

FINAL



November 2020

St. Lawrence River Watershed Recommendations & Implementation Strategy



EcoLogic



Prepared for Franklin County Soil & Water Conservation District

*This plan was prepared with funding provided by the New York State
Department of State under Title 11 of the Environmental Protection Fund.*



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Prepared for

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TABLE OF CONTENTS

1	Introduction	5
2	Role of Municipalities in Watershed Protection	7
3	General Recommendations for Watershed Health	9
3.1	Introduction.....	9
3.2	Agricultural Practices and Management.....	10
3.2.1	Restoration & Protection Actions	11
3.2.2	Collaboration, Partnerships, & Outreach	14
3.2.3	Municipal & Programmatic Actions.....	16
3.3	Floodplain and Stormwater Management	17
3.3.1	Restoration & Protection Actions	17
3.3.2	Collaboration, Partnerships, & Outreach	19
3.3.3	Municipal & Programmatic Actions.....	20
3.4	Forest Management.....	23
3.4.1	Restoration & Protection Actions	24
3.4.2	Collaboration, Partnerships, & Outreach	25
3.4.3	Municipal & Programmatic Actions.....	25
3.5	Invasive Species Management.....	26
3.5.1	Restoration & Protection Actions	26
3.5.2	Collaboration, Partnerships, & Outreach	28
3.5.3	Municipal & Programmatic Actions.....	28
3.6	Infrastructure and Development.....	31
3.6.1	Restoration & Protection Actions	31
3.6.2	Collaboration, Partnerships, & Outreach	34
3.6.3	Municipal & Programmatic Actions.....	35
3.7	Water and Wastewater Management.....	36
3.7.1	Restoration & Protection Actions	37
3.7.2	Collaboration, Partnerships, & Outreach	38
3.7.3	Municipal & Programmatic Actions.....	39
3.8	Water Quality Research & Monitoring	42
3.8.1	Restoration & Protection Actions	42
3.8.2	Collaboration, Partnerships, & Outreach	43
3.8.3	Municipal & Programmatic Actions.....	44
3.9	Watershed Planning, Management, & Outreach.....	44

3.9.1	Restoration & Protection Actions	44
3.9.2	Municipal & Programmatic Actions	46
4	Subwatershed Priority Focus Areas.....	48
4.1	Summary of Subwatershed Stressors and Sources.....	49
4.2	Subwatershed Specific Recommendations	52
4.3	Upper St. Lawrence (04150301).....	55
4.4	Oswegatchie River (04150302).....	57
4.5	Indian River (04150303).....	59
4.6	Grasse River (04150304).....	61
4.7	Raquette River (04150305).....	63
4.8	St Regis River (04150306).....	66
4.9	Salmon River (04150307).....	67
4.10	Chateaugay-English (04150308).....	69
5	Implementation Strategy & Schedule	71
5.1	Implementation Strategies and Projects.....	71
5.2	Potential Funding Sources.....	72
6	Ongoing Implementation Framework.....	80
6.1	Implementation Team	80
6.2	Mechanisms for Tracking Implementation and Evaluating Progress.....	81
6.3	Developing Work Plans.....	82
6.4	Communicating Efforts and Achievements.....	82
7	References	83

TABLES

Table 1	Summary of Land Use Regulations, County-Level	7
Table 2	Summary of Subwatershed Stressors and Sources.....	49
Table 3	Specific Subwatershed Priority Recommendations	52
Table 4	Key Programs and Resources to Support Recommendations.....	72

ACRONYMS

AEM	Agricultural Environmental Management
APA	Adirondack Park Agency
APIPP	Adirondack Park Invasive Plant Program PRISM
BMP	Best Management Practice
CAFO	Concentrated Animal Feeding Operation
CCE	Cornell Cooperative Extension
CNP	Certified Nutrient Planner
CNMP	Certified Nutrient Management Plan
CSC	Climate Smart Community
CSLAP	Citizens Statewide Lake Assessment Program
CSO	Combined Sewer Overflow
CSLAP	Citizens Statewide Lake Assessment Program
DANC	Development Authority of the North Country
DOW	Division of Water
DPW	Department of Public Works
FEMA	Federal Emergency Management Agency
GIS	Geographical Information Systems
HAB	Harmful Algal Bloom
HUC	Hydrologic Unit Code
IJC	International Joint Commission
IRLC	Indian River Lakes Conservancy
MS4	Municipal Separate Storm Sewer System
NCREDC	North Country Regional Economic Development Council
NMP	Nutrient Management Plan
NRCS	Natural Resources Conservation Service
NYSERDA	NYS Energy Research & Development Authority
NYSDEC	NYS Department of Environmental Conservation
NYSDOH	NYS Department of Health
NYSDOS	NYS Department of State
NYSDOT	NYS Department of Transportation
NYNHP	NY Natural Heritage Program
NYSOPRHP	NYS Office of Parks, Recreation, and Historic Preservation
PEERS	Professional External Evaluations of Rivers and Streams
POTW	Publicly Owned Treatment Works
PRISM	Partnership for Regional Invasive Species Management
SLELO	St. Lawrence/Eastern Lake Ontario PRISM

SLRWP	St. Lawrence River Watershed Project
SPDES	State Pollution Discharge Elimination System
SRMT	Saint Regis Mohawk Tribe
SWCD	Soil & Water Conservation District
TILT	Thousand Islands Land Trust
TNC	The Nature Conservancy
USACE	United States Army Core of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAVE	Water Assessments by Volunteer Evaluators
WI/PWL	Waterbody Inventory/ Priority Waterbodies List (NYSDEC compendium)
WWTP	Wastewater Treatment Plant

1 Introduction

This chapter of the Watershed Revitalization Plan sets forth recommendations designed to protect and restore the lands and waters draining to the St. Lawrence River in northern New York. These recommended actions focus on measures to enhance water quality and the natural environment while protecting quality of life for residents and aligning with the community's vision for a sustainable future. Achieving the community's vision will require balancing multiple factors; these factors include economic development, water quality and habitat protection, recreation, food security, and building resilience to a changing climate. Implementing the recommendations will require a coordinated effort across multiple levels, including federal, state, and local governments, educational institutions, resource management agencies, not-for-profit organizations, and community residents.

The recommendations reflect a watershed-specific analysis of the natural and built environment, current water quality conditions, key sources of pollution, and the existing institutional framework. Some recommendations address improving land conditions and water resources while others are oriented toward long-term protection.

