Watershed Action Plan for Lake George
Community Outreach Plan

Contract #C1000678

Task 4

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

NEW YORK STATE OF OPPORTUNITY. Department of State

Watershed Action Plan for Lake George

Project Background

Town of Queensbury received grant from the New York State Department of State to develop a Watershed Action Plan for Lake George that will guide future actions for the protection and improvement of the watershed and the lake. The Plan will include watershed wide and site-specific recommendations for water quality protection and improvements. The Town has contracted with the Lake Champlain Lake George Regional Planning Board to lead the planning effort and the Warren County Planning Department for grant administration. Local match will be provided for this grant through the volunteer hours of the eligible members of the Watershed Advisory Committee and the Steering Committee.

Overview

The Lake George watershed covers 233 square miles and includes land in three counties: Warren, Washington and Essex, and nine municipalities including the Towns of Lake George, Bolton, Hague, Ticonderoga, Putnam, Dresden, Fort Ann, and Queensbury, as well as the Village of Lake George.

Known pollutants in Lake George include silt/sediment, invasive species and pathogens. Identified sources of pollutants are streambank and road bank erosion, urban and stormwater runoff, and onsite wastewater treatment systems. This watershed action plan will address these and other identified impairments within Lake George and the Lake George Watershed by developing watershed wide and site-specific recommendations for water quality protection and improvements.

This public participation plan identifies an array of outreach mechanisms to achieve this goal including hosting community outreach sessions to solicit input in defining and characterizing the issues within the watershed, reviewing and discussing water quality protection and restoration issues, and identifying water resource priorities and pollutant concerns.

Elements of the Plan

- Utilizing Websites, Social Media, and Web Conferencing Platforms
- Watershed Advisory Committee meetings
- Steering Committee meetings
- Lake George Partnership meetings
- Community Workshops (3)
- Public Outreach Working Groups
- Consultations, Discussions, and Reporting

Key Partners

- Town of Queensbury
- Lake George Partnership Membership
- Warren County Planning Department
- Lake Champlain Lake George Regional Planning Board

- New York State Department of State
- Warren County Soil and Water Conservation District
- Essex County Soil and Water Conservation District
- Washington County Soil and Water Conservation District
- Lake George Land Conservancy
- Lake George Association
- Lake George Park Commission
- Washington County Planning Department

Key Contacts

John Strough Supervisor, Town of Queensbury	Christopher Belden Assistant Directory, Warren County Planning Department	Allison Gaddy Senior Planner, Lake Champlain Lake George Regional Planning Board
742 Bay Road Queensbury, NY 12804 518-761-8200 johns@queensbury.net	1340 U.S. Route 9 Lake George, NY 12845 518-761-6553 BeldenC@warrencountyny.gov	PO Box 765 Lake George, NY 12845 518-668-5773 Allison.gaddy@lclgrpb.org

Watershed Advisory Committee Members

Members of the Watershed Advisory Committee (WAC) will take a lead role in the direction and development of this plan. The WAC will facilitate communication and cooperation with involved local governments, State agencies, and other stakeholders essential to preparation and implementation of the watershed plan. The committee will help focus the planning process and assist in the creation of and review of work products.

Beth Gilles	LCLGRPB	Beth.gilles@lclgrpb.org
Allison Gaddy	LCLGRPB	Allison.gaddy@lclgrpb.org
Chris Belden	Warren County Planning Dept.	beldenc@warrencountyny.gov
Kate Hogle	NYSDOS	Katherine.Hogle@dos.ny.gov
Randy Rath	Lake George Association	rrath@lakegeorgeassociation.org
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Joe Thouin	Lake George Park Commission	Joe@lgpc.state.ny.us
Dan Barusch	Town/Village of Lake George	dbarusch@lakegeorgetown.org
Monica Dore	Lake George Land Conservancy	mdore@lglc.org
Stu Baker	Town of Queensbury	stuartb@queensbury.net
Jim Lieberum	Warren County SWCD	Jim99@nycap.rr.com
Pamela Landi	Washington County Planning Dept.	plandi@washingtoncountyny.gov
Alice Halloran	Essex County SWCD	ahalloran@westelcom.com
Laura Generous	Washington County SWCD	Laura.generous15@gmail.com

Steering Committee Members

The Steering Committee will receive updates from the WAC and review and provide comments on work products produced by LCLGRPB and members of the WAC. The Steering Committee is comprised of local and State officials and representatives from other stakeholder groups.

Ron Conover	Town of Bolton	supervisor@town.bolton.ny.us
John Strough	Town of Queensbury	johns@queensbury.net
Edna Frasier	Town of Hague	supervisor@townofhague.org
Joseph Giordano	Town of Ticonderoga	supervisor@townofticonderoga.org
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Carol Collins	Assembly Point WQC	limnolady@aol.com
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Kathy Bozony	Queensbury Clean Energy Committee	kbozony@hotmail.com
Gina Mitzner	Lake George Chamber	gmitzner@lakegeorgechamber.com
Rich Miller	Town of Bolton Planning Dept.	planning@town.bolton.ny.us
Rosemary Pusateri	Cleverdale Rockhurst Lake Stewards	Pusateri14@aol.com

Outreach Efforts

I. Social Media, Web Conferencing Platforms and Project Website

In order to maintain a robust public outreach project partners will be creating a Facebook page and website devoted to this plan. Meeting notifications, meeting minutes, and plan updates will be provided through these sources. The project website will be linked to the websites of the Town of Queensbury and Lake Champlain Lake George Regional Planning Board. The project website will be created and maintained in a way that is compliant with Title III of the Americans with Disabilities Act (ADA). Chris Belden of the Warren County Planning Department will serve as the point of contact for website ADA accessibility questions and concerns.

In accordance with the New York State on Pause Executive Order, project meetings will be held using the web conferencing platform, Zoom, and streamed on the LCLGRPB YouTube Channel for public viewing, this will also provide a platform for the public to ask questions and provide feedback in real-time. The public notification will provide the web address of the YouTube Channel and a call-in number will be provided upon request. Meetings will be recorded and posted on the project website. Public comment and questions, when appropriate, will be accepted for five days following the scheduled meeting and questions will be answered by e-mail no later than 15 days following the close of the meeting. Meeting minutes will be posted on the project website no later than two weeks following the scheduled meeting. Hard copies of meeting materials will be provided upon request from LCLGRPB.

Meetings may be held in-person following the expiration of the Pause Executive Order, and will continue to follow this notification and outreach plan.

II. Watershed Advisory Committee (WAC) Meetings

Purpose: Oversee creation and direction of project in cooperation with the Steering Committee, Lake George Partnership membership, municipal officials, LCLGRPB and the public. The members of the WAC were selected to bring unique perspectives to the planning process based on their professional capacity, expertise, and individual communities.

Membership: Identified above.

Public Participation: All meetings are open to the public.

Notification: Meetings will be noticed no fewer than 10 days prior to the schedule meeting. Meeting announcements will be sent by email to all participants, posted on the project social media pages and website, and noticed in local publications including the Post Star, the Sun Community New and the Lake George Mirror, as well as on the Town of Queensbury and Warren County events calendars.

Schedule: As needed throughout the life of the contract.

