenance requirements, and ensuring appropriate maintenance for existing municipal infrastructure and facilities.

Water Quality Monitoring

Monitoring is a way to understand the effectiveness of programs, set baselines for water quality indicators, and protect human health. Projects identified in this plan include enhanced and expanded water quality monitoring within Lake George and its tributaries to track nutrients and other water quality indicators. Additional program recommendations include the expansion of swimming area monitoring to popular bays throughout the lake, monitoring for efficiencies in municipal wastewater treatment plants, and maintaining a sensor network for enhanced water quality monitoring.

Education and Outreach

Education and outreach activities that connect individual actions with environmental impacts are often a useful strategy in conjunction with new regulations. People and businesses are unlikely to embrace issues that they are unfamiliar with. Education and outreach activities have the ability to alter individual attitude and action to the extent that additional regulations and ordinances may be unnecessary. Identified projects and programs include educational training for municipal staff and discretionary boards, homeowner educational programs, and supporting and expanding existing educational programs.

Climate Resiliency

Impacts from our changing climate can been seen throughout the watershed and implementing actions that can mitigate these impacts will help create a more resilient, healthy watershed. Programs and actions related to climate resiliency include promoting climate mitigation and resiliency planning, assessing areas of flood vulnerability, collecting data on climate change in the watershed, and updating municipal infrastructure to withstand more intense and severe storm events because of climate change. Additionally, maintaining and protecting the high percentage of forested land in the watershed should be a priority to mitigate the increased expected water yields, run off levels, and sedimentation.

Planning

Planning is often the first step in finding a solution to an identified problem or in understanding the needs and desires of a community. Effective planning can often lead to an engaged community, defined project goals, and secured funding for implementation. Identified planning projects and programs include updating municipal comprehensive plans to include considerations for water quality protection and climate resiliency, assessing compliance with exiting municipal plan and ordinances, and developing additional plans for the protection of the Lake George Watershed.

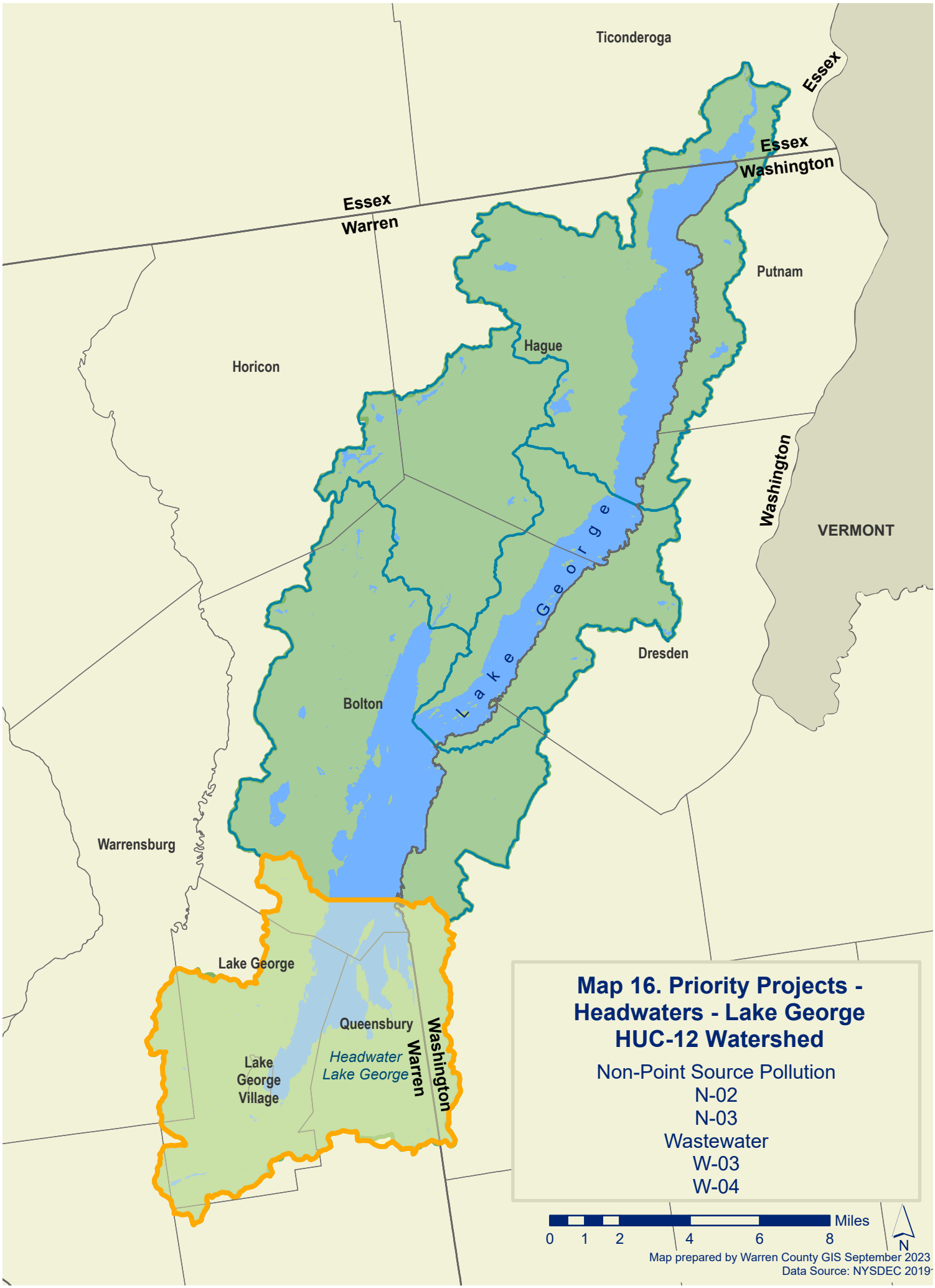
Land Conservation

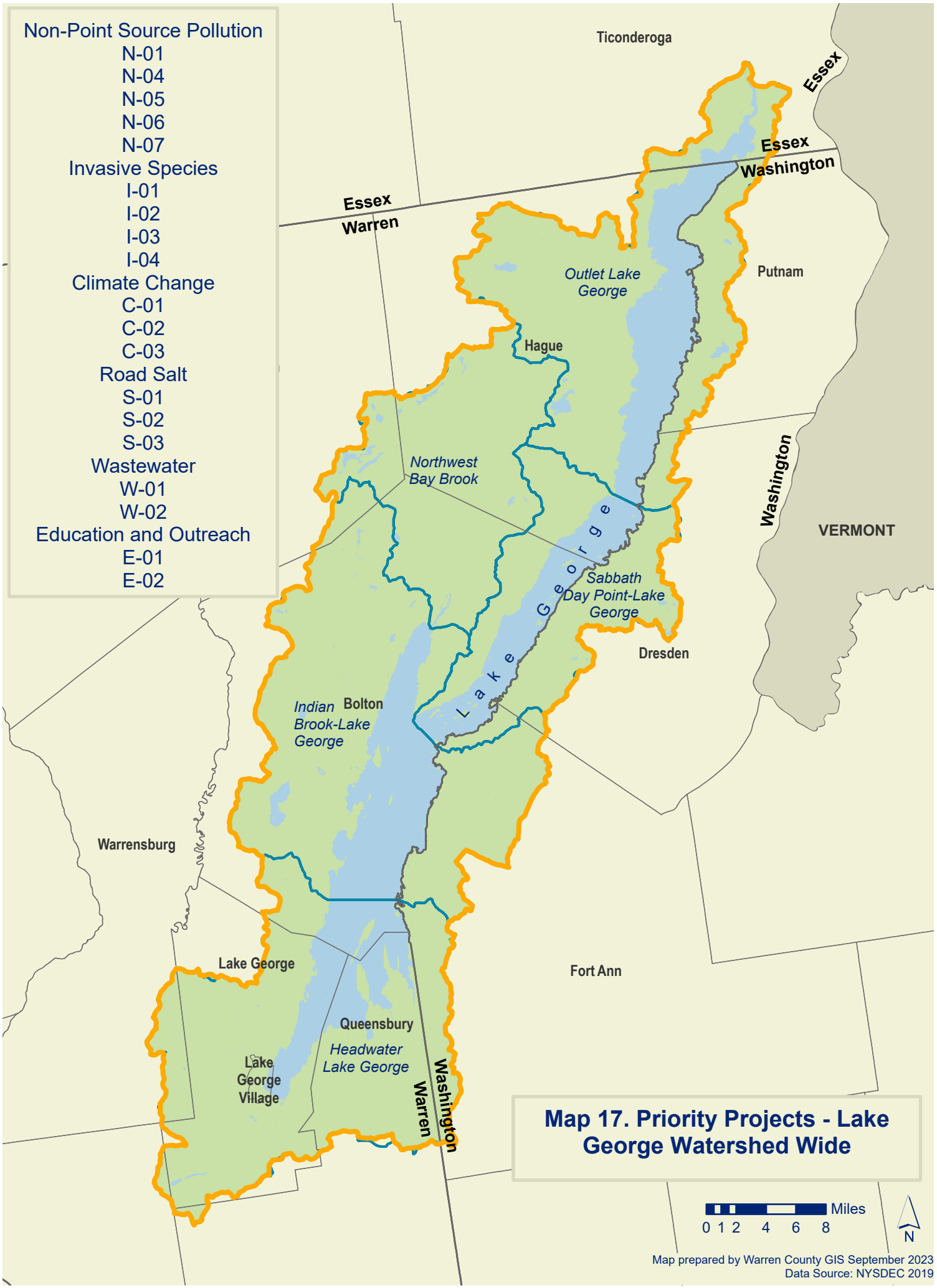
Land conservation is an important element of water quality protection and climate resiliency. The Lake George Land Conservancy actively works to identify key land parcels throughout the watershed where conservation would contribute to water quality and water resources protection. Development is restricted on these parcels, however public access and recreation is generally promoted. Municipalities can also follow this model. Land conservation is an important key to preserving water quality in Lake George by ensuring that key forested and undeveloped areas remain available to serve their important ecological functions that contribute to the water quality and other natural resources of the watershed. Maintaining a forest cover of between 60% and 90% is recommended in order to avoid water quality decline. Additionally, forest preservation is a key priority to mitigating the impacts of climate change on water quality. Preserving and maintaining high levels of forested areas in the watershed will mitigate water quality decline associated with increases in rain events, runoff, and sedimentation as well as reduce the impacts of flooding.