Recommendations are grouped into eight broad categories:

- Agricultural Practices and Management
- Floodplain and Stormwater Management
- Forest Management
- Invasive Species Management
- Infrastructure and Development
- Water and Wastewater Management
- Water Quality Research & Monitoring
- Watershed Planning, Management, & Outreach

Each recommendation includes discussion of the need for action, benefit, and potential leadership. Some of the recommended actions apply broadly across the entire watershed. As outlined in **Section 3**, general recommendations are grouped into three categories: restoration and protection actions; collaboration, partnership, and outreach; and municipal and programmatic actions.

However, the large and diverse watershed area also requires tailored recommendations to reflect regional differences. Each HUC10 subwatershed within the St. Lawrence River watershed has its own set of factors that influence water quality and offer unique opportunities for protection and restoration. Priority focus areas for each subwatershed are identified in **Section 4**.

Finally, **Appendix D: Implementation Strategy & Project Matrix** presents a summary matrix of specific measures for watershed revitalization. The inventory connects recommendations to strategy components to be advanced and watershed goals to be achieved.

2 Role of Municipalities in Watershed Protection

The purpose of this Watershed Revitalization Plan is to identify water resource management issues facing the St. Lawrence River watershed and recommend potentially effective strategies for their resolution. Due to the size and diversity of the landscape draining into the St. Lawrence River from New York State, the Plan offers a range of strategies for consideration. The 5,600 square-mile watershed encompasses all or portions of eight counties and 100 municipalities, each with its own governance and local laws, resource base, population and demographics, economic drivers, and water resource management priorities.

The primary authority for guiding community planning and development is vested in cities, towns, and villages according to the Home Rule provision of the New York State Constitution. This provision empowers local municipalities to define their community’s vision and manage important elements of growth and development. Because land use decisions can have a direct effect on the quality and quantity of water, local planning and zoning laws are valuable tools to address the opportunities and challenges of development in the context of water resources management.

Municipalities within the St. Lawrence River watershed differ widely in the extent to which effective planning and zoning tools have been adopted. While some have comprehensive land use regulations and guidelines, others lack essential tools needed to guide growth in a manner that considers community character and environmental quality. As summarized in **Table 1**, there is diversity among the eight watershed counties with respect to some key land use planning tools.

Table 1
Summary of Land Use Regulations, County-Level

County	Planning Board / Commission	Written Comprehensive Plan	Farmland Protection Board	Farmland Protection Plan	Right-To-Farm Law
St. Lawrence	Yes	Yes	Yes	Yes	Yes
Jefferson	Yes	No	Yes	Yes	Yes
Franklin	No	No	Yes	Yes	Yes
Lewis	Yes	No	Yes	Yes	Yes
Essex	Yes	Yes	Yes	Yes	Yes
Hamilton	No	No	No	No	No
Clinton	Yes	Yes	Yes	Yes	No
Herkimer	Yes	No	Yes	Yes	No

Source: New York Land Use Tools: A 2008 Survey of Land Use Planning & Regulations in NYS (NYS Legislative Commission on Rural Resources)

An earlier section of this Plan, the **St. Lawrence River Watershed: Local Laws and Programs Affecting Water Quality**, includes an inventory and assessment of local laws for water resource protection at the municipal level. To meet a shared vision for sustaining St. Lawrence River watershed

resources, communities are strongly recommended to review the current municipal analysis and perform a gap analysis to identify opportunities to address water quality concerns. Based on the recent inventory, many areas will benefit from adoption of the following tools:

- compliance with SPDES stormwater construction permit requirements,
- lakeshore/riparian overlay districts,
- floodplain protection,
- sediment and erosion control,
- limitations on impervious cover,
- steep slope development restrictions, and
- riparian setbacks.

Although there are significant differences amongst watershed municipalities in regard to land use, population, and current local laws, municipalities would benefit from working together to improve consistency throughout the watershed and address water quality. New York State has recently (2019) completed a major project to support communities with planning tools. The [NYS DOS Model Local Laws to Increase Resilience](#) supports local communities in watersheds vulnerable to flooding that have limited access to legal and planning resources, as well offer an effective means to reduce flooding impacts and enhance public health and safety. The model laws target water quantity (e.g., flood risk) as well as quality (e.g., sources of sediment and nutrients).

Recommendations concerning municipal actions are included in the general watershed recommendations under municipal and programmatic actions for each category. All these actions are recommended for implementation. However, it is recognized that there is a disparity in resources that affects the potential for the measures to be implemented. For example, Franklin County lacks a Planning Department, which limits their capacity to work with their communities to revise local laws. One approach to increasing capacity is to add regional planning professionals as “circuit riders” to work with local leaders as they incorporate water resources protection provisions into their codes. Therefore, **it is highly recommended that elected officials and other local leaders utilize the Watershed Revitalization Plan and plan to build the necessary capacity in terms of staffing and resources to ensure the Plan’s effective implementation.**

3 General Recommendations for Watershed Health

3.1 Introduction

General recommendations are appropriate across the watershed to advance the community's vision for the future. The actions are grouped into three broad categories: (1) restoration and protection actions to minimize adverse impacts of human activities on lands and waters; (2) collaborations, partnerships and outreach to maximize effectiveness of actions and build local support; and (3) opportunities for local officials to strengthen communities and environmental protections.

Restoration and protection actions are designed to minimize nonpoint source pollution and protect and restore the quality and ecological functioning of water resources; these actions are often referred to as "best management practices" or BMPs. A management practice is considered "best" in context of a specific land use and environmental setting. What works in one area may not be feasible or cost-effective in another due to site-specific factors. BMPs can have a broad, generic application or can be highly specific to certain geographic, hydrologic, and chemical conditions. BMPs are often most effective when combined with other practices in a system that reduces sources, minimizes edge-of-field losses, and prevents transport to receiving waters.

Recommendations also center around opportunities for *collaboration, partnerships, and outreach* to advance the recommendations of the St. Lawrence River Watershed Revitalization Plan. The SLRWP coalition brought together multiple levels of government, resource management agencies, and volunteer organizations to develop the Revitalization Plan. Continued collaboration among these partners will be essential. Outreach to watershed communities on resource management issues will be needed to build local support for actions such as modifications to local laws, enhanced investment in staffing resource management agencies, and participation in citizen monitoring programs.

The third category of recommendation encompasses *municipal and programmatic actions* for watershed municipalities. As the New York State Constitution provides for home rule, the primary authority for guiding community planning and development is vested in cities, towns, and villages. This provides local municipalities with the power to direct a community's vision and growth. Local planning and zoning laws are valuable tools to confront both opportunities and challenges of development and watershed planning. Strong local leadership is essential to promoting sustainability, reducing the risk of flood damage, and revitalizing communities through the adoption of appropriate zoning and land use policies. The **St. Lawrence River Watershed Revitalization Plan: Local Laws and Programs Affecting Water Quality** is a comprehensive overview of relevant planning tools and their use across the watershed. This document is appended to the **St. Lawrence River Watershed Characterization Report (2020)**.