III. Steering Committee

Purpose: Receive updates from the WAC and review and provide comments on work products produced by LCLGRPB and the WAC. The Steering Committee will assist in facilitating public input by attending and moderating Public Outreach Working Groups.

Membership: Members are identified above.

Public Participation: All Steering Committee meetings are open to the public.

Notification: Meetings will be noticed by email to all participants, on the project social media pages and website, as well as on the Town of Queensbury and Warren County events calendars.

Schedule: As needed throughout the life of the contract.

IV. Lake George Partnership Meetings

Purpose: The purpose of this partnership is to bring together diverse groups with a shared interest of protecting and preserving water quality in Lake George and its watershed.

Membership: County and municipal officials, other governmental entities, nonprofit entities, and residents from around the Lake George watershed.

Public Participation: All meetings are open to the public.

Notification: Meetings are noticed in the Post Star, Lake George Mirror and the Sun Community News, announced by email and posted on the Town of Queensbury and Warren County events calendar.

Schedule: Quarterly and more frequently, as needed.

V. Community Workshops

Purpose: Obtain input from participating community members, regarding the definition and characterization of water quality and natural resources

Participants: Members of the WAC and Steering Committee, community organizations, and members of the public.

Notification: Meetings will be noticed no fewer than 10 days prior to the schedule meeting. Meeting announcements will be sent by email to all participants, posted on the project social media pages and website, and noticed in local publications including the Post Star, the Sun Community New and the Lake George Mirror, as well as on the Town of Queensbury and Warren County events calendars.

Schedule: A total of three workshops will be held throughout the planning process.

Deliverables: Three workshops will be held throughout the life of the contract. Sign-in sheets, workshop summaries and photos will be submitted to the Department.

VI. Public Outreach Working Groups

Purpose: In recognition that there are many user groups throughout Lake George, working groups will be held throughout the planning process in order to get a diversity of input and to achieve a greater understanding of the needs and priorities of each user group. Subjects for working groups may include, but are not limited to: Business, Municipal Operations, Land Use Regulations, School and Camps, Recreation and Education.

Participation: Members of the public and relevant interest groups will be invited by LCLGRPB, WAC and Steering Committee to attend.

Notification: Meetings will be noticed no fewer than 10 days prior to the schedule meeting. Meeting announcements will be sent by email to all participants, posted on the project social media pages and website, and noticed in local publications including the Post Star, the Sun Community New and the Lake George Mirror, as well as on the Town of Queensbury and Warren County events calendars.

Schedule: As appropriate throughout the life of the contract.

Deliverables: Sign-in sheets, meeting notes and photos will be submitted to the department.

VII. Consultation, Discussions and Reporting

Purpose: All project reporting is done by the Warren County Planning Department and the Town of Queensbury with support from the Lake Champlain Lake George Regional Planning Board.

Participants: Town of Queensbury, Warren County Planning Department, and Lake Champlain Lake George Regional Planning Board.

Notification: E-mail among participants.

Schedule: Regular quarterly progress reports.

Contract #C1000678
Task 7: Assessment of the Waterbody and Watershed Resources
June 8, 2021

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

Assessment of the Waterbody and Watershed Resources

Lake George and the 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. 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.

Lake George is approximately 32 miles long and flows south to north, emptying into the LaChute 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 and boasting over 170 islands with 180 miles of irregular and varied shoreline.

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 have an impact on the lake and its environmental features. Some conditions of Lake George and its watershed have remained unchanged since the 2001 publication of *Lake George – Planning for the Future*, while many others have changed. This chapter serves as a snapshot of the current conditions within the Lake George Watershed.

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 infiltrations rates. 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 (McClellan, 1986, and Shuster, 1994).

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 occurs 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 eroded in water deptchs less than 20 meters. Holocene muds, rich in organic matter, generally accumulate in water depths greater than 30 meters and form thick layers, up to 15 meters, in the deep basins (Boylen, 2014).

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. The most prevalent soil type in

the watershed is glacial till, 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 plant and soil organisms. In the 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. Additionally, water moves more quickly and infiltrates more readily in soils the large pores of sandy soil than it does through the small pores of clay soils.

Soil types are classified by the United States Department of Agriculture Natural Resource Conservation Service (NRCS) into four hydrologic soils groups:

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.		

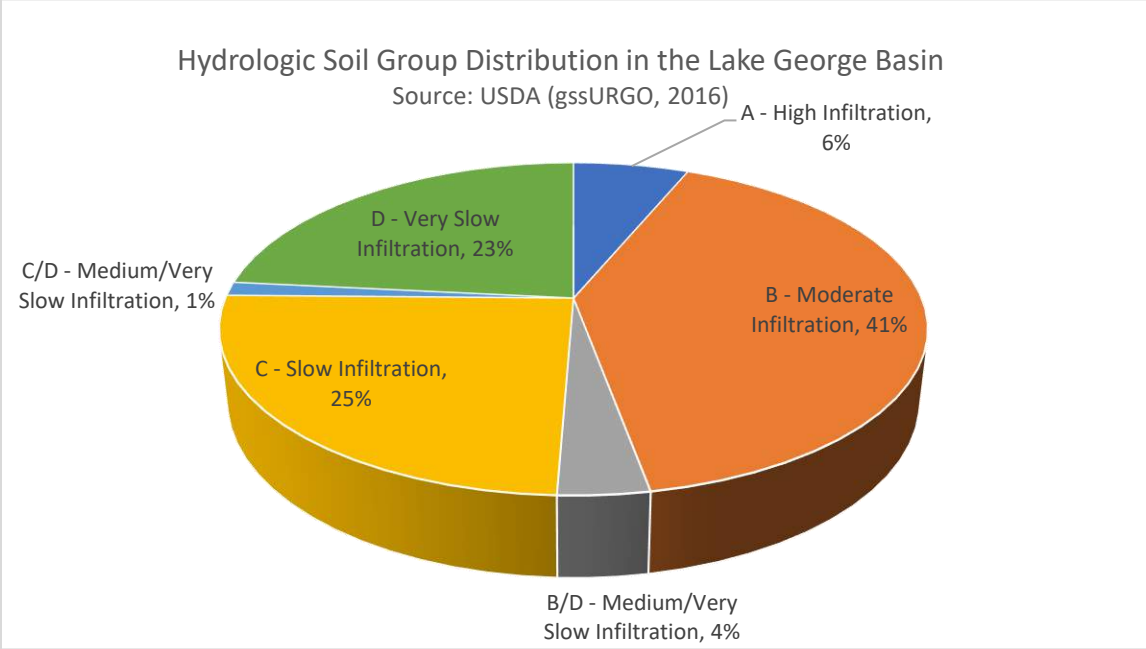


Figure 1: Hydrologic Soil Group Distribution by Percentage. Source: USDA (modelmywatershed.org)

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%) 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.

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. Outflow occurs primarily at the dam and hydroelectric plant on the LaChute River in Ticonderoga at the northern end of the lake.

Surface water inflow is the major water contributor the Lake George, providing approximately 57% of water entering the lake (Shuster, 1994, as cited in Boylen, 2014). In addition to the approximately 141 streams, it is estimated that snowmelt contributes to approximately 24-35% of surface water flow (Madsen, 1989, as cited in Boylen, 2014). 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 ten largest streams drain about 48% of the lake's watershed (Boylen, 2014).