9.2 Priority Project Maps

Following the collection and compilation of project recommendations for this plan, the WAC met to identify priority projects. Each priority issue has its own priority projects that were decided on based on the WAC's personal and professional knowledge of the watershed. Project time frame, projected costs, and potential funding opportunities were also considered for prioritization.

The HUC-12 watershed is identified for each project in this plan, however in many cases, the project applies for the entire Lake George watershed. These projects are identified as watershed wide projects. The following maps depict the watershed location of each of the 23 priority projects identified within this plan. Four of the priority projects are site-specific and located in the Headwaters-Lake George HUC-12 Watershed **(Map 16 Priority Projects Map, Headwaters Lake George)**, while the remaining 19 priority projects Watershed wide projects meaning that the project could be implemented at discrete points throughout the watershed or at the watershed wide level **(Map 17 Priority Projects Map, Lake George Watershed Wide)**.


Ticonderoga
Essex
Essex
Washington
Essex
Warren
Putnam
Hague
Horicon
Washington
VERMONT
Lake George
Dresden
Bolton
Warrensburg
Lake George
Queensbury
Lake George Village
Headwater Lake George
Warren
Washington
Map 16. Priority Projects - Headwaters - Lake George HUC-12 Watershed
Non-Point Source Pollution
N-02
N-03
Wastewater
W-03
W-04
Miles
0 1 2 4 6 8
N
Map prepared by Warren County GIS September 2023
Data Source: NYSDEC 2019


Non-Point Source Pollution
N-01
N-04
N-05
N-06
N-07
Invasive Species
I-01
I-02
I-03
I-04
Climate Change
C-01
C-02
C-03
Road Salt
S-01
S-02
S-03
Wastewater
W-01
W-02
Education and Outreach
E-01
E-02
Ticonderoga
Essex
Essex
Washington
Essex
Warren
Outlet Lake George
Putnam
Hague
Northwest Bay Brook
Washington
VERMONT
Lake George
Sabbath Day Point-Lake George
Dresden
Indian Brook-Lake George
Bolton
Warrensburg
Lake George
Fort Ann
Queensbury
Headwater Lake George
Lake George Village
Warren
Washington
Map 17. Priority Projects - Lake George Watershed Wide
Miles
0 1 2 4 6 8
N
Map prepared by Warren County GIS September 2023
Data Source: NYSDEC 2019

9.3 Recommendations.

Throughout the planning process, projects and programs intended to improve the overall water quality of Lake George and its watershed were collected from municipal officials and employees, lake associations, and other water quality professionals. **In total, 100 projects are identified in this plan, representing at least $74,000,000 in water quality improvement funding needs in the Lake George watershed**. The full list of projects is shown in the following charts and are organized by watershed threats and emerging issues with management strategies identified where applicable. A handful of educational projects and programs that benefit the watershed were identified that do not fit neatly within one of the five categories of threats and emerging issues. Because of this, an additional category "education and outreach" has been added to the charts below. When implemented, each of the recommendations listed below will advance efforts in achieving the vision and goals articulated in this watershed action plan. Priority recommendations are listed first in each section and labeled as such.

Of the 100 recommendations identified below, there are 48 non-point source pollution projects, ten invasive species projects, eight climate change projects, 17 wastewater treatment projects, and 11 categorized as education and outreach. While each of these project categories are priority issues in the watershed, the distribution of the project types indicates that non-point source pollution is a larger, more established concern in the watershed that some of the other emerging issues that have been identified in this plan.

The recommendations below were prioritized by the WAC using factors such as project readiness, funding availability, and articulated importance by a watershed stakeholder. Additionally, projects were crosschecked with the 2022 HABs Action Plan for Lake George to ensure that the priority actions of that plan are recognized here as well. Projects that are identified in both the HABs Action Plan for Lake George and this Watershed Action Plan for Lake George are denoted by this symbol *.

Non-Point Source Pollution			
PRIORITY ID# N-01*	**Education and Outreach, Monitoring**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	LGA, Lake Associations
Project Description:	Expand HABs program to include enhanced sampling and monitoring protocols to assess potential causes of algal blooms and HABs.		

PRIORITY ID# N-02*	**Stormwater Runoff, Erosion Control, Infrastructure**		
Municipality:	Village and Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$10,000,000
Potential Funding Source:	NYSDEC, LCBP, NYSDOT	**Involved Parities in Implementation:**	NYSDEC, NYSDOT, DPW, Town, Village, County
Project Description:	Bolton Road Reconstruction Project: Reconstruction of Route 9N from Village boundary to Hearthstone Point Campground complete with new sewer district and infrastructure, realigned water and stormwater infrastructure, muti-use path, bicycle, and pedestrian amenities. The project will disconnect upwards of 500 on-site septic systems, approximately 150 of which are on the lake shore		
PRIORITY ID# N-03	**Stormwater Runoff**		
Municipality:	Village of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Village, DPW
Project Description:	Design and implement green stormwater infrastructure improvements to Shepard's Park		
PRIORITY ID# N-04*	**Education and Outreach, Stormwater Runoff**		
Municipality:	Watershed-wide	**HUC-12 Watershed:**	Watershed-wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$5,000,000
Potential Funding Source:	LCBP, NYSDOS, NYSDEC	**Involved Parities in Implementation:**	Towns, Counties, LGA, SWCD, LCLGRPB
Project Description:	Implement a Save the Rain Program in developed areas of the watershed similar to Onondaga County's program and includes stormwater retrofits		
PRIORITY ID# N-05*	**Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	NA	**Project Cost:**	$250,000
Potential Funding Source:	NYSDOS, NYSERDA, USEPA	**Involved Parities in Implementation:**	LGA
Project Description:	Develop a Nine Element Watershed Plan for Lake George		

PRIORITY ID# N-06*	**Education and Outreach, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Private	**Project Cost:**	$150,000
Potential Funding Source:	LCBP	**Involved Parities in Implementation:**	LGLC, LGA, SWCD
Project Description:	Create incentive program for homeowners to make enhanced stormwater management improvements on their properties, including streambank and shoreline buffers		
PRIORITY ID# N-07*	**Erosion Control**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	NA	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, NYSAGM, LCBP	**Involved Parities in Implementation:**	LGA, Lake Associations
Project Description:	Identify forests in locations where significant soil erosion and nutrient loading occurs and target for forest management practices and conservation		
ID# N-08	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000
Potential Funding Source:	LCBP, LGA	**Involved Parities in Implementation:**	Town
Project Description:	Maintain and expand algae watch program to identify the influence of land use on water quality indicators		
ID# N-09	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$50,000
Potential Funding Source:	LCBP, NYSDEC	**Involved Parities in Implementation:**	LCLGRPB, LGA, NYSDOS
Project Description:	Maintain sensor network for water quality monitoring and reporting		

ID# N-10	Stormwater Runoff		
Municipality:	Town of Queensbury	**HUC-12 Watershed:**	Watershed wide
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, NYSDOS, LCBP	**Involved Parities in Implementation:**	LGA, Lake Associations
Project Description:	Conduct NPS Feasibility study for Assembly Point Road		
ID# N-11	**Education and Outreach**		
Municipality:	Town of Queensbury	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$75,000
Potential Funding Source:	NYSDEC, LCBP, Town	**Involved Parities in Implementation:**	Town, Village, LCLGRPB
Project Description:	Test popular swim areas including Sandy Bay for total coliform and E. coli twice a month for two swimming seasons		
ID# N-12	**Stormwater Runoff, Erosion Control**		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$250,000
Potential Funding Source:	NYSDOS, NYSDEC, LCBP, LGA	**Involved Parities in Implementation:**	LGA, Lake Associations, Town
Project Description:	Implement Coolidge Hill Road stormwater remediation project		
ID# N-13	**Stormwater Runoff, Erosion Control**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, NYSEFC, LCBP, LGA	**Involved Parities in Implementation:**	NYSDEC, SWCD, LGLCRPB, Town/Village
Project Description:	Implement English Brook streambank stabilization project		

ID# N-14	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$25,000
Potential Funding Source:	NYSDEC	**Involved Parities in Implementation:**	Town, DPW, SWCD
Project Description:	Installation of covered fueling station at the Town Highway Garage		
ID# N-15	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC	**Involved Parities in Implementation:**	Town, SWCD
Project Description:	Construct a new wash bay at the Town Highway Garage that is connected to a new oil/water separator to minimize runoff from vehicle washing.		
ID# N-16	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years_
Jurisdiction:	Public	**Project Cost:**	$300,000
Potential Funding Source:	NYSDEC	**Involved Parities in Implementation:**	Town, DPW
Project Description:	Install new floor drain connection system for the main bays at the Town Highway Garage.		
ID# N-17	**Stormwater Runoff, Erosion Control**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Long Term (6+ Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, NYSEFC	**Involved Parities in Implementation:**	Town, DPW
Project Description:	Implement a systematic roadway stormwater pretreatment and infiltration program in the Town and Village of Lake George.		