3.2 Agricultural Practices and Management

Agriculture is a leading industry and land use in the St. Lawrence River watershed, particularly along the St. Lawrence River floodplain where rich soils and relatively flat elevation provide excellent conditions for farming. Not only does agriculture play a significant role in the economy, the agricultural landscape reinforces the rural character of the north country, retains valued open space and scenic vistas, and supports wildlife habitat. An estimated 620,700 acres (approximately 17%) of the lands within the St. Lawrence River watershed were dedicated to agriculture in 2017 (USDA Census of Agriculture, 2017).

New York strives to balance the essential services of agricultural production with environmental protection. Larger livestock farms are classified as Concentrated Animal Feeding Operations (CAFOs) and regulated by NYSDEC through State Pollutant Discharge Elimination System (SPDES) permits. CAFOs are required to complete nutrient management plans, emergency response plans, and other information related to resource management. For smaller farms below the CAFO thresholds (AFOs), the focus is on voluntary incentive-based adoption of BMPs. The tiered Agricultural Environmental Management (AEM) program is a voluntary program managed by county Soil and Water Conservation Districts. AEM provides customized technical advice and support to producers tailored to their individual circumstances. The tiered approach begins with inventory and planning and progresses through implementation and assessment. An adaptive management approach ensures that the technical advice and support is responsive to changing circumstances and new information.

Despite these efforts, agricultural land use practices are a significant contributor to nutrient and sediment inputs to waterbodies in the St. Lawrence River drainage; agriculture adversely affects 26% of assessed stream miles and 15% of assessed lake acres. The NYSDEC 2016 Waterbody Inventory/Priority Waterbodies List for the watershed cites the following agricultural conditions and practices for their adverse impact on water quality and aquatic habitat:

- Increased siltation/sedimentation and nutrient inputs from agricultural runoff
- High rates of erosion from row crop production, most commonly corn grown for silage
- Crop production on steep slopes and erosive soils adjacent to the river
- Improper manure storage and handling, e.g., daily manure spreading, stockpiling of manure along streambanks throughout winter and loss to the stream during spring runoff, winter manure spreading on frozen ground
- Large numbers of cattle with access to streams resulting in streambank erosion and pathogen inputs

Recommended practices to mitigate these impacts and control nonpoint source pollution from agricultural lands are tabulated below.

3.2.1 Restoration & Protection Actions

1. Increase Implementation of Best Management Practices (BMPs)

Description Erosion control practices include both operational and vegetative practices designed to retain, divert, or collect runoff. Examples include but are not limited to:

- Conservation tillage (no till, strip-till, reduced-till)
- Contour farming
- Cover crops and winter cover crops
- Manure injection fertilization
- Strip-cropping
- Vegetative covers
 - » Buffer strips
 - » Riparian buffers
 - » Vegetative treatment areas
- Waterways/water drainage systems



Cereal rye is an excellent winter cover crop because it rapidly produces a ground cover that holds soil in place against the forces of wind and water.

Photo source: Joseph Murphy, Soybean Association

Benefit These practices reduce pollutant transport in surface runoff by decreasing soil erosion and surface runoff volumes by increasing the soil's infiltration capacity. Plant residue on the soil surface reduces soil and nutrient loss during storm events and decreases runoff volumes by increasing the soil's infiltration capacity. In addition, conservation tillage reduces compaction, saves time, fuel and labor costs, increases soil organic matter and moisture-holding capacity, and lowers soil loss due to wind erosion. By targeting these actions in watersheds identified as impacted by agriculture within the NYSDEC WI/PWL, communities will achieve the greatest benefits towards improved water quality.

Partners SWCDs, NYS Ag & Markets, USDA-NRCS, NYSDEC, CCE, Cornell Pro-Dairy, Farmers

Resources [NYS Soil & Water Conservation Committee's Agricultural Best Management Practices System Catalogue](#)

2. Provide Adequate Manure Storage and Management

Description A manure management system includes a plan for the collection, transport, and storage of manure. The design is dependent on livestock operation, site location, and management considerations. A manure storage system controls the loss of nutrients and pathogens by safely storing manure when the potential for erosion and surface runoff is high.



Covered concrete manure storage facility provides increased storage capacity to prevent spreading on sensitive or inaccessible winter-time fields.

Photo source: USDA-NRCS

Benefits Adequate manure storage systems reduce nutrient loss when runoff and erosion potential is high, allow manure to be treated as a resource rather than a waste, and improve herd health, aesthetics, and relations with neighbors. Without adequate storage facilities in the north country, farmers must resort to winter manure spreading on frozen ground.

Partners SWCDs, NYS Ag & Markets, USDA-NRCS, NYSDEC, CCE, Cornell Pro-Dairy, Farmers

Resources [NRCS Standards for Waste Storage Facilities](#)

3. Promote Pasture Management

Description Prescribed grazing involves subdividing pastures and hayfields into 5 or more paddocks for a grazing season. The size and number of paddocks is dependent on the level of pasture productivity, livestock density, and residence time. The frequent rotation of livestock allows forage to recover from grazing, permitting vegetative productivity and re-growth.



Fencing plays a role in effective pasture management.
Photo Source: USDA-NRCS

Benefits Overgrazing of pastures reduces ground cover and total forage yields. When a prescribed grazing management system is in place, forage is improved and ground cover is increased thereby preventing soil erosion, reducing surface runoff, and distributing animal manure. Infiltration is increased. Critical resources including riparian buffers, streambanks, and shorelines are at lower risk of damage.

Partners SWCDs, NYS Ag & Markets, USDA-NRCS, NYSDEC, CCE, Cornell Pro-Dairy, Farmers

Resources [USDA-NRCS National Range and Pasture Handbook](#)

4. Develop and Implement AEM Tier III Management Plans

Description Nutrient management is an integrated approach to maximize economic production of soil, crops, animal feeds and products, and commercial fertilizer. Management incorporates soil testing, manure nutrient analysis, and timing, placement, and method of nutrient application. AEM Tier III Management Plans evaluate all aspects of farm production and prescribe conservation practices to advance production and natural resource conservation goals. Practices are selected based on site-specific conditions of soil, topography, drainage, cropping practices, and livestock density. Comprehensive Nutrient Management Plans (CNMPs) are the foundation for the NYSDEC regulatory program to control potential water pollution from Concentrated Animal Feeding Operations (CAFOs) under state General Permit GP-04-04. CNMPs are also required for farms seeking federal or state cost-sharing to construct manure storage structures. Any livestock farm seeking to maximize production while efficiently managing their natural resources and protecting the environment is also encouraged to develop and implement a CNMP.