Table 2: Ten Largest Tributaries to Lake George by Watershed Area Source: Lake George Association, 2012 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	4,668	3.9%
Finkle Brook	2,743	2.3%
East Brook	2,147	1.8%
Sucker Brook	1,572	1.3%
Foster Brook	1,176	1.0%
Total	58,107	48.2%

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 (typically about 27%) (Stearns & Wheler, 2001).

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 like improving water quality, providing habitat for wildlife, maintaining ecological productivity, mitigating impacts of storms and flooding, improving water supply, and providing recreational and educational opportunities.

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). Wetlands provide important habitat to rare, threatened, or endangered species. Additionally, these areas provide other functional benefits associated with flood control and improved water quality.

Lake George has very few wetlands due to the geomorphological processes that formed the lake. The steep slopes of the watershed allow for very few areas 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. Dunham's Bay Wetland, a 1,300-acre system borders Lake George at the southeast margin while a 400-acre wetland system is located at the head of Northwest Bay. Smaller wetlands of varying sizes dot the sshoreline in Warner Bay, Huddle Bay, East Brook and the Shelving Rock area. 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).

In the Lake George watershed, X acres (X%) of NYS designated wetlands are Class I and X acres (X%) are Class II. *Waiting for mapping.*

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 44.45 degrees Fahrenheit. The average annual precipitation in the watershed between 1981 and 2010 is between 40 and 50 inches. In general, precipitation here reaches its highest levels in July and August and its lowest in February.

Ecological Communities and Threatened and Endangered Species

The Lake George basin occupies two ecozones. The far northern portion of the basin is located within the Lake Champlain Valley and the remainder of the lake 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.

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.

Table 3: 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

State of the Watershed

Population and Trends

The Lake George Watershed contains all or portions of eleven Towns and one Village across three counties:

Warren County:

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

Washington County:

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

Essex County:

- Town of Ticonderoga

The Lake George Association's 2016 *Lake George Data Atlas* evaluates population trends of the watershed. The following is a summary of those findings.

The population within the watershed has grown steadily since the 1980s, adding nearly 1,700 new full-time residents, an increase of about 20%, between 1980 and 2010 (US Census, 2010). Seasonal residents and vacationers have the potential to increase the watershed's population by more than 270% during peak summer months.

Population and growth are not evenly distributed throughout the watershed. Between 1980 and 2010, the watershed population in the Towns of Bolton, Queensbury and Ticonderoga increased between 29% and 80% while the watershed population in the Village of Lake George, and the Towns of Dresden and Hague decreased during this same period of time.

The Towns of Lake Luzerne and Warrensburg and the communities in Washington County have the smallest populations in the watershed, together accounting for merely 6% of the total 2010 population. In comparison, The Towns of Bolton, Lake George, Queensbury, and Ticonderoga together account for 77% of the watershed population. Lake George had the largest watershed population in 2010 with 2,292 residents, followed by Bolton, Queensbury and Ticonderoga respectively while Lake Luzerne and Warrensburg have few or no watershed residents (The Lake George Association, 2016). *(Note: This information will be updated pending the release of the 2020 US Census this year)*

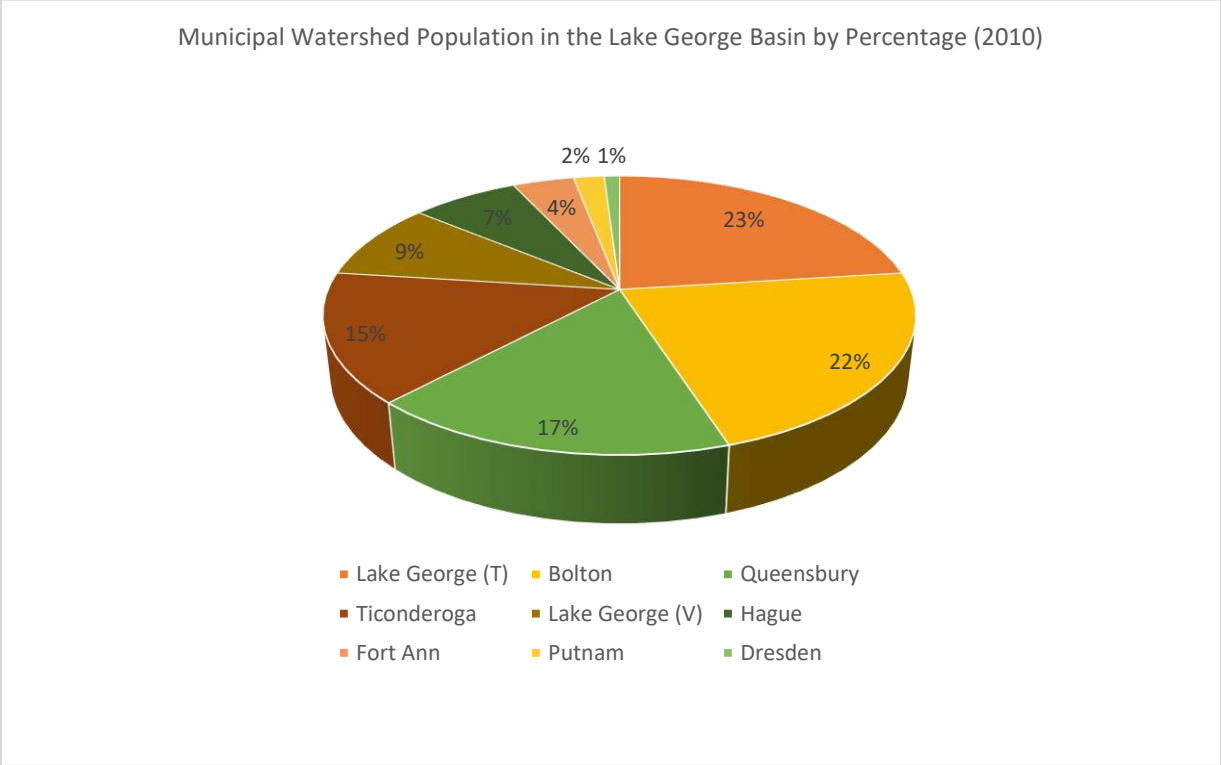


Figure 2: Municipal Watershed Population by Percentage. Source: LGA, 2016 based on 2010 US Census.

Build Out Analysis

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. 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. 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 ahead to manage these. Development has the potential to affect water quality as well as the availability of open space among other things. The result of this analysis may indicate the need for local law review/revision to better guide development and protect local resources that are considered important.

According to this analysis, performed in 2016, the watershed has a potential for over 8,600 new residences, 63% of which could be located 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).

Land Use and Land Cover

Land use and land cover are two tools used to evaluate the extent to which human populations and activities have shaped the natural landscape. Land cover is a classification designating 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, commercial uses among others.

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.

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 in to one of three categories: protected, residential, or undeveloped. Approximately 43% of the watershed is State Forest land, categorized as protected, followed by residential, vacant, and private forest land. 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%.