ID# N-18*	Stormwater Runoff		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Long Term (6+ Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, NYSDOT	**Involved Parities in Implementation:**	Town, DPW
Project Description:	Upgrade Routes 9, 9N, and 9L stormwater conveyance systems to incorporate stormwater capture and infiltration facilities.		
ID# N-19	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Long Term (6+ Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, NYYEFC, LCBP	**Involved Parities in Implementation:**	Town, Village, DPW
Project Description:	Install stormwater infiltration and retention facilitate at Steamboat Landing		
ID# N-20	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$1,000,000+
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, County, NYSDOT
Project Description:	Implementation of Cedar Land and Beatty Road Green Infrastructure Feasibility Study.		
ID# N-21	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$750,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, Village, DPW, SWCD, LGA
Project Description:	Install water quality protection and stormwater treatment measures at Beatty Road and Cedar Lane.		

ID# N-22	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000
Potential Funding Source:	NYSDEC, NYSDOT, LCBP	**Involved Parities in Implementation:**	Town, DPW, SWCD, NYSDOT
Project Description:	Complete Northway (I-87) stormwater improvements		
ID# N-23	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, SWCD
Project Description:	Install hydrodynamic separator at Cedar Lane for removal of sediment and attached phosphorus.		
ID# N-24	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	NYSDOT, SWCD, LGA
Project Description:	Implement stormwater improvements for Route 9L and East Brook outlet.		
ID# N-25	**Stormwater Runoff**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$150,000
Potential Funding Source:	NYSDEC	**Involved Parities in Implementation:**	Town, SWCD
Project Description:	Install hydrodynamic separator and oil/water separator at Village DPW campus.		

ID# N-26	Stormwater Runoff		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$150,000
Potential Funding Source:	NYSDEC. LCBP	**Involved Parities in Implementation:**	Town, SWCD, LGA
Project Description:	Implement stormwater improvements for Skylar Heights and Diskau Street.		
ID# N-27*	**Stormwater Runoff, Planning**		
Municipality:	Village of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$150,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Village
Project Description:	Complete a stormwater engineering assessment for Prospect Mountain Brook watershed looking at runoff velocity reduction and flood attenuation.		
ID# N-28	**Stormwater Runoff**		
Municipality:	Village of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$350,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Village, SWCD
Project Description:	Implement recommendations from Prospect Mountain Brook watershed engineering assessment, including stormwater controls to mitigate siltation and sediment deposits in the lake from the brook and ameliorate the need for dredging of the delta.		
ID# N-29	**Stormwater Runoff, Erosion Control**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Village, SWCD
Project Description:	Implementation of Bereton Road stormwater project including ditching and installation of check dams and catch basins		

ID# N-30	Stormwater Runoff		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$6,000,000
Potential Funding Source:	NYSDEC, NYSDOS	**Involved Parities in Implementation:**	Town
Project Description:	Implement Veteran's Park improvements to drainage, recreation, and parking amenities		
ID# N-31	**Stormwater Runoff, Erosion Control**		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, SWCD, LGA
Project Description:	Installation of vegetated swales on Valley Woods Road		
ID# N-32	**Erosion Control, Planning**		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$1,000,000+
Potential Funding Source:	Town, Private, LCBP	**Involved Parities in Implementation:**	Town
Project Description:	Conduct a needs assessment of dredging lake adjacent tributaries to protect Lake George from siltation, pollution, and erosion.		
ID# N-33	**Stormwater Runoff, Planning**		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$750,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, Property Owners, SWCD
Project Description:	Mohican Road stormwater assessment and implementation.		

ID# N-34	**Erosion Control**		
Municipality:	Town of Putnam	**HUC-12 Watershed:**	Outlet-Lake George
County:	Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$10,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Homeowner, Town, SWCD, LGA
Project Description:	Stabilize and implement erosion and sediment control practices on Sagamore Road.		
ID# N-35	**Erosion Control**		
Municipality:	Town of Putnam	**HUC-12 Watershed:**	Outlet-Lake George
County:	Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$10,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Homeowner, Town, SWCD, LGA
Project Description:	Stabilize and implement erosion and sediment control practices on Gull Bay Way.		
ID# N-36	**Erosion Control**		
Municipality:	Town of Putnam	**HUC-12 Watershed:**	Outlet-Lake George
County:	Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$100,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Homeowner, Town, SWCD, LGA
Project Description:	Replace culvert and install erosion and sediment control practices on Link Way and Bayview Way in Gull Bay.		
ID# N-37	**Stormwater**		
Municipality:	Town of Putnam	**HUC-12 Watershed:**	Outlet-Lake George
County:	Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$150,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, SWCD, LGA
Project Description:	Implement stormwater control project and monitor water quality improvements.		

ID# N-38*	**Stormwater Runoff, Erosion Control**		
Municipality:	Town of Ticonderoga	**HUC-12 Watershed:**	Outlet-Lake George
County:	Essex	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$250,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, SWCD, LGA
Project Description:	Implement roadside stormwater and erosion control measures on Baldwin Road and Black Point Road.		
ID# N-39	**Stormwater Runoff, Erosion Control**		
Municipality:	Town of Hague	**HUC-12 Watershed:**	Outlet-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$150,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, SWCD, LGA
Project Description:	Replace West Hague Road culvert		
ID# N-40	**Erosion Control**		
Municipality:	Town of Hague	**HUC-12 Watershed:**	Outlet-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$75,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town, SWCD, LGA
Project Description:	Implementation of Coldwater Canyon erosion control project		
ID# N-41	**Education and Outreach, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	NA	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	LGA, Lake Associations
Project Description:	Implement an expanded HABs sampling and monitoring protocols to assess the potential causes of algal blooms and HABs		

ID# N-42	Education and Outreach, Planning		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$150,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	LGA, Lake Associations
Project Description:	Expand in-lake tributary sampling program		
ID# N-43*	**Erosion Control, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$1,500,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	LGA, Lake Associations
Project Description:	Implement erosion and sediment control practices on local, county, and state roads		
ID# N-44	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$60,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Towns, LCLGRPB
Project Description:	Develop a program to improve water quality evaluation metrics beyond AA-Special standard		
ID# N-45	**Education and Outreach**		
Municipality:	Town of Queensbury	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$250,000
Potential Funding Source:	NYSDEC, LCBP, Town	**Involved Parities in Implementation:**	Town, Lake Associations, LGA
Project Description:	Test popular swim areas including Sandy Bay for total coliform and E. coli twice a month for two swimming seasons		

ID# N-46	Erosion Control		
Municipality:	Towns of Hague, Bolton, and Lake George	**HUC-12 Watershed:**	Headwaters-Lake George, Indian Brook-Lake George, Outlet-Lake George
County:	Warren	**Timeframe:**	Short Term (1-3 Years)
Jurisdiction:	Public	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, Towns	**Involved Parities in Implementation:**	Towns
Project Description:	Remove sediment from sediment retention ponds in Hague, Bolton, and Lake George		
ID# N-47*	**Land Acquisition, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Ongoing
Jurisdiction:	Public/Private	**Project Cost:**	$3,000,000 each
Potential Funding Source:	NYSDEC, LCBP, Private	**Involved Parities in Implementation:**	LGLC, Towns
Project Description:	Implement priority conservation initiatives of the Lake George Land Conservancy including the Sucker Brook, Northeast Shoreline, Indian Brook/Northwest Bay, and Huletts Landing Conservation Initiatives		
ID# N-48*	**Land Acquisition, Planning**		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook-Lake George
County:	Warren	**Timeframe:**	Ongoing
Jurisdiction:	Public	**Project Cost:**	$3,000,000
Potential Funding Source:	NYSDEC, LCBP, Private	**Involved Parities in Implementation:**	LGLC, Town
Project Description:	Implement priority conservation projects identified in the Bolton Recreation Hub Plan		
ID# N-49	**Planning**		
Municipality:	All	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000 each
Potential Funding Source:	NYSDEC, NYSDOS	**Involved Parities in Implementation:**	Towns, LCLGRPB>
Project Description:	Incorporate and adopt ordinances and regulations into municipal code that protect water quality resources. See Section 8. Model Regulations and Resources		

Invasive Species			
PRIORITY ID# I-01*	**Education and Outreach, Climate Resiliency**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$200,000
Potential Funding Source:	LCBP, Private	**Involved Parities in Implementation:**	LGLC, APIPP, SWCD
Project Description:	Enhance HWA management program, utilizing chemical and biological controls. Provide outreach and training on BMPs for landowners with forested lands		
PRIORITY ID# I-02	**Education and Outreach, Climate Resiliency, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$250,000
Potential Funding Source:	LCBP, NYSDEC	**Involved Parities in Implementation:**	LCLGRPB, LGLC, APIPP, SWCD
Project Description:	Create a watershed wide HWA monitoring, assessment, loss, and succession plan to identify places in the watershed that are most vulnerable to hemlock species loss due to HWA using remote sensing and aerial imagery. Create a plan for this eventual loss in ways that mitigate negative impacts to the watershed ecology including a species planting replacement plan.		
PRIORITY ID# I-03*	**Education and Outreach, Climate Resiliency**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$150,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	LGLC, LGA
Project Description:	Enhance HWA monitoring: secure funding for on-the-ground and remote sensing applications to track spread and impact on surrounding areas		

PRIORITY ID# I-04	Education and Outreach, Planning, Climate Resiliency		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	NA	**Project Cost:**	$95,000
Potential Funding Source:	NYSDEC, NYSDOS, LCBP	**Involved Parities in Implementation:**	Counties, LGA, LGPC, SWCD
Project Description:	Develop system to monitor the effectiveness of milfoil harvesting programs		
ID# I-05	**Education and Outreach, Planning, Climate Resiliency**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC	**Involved Parities in Implementation:**	LGA, LGPC, Lake Associations
Project Description:	Resume Asian clam control, focusing on areas of dense infestation, to prevent further spread while research identifies best control methods.		
ID# I-06	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, LCBP, Private	**Involved Parities in Implementation:**	LGA, LGPC, Lake Associations, consultant, universities
Project Description:	Conduct research to identify best control method(s) for Asian clam and implement once identified		
ID# I-07	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, NYSDOS, LCBP	**Involved Parities in Implementation:**	LGA, Lake Associations
Project Description:	Education and outreach to help prevent spread within Lake George from boating activities such as anchoring in areas of Asian clam infestations		

ID# I-08	Education and Outreach		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	NA	**Project Cost:**	$50,000
Potential Funding Source:	LCBP, NYSDEC	**Involved Parities in Implementation:**	LGA
Project Description:	Host annual AIS monitoring event with web interface		
ID# I-09	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$300,000
Potential Funding Source:	LCBP, NYSDEC	**Involved Parities in Implementation:**	LGA, LGPC, AWI, Towns, Counties
Project Description:	Secure funding to expand and continue boat wash and inspection program		
ID# I-10	**Climate Resiliency, Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years) and ongoing
Jurisdiction:	Public/ Private	**Project Cost:**	$300,000
Potential Funding Source:	LCBP, NYSDEC, private	**Involved Parities in Implementation:**	LGLC, APPIP, TNC
Project Description:	Continue treatment of HWA on public and private conserved lands including Clark Hollow Bay, and Dome Island.		