Benefits AEM Tier III Management Plans address elements such as manure and wastewater, feed, and nutrient management, record keeping, and emergency action planning.

These plans help farmers achieve sustainability goals, protect water quality, and make them more competitive when applying for cost-sharing funds.

Partners SWCDs, NYS Ag & Markets, private sector planning consultants, farmers

Resources Contact County Soil and Water Conservation District (SWCD) at www.nys-soilandwater.org/contacts

3.2.2 Collaboration, Partnerships, & Outreach

5. Increase Engagement with Agricultural Environmental Management (AEM)

Description AEM is a cooperative interagency program led by SWCDs that provides one-on-one help to farmers to inventory existing environmental stewardship practices, address those that contribute to soil and nutrient loss, identify opportunities for mitigation, and enhance farm viability. By participating in AEM, farmers can document their environmental stewardship and advance their positive contributions to their communities, food systems, economy, and the environment. Farmers work with local AEM resource professionals to develop comprehensive farm plans using a tiered process:

- Tier 1 – Inventory current activities, future plans, and potential environmental conservation interests
- Tier 2 – Document current land stewardship while assessing and prioritizing potential environmental concerns
- Tier 3 – Develop farm plans to address concerns and opportunities identified in Tier 1 and 2
- Tier 4 – Implement plans utilizing available financial, educational, and technical assistance
- Tier 5 – Evaluate and update plans to ensure continued environmental conservation and farm viability

Benefits AEM is a resource for farmers to help identify effective BMPs for their operations to improve water quality. Farmers are more-eligible for cost-share projects, ability to prioritize and implement projects/practices that can reduce soil erosion and runoff. For qualifying operations, engagement in AEM may help promote farm products through New York State Grown & Certified.

Partners SWCDs, NYS Ag and Markets, Cornell Cooperative Extension, Farmers

Resources Contact your local Soil and Water Conservation District at www.nys-soilandwater.org/contacts or visit the AEM website at www.nys-soilandwater.org/aem to learn more.

6. Inventory Current Agricultural Practices and Improve GIS Data

Description Inventory the location (HUC12 level, GIS data) and implementation of BMPs within the watershed. This would help to track existing practices and identify opportunities for improvement.

Benefit A long-term database of implemented projects, together with water quality monitoring, would help determine the efficacy of a particular BMP. In addition, it would provide data to determine which practices are most appropriate or popular for a region.

Partners SWCDs, NYS Ag & Markets, USDA-NRCS, NYSDEC, Farmers

7. Encourage “Ag in the Classroom” Programs and Agriculture Related Career Exploration

Description The “Ag in the Classroom” program is delivered through Cornell Cooperative Extension to local schools that aims to foster awareness, understanding, and appreciation of how we produce the food and fiber that depend on in our daily lives.



Cornell Cooperative Extension Franklin County's Connie Gerow looks on as 2nd graders work as “farmers” and “market goers”.
Photo source: CCE Franklin County

Benefit This program helps students engage with agriculture and food systems and plant the seed to learn about agriculture related careers.

Partners NYS Ag & Markets, Cornell University, NYS Education Department, Cornell Cooperative Extension, New York Farm Bureau, Agriculture and Farmland Protection Boards, local schools, and farmers

Resources [New York Agriculture in the Classroom](#)

8. Build Rapport Between Agricultural Community and the Public

Description Coordinate and improve communications between the agricultural community, municipalities, and other watershed stakeholders in topics such as:

- Right to farm laws
- The need for public and private funds to help advance installation of BMPs within the watershed

- Water quality impacts of certain agricultural practices
- Steps farmers take to mitigate water quality impacts of agriculture

Benefit Developing relationships between farmers, the public, and municipalities could potentially increase BMP implementation by removing barriers to adoption.

Partners NYSDEC, SWCDs, NY Farm Bureau, County Planning, CCE, Agricultural and Farmland Protection Boards, Farmers

Resources An example of an organization with this goal is [Partners for Healthy Watersheds](#) within Cayuga County

3.2.3 Municipal & Programmatic Actions

9. Seek Additional Support for Agricultural Services

Description Seek additional sources of support for agricultural programs and services provided by SWCDs, private-sector planning professionals, and Cornell Cooperative Extension (CCE). Encourage enrollment in Agriculture Districts.

Benefits Funding support is critical to fulfilling goals for the watershed, implementation efforts would result in reduced nutrient and sediment loss.

Partners NYSDEC, SWCDs, County Planning, CCE, private sector planning consultants, farmers

Resources [NYS DAM Funding Opportunities](#)

10. Support Soil & Water Conservation Districts and Planners in Obtaining Certification to Develop Comprehensive Nutrient Management Plans

Description Qualified, certified planners are needed to develop Comprehensive Nutrient Management Plans (CNMPs), which evaluate all aspects of farm production and offer conservation practices that help achieve production and natural resource conservation goals for farm businesses. NMPs are the foundation of the NYSDEC regulatory program to control potential water pollution from CAFOs under state General Permit GP-04-04. Use of CNPs is a requirement for farms seeking federal or state cost-sharing for manure storage structures.

Benefits Having in-house certified planners at SWCDs would expand the agencies' capacity to serve the agricultural community and increase the funding stream for developing AEM Tier III Plans.

Partners NYS Ag & Markets, SWCDs, Private Nutrient Management Planners, Municipalities

Resources To find planners in your County, visit [Agricultural Environmental Management: Certified Planner Directory 2020](#). For more information on certification requirements

visit [NYS DAM Comprehensive Nutrient Management Planning](#) and [Certified Crop Adviser: Become Certified](#).

3.3 Floodplain and Stormwater Management

The St. Lawrence River watershed is experiencing increased frequency and intensity of flooding events, particularly along the St. Lawrence River shoreline. Localized flooding can result from minor to heavy storms, prolonged precipitation events, or river flow management decisions. Runoff can overload drainageways, send flows into streets and low-lying areas, back up sewers, cause areas to be inundated, wreak havoc on municipal water systems, cause safety hazards, be detrimental to affected residents and business owners, damage habitat, erode streambanks, and allow for transport of sediment, nutrients, oils and other chemicals.

To adapt to this new normal, watershed communities need to build resiliency through proactive management of development, infrastructure, and stormwater. Examples of strategies for floodplain and stormwater management include:

- Use planning tools to restrict development in flood-prone areas such as floodplains and wetlands
- Protect existing buildings, facilities, and people in vulnerable areas and reduce future flooding risk
- Actively manage stormwater to maximize storage, slow velocity, and encourage infiltration.