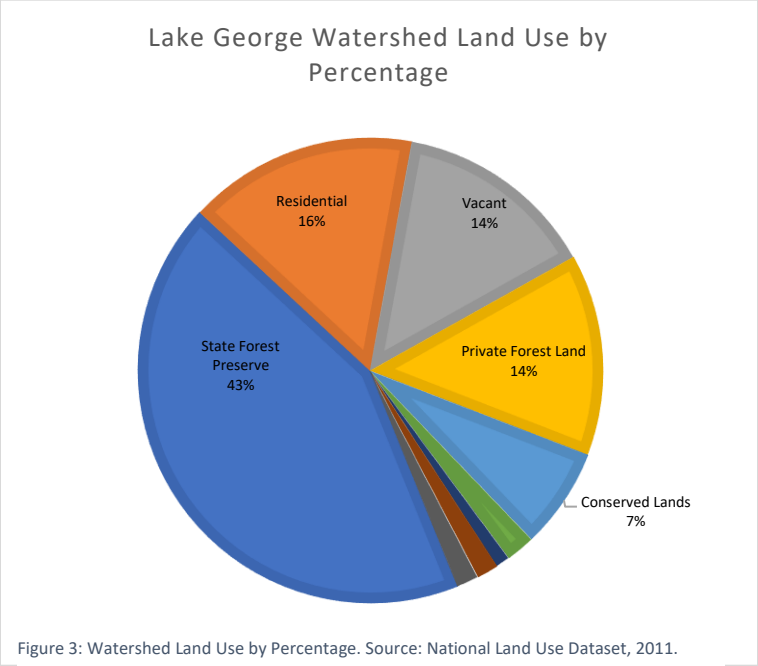


Figure 3: Watershed Land Use by Percentage. Source: National Land Use Dataset, 2011.

Table 5: Land Cover Distribution, Lake George Watershed Source: National Land Cover Dataset (NLCD, 2011)		
Type	Area (km²)	Coverage (%)
Deciduous, Evergreen, Mixed Forest	484.92	71.96%
Open Water	121.35	18.01%
Developed, Open Space	25.77	3.82%
Woody Wetlands	15.78	2.34%
Developed, Low Intensity	7.05	1.05%
Pasture/Hay	6.56	0.97%
Shrub/Scrub	3.93	0.58%
Cultivated Crops	2.8	0.42%
Developed, Medium Intensity	2.35	0.35%
Emergent Herbaceous Wetlands	1.23	0.18%
Grassland/Herbaceous	0.93	0.14%
Developed, High Intensity	0.65	0.10%
Barren Land (Rock/Sand/Clay)	0.13	0.02%

While land use classification identifies how people are using the land, land cover indicates the physical attributes of the land such as forested 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, followed by open water which makes up 18% of the watershed.

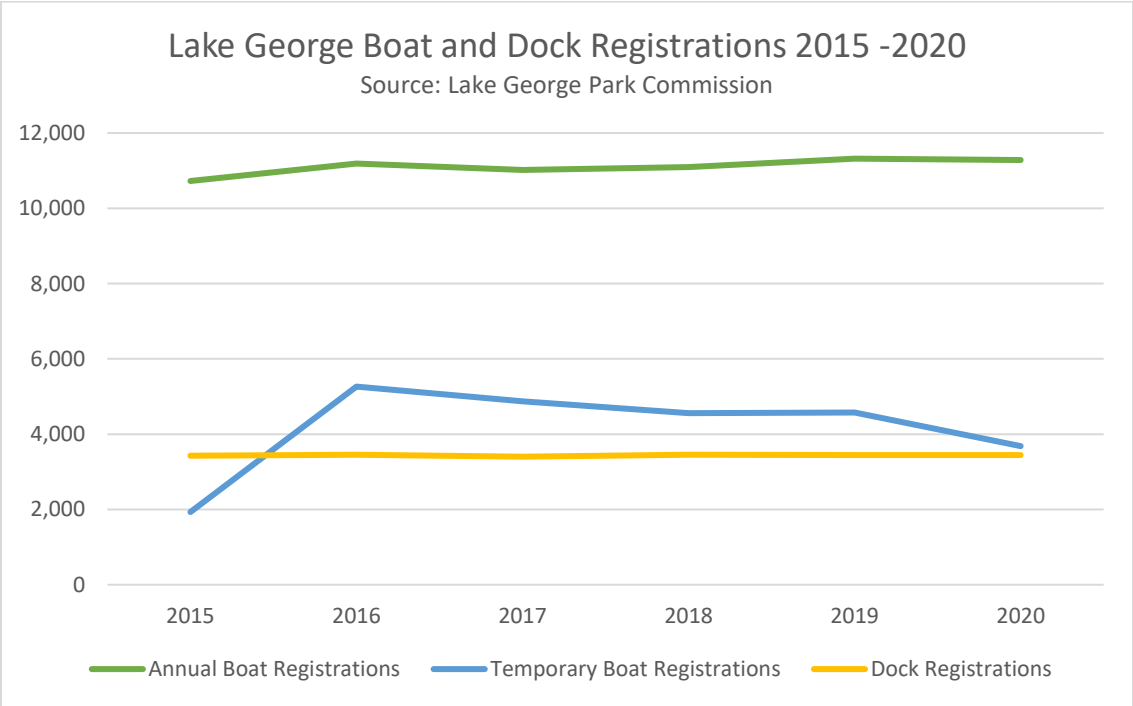
Water quality in a watershed can be greatly affected by the amount of developed or disturbed land. As impervious surfaces from development within a watershed increase, the hydrology of that watershed is altered, leading to a higher percentage of precipitation and snowmelt running off the land surface rather than infiltrating the soil and recharging the ground water.

More narrative when mapping is complete.

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 municipal. The majority of 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 a high level of boating activity in the southern portion of the lake (Lake George Park Commission, 2015).

The Lake George Park Commission is responsible for registering boats and docks in Lake George and collecting data on these activities. Data provide for the years 2015 to 2020 reveal a moderate overall increase in annual boat registrations and dock registrations and a substantial increase in temporary passes between 2015 and 2016 which has tapered off and stabilized to date.



There are three-state run campgrounds, 365 overnight campsites and 116 day use of picnic sites located on 44 state-owned islands and the shorelines of Lake George (Lake George Park Commission, 2015).

In addition to the protected state land and 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 approximately 11,620 acres, most of which is open to the public for recreation purposes. In addition, The Nature Conservancy has approximately 1,500 acres of conserved lands within the watershed.

Infrastructure

The 2016 *Lake George Watershed Data Atlas* compiled by the Lake George Association and the Lake Champlain Lake George Regional Planning Board describes the nature of wastewater, water, and sewer infrastructure in the Lake George Watershed. Development patterns are often influenced by the availability of infrastructure. Within the Lake George watershed, six areas are served by municipal sewer 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 from Lake George itself.

Approximately 35% of residential development within the watershed is served by public sewer and approximately 25% receives public water. The Town of Ticonderoga has the largest sewer district with 1,300 connections, less than half of which are located within the Lake George watershed.

Sewer Service

The Town and Village of Lake George has the greatest number of sewer connections within the watershed, totaling 1,120 including residential and commercial. The Town of Putnam, a portion of which is serviced by Ticonderoga's sewer district, has three connections, the fewest in the watershed.

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.