Climate Change

PRIORITY ID# C-01	Climate Resiliency, Planning		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$50,000 - $200,000
Potential Funding Source:	NYSDOS, NYSDEC, LCBP, NYSERDA, USEPA	**Involved Parities in Implementation:**	Towns, Counties, LCLGRPB
Project Description:	Conduct and promote municipal, county, and watershed wide climate mitigation and resiliency planning		

PRIORITY ID# C-02	Climate Resiliency, Infrastructure		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	LCBP, SWCD	**Involved Parities in Implementation:**	SWCD, LCLGRPB, LGA
Project Description:	Complete culvert assessments using NAACC protocol and create priority list for repairs and replacement		
PRIORITY ID# C-03	**Climate Resiliency, Infrastructure**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Long Term (6+ Years)
Jurisdiction:	Public	**Project Cost:**	$1,000,000
Potential Funding Source:	NYSDEC, NYSDOS, LCBP	**Involved Parities in Implementation:**	Towns, Counties, SWCD
Project Description:	Replace undersized culverts in watershed with climate resilient culverts		
ID# C-04	**Climate Resiliency**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$50,000 per municipality
Potential Funding Source:	NYSDEC, USEPA	**Involved Parities in Implementation:**	Towns, Counties, LCLGRPB
Project Description:	Conduct municipal tree inventories and promote municipal tree planting and street tree programs		
ID# C-05	**Climate Resiliency, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000
Potential Funding Source:	NYSDEC, USEPA	**Involved Parities in Implementation:**	Towns, Counties, LCLGRPB, LGA
Project Description:	Launch program to collect climate change data to evaluate potential trends that will inform future planning efforts		

ID# C-06	Climate Resiliency		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$120,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	LGA, SWCD
Project Description:	Implement long-term ecological monitoring in priority tributaries to monitor macroinvertebrates indicative of water quality		
ID# C-07	**Climate Resiliency, Planning**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Watershed wide
County:	Warren	**Timeframe:**	Long Term (6+ Years)
Jurisdiction:	Public/Private	**Project Cost:**	$1,000,000
Potential Funding Source:	LCBP, NYSDSHES	**Involved Parities in Implementation:**	Towns, Counties, SWCD
Project Description:	Development of Lake George Floodplain Management Plan to create strategies and action to help mitigate localized flooding and the impacts of flooding caused by climate change		
ID# C-08	**Climate Resiliency, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000 each
Potential Funding Source:	NYSDOS, NYSDEC	**Involved Parities in Implementation:**	Towns, Village
Project Description:	Evaluate and update Comprehensive Plan in all watershed municipalities to include elements of water quality protection and climate resiliency		

Road Salt			
PRIORITY ID# S-01	**Stormwater Runoff**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, NYSDOS, LCBP	**Involved Parities in Implementation:**	Towns, Counties, NYSDOT, LGA
Project Description:	Identify and implement road salt reduction targets to protect water resources		
PRIORITY ID# S-02	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Towns, Counties, NYSDOT, LGA
Project Description:	Provide pre- and mid-winter calibration training for local and county winter maintenance crews		
PRIORITY ID# S-03	**Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$65,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	LGA, SWCD, LCLGRPB
Project Description:	Complete a comprehensive analysis of the effects of alternative de-icing products as they pertain to phosphorus inputs		
ID# S-04	**Infrastructure**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$1,000,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Towns, Counties, LGA, LCLGRPB
Project Description:	Secure funding to assist county and town highway departments to convert all winter road maintenance machinery to allow for reduced and alternative salt usage.		

ID# S-05	Stormwater Runoff, Infrastructure		
Municipality:	Town of Hague	**HUC-12 Watershed:**	Outlet – Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$1,500,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town
Project Description:	Construct sustainable salt storage facility for Town Highway Department		
ID# S-06	**Infrastructure**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$200,000
Potential Funding Source:	NYSDEC, NYSDOT	**Involved Parities in Implementation:**	Towns, Counties
Project Description:	Provide AVL/GPS tracking devices, roadside cameras with adequate data storage for local and county winter road maintenance programs		

Wastewater

PRIORITY ID# W-01*	Education and Outreach		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Private	**Project Cost:**	$3,000,000
Potential Funding Source:	NYSDEC	**Involved Parities in Implementation:**	Counties
Project Description:	Continue and expand matching septic system replacement grant program that includes funding to assist homeowners to connect to municipal sewer in lieu of septic system replacement		
PRIORITY ID# W-02*	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$95,000
Potential Funding Source:	NYSDEC	**Involved Parities in Implementation:**	Towns, Counties, LGPC
Project Description:	Implement a watershed wide septic system inspection and management program for near-shore septic systems		

PRIORITY ID#W-03*	**Infrastructure**		
Municipality:	Town of Queensbury	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$75,000
Potential Funding Source:	NYSDEC, NYSEFC	**Involved Parities in Implementation:**	Town, Homeowners
Project Description:	Create Rockhurst Wastewater Management District for collection and treatment of residential wastewater for 52 residents		
PRIORITY ID#W-04	**Infrastructure**		
Municipality:	Town of Queensbury	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$6,000,000
Potential Funding Source:	NYSDEC, USDA, NYSEFC	**Involved Parities in Implementation:**	Town, Homeowners
Project Description:	Implement Rockhurst Wastewater Collection and Treatment system		
ID# W-05*	**Infrastructure**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Long Term (6+ Years)
Jurisdiction:	Public	**Project Cost:**	$5,000,000
Potential Funding Source:	NYSDEC, USDA, NYSEFC	**Involved Parities in Implementation:**	Town, County, NYSDOT
Project Description:	Implement Route 9N sewer system extension to Hearthstone Point campground		
ID# W-06	**Infrastructure**		
Municipality:	Town of Ticonderoga	**HUC-12 Watershed:**	Outlet – Lake George
County:	Essex	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$4,000,000
Potential Funding Source:	NYSDEC, NYSEFC	**Involved Parities in Implementation:**	Town
Project Description:	Form district for sewer extension for Outlet Drive and Sagamore Drive to disconnect 44 aging and failing septic systems		

ID# W-07*	Infrastructure		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook – Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$250,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town
Project Description:	Install two additional woodchip bioreactors for nitrate removal at wastewater treatment facility		
ID# W-08	**Infrastructure**		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook – Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$1,000,000+
Potential Funding Source:	NYSDEC, NBRC, NYSEFC	**Involved Parities in Implementation:**	Town
Project Description:	Implement upgrades to the Town's aging and inefficient sewer pump station at Roger's Park		
ID# W-09*	**Infrastructure**		
Municipality:	Town of Ticonderoga	**HUC-12 Watershed:**	Outlet – Lake George
County:	Essex	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$2,000,000
Potential Funding Source:	NYSDEC, NYSEFC, USDA	**Involved Parities in Implementation:**	Town
Project Description:	Install sewer system for Outlet and Sagamore Drives		
ID# W-10	**Infrastructure**		
Municipality:	Town of Dresden	**HUC-12 Watershed:**	Watershed wide
County:	Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$250,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Towns, Counties, LGPC
Project Description:	Relocate hazardous sewer crossing over Foster Brook		

ID# W-11	Infrastructure		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Outlet – Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$750,000
Potential Funding Source:	NYSDEC, NYSDOH	**Involved Parities in Implementation:**	Town, SWCD
Project Description:	Install wastewater pump station enhancements including SCADA		
ID# W-12	**Planning**		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook – Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$500,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town
Project Description:	Monitor nitrate removal efficiency		
ID# W-13	**Planning**		
Municipality:	Village of Lake George	**HUC-12 Watershed:**	Indian Brook – Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Town
Project Description:	Monitor nitrate removal efficiency of new wastewater treatment facility		
ID# W-14	**Planning**		
Municipality:	Town of Lake George	**HUC-12 Watershed:**	Headwaters – Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$75,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	Village
Project Description:	Implementation of recommendations from Town Septic Initiative Report including a continued water monitoring program, a new online database for septic systems in the initiative boundary, and a potential for inspection program or transfer law		