Below is a list of best management practices, management strategies, and opportunities for growth to protect and enhance floodplain and stormwater management.

3.3.1 Restoration & Protection Actions

1. Complete Streambank Assessments and Restoration

Description Conduct surveys and field inspections of streams within the basin to assess their stability and propensity to contribute to soil erosion and hydrological problems. Develop an inventory and assessment protocol to prioritize efforts of streambanks in need of restoration. Design and implement stream restoration to restore (or mimic) natural hydrologic and biological processes using soft or vegetative engineering.



Streambank stabilization reduces the amount of sediment and nutrients from reaching streams.
Photo source: Franklin County SWCD

Benefits Assessment efforts will allow for the prioritization of restoration efforts and increased resilience to flooding and erosion after restoration.

Partners SWCDs, NYSDEC, Trout Unlimited, Nonprofits

Resources The [NYS Riparian Restoration Opportunity Assessment](#) has a soil erosion layer at the HUC12 scale that can help prioritize areas for assessment and restoration.

2. Wetland Restoration, Rehabilitation, Enhancement and Creation

Description Wetlands can be physically, chemically, or biologically manipulated to enhance/restore their natural functions. Wetlands help reduce the frequency and intensity of floods by slowing velocity and promoting infiltration and evapotranspiration.

Benefits Reduce frequency and intensity of flooding, filter nutrients, slow runoff, and reduce transport of sediment and nutrients

Partners NYSDEC, USEPA, USDA-NRCS, SWCD, TILT, IRLC

Resources The [NYSDEC Environmental Resource Mapper](#) identifies state and federally regulated wetlands.

3. Implement Stormwater Best Management Practices and Green Infrastructure

Description Effective stormwater management involves implementation of structural, vegetative, and institutional best management practices. Examples include bioretention ponds, bioswales, permeable pavement, filter strips, open space conservation, spill prevention, and waste reduction practices.



A bioswale collects stormwater runoff while removing debris and pollution.
Photo Source: Chesapeake Stormwater Network

Benefits Flood control, pollution prevention, and recreation and environmental amenities.

Partners NYSDEC, SWCDs, Municipalities

Resources [USEPA's National Menu of Best Management Practices \(BMPs\) for Stormwater](#)

3.3.2 Collaboration, Partnerships, & Outreach

4. Develop an Educational Program on Stormwater and Floodplain Protection

Description Initiate an educational program and instruction for planners, highway departments, and local elected and appointed officials, with the goal of increasing knowledge of the critical need for healthy sustainable wetlands and develop methods to incorporate this awareness into their decision making and planning processes.

Benefits Strengthen local capacity for successful management and protection by empowering decision-makers.

Partners County Planning, NYSDOS, NYSDEC, DANC, SWCD, SLRWP

5. Implement a Formal Drainage Maintenance Program

Description Inspection and maintenance program for ditches, culverts, and storm sewers. Inspections scheduled at least annually and following large rain events. This program could potentially engage the public where a local resident “adopts” a drainage area and reports its status after a large rain event. GIS tools and smart phones offer low-cost and efficient ways to support community awareness and participation.

Benefits Identify and repair areas that are damaged, blocked, or lack capacity to handle flow

Partners County Planning, DANC, SWCD, County Highway Departments

6. Complete Mapping of Flood-Prone Areas

Description Flood maps across much of the St. Lawrence River watershed are incomplete, out of date, or not available in digital format. FEMA’s flood hazard mapping program identifies flood hazards, assesses flood risks and partners with states and communities to provide accurate flood hazard and risk data to guide them to mitigation actions.

Benefits Mapping of areas would allow smarter decisions to be made concerning development

Partners FEMA, County Planning, DANC, SWCD, County Highway Departments, County Emergency Management Programs

7. Expand Participation in the NYSDEC Trees for Tribs Program

Description Trees for Tribs is a statewide program that works to reforest New York State’s tributaries by planting trees and shrubs to create riparian buffers. Through the “buffer in a bag” program, free seedlings are provided to residents to plant along waterways.



Volunteers plant trees along tributaries as part of the NYSDEC Trees for Tribs Grant Program.
Photo source: NYSDEC

Benefits Riparian buffers help slow runoff, decrease erosion, reduce flood damage, improve habitat, and protect water quality.

Partners NYSDEC, SLRWP, County SWCDs, Municipalities, Land Trusts, Not-for-profit Agencies

Resources Learn more about [NYSDEC’s Trees for Tribs grant program](#).

3.3.3 Municipal & Programmatic Actions

8. Reserve Open Space and Floodplain Property Through Property Acquisition

Description Allow communities to purchase flood-prone properties and reserve them for floodplain protection and open-space.

Benefits Restoration of open space and natural land cover will reduce flood hazard and provide recreational amenities.

Partners Municipalities, FEMA, Land Trusts, The Nature Conservancy, TILT, IRLC

9. Adopt Local Measures to Limit Activity on Floodplains

Description Municipalities without adequate floodplain protections should modify comprehensive plans and zoning laws to limit development in floodplains.

Benefits Reduced loss caused by floods and protection of floodplains

Partners State, regional, and county planning agencies; APA, elected and appointed local officials

Resources [NYSDOS, 2019. Model Local Laws to Increase Resilience.](#)

10. Incorporate Shorelines in the Definitions Section of Municipal Zoning Ordinances

Description Definitions should include shorelines of lakes, streams, creeks, ponds, wetlands, and other waterbodies.

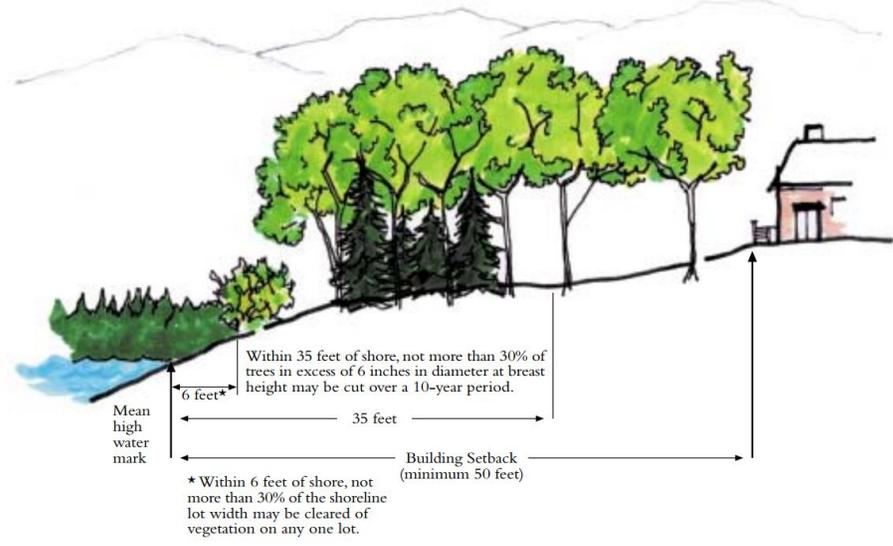
Benefits A clear definition (indexed to an elevation or mean high water level) allows maximum efficacy of the local law or zoning ordinance question.