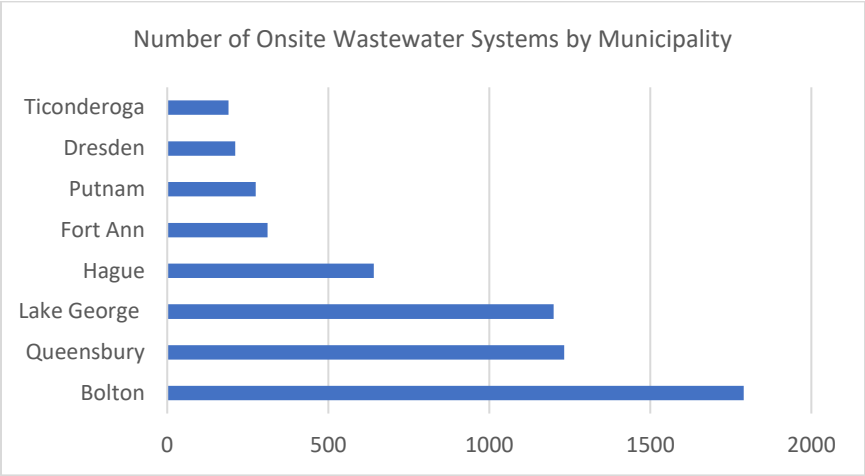


Figure 4: Onsite Wastewater Systems by Municipality. Source LGA, 2016.

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. 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).

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, 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 a non-community water system that serves 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 Isle 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).

Road Network

The *Lake George Watershed Data Atlas* estimates that there are nearly 3,000 acres of roadway in the Lake George watershed. The Town of Bolton has the greatest roadway miles, followed by the Town of Lake George and Hague, the majority of which are local roadways (The Lake George Association, 2016). *Map to indicate where state, county and local roads are located.*

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 the table 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, with the exception of 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 the table 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 are considered impaired by the NYSDEC based on evaluation of their designated uses:

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

Stream Monitoring Data

The Lake George Association 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.

Table 9: Streams Sampled in 2019
Source: Lake George Association, 2019

Stream Name	NYSDEC Assessment	Species Found
Big Hollow Brook	No Known Impact	Common stonefly, Fingernet caddisfly, Spiny crawler mayfly, Giant stonefly, Net-spinning caddisfly, Flatheaded mayfly, Free-living caddisfly, Perlodid stonefly
Butternut Brook	No Conclusion	Flatheaded mayfly, Perlodid stonefly, Northern caddisfly, Crane fly, Clubtail dragonfly, Small minor mayfly, Nonbiting midge, Beetle
Cotton Brook	No Conclusion	Green stonefly, Net-spinning caddisfly, Microcaddisfly
East Brook	No Conclusion	Perlodid stonefly, Fingernet caddisfly, Northern caddisfly, Small minnow mayfly, Spring stonefly, Black fly, Nonbiting midget
Edmunds Brook	No Known Impact	Northern caddisfly, Common stonefly, Giant stonefly, Free-living caddisfly, Flatheaded mayfly, Fingernet caddisfly, Crane fly, Net-spinning

		caddisfly, Spring stonefly, Spiny crawler mayfly, Clubtail dragonfly
Finkle Brook	No Conclusion	Free-living caddisfly, Small minnow mayfly, Common stonefly, Fingernet caddisfly, Net-spinning caddisfly, Black fly, Dobsonfly, Riffle beetle, Roach-like stonefly
Foster Brook (Downstream)	No Known Impact	Clubtail dragonfly, Net-spinning caddisfly, Common stonefly, Giant stonefly, Small winter stonefly
Foster Brook (Upstream)	No Conclusion	Flatheaded mayfly, Common stonefly, Fingernet caddisfly, Net-spinning caddisfly, Giant stonefly, Small winter stonefly
Gage Brook	No Known Impact	Free-living caddisfly, Common stonefly, Crane fly, Giant stonefly, Fingernet caddisfly, Small minnow mayfly, Flatheaded mayfly, Green stonefly, Spiny crawler mayfly
Hague Brook (Downstream)	No Known Impact	Net-spinning caddisfly, Flatheaded mayfly, Crane fly, Dobsonfly, Free-living caddisfly, Saddle-case maker, Small minnow mayfly, Common stonefly, Watersnipe fly, Green stonefly, Spiny crawler mayfly, Riffle beetle
Hague Brook (Upstream)	No Conclusion	Fingernet caddisfly, Common stonefly, Free-living caddisfly, Giant stonefly, Crane fly, Small minor mayfly, Rolled-wing stonefly
Huddle Brook	No Conclusion	Net-spinning caddisfly, Common stonefly, Flatheaded mayfly, Dobsonfly, Fingernet caddisfly
Indian Brook	No Known Impact	Dobsonfly, Net-spinning caddisfly, Free-living caddisfly, Flatheaded mayfly, Common stonefly, Spiny crawler mayfly, Water penny beetle, Fingernet caddisfly, Brushlegged mayfly, Darner, Clubtail dragonfly
Jabe Pond Stream (Downstream)	No Conclusion	Flatheaded mayfly, Clubtail dragonfly, Net-spinning caddisfly, Giant stonefly, small minnow mayfly, Non-biting midge, Early smoky wing sedge, True bug, Tube making caddisfly, Microcaddisfly
Jabe Pond Stream (Upstream)	No Conclusion	Green stonefly, Small minnow mayfly, Flatheaded mayfly, Non-biting midge, True bug, Prong-gilled mayfly, Net-spinning caddisfly, Rolled-wing stonefly, Microcaddisfly
Northwest Bay Brook	No Known Impact	Small minor mayfly, Fingernet caddisfly, Net-spinning caddisfly, Flatheaded mayfly, Common stonefly, Giant stonefly, Brushlegged mayfly, Saddle-case maker, Riffle beetle, Dobsonfly
Shelving Rock Brook	No Known Impact	Flatheaded mayfly, Net-spinning caddisfly, Giant stonefly, Common stonefly, Crane fly, Roach-like stonefly, Dobsonfly, Fingernet caddisfly, Goeridae (caddisfly), Small minnow mayfly
Shelving Rock Brook	No Conclusion	Dobsonfly, Green stonefly, Small minnow mayfly, Flatheaded mayfly, Prong-gilled mayfly, True bug, Combmouthed minnow mayfly, Riffle beetle, Spiketail

Smith Brook	No Known Impact	Giant stonefly, Crane fly, Free-living caddisfly, Small minnow mayfly, Clubtail dragonfly, Fingernet caddisfly, Spiny crawler mayfly, Perlodid stonefly
West Brook (Gage Brook)	No Conclusion	Small minnow mayfly, Green stonefly, Black fly, Northern caddisfly, Bizarre caddisfly, Spiny crawler mayfly, Non-biting midge, Giant casemaker, Rolled-wing stonefly, Pond snail
West Brook (Lake George Recreation Center)	No Known Impact	Perlodid stonefly, Small minnow mayfly, Crane fly, Flatheaded mayfly, Giant stonefly, Net-spinning caddisfly, Fingernet caddisfly, Roach-like stonefly, Rolled-wing stonefly
West Brook (West Brook Road)	No Conclusion	Rolled-winged stonefly, Non-biting midge, Aquatic sow bug
Unnamed Stream (Hague)	No Known Impact	Roach-like stonefly, Watersnipe fly, Fingernet caddisfly, Free-living caddisfly, Flatheaded mayfly, Small minnow mayfly, Net-spinning caddisfly, Common stonefly

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 (Lake George Association, 2019).