ID# W-15*	Infrastructure		
Municipality:	Town and Village of Lake George	**HUC-12 Watershed:**	Headwaters – Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$200,000
Potential Funding Source:	NYSEFC, Town, Village	**Involved Parities in Implementation:**	LGA, Town
Project Description:	Reduce I&I of wastewater system withing the Town and Village by slip lining conveyance pipes		
ID# W-16	**Infrastructure**		
Municipality:	Town of Fort Ann	**HUC-12 Watershed:**	Sabbath Day Point-Lake George
County:	Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$200,000
Potential Funding Source:	NYSEFC, NYSDEC, USDA	**Involved Parities in Implementation:**	Town, Homeowners
Project Description:	Creation of onsite septic district on Pilot Knob		
ID# W-17	**Education and Outreach, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Ongoing
Jurisdiction:	Public/Private	**Project Cost:**	$15,000 annually
Potential Funding Source:	LCBP, NYSDEC	**Involved Parities in Implementation:**	LCLGRPB, LGPC, Counties
Project Description:	Continue and expand LCLGRPB's Septic Smart Campaign aimed at homeowners, and short-term rental hosts and guests with properties that utilize septic systems		

Education and Outreach

PRIORITY ID#E-01	Education and Outreach, Planning		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term
Jurisdiction:	Public	**Project Cost:**	$50,000
Potential Funding Source:	NYSDOS, LCBP	**Involved Parities in Implementation:**	Towns, LCLGRPB, LGA
Project Description:	Develop training for municipal planning and zoning boards about how land use and development decisions can impact water quality		

PRIORITY ID# E-02	**Education and Outreach, Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$50,000
Potential Funding Source:	NYSDOS, LCBP	**Involved Parities in Implementation:**	Towns, LCLGRPB
Project Description:	Work with municipalities to conduct assessments of local land use ordinances, discretionary approvals, and approved development projects with a lens towards water quality impacts		
ID# E-03	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$50,000
Potential Funding Source:	LCBP, Private	**Involved Parities in Implementation:**	LGA
Project Description:	Expand series of Summit events for salt, septic, stormwater, and economics		
ID# E-04	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public/Private	**Project Cost:**	$75,000
Potential Funding Source:	NYSDEC, LCBP	**Involved Parities in Implementation:**	LGA
Project Description:	Provide community outreach events for property owners in priority bays		
ID# E-05	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Private	**Project Cost:**	$200,000
Potential Funding Source:	LCBP	**Involved Parities in Implementation:**	LGA
Project Description:	Expand Floating Classroom education programs		

ID# E-06	**Planning**		
Municipality:	Town of Queensbury	**HUC-12 Watershed:**	Headwaters-Lake George
County:	Warren	**Timeframe:**	Long Term (6+ Years)
Jurisdiction:	Public	**Project Cost:**	$75,000
Potential Funding Source:	NYSDEC, NYSDOS, LCBP	**Involved Parities in Implementation:**	Town, Lake Associations, LGA
Project Description:	Use Sandy Bay testing results to develop education and outreach, and to plan, as dictated by results, future lake protection projects		
ID# E-07	**Planning**		
Municipality:	Town of Bolton	**HUC-12 Watershed:**	Indian Brook-Lake George
County:	Warren	**Timeframe:**	Short Term (1-2 Years)
Jurisdiction:	Public	**Project Cost:**	$75,000
Potential Funding Source:	Town, LCBP	**Involved Parities in Implementation:**	Town, SWCD, LGA
Project Description:	Create a systematic approach for use by Town officials, Planning Board, and ZBA to assess proposed projects for compliance with LWRP policies.		
ID# E-08	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Short Term (1-3 Years)
Jurisdiction:	Public	**Project Cost:**	$75,000
Potential Funding Source:	NYSDEC, LGA	**Involved Parities in Implementation:**	LGA, Lake Associations
Project Description:	Manage WAVE and CSLAP citizen science programs for water quality monitoring.		
ID# E-09	**Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$50,000
Potential Funding Source:	NYSDEC, NYSDOS, LCBP	**Involved Parities in Implementation:**	LGA
Project Description:	Implement lake protector web-based tool for property improvements.		

ID# E-10*	**Planning**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Long Term (6+ Years)
Jurisdiction:	Public	**Project Cost:**	Unknown
Potential Funding Source:	Unknown	**Involved Parities in Implementation:**	Towns, Counties
Project Description:	Support tax credit program for Low Impact Development (LID) certified projects		
ID# E-11	**Climate Resiliency, Erosion Control, Education and Outreach**		
Municipality:	Watershed wide	**HUC-12 Watershed:**	Watershed wide
County:	Essex, Warren, Washington	**Timeframe:**	Medium Term (3-5 Years)
Jurisdiction:	Public	**Project Cost:**	$100,000
Potential Funding Source:	NYSDEC, NYSDOS, LCBP	**Involved Parities in Implementation:**	Towns, Counties, LCLGRPB, LGA
Project Description:	Promote education and outreach materials for waterfront landowners that address better yard management practices, riparian buffer design, and how to mitigate shoreline erosion		

Section 10. Funding, Tracking and Monitoring

10.1 Funding

Each project in **Section 9.3** lists potential funding sources based on the type of project, most funding sources identified are at the State level, but there are federal funding sources as well.

10.2 State Funding Opportunities

New York State Department of Environmental Conservation (NYSDEC)

- Water Quality Improvement Program (WQIP): A competitive program administered by the NYSDEC that funds projects that directly address documented water quality impairments or protect a drinking water source. Individual programs include:
    - Land acquisition for source water protection
    - Construction of Salt Shed
    - Wastewater Treatment Improvement
    - Aquatic Connectivity Restoration
    - Non-Agricultural Nonpoint Source Abatement and Control
- Invasive Species Grant Program: Supports projects that target both aquatic and terrestrial invasive species.
- Non-Agricultural Non-Point Source Planning and MS4 Mapping Grants: Provides funds for planning reports for nonpoint source water quality improvement projects and mapping of MS4s.

New York State Department of State (NYSDOS):

- Brownfield Opportunity Area (BOA) Program: Provides communities with grant funding and technical assistance to develop area-wide plans to effectively redevelop brownfields and other vacant and abandoned sites, transforming them into catalytic properties that facilitate community investment and improvement.
- Local Waterfront Revitalization Program (LWRP), implementation: Funding for the implementation of project identified in an LWRP is available through this program with funding from the NYS Environmental Protection Fund (EPF).
- Smart Growth Comprehensive Planning Grant Program: Provides funding to communities to develop a comprehensive plan document that addresses Smart Growth Principles and develop goals and a comprehensive strategy for the best and most efficient use of those resources, propose future projects and adopt a local plan that will guide appropriate development and promote Smart Growth.

New York State Environmental Facilities Corporation (NYSEFC):

- Water Infrastructure Improvement Act (WIIA): Competitive grants to help municipalities fund water quality infrastructure projects. WIIA grants are available for wastewater and drinking water projects that protect or improve water quality and/or protect public health.
- Green Innovation Grant Program (GIGP): Provides funding for projects that improve water quality and incorporate green stormwater infrastructure.
- Engineering Planning Grant Program (EPG): Offers grants to municipalities to help pay for the initial planning of eligible Clean Water State Revolving Fund water quality projects.

New York State Department of Transportation (NYSDOT):

- BridgeNY: Funding available to local governments to rehabilitate and replace bridges and culverts throughout New York State. Projects are evaluated based on the resiliency of the structure, the significance of the bridge, and the current condition of the infrastructure.
- Transportation Alternatives Program (TAP): Provides funding for roadway improvements and culvert and bridge replacements, as well as pedestrian and bicycle paths.

New York State Environmental Bond Act

- The Bond Act was approved by New Yorkers in 2022, making $4.2 billion available for environmental and community projects. State agencies, local governments, and partners can access funding to protect water quality, help communities adapt to climate changes, improve resiliency, and create green jobs. Bond Act funding will support new and expanded projects across the state to safeguard drinking water sources, reduce pollution, and protect communities and natural resources from climate change. Priorities of the Bond Act include advancing environmental justice, job creation, climate change mitigation, and the protection of natural resources.

New York State Homes and Community Renewal:

- Community Development Block Grants (CDBG): Funding for drinking water, clean water and stormwater, and public works. Green Infrastructure components may be a part of larger public infrastructure projects funded through this program.

10.3 Federal Funding Opportunities:

Lake Champlain Basin Program (LCBP):

- LCBP coordinates and funds efforts that benefit the Lake Champlain Basin's water quality, fisheries, wetlands, wildlife, recreation, and cultural resources, in partnership with government agencies from New York, Vermont, Quebec, private organizations, local communities, and individuals. As part of the Lake Champlain Basin, municipalities within the Lake George watershed are eligible for this funding source which includes numerous funding categories available on an annual basis.

Northern Border Regional Commission (NBRC):

- Catalyst Program: This program makes available funding for infrastructure and non-infrastructure projects that stimulate growth and inspire partnerships for rural economic vitality in the northern border region. All counties within the Lake George Watershed are eligible for NBRC funding.

United State Economic Development Administration (USEDA):

- Public Works Program: This program invests in communities to revitalize, expand, and upgrade their physical infrastructure to attract new industry; encourage business expansion, diversify local economies, and generate job growth. The program invests in technology-base infrastructure as well as traditional public works projects such as water and sewer improvements, industrial parks, and brownfield redevelopment.

10.4 Implementation, Tracking, and Monitoring

Ongoing implementation.

Implementation of the Watershed Action Plan for Lake George is an ongoing process that will continue for many years. Projects identified within the document will be completed and new projects will be developed, as such, the plan should be updated every five to ten years based on the progress of implementation and changing conditions and priorities within the watershed. Lake George Watershed municipalities and project partners will continue to collaborate to apply for funding to implement the projects identified within this plan.

Tracking and Monitoring.

Tracking and documenting the success and progress of water quality improvements resulting from the implementation of this plan is imperative to understanding the connection between the recommended actions and water quality and ecosystem health. The projects recommended in **Section 9.3** include anticipated time frames for implementation that can be used to monitor and track these projects over time. Short-term projects should be undertaken within one to three years, medium-term in three to six years, and long-term projects are those which will take more than six years to fully implement. The project charts also identify project partners that may be involved in the implementation of each project and include municipalities, counties, soil and water conservation districts, LCLGRPB, lake associations, state entities and other organizations.