Partners Municipalities, County Planning, NYSDOS

Resource [NYSDOS, 2019. Model Local Laws for Resilience.](#)

11. Adopt Watercourse Setback and Protection Regulations

Description Extend buffer areas along streams, lakes, ponds, creeks, waterways, channels (e.g., 35 ft each side) and wetlands (e.g., 100 ft). These areas should prohibit placement of impervious surfaces and require natural vegetation. The recommended buffer width is 100 ft, with a 35 ft minimum.



Example of building and vegetative buffer setbacks within the Adirondack Park.
 Photo Source: Adirondack Park Agency

Benefits Forest and grass buffers help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater.

Partners DANC, County Planning, Municipal Planning Boards, Agricultural Protection Boards

Resources [NYS DOS, 2019. Model Local Laws to Increase Resilience.](#)

12. Revise Land Use Laws to Limit Development on Slopes

Description Steep slopes (> 10%) typically are more prone to erosion; consequently, communities should regulate development of these areas to reduce erosion, property damage, and risk of landslides. Options include adoption of a local law, designation of an overlay district, and enhanced requirements for erosion and sediment controls during construction.

Benefits Reduced erosion and sedimentation.

Partners County Planning, APA, DANC, municipal planning boards

Resources [NYS DOS, 2019. Model Local Laws to Increase Resilience.](#)

13. Create and Adopt Stormwater Pollution Prevention Plans

Description Secure funding for non-MS4 municipalities to create and adopt stormwater management plans. Stormwater programs traditionally regulate stormwater discharges from three potential sources: municipal separate storm sewer systems

(MS4s), construction activities, and industrial activities. MS4 communities are required to develop Stormwater Pollution Prevention Plans (SPPP) that aim to prevent and reduce pollutant runoff through pollution prevention measures. Although not wholly within the watershed, Fort Drum and LeRay are MS4 communities. These communities must implement a 6-point management program that includes public education and outreach, public participation and involvement, illicit discharge detection and elimination, construction site runoff, post-construction controls, and good housekeeping and pollution prevention. This includes the implementation of BMPs such as street sweeping, road salt reduction, and incorporation of adaptive landscape features called green infrastructure. Extending the requirement to non-MS4 communities to develop SPPP's would further reduce runoff and contamination to waterbodies.

- Benefits** Reduce runoff contamination and slow the transport of water.
- Partners** NYSDEC, municipalities
- Resources** [Green Infrastructure Modeling Toolkit \(USEPA\)](#)
[Community Solutions for Stormwater Management \(USEPA, 2016\)](#)

3.4 Forest Management

The St. Lawrence River watershed includes a considerable forestry base. Forests are environmental and economic assets that provide a range of ecosystem services: habitat, scenic vistas, recreation, wood products, carbon sequestration, and improved watershed health. Forest management is necessary to keep large tracts intact, protect habitat and migration corridors, provide resilience and value to an area. Forests are managed for a variety of purposes including commercial logging, habitat protection, recreation and aesthetics, and watershed protection.

When properly managed, tree harvesting has minimal impacts on the forest and can improve forest conditions by making way for new growth. However, unsustainable harvesting practices can weaken growing stock and contribute to erosion and sedimentation. Selective cutting of mature trees may leave a less diverse and lower-quality forest behind. Fragmentation of forests due to land use changes and development have degraded habitat, decreased biodiversity and recreational value, and jeopardized forest-related businesses. Logging roads are an additional source of sediment, particularly when abandoned without reseeded.

Much of the forested lands in the St. Lawrence River watershed are under the jurisdiction of the Adirondack Park Agency (APA) and NYSDEC and are therefore subject to their management guidelines. These lands consist of Forest Preserve, Forever Wild Areas, State Forests, and Wildlife Management Areas. Creation of the Forest Preserve was largely motivated by a desire to protect

water resources; Forest Preserve and Forever Wild Areas do not allow timber harvesting. State Forests and Wildlife Management Areas do allow managed timber harvesting. Forest operations within the Adirondack Park boundary affecting more than 25 acres require a permit from the APA.

Outside of the APA boundary, local government has the potential to play a role in forestry management. Within the St. Lawrence River watershed, few municipalities have enacted forestry-related local laws. The SWCDs provide support to landowners to manage their forested areas to meet multiple objectives and protect water resources. Strategies for forest management focus on:

- Ensuring continued viability of forestry and timber production
- Protecting water quality by utilizing BMPs during timber production
- Minimizing forest fragmentation

The following recommendations help meet these objectives.

3.4.1 Restoration & Protection Actions

1. Utilize Erosion and Sediment Control Mechanisms

Description BMPs should minimize impacts of logging roads and harvesting practices on streams, lakes, and wetlands. Methods include silt fencing, rolled erosion products, water bars to control runoff flow direction, proper placement of skid trails, bridges, and haul roads, incorporating buffers, selective cutting, and replanting.



A silt fence helps filter surface water runoff from a truck road, skid trail, or landing.
Photo Source: NYSDEC

Benefits Reduce erosion and sedimentation

Partners APA, SWCD, CCE, Timber harvesters

2. Implement Forest Management Plans

Description	Community and forest management plans provide guidance to managing and caring for the forest.
Benefits	Increase and preserve canopy cover and green infrastructure, protect forests from damage and loss, and monitor and manage invasive species (emerald ash borer).
Partners	County Planning, SWCDs, NYSDEC, St. Regis Mohawk Tribe, USFS, USDA Animal and Plant Health Inspection Service, CCE, SLELO PRISM
Resources	Akwesasne Community Forest Management Plan (2018) Massena Tree Management Plan (2018) Ogdensburg Inventory Management Plan Part 1 Ogdensburg Management Plan Part 2