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. 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, however no long-term trends have been established (CSLAP, 2019). 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 over the past three decades (The Jefferson Project, n.d.).

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 (The Jefferson Project, n.d.).

The concentration of chlorophyll-a in Lake George has increased by 32% since 1980 but continues to be much lower that many other lakes in the region. Until the Fall of 2020, Lake George had never experienced a confirmed Harmful Algal Bloom (HAB).

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 and over half of the water in the lake comes from streams. There are over 141 streams that flow into Lake George, making up 57% of the water that enters the lake. The rest of the water entering the lake comes from precipitation (25%) and groundwater (18%) (Shuster, 1994). Because of the large amount of water entering the lake from

streams, the water quality of Lake George is heavily dependent on the amount and quality of inflow from streams and on human activity in the watershed.

There are eight major streams that supply nearly half of the total amount of flow that comes from that source: Northwest Bay Brook, Indian Brook, Hague Brook, West Brook, English Brook, Shelving Rock Brook, Finkle Brook, and East Brook.

The retention time of a lake is the average length of time that water remains in the lake. Lake size, water source, and watershed area are primary factors in determining retention time. The retention time of Lake George is six to eight years, a long time in relation to other comparable lakes. 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).

Dissolved Oxygen

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

Lake George has high levels of DO with some variability throughout the year in different parts of the lake. 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. There is a seasonal hypoxic zone (dead zone) that occurs in Caldwell Basin that occurs at a depth ranging between 24 and 30 meters deep (Boylen, 2014). The depletion of oxygen from the deep waters creates a condition in which phosphorus separates from the sediments and becomes available, contributing to phosphorus 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.).

Fish Community

Lake George is a two-tiered fishery because it 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, 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 landlocked salmon, bullhead, chain pickerel, sunfish, smelt, sunfish, trout, and yellow perch.

Plant Community

The Lake George plant community is comprised of approximately 47 aquatic plant species. 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, however, the most plants are found between 0 – 6 meters (Ogden, 1976).

Invasive Species

Invasive species are non-native species 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.

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. The Lake George Park Commission (LGPC), Lake George Association (LGA), and the FUND for Lake George/ Lake George Waterkeeper, along with Warren County and watershed municipalities have come together to advance an approach of advocacy, outreach, research, surveillance, monitoring, and remediation in order to prevent and manage AIS in Lake George.

The Lake George Park Commission 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, the FUND for Lake George, and grant funding from New York State (Wick, 2020).

Asian Clam. The Asian clam (Corbicula fluminea) is currently believed to be the most serious AIS infestation in Lake George. First detected in 2010, the 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 on the more developed western shoreline which has many sandy areas, 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 as a result of the invasive species, 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).

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 threaten 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 and was first identified in 1985 in three distinct location that has since grown to over 200. 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 Eurasian watermilfoil 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 off of Long Island. In the north basin, clusters have been found near Huletts Landing, Putnam, Hague, and Roger's Rock (Lake George Park Commission, 2013).

Curly-leaf pondweed.

Curly-lead pondweed (*Potamogeton crispus* L.) 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 Lake George (Lake George Park Commission, 2013).

Spiny water flea.

An 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, which each spiny water flea able to produce up to 10 offspring in as little as two weeks. This rapid reproduction can have significant impact on waterbodies in numerous ways including 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 phytolplakton zooplankton populatin 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).

Terrestrial Invasive Species.

In addition to AIS, there numerous well established terrestrial invasive species (TIS) in the Lake George watershed, but only a few pose significant risks to the surrounding habitat and water quality: shrubby honeysuckle, garlic mustard, purple loosestrife, *phragmites,* 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).

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. HWA was also confirmed on Prospect Mountain in 2017 and Dome Island in Lake George in October 2020. A terrestrial invasive species (TIS), this tiny, aphid-like insect attaches to hemlock trees and sucks the moisture and nutrients from the base of the tree's needle. The hemlock stands of the Lake George watershed comprise an estimated 60% of the watershed's total tree cover, do not have any natural resistance to infestations. Commonly found along streams, the roots of the eastern hemlocks stabilize streambanks, preventing erosion and reducing the amount of sediment 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 increased runoff and sedimentation from areas where roots had previously assisted in stabilization. Eastern hemlocks also provide valuable habitat and aesthetic value to the watershed.

Threats and Emerging Issues

Phosphorus

Phosphorus is a natural element and an essential nutrient for plant growth; however, an elevated level of phosphorus can have a devastating impact on water quality and can stimulate algae and plant growth. Phosphorus has many sources, and lakes and streams have a natural level of phosphorus, but human activities from residential, urban and agricultural areas contribute a significant amount of the pollutants to our environment. Stormwater runoff travels across the land and picks up the phosphorus from fertilizers, eroded soil particles, septic systems, and pet waste and discharges it into nearby lakes and streams. While phosphorus remains a threat to the ecosystem of Lake George, total phosphorus in the lake has remained stable since 1980 (The Jefferson Project, n.d.).

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. Much of the phosphorus entering Lake George is adhered to sediment particles that are moved through stormwater runoff.

Stearns and Wheeler (2001) conclude that the majority of 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, and at the time of the study developed areas accounted for 5% of the land area in the watershed and 43% of all phosphorus entering Lake George. *The Lake George Urban Runoff Study,* conducted with data collected from mid-1980 to late 1982, concluded that as development in a subwatershed increased, so did phosphorus input into the waterways of that subwatershed (Sutherland, 1983). According to the US Census, year-round housing units within the watershed has increased by over 27% since the 1990s and it is estimated that housing within the watershed has increased by 140% since 1970. With 2,498 units, the Town of Bolton has the most housing units within the watershed, followed by Lake George (1,887), Queensbury (1,516), Hague (1,184), and Ticonderoga (1,097). Additionally, there are over 600 housing units within the Village of Lake George and the watershed communities in Washington County range from 266 – 418 housing units (The Lake George Association, 2016). This housing unit information combined with the findings of the afore mention studies suggests that phosphorus loading to the lake from runoff will be greatest in the Towns with greatest densities of development within the watershed.

Lake George is part of the larger Lake Champlain Watershed, and as such is subject to the Lake Champlain Total Maximum Daily Load (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 located in the South Lake A lake segment which also includes the La Chute River and Putnam Creek. Load allocations and reduction requirements were established be 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 New York lake segment 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. 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, 2018). Lake George had not had a confirmed HABs incident until November 7, 2020 when staff from the Lake George Association (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.

A HABs outbreak produces toxins that pose serious health hazards to people, pets and aquatic life. Remediating these health hazards could result in billions of dollars in documented expenses for communities as well as billions more in damage to recreation, property values, tourism, commercial fishing and municipal infrastructure every year. In Lake George, water samples analyzed by the NYSDEC at a state laboratory confirmed the presence of cyanobacteria but indicated that the toxin levels were below the EPA's 10-day drinking water health advisory level (New York State Department of Environmental Conservation, 2020).

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% (The Jefferson Project, n.d.).

Wastewater Treatment and Disposal

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 (Navitsky, 2018).