It's important that the project partners work together throughout implementation to track and monitor the progress of the recommendations of this Plan. The LCLGRPB will serve as a clearinghouse to track project implementation. Each year, LCLGRPB will send out a questionnaire to project partners and WAC committee members to monitor progress and implementation of plan recommendations. The findings of those questions will be maintained in a database available on the LCLGRPB website. Additionally, the project chart will be updated yearly, at which point completed projects will be indicated as such, implementation time frames will be adjusted as needed, and new projects will be added to the list.

Project partners will monitor water quality data including CSLAP and other data sources. Project prioritization will shift based on any new and emerging contaminants and water quality concerns that are found. Using this information, members of the WAC will convene and identify new projects, update project prioritization, and identify funding sources and implementation partners.

When applicable, LCLGRPB will calculate pollutant reduction loads achieved through project implementation by running the project parameters through the NYSDEC Pollutant Load Reduction Calculator. This calculator will allow watershed partners to quantify the estimated phosphorus, nitrogen, and sediment reductions resulting from the implementation of these water quality improvement projects. Project accomplishments and estimated pollutant load reductions will be reported on an annual basis by LCLGRPB.

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Appendix A. Summary of Survey Findings and Community Outreach Events

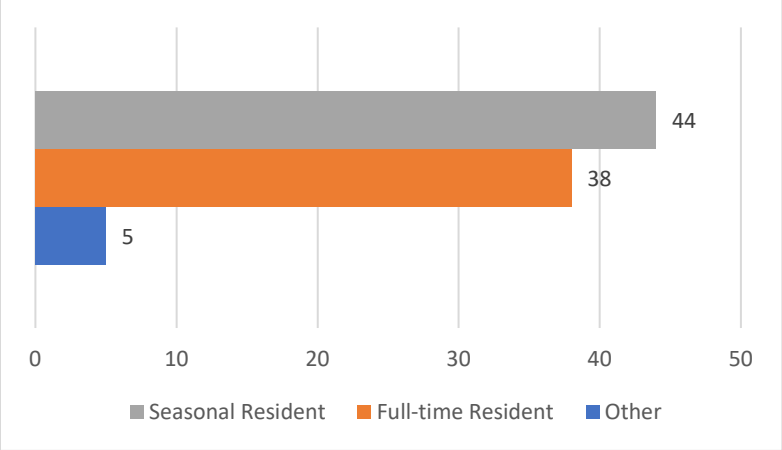
The Lake George Watershed Action Plan Community Outreach Survey was available on the online survey platform Jotform from August 27, 2021, to October 21, 2021. The survey was promoted at public outreach events held in Bolton Landing on September 1, 2021, and in Ticonderoga on September 25, 2021, as well as through social media and email promotion by committee members. The purpose of this survey is to gain a better understanding of how people use the lake, how users perceive the quality of the lake, and to gage what is important to them in terms of water quality and water quality protection.

A total of 88 individual responses were collected. Many questions allowed for multiple answers and write in responses, these are indicated throughout this report. Many questions were left blank by respondents.

Question: Are you a full-time resident, seasonal resident, or visitor to the Lake George Watershed?

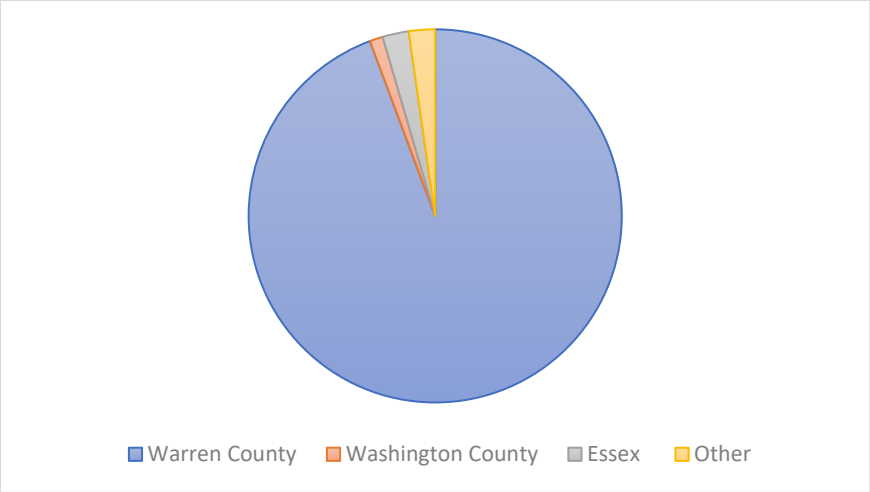
87 Responses, 2 No Response

44 of those who responded to this question were seasonal residents, followed by 38 full-time residents and 5 other responses. Other responses include employee, business owner and year-round weekend resident.



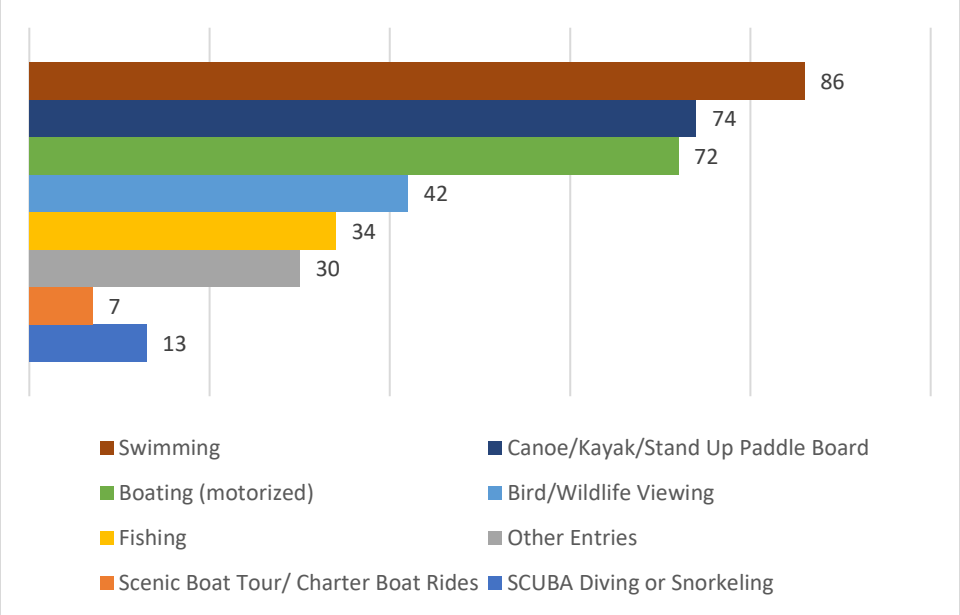
In which county do you reside or are you visiting?

The majority of respondents to this survey were from Warren County (94%) while 2% were from Essex County, 1% were from Washington County and 2 did not answer the question.



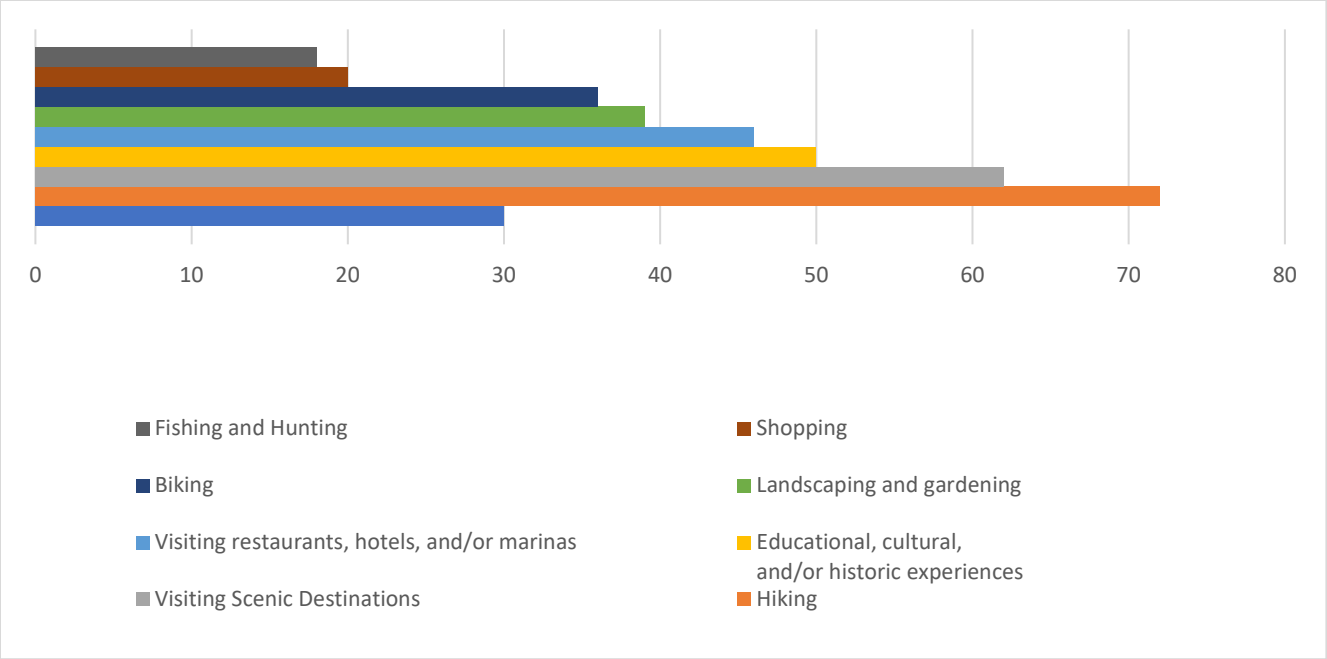
Question: What activities do you enjoy in Lake George? (Multiple responses allowed)

The most popular activity among respondents is swimming, followed by canoe/kayak/stand up paddleboards and motorized boating. There were 30 "other" entries which included: camping, hiking, waterskiing, sailing, and general scenery viewing.