3.4.2 Collaboration, Partnerships, & Outreach

3. Promote Sustainable Forestry Practices and Management

Description	Discourage clearcutting and encourage selective harvesting, which removes certain trees and improves forest health, vigor, and future growth by making way for natural regeneration. It is recommended to not remove more than 10% of the total forest area during any one harvest to maintain adequate canopy cover.
Benefits	Responsible forest management and stewardship allows a forest to provide sustainable ecosystem services, whether managed for timber harvesting, recreation, or wildlife habitat.
Partners	NYSDEC (Forest Stewardship Program), SWCD, CCE (Forestry Extension Program, Master Forest Owner Program), APA

3.4.3 Municipal & Programmatic Actions

4. Adopt Appropriate Zoning

Description	Zoning ordinances that assure that the land can be managed for multiple forest uses, including harvesting, while potentially conflicting uses such as residential subdivisions are discouraged. Municipalities should also review existing regulations to identify any “forestry unfriendly” language that may create obstacles to generally accepted forest management.
Benefits	Prevent fragmentation and conversion of forest land to other uses.
Partners	APA, municipalities

5. Require Buffer Strips Along Sensitive Areas

Description	Buffer strips along streams, steep slopes, scenic byways, recreational trails, and where rare, threatened, or endangered species are present.
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Benefits	Reduce erosion and sedimentation, preserve sensitive habitats and scenic beauty, improve water quality
Partners	APA, municipalities, SWCD

3.5 Invasive Species Management

The St. Lawrence River watershed is vulnerable to invasive species because of its high recreation usage and proximity to a major shipping corridor. Invasive species can affect forests, agricultural crops, and the recreational quality and food webs of aquatic resources. The risk of damage to public health, native ecosystems, food supply, and economics is very high. Disturbed landscapes and areas affected by nonpoint source pollution may be even more at risk.

It is essential that residents are aware of the risks of invasive species and understand the immense value of prevention, early detection, and rapid response. While it is not possible to eliminate invasive species from reaching the lands and waters, aggressive actions can help reduce the risk of these species becoming established.

The Adirondack Park Invasive Plant Program (APIPP), the St. Lawrence-Eastern Lake Ontario (SLELO) PRISM, NYSDEC, SWCDs, and local nonprofit organizations have developed robust invasive species management programs. Collaborative efforts within the watershed should focus on the following strategies:

- Education on invasive species, their impact, best practices, and what to look for
- Monitoring, early detection, and rapid response to prevent establishment of new invasive species
- Manage established infestations
- Develop a prioritization tool to focus invasive species management efforts

The following recommendations support these strategies.

3.5.1 Restoration & Protection Actions

- 1. Expand Watershed Steward Programs and Install Informational Kiosks at Public Boat Launches**

Description Expand the number and locations of volunteer and paid stewards at water access sites to inspect recreational watercraft and gear for invasive species, provide boat washes (clean-drain-dry) and educate the public.



Stewards inspect boats and educate boaters throughout the Adirondacks, helping to prevent the spread of invasive species.

Photo source: Adirondack Explorer

High-use lakes within the Adirondack Park are already included in the Adirondack Watershed Institute’s Stewardship Program; therefore, new programs should focus on high-use waterbodies outside of the Park. Watershed steward programs will require ongoing support, including adequate funding to attract students to serve in remote areas. Informational kiosks educate the public on what invasive species are, their impact, and which ones to look out for.

Benefits Reduced risk of invasive species introduction and establishment

Partners PRISMs, residents, NYSDEC, CCE Invasive Species Program, Adirondack Watershed Institute, Save the River, Indian River Land Trust, Indian River Lakes Conservancy

2. Provide Signage at Marinas and Water Access Points

Description Development of standard signage with information at marinas and boat launches that inform the public with descriptions of local invasive species, watch species, proper decontamination methods and reporting contact information.

Benefits Informs and allows the community with knowledge to reduce the spread of invasive species.

Partners PRISMs, residents, NYSDEC, CCE Invasive Species Program

3. Manage Established Infestations

Description There are three main methods used for control of invasive species – biological, mechanical, and chemical. Biological control is the intentional manipulation of natural enemies by humans for the purpose of controlling pests. Mechanical control includes mowing, hoeing, cultivation, and hand pulling. Chemical control is the use

of herbicides. These methods can be used in combination for an integrated management approach.

Benefits Managing established invasive infestations will restore the ecological, recreational, and economic value of the region’s lakes, rivers, and ponds, particularly those with public access.

Partners SLELO, APIPP, NYSDEC, SWCDs, non-profits, lake associations, municipalities

3.5.2 Collaboration, Partnerships, & Outreach

4. Advance the Capabilities of iMapInvasives

Description New York has adopted a management framework that includes both centralized and regional organizations and partnerships. These sites provide extensive information; however, the scattered array of online resources has a high potential for conflicting or outdated information and risks duplication of effort. The current iMapInvasives mapping resource provides outstanding opportunities for geographic analysis of invasive species challenges and empowering citizen science, however, its current platform limits usage. This site should be established by concentrating on fulfilling the needs of end-users, with an information architecture and design that make key information readily accessible. iMapInvasives staff should engage with Soil and Water Conservation Districts (SWCDs), NYSDEC, Cornell Cooperative Extension, NYSDAM, etc., to evaluate opportunities for data sharing and ongoing software updates that facilitate shared goals.

Benefits Encourages collaborative efforts, informs the public

Partners iMapInvasives, APIPP, SLELO, NYSDEC, CCE, SWCDs, NYSIPM Program, NYS OPRHP, NYNHP, SUNY ESF

References Adirondack Partnership for Regional Invasive Species Management Strategic Plan (2013-2017), [NYS Invasive Species Comprehensive Management Plan](#) (2018).

3.5.3 Municipal & Programmatic Actions

5. Support and Expand Education and Monitoring to Improve Early Detection and Rapid Response

Description Recruit, train, and coordinate scientists and citizens to assist in monitoring program and provide associated coordination, training, data management, and quality control. Efforts should focus on educating all field crews, cooperators, resource managers, volunteers, and visitors on invasive species identification. Through these efforts, priorities will be established to allow greater focus on species that pose the most significant threat.



SLELO volunteer inspecting hemlock for hemlock woolly adelgid.
Photo source: SLELOinvasives.org

Benefits Public engagement, early detection of species may prevent full invasion, ability to set priorities

Partners PRISMs, citizens, NYSDEC, CCE Invasive Species Program, Adirondack Watershed Institute, Save the River, Indian River Lakes Conservancy

6. Support Watershed Stewardship Programs throughout the Watershed

Description Municipalities and lake associations are encouraged to seek support and grant opportunities to finance the expansion of watershed steward programs, boat wash stations, and necessary staff on high-use lakes.