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.

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. Between 1980 and 2009 the overall surface water temperature of the uppermost 10 meters of the lake has increased by 1.8°C (3.2°F) (Boylen, 2014).

Previous Plans

Since the 1980s, there have been numerous reports and studies completed with an eye toward the water quality in Lake George. A recurring theme in each of the plans listed below was a desire to preserve and protect the waters of Lake George. A summary each of the plans listed below include:

Plan for the Future of the Lake George Park (1987)-The first document to provide an overall assessment of Lake George and its watershed, this plan identifies objectives and recommendations for the management of future growth in the Lake George Park.

Lake George Plan for the Future (2001) – This plan serves as an update to the 1987 *The Plan for the Future of the Lake George Park* and identifies seven major areas for action: stormwater management, nuisance species control, wastewater management, institutional support, stream corridor management, wetlands management and protection, public education, project funding.

Additional findings of this report include:

- Many watershed residents utilize the lake for drinking water.
- There have been some water quality declines including lower transparencies, lower dissolved oxygen concentrations, higher phosphorus and chlorophyll-A concentrations, and increased growth of nuisance rooted aquatic vegetation as well as the presence of Eurasian watermilfoil and Zebra mussels.
- Non-point source pollution remains a threat to water quality in Lake George. Septic systems, stormwater runoff, and streambank erosion are identified as sources.
- There is a need for a basin wide approach to water quality management and resource conservation.
- Funding is needed to complete and implement water quality projects.

The plan goes on to recommend six priority actions to be accomplished over a 5-year period.

The State of the Lake: Thirty Years of Water Quality Monitoring on Lake George (2014) – This report identifies three threats facing Lake George: invasive species, rising salt levels, and declining water quality and clarity.

Fate of the Lake (2015) – This document, created as a response to the findings of *The State of the Lake,* outlines the FUND for Lake George's strategy to stop "the present decline of water quality and achieving sustained protection of Lake George for the next generation."

Lake George HABs Plan (2013) – Written prior to the first HAB occurrence in Lake George, this document was written to provide specific recommendation to minimize the presence, frequency, duration, and/or intensity of HABs to protect the health and livelihood of its residents and wildlife. The plan identifies short-term, medium-term, and long-term projects that should be implemented in order to manage water quality and reduce the potential for HABs in Lake George.

Town of Lake George Comprehensive Plan (2015)- This plan provides an inventory and analysis of the resource and service in the Town of Lake George and makes recommendations in the following categories: Economic and Tourism Development, Infrastructure and Transportation, Natural and Environmental Resources, Recreational Resources, and Community Character and Services.

Town of Queensbury Comprehensive Plan (2007) – The plan was created with an emphasis on the natural beauty and surroundings of the Town. Goals include:

- Protecting natural areas, balancing the community's land use goals with economic development
- Maintain safe and stable neighborhoods
- Creating design standards for development
- Promoting pedestrian and bicycle improvements
- Expanding trail networks and increasing public access to recreational areas
- Increasing connections between residential and commercial neighborhoods
- Creating mixed-use neighborhood centers

And others related to community outreach and development review processes.

Town of Bolton Comprehensive Plan (May 2003) – This plan was designed around five general goals:

- Preserve the natural environment
- Maintain Bolton's distinct rural character
- Foster an economic base focused on a balance of quality tourism and year-round services
- Retain connections to Lake George as a resource for swimming, boating, fishing, and viewing
- Preserve the Hamlet of Bolton Landing as the economic/cultural/civic/social focal point for the community

Town of Bolton Local Waterfront Revitalization Program (2016) – A local prepared, comprehensive land and water use plan for the Town's natural, public, and developed waterfront resources and seeks to provide a balance of environmental, recreational, and economic development actions. The plan states, "the Lake George watershed must be protected from adverse impacts to water quality" (p. 4) and sets forth policies that balance economic development and preservation to permit beneficial use of and prevent adverse effects on local waterfront resources.

Town of Ticonderoga Comprehensive Plan (2006)- This plan serves as a foundation for the town's land use regulation and provides a blueprint for future development in the town and advise potential future land use controls for the town. The plan also identifies a handful of broad goals and objectives:

- Achieve a strengthen and diverse economy based on the Town's historic, cultural, and natural resources
- Maintain the hamlet as the residential, commercial, and civic center of the community
- Preserve the rural character of the outlying areas of Ticonderoga
- Protect the quality and scenic character of Ticonderoga's lakes and other natural resources

And others related to the Town's economy, neighborhoods, transportation, laws and regulation and community character.

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Task 8: Local Ordinance Assessment

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Regulatory Framework for the Lake George Watershed

Within the Lake George Watershed there are numerous entities and organizations that work independent 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.

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 to produce the desired environmental outcomes for a community.

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 maintain 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 compliance 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.

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.

Adirondack Park Agency (APA)

The Adirondack Park Agency 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.

Lake George Park Commission (LGPC)

The Lake George Park Commission is charged by NYS 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, as well as 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, 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. At the time of this writing, it is anticipated that these municipalities will also adopt and administer the stream corridor regulations, which recently became effective in April 2021.

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.

Lake George Watershed Municipalities Local Ordinance Assessment

Introduction

This "Local Ordinance Assessment" 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:

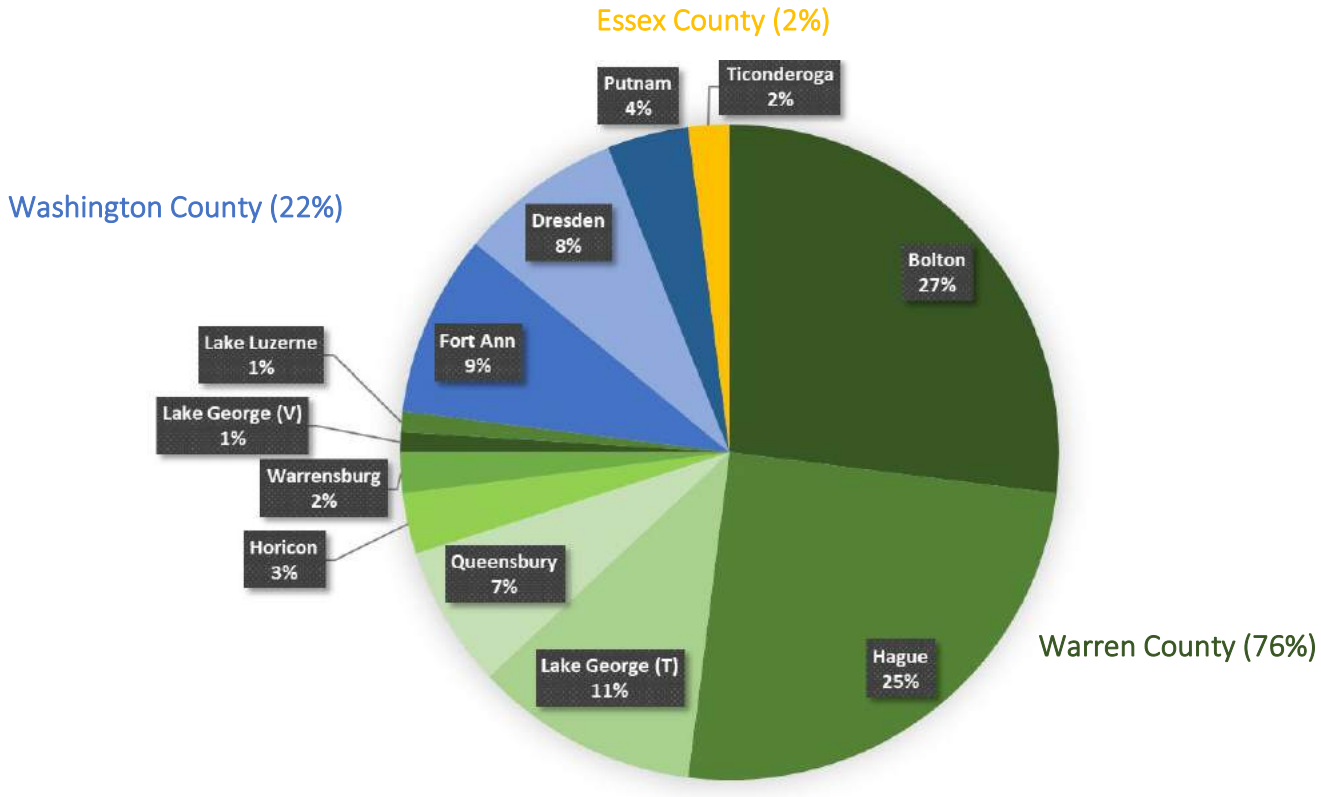
The Lake George watershed encompasses 12 municipalities in three counties, including 11 towns and one village.