Question. What activities do you enjoy in the Lake George Watershed?

The most common response was hiking, visiting scenic destinations and educational, cultural and/or historic experiences. Those who responded "other" enjoy outdoor activities like cross country skiing, playing pickleball, walking, and enjoying peace and quiet. Multiple answers were accepted for this question.



Question. How would you rate the water quality of Lake George

Repondents were asked rate the water quality of Lake George from 1 to 5 starts, 1 being "poor" and 5 being "excellent". The majority of respondents selected 4 stars and the average response was 4.09 stars.

4.09
Avg. Response

81
Responses

Data	Response	%
★★★★★	28	35%
★★★★☆	36	44%
★★★☆☆	13	16%
★★☆☆☆	4	5%
★☆☆☆☆	0	0%

Respondents who chose less than excellent (5 stars) for the previous questions were provided with a text box to describe why they felt this way. Ques in this question asked about the factors that led to their selection and if this was a change they had seem over time. A summary of responses is below:

- Reductions in water clarity over time, additional algae present in the lake.
- Invasive species

- Harmful Algal Blooms (HABS)
- Increased salt levels in the lake
- More boats
- Aging septic systems
- No longer feel comfortable drinking untreated lake water

Community Outreach #1

Bolton Landing Farmer's Market, Bolton Landing, New York

On September 2, 2021, Allison Gaddy from Lake Champlain Lake George Regional Planning Board and Sue Tucker from the Warren County Planning Department attended the Bolton Landing Farmer's Market to introduce the plan to the public and gather input and opinions.

Photo 1: Community members respond to input boards at the Bolton Landing Farmer's market on September 2, 2021.

Summary of Findings

Approximately 35 people, both residents and visitors, stopped to talk about the plan. All were supportive and expressed their own personal interest in maintaining and improving the quality of Lake George.

Improperly functioning septic systems and municipal wastewater treatment facilities was the primary concern from those interviewed, followed by invasive species management.

Attendees also commented on an observed decrease in clarity of the lake over time, a potential change in fisheries, and a concern about the State DOT's use of pesticides on some roadways in the watershed. So far, one attendee from the Farmer's Market has responded to the online survey.

The next public outreach will be conducted on September 25th during the Ticonderoga Fall Fest at Bicentennial Park.

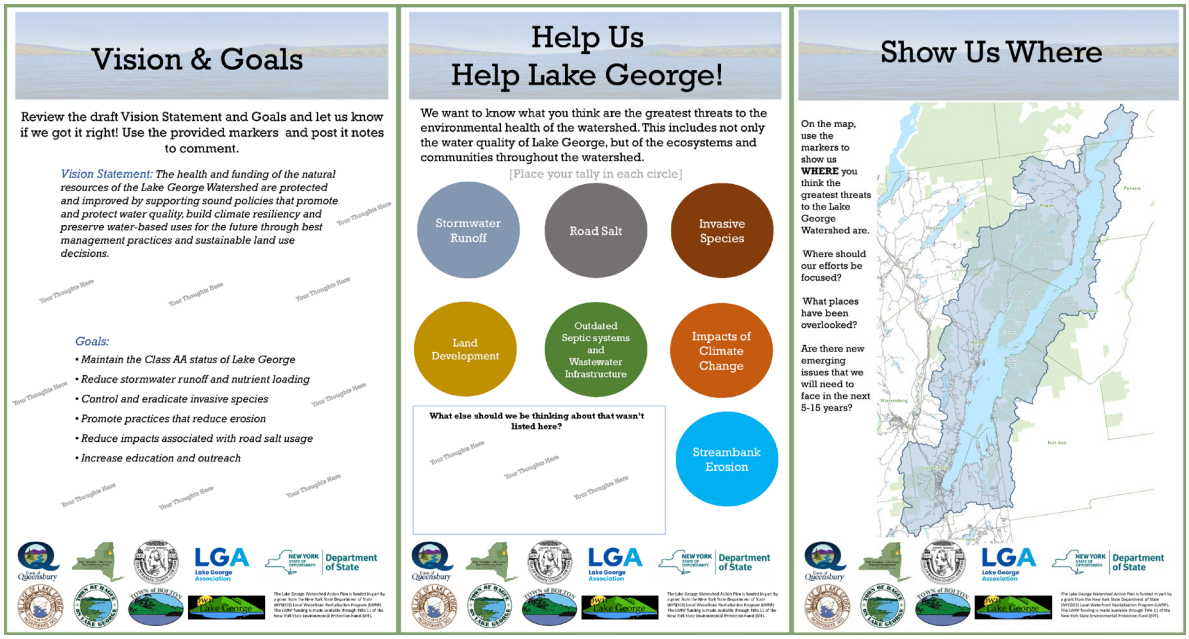


Photo 2: Outreach boards provided for context and comment at the Bolton Landing Farmer's Market on September 2, 2021.

This report was prepared with funding provided by the New York State Department of State under Title 11 of the Environmental Projection Fund.

Community Outreach #2

Ticonderoga Fall Fest, September 25, 2021

On September 25, 2021, Allison Gaddy from Lake Champlain Lake George Regional Planning Board attended the Ticonderoga Fall Fest held at Bicentennial Park in the heart of Ticonderoga. The park was an ideal setting, on the banks of the La Chute River, to introduce the plan to the public and gather input and opinions.

Summary of Findings

Approximately 50 people, both residents and visitors, stopped to talk about the plan. All were supportive and expressed their own personal interest in maintaining and improving the quality of Lake George.

Many who were interviewed expressed concern over litter and debris- old waterlines, anchors, moorings, etc.- in the water.

While attendees were generally aware of all the issues identified on the project boards, invasive species and impacts from climate change were the topics of most concern to those who commented. So far, three attendees of Fall Fest have responded to the online survey.

One more public outreach event will be held during this planning Process. The survey will be closed on October 20, 201.

Photo 1: Community members respond to input boards at the Ticonderoga Fall Fest on September 25, 2021.

Photo 2: Outreach boards provided for context and comment at the Ticonderoga Fall Fest on September 25, 2021

This report was prepared with funding provided by the New York State Department of State under Title 11 of the Environmental Projection Fund.

Community Outreach #3

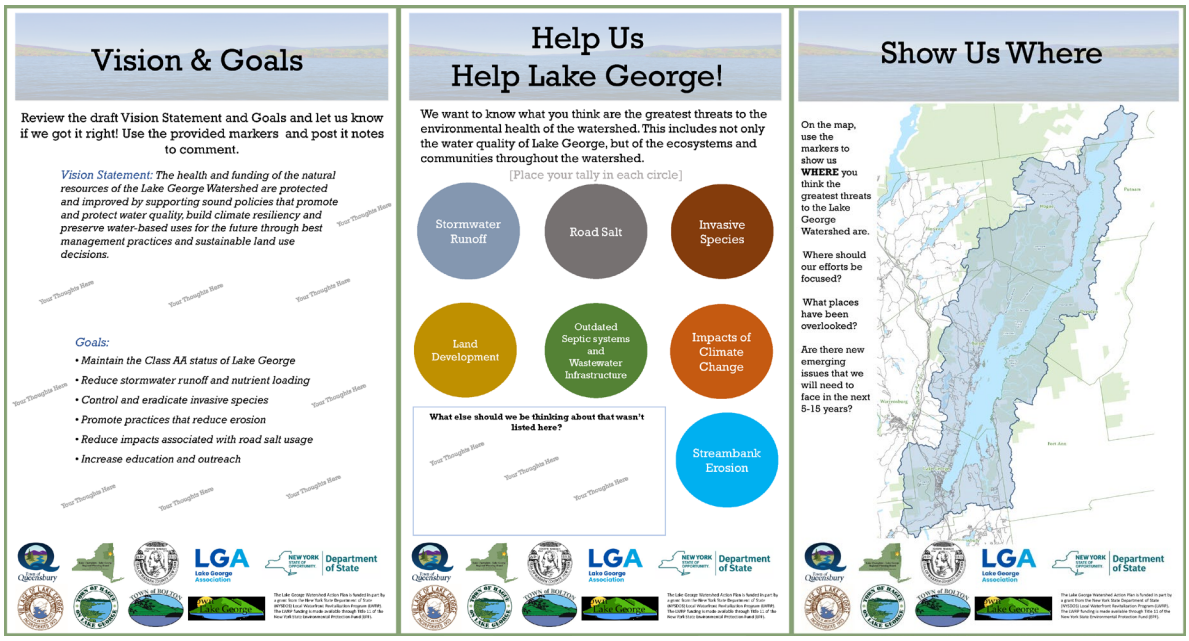
Town of Queensbury Activity Center, February 17, 2022

On February 17, 2022, Allison Gaddy and Sam Blake from Lake Champlain Lake George Regional Planning Board along with Stu Baker, from the Town of Queensbury hosted a public workshop at the Queensbury Activity Center located in the town municipal complex. Boards were set up along either side of the center and markers and sticky notes were provided for attendees to provide feedback on the plan so far.

Summary of Findings

Allison Gaddy began the workshop by outlining the purpose of the plan and presenting the draft goals and vision statement that has been crafted by the WAC and through previous community workshops/outreach. Attendees asked questions, particularly about the reach and scope of the watershed action plan. Ms. Gaddy explained that this plan is not a policy document but may provide a basis for municipalities to create policies directed at water quality improvement around the lake.