- 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 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.

Table 1: 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 1: Lake George Watershed Municipalities Land Area as a Percentage of the Watershed



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 plan 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.

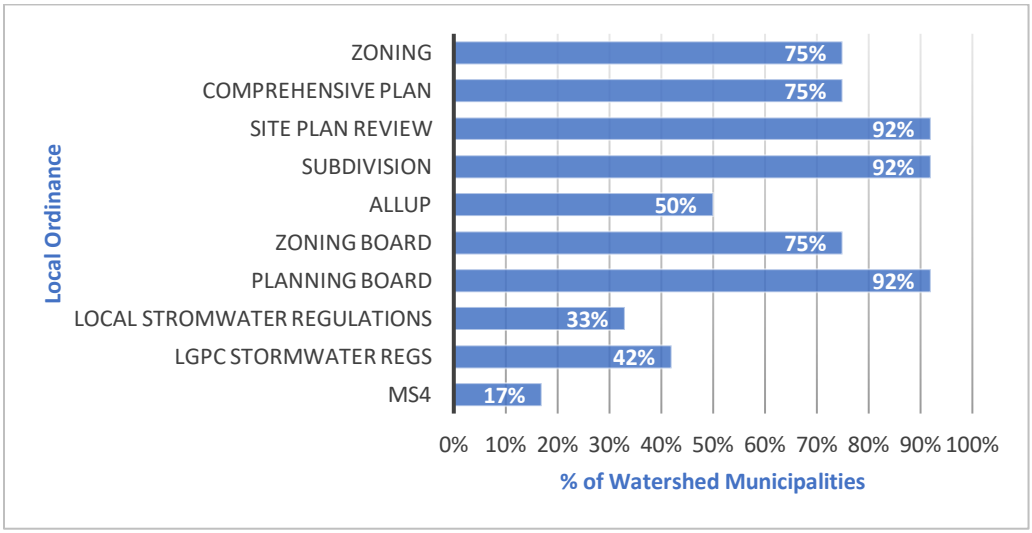
- **Zoning Board and Appeals (ZBA)** are active in 75% (9/12) municipalities in the Lake George Watershed, representing 79% of the watershed area.

- **Local Stormwater Regulations** have been enacted in 33% (4/12) watershed municipalities, representing 46% of the land area in the watershed.

- **Lake George Park Commission (LGPC) Stormwater Regulations** are followed in 42% (5/12) municipalities in the watershed, representing 42% of the watershed area.

- **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 2: Percentage of Watershed Municipalities with Adopted Ordinances and Regulations



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 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 2: 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 will begin updates to the Comprehensive Plan in 2021.

Based on the results of the local ordinance review, 75% of watershed municipalities have adopted comprehensive plans. However, with the exception of the Town of Lake George, each of these plans are over ten years old. It is recommended that comprehensive plans be updated every 5 to 10 years to maintain relevancy. 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.

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.

The APA developed the Adirondack Park Land Use and Development Plan in 1973. This document regulates development on private lands within the Adirondack Park 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. The Adirondack Park State Land Master plan was last revised in August 2019.

For permitting purposes, the APA categorizes regional projects into Class A and Class B projects. Permits for Class A regional projects are always issued by the APA and permits for Class B regional projects are issued by towns if they have an ALLUP in place. When reviewing Class A regional projects, the APA consults with Town officials and accepts advisory recommendations to ensure that the projects meets all of the conditions of an adopted land use plan.

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 subdivision 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

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.

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 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.

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

Table 3: 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**

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. 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.

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 Commission has specific regulatory and enforcement power relating to activities on the lake and in the watershed.

LGPC Stormwater Regulations: The Commission'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 of the municipalities in the Lake George Park have adopted regulations at least as stringent as the LGPC and therefore have local control. Local stormwater regulatory programs have been approved by the Commission for the Towns of Queensbury, Lake George, Bolton, and the Village of Lake George. The Commission provides technical assistance to these communities in administering their programs.

Table 4: 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 updates to 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

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.

Winter Road Maintenance Policies

There is 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.

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. 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.

Warren County has debated the adoption of such a law, and a draft law is currently under development at the Committee level. Additionally, the Lake George Park Commission has established a committee to review the feasibility and needs to implement a watershed-wide regulatory program.

Table 5: 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

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.

NYSDEC. State wetland regulations protect freshwater wetlands greater than 12.4 acres, and 1 acre in the Adirondack Park, freshwater wetlands of unusual local importance, and tidal wetlands. The state has established adjacent wetland buffer zones, prohibiting, or restricting certain activities within such areas, and has established standards for permit issuance. Under the Environmental Conservation Law (ECL), three regulatory possibilities are present for freshwater wetlands:

Under ECL, all wetlands smaller than 12.4 acres and not deemed of "unusual importance," are subject to the exclusive jurisdiction of the municipality where the wetland is located. Additionally, a municipal may enact its own wetland protection laws and assume control of these regulations so long as those laws are as stringent as the NYSDEC, and the municipality is certified by the NYSDEC as able to administer the ordinance.

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.

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.

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.

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.

Table 6: Local Staff Capacity by Municipality in the Lake George Watershed						
Municipality	**Permitting & Administration**	**Code Compliance & Enforcement**	**Building Codes**	**Clerical**	**Total**	**% of Watershed**
Bolton	1	0	0	1	2	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%

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

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.

Lake George Watershed Action Plan

C1000678 I Task 11

Refinement of Vision Statement and Goals

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:

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
- 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 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 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 a 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, 2019)
- 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 mandatory boat wash and inspection stations throughout the watershed

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 land acquisition/conservation easements in 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, and business owners based on the goals and objectives of this plan
- Support and expand existing education and outreach programs in the watershed