Approximately 10 people attended this workshop. Participation was lower than expected due to inclement weather conditions. Most attendees were residents of the Town of Queensbury and much of the discussion focused on municipal regulations and new developments proposals and approvals around the southern end of Lake George.



Outreach boards provided for context and comment at February workshop.

This report was prepared with funding provided by the New York State Department of State under Title 11 of the Environmental Projection Fund.

Appendix B. Endangered and Threatened Species

Table 14. Endangered and Threatened Species in the Lake George Watershed
Source: NYSDEC, 2014.

Common Name	Group	Distribution Status	State Protection Status
Peregrine Falcon	Birds	Recently Confirmed	Endangered
Short-eared Owl	Birds	Recently Confirmed	Endangered
Bald Eagle	Birds	Recently Confirmed	Threatened
Henslow's Sparrow	Birds	Recently Confirmed	Threatened
Least Bittern	Birds	Recently Confirmed	Threatened
Northern Harrier	Birds	Recently Confirmed	Threatened
Pied-billed Grebe	Birds	Recently Confirmed	Threatened
Sedge Wren	Birds	Recently Confirmed	Threatened
Upland Sandpiper	Birds	Recently Confirmed	Threatened
Karner Blue	Butterflies and Moths	Recently Confirmed	Endangered
Frosted Elfin	Butterflies and Moths	Recently Confirmed	Threatened
Round Whitefish	Fish	Possible but not Confirmed	Endangered
Eastern Sand Darter	Fish	Recently Confirmed	Threatened
Indiana Bat	Mammals	Recently Confirmed	Endangered
Northern Long-eared Bat	Mammals	Recently Confirmed	Threatened
Bog Turtle	Reptiles	Historically Confirmed	Endangered
Timber Rattlesnake	Reptiles	Recently Confirmed	Threatened
Blunt-lobe Grape Fern	Ferns and Fern Allies	Historically Confirmed	Threatened
Marsh Horsetail	Ferns and Fern Allies	Recently Confirmed	Threatened
Meadow Horsetail	Ferns and Fern Allies	Recently Confirmed	Threatened
Smooth Cliff Brake	Ferns and Fern Allies	Historically Confirmed	Threatened
Auricled Twayblade	Flowering Plants	Recently Confirmed	Endangered
Black Sedge	Flowering Plants	Recently Confirmed	Endangered
Buttonbush Dodder	Flowering Plants	Historically Confirmed	Endangered
Canadian Single-spike Sedge	Flowering Plants	Recently Confirmed	Endangered
Carey's Smartweed	Flowering Plants	Historically Confirmed	Endangered
Cat-tail Sedge	Flowering Plants	Recently Confirmed	Endangered
Clinton's Club Sedge	Flowering Plants	Recently Confirmed	Endangered
Downy Lettuce	Flowering Plants	Recently Confirmed	Endangered
Downy Wood Mint	Flowering Plants	Historically Confirmed	Endangered
Dwarf Bilberry	Flowering Plants	Historically Confirmed	Endangered
Dwarf Bulrush	Flowering Plants	Recently Confirmed	Endangered
Elk Sedge	Flowering Plants	Historically Confirmed	Endangered
Fairywand	Flowering Plants	Historically Confirmed	Endangered
Georgia Bulrush	Flowering Plants	Historically Confirmed	Endangered
Green Parrot's Feather	Flowering Plants	Historically Confirmed	Endangered

Hooker's Orchid	Flowering Plants	Recently Confirmed	Endangered
Hudson River Water Nymph	Flowering Plants	Historically Confirmed	Endangered
Lindley's Aster	Flowering Plants	Historically Confirmed	Endangered
Lowland Yellow Loosestrife	Flowering Plants	Recently Confirmed	Endangered
Mare's Tail	Flowering Plants	Historically Confirmed	Endangered
Marsh Valerian	Flowering Plants	Historically Confirmed	Endangered
New England Violet	Flowering Plants	Recently Confirmed	Endangered
Northeastern Bulrush	Flowering Plants	Extirpated	Endangered
Northern Bog Violet	Flowering Plants	Historically Confirmed	Endangered
Northern Wild Comfrey	Flowering Plants	Historically Confirmed	Endangered
Nottoway Brome Grass	Flowering Plants	Historically Confirmed	Endangered
Orange Fringed Orchid	Flowering Plants	Historically Confirmed	Endangered
Ovate Spike Rush	Flowering Plants	Historically Confirmed	Endangered
Pinedrops	Flowering Plants	Historically Confirmed	Endangered
Prickly Rose	Flowering Plants	Historically Confirmed	Endangered
Purple Bluets	Flowering Plants	Historically Confirmed	Endangered
Puttyroot	Flowering Plants	Recently Confirmed	Endangered
Riverbank Goldenrod	Flowering Plants	Historically Confirmed	Endangered
Slender Bulrush	Flowering Plants	Recently Confirmed	Endangered
Small White Lady's Slipper	Flowering Plants	Historically Confirmed	Endangered
Small Whorled Pogonia	Flowering Plants	Historically Confirmed	Endangered
Small's Knotweed	Flowering Plants	Historically Confirmed	Endangered
Smooth Whitlow Grass	Flowering Plants	Recently Confirmed	Endangered
Southern Bluets	Flowering Plants	Historically Confirmed	Endangered
Southern Snailseed Pondweed	Flowering Plants	Historically Confirmed	Endangered
Southern Swamp Buttercup	Flowering Plants	Historically Confirmed	Endangered
Sparse-flowered Sedge	Flowering Plants	Recently Confirmed	Endangered
Spurred Gentian	Flowering Plants	Recently Confirmed	Endangered
Sticky False Asphodel	Flowering Plants	Recently Confirmed	Endangered
Straight-leaved Pondweed	Flowering Plants	Recently Confirmed	Endangered
Straw Sedge	Flowering Plants	Historically Confirmed	Endangered
Sweet Coltsfoot	Flowering Plants	Historically Confirmed	Endangered
Virginia Ground Cherry	Flowering Plants	Historically Confirmed	Endangered
Water Awlwort	Flowering Plants	Recently Confirmed	Endangered
Whip Nut Sedge	Flowering Plants	Recently Confirmed	Endangered
Alternate-flowered Water Milfoil	Flowering Plants	Recently Confirmed	Threatened
Back's Sedge	Flowering Plants	Recently Confirmed	Threatened
Blunt Mountain Mint	Flowering Plants	Historically Confirmed	Threatened
Brown Bog Sedge	Flowering Plants	Recently Confirmed	Threatened

Canada Rice Grass	Flowering Plants	Recently Confirmed	Threatened
Clustered Sedge	Flowering Plants	Recently Confirmed	Threatened
Cork Elm	Flowering Plants	Historically Confirmed	Threatened
Crawe's Sedge	Flowering Plants	Recently Confirmed	Threatened
Creeping Sedge	Flowering Plants	Recently Confirmed	Threatened
Culver's Root	Flowering Plants	Historically Confirmed	Threatened
Douglas' Knotweed	Flowering Plants	Recently Confirmed	Threatened
Dragon's Mouth Orchid	Flowering Plants	Recently Confirmed	Threatened
Drummond's Rock Cress	Flowering Plants	Historically Confirmed	Threatened
Dwarf Cherry	Flowering Plants	Recently Confirmed	Threatened
False Hop Sedge	Flowering Plants	Recently Confirmed	Threatened
Fernald's Sedge	Flowering Plants	Recently Confirmed	Threatened
Golden Corydalis	Flowering Plants	Recently Confirmed	Threatened
Great Plains Flatsedge	Flowering Plants	Recently Confirmed	Threatened
Green Rock Cress	Flowering Plants	Recently Confirmed	Threatened
Handsome Sedge	Flowering Plants	Recently Confirmed	Threatened
Hill's Pondweed	Flowering Plants	Recently Confirmed	Threatened
Houghton's Sedge	Flowering Plants	Historically Confirmed	Threatened
Lake Cress	Flowering Plants	Recently Confirmed	Threatened
New England Northern Reed Grass	Flowering Plants	Historically Confirmed	Threatened
Nodding Pogonia	Flowering Plants	Historically Confirmed	Threatened
Northern Bog Aster	Flowering Plants	Recently Confirmed	Threatened
Oakes' Evening Primrose	Flowering Plants	Historically Confirmed	Threatened
Pink Wintergreen	Flowering Plants	Recently Confirmed	Threatened
Prairie Dropseed	Flowering Plants	Recently Confirmed	Threatened
Primrose-leaved Violet	Flowering Plants	Recently Confirmed	Threatened
Purple Rock Cress	Flowering Plants	Historically Confirmed	Threatened
Ram's-head Lady's Slipper	Flowering Plants	Historically Confirmed	Threatened
Rand's Goldenrod	Flowering Plants	Recently Confirmed	Threatened
Red Pondweed	Flowering Plants	Recently Confirmed	Threatened
Reflexed Sedge	Flowering Plants	Recently Confirmed	Threatened
Rhodora	Flowering Plants	Historically Confirmed	Threatened
Rock Whitlow Grass	Flowering Plants	Recently Confirmed	Threatened
Rough Avens	Flowering Plants	Historically Confirmed	Threatened
Rough Pennyroyal	Flowering Plants	Historically Confirmed	Threatened
Small Bur-reed	Flowering Plants	Recently Confirmed	Threatened
Small Floating Bladderwort	Flowering Plants	Recently Confirmed	Threatened
Swamp Lousewort	Flowering Plants	Historically Confirmed	Threatened
Velvety Bush Clover	Flowering Plants	Historically Confirmed	Threatened
Yellow Giant-hyssop	Flowering Plants	Recently Confirmed	Threatened
Yellow Wild Flax	Flowering Plants	Historically Confirmed	Threatened

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