Benefits Reduce invasive species spread, prevention and education are most important for invasive species prevention

Partners Paul Smith’s College Watershed Stewardship Program, Adirondack Regional Watershed Stewardship Program, Lake Associations, NYS OPRHP, NYSDEC, SLELO, APIPP

References NYS Aquatic Invasive Species Management Plan (2015), Adirondack Partnership for Regional Invasive Species Management Strategic Plan (2013-2017)

7. Provide Support for Certified Pesticide Applicator Trainings and Equipment

Description Federal law requires any person who applies or supervises the use of restricted use pesticides to be certified in accordance with USEPA, state, and tribal laws. Many invasive species management strategies include pesticide application which requires trained and certified applicators as well as special-use equipment.

- Benefits** Removes barriers to rapid response and early detection management strategies.
- Partners** NYSDEC, SWCDs, CCE
- Resources** Visit the [NYS Pesticide Administration Database](#) to find information regarding certified applicators and technicians within your region, training courses, and certification/recertification exams.
- References** [NYS Invasive Species Comprehensive Management Plan](#) (2018).

8. Support Post-IS Management Monitoring

- Description** Post-management documentation and evaluation is necessary to determine the effectiveness of management efforts. For example, number of native plants emerging, number of plants that do not appear after 3 years are useful metrics.
- Benefits** Evaluate the effectiveness of invasive species management efforts, helps to determine the best and most effective projects to fund.
- Partners** NYSDEC, SWCDs, CCE
- References** [NYS Invasive Species Comprehensive Management Plan](#) (2018).

9. Support Research and Use of Emerging Technology to Monitor Invasive Species

- Description** Invest in research and technology tools to advance knowledge on invasive species interactions, mechanism of control and eradication. Some examples include eDNA, ballast water treatment, and innovative barriers.
- Benefits** Allows for a rapid and coordinated response to new detections.
- Partners** iMapInvasives, APIPP, SLELO, NYSDEC, CCE, SWCDs, NYSIPM Program, NYS OPRHP, NYNHP
- References** [NYS Invasive Species Comprehensive Management Plan](#) (2018).

10. Support Efforts to Mitigate Established Aquatic Invasive Species Infestations Through Expanded Local and State Funding

- Description** Funding support to control invasive species infestations is not currently adequately recognized, yet there is a substantial need.
- Benefits** Funding aids in the implementation of control efforts that will restore the use of lakes, rivers, and streams in the watershed.
- Partners** NYS, PRISMs, NYSDEC, SWCDs, lake associations

3.6 Infrastructure and Development

Municipal activities and development contribute to nonpoint source pollution. Construction, streambank erosion, changes in land use, and impervious surfaces have the potential to alter hydrological processes and contribute to sediment, nutrient and salt pollution.

Roadways and roadway ditches are designed to move water off the road as quickly as possible. As a result, road installation and maintenance activities can affect local hydrology and increase the risk that stormwater runoff will increase pollutant transport to waterways.

Deicing practices are a concern in the St. Lawrence River watershed. When considering the adverse effects, effectiveness, and economic reasons for sustaining current winter road management strategies, hidden, chronic, and cumulative costs should be considered. Road salt has contaminated residential drinking wells and increased the salinity of adjacent waterbodies.

The recommendations seek to minimize potentially adverse water quality impacts of municipal activities. Strategies include:

- work with municipalities to identify gaps in local laws relevant to reducing nonpoint source pollution
- ditch management,
- implementing stormwater, erosion control, and de-icing BMPs
- preparing for a changing climate.

3.6.1 Restoration & Protection Actions

1. Implement Road Deicing BMPs

Description Highway and road maintenance crews spread salt to de-ice roads, which ultimately moves into nearby road ditches and streams, leaches into groundwater, and may reach drinking water wells. Example BMPs to minimize the impacts and maximize the effectiveness of road salt include:



Salt truck out on route to service winter roads.
Photo source: Adirondack Watershed Institute

- Apply salt at lowest reasonable truck/applicator speeds (MDOT, 2012)
- Utilize pre-wetting (brine added to salt prior to being road applied)
- Apply anti-icing treatments (pretreatment of pavement with de-icing chemicals intended to prevent snow and ice from sticking to surface)
- Calibrate spreaders and produce a calibration chart to be used as a guideline for operators to determine how many pounds per lane mile should be applied at any given spreader setting
- Explore alternative deicers
- Build salt/sand storage facilities

Benefits Increased efficiency of road salt use, reduced salt contamination of adjacent waterbodies. BMPs implementation should prioritize source water areas where surface and groundwater resources used for drinking water need to be protected.

Partners NYSDOT, County Highway Departments, Municipal Highway Departments, Local Public Works Departments

2. Identify Areas Most at Risk of Adverse Impacts from Road Salt

Description Map sensitive areas using knowledge of landscape conditions, drinking water sources, and known problem areas (e.g., increasing concentrations in soils, groundwater, streams, wetlands, and water supply wells). Areas identified as sensitive and targeted for lower rates of deicing materials should have signage warning drivers of potentially icy conditions.

Benefits Identifies vulnerable areas to road salt and develops a strategy to reduce impacts.

Partners NYSDOT, NYSDEC, APA

3. Invest in Improved Technology and Equipment

Description Standardized and automated systems including pavement temperature sensors, bucket scales, GPS/automated vehicle location systems, plow trucks with segmented plow blade, alternative blade technologies, closed loop ground speed controllers, and automated spreaders

Benefits Advanced technology can improve winter road maintenance operations, saving municipalities money and reducing environmental impacts.

Partners Municipalities, NYSDOT, County Highway Departments, Municipal Highway Departments, Local Public Works Departments, Cornell Local Roads Program

4. Implement Erosion Control Mechanisms

Description Methods for roadside erosion remediation include installation of sediment basins, hydroseeding of road ditches, ditch stabilization, rolled erosion products, bank toe stabilization, and check dam installation.



SWCD hydroseeder was used to vegetate a recently cleaned ditch.
Photo source: NYS Conservation District Employee's Association

Benefits Reduce roadside erosion and allow space for stormwater runoff infiltration and slow.

Partners County Highway Departments, Municipal Highway Departments, NYSDOT, SWCD, NYSDEC, Cornell Local Roads Program

5. Streambank Assessment and Restoration

Description Design and implement streambank assessment and restoration programs that restore (or mimic) natural hydrologic and biological processes. Maximize the use of bioengineering approaches and design for projected impacts of climate change on rainfall frequency and intensity.

Benefits Reduce erosion, improve habitat and water clarity, provide source water protection for water supply intakes.

Partners SWCDs, NYSDEC, nonprofits

6. Continue Surveying and Assessing Road-Stream Crossings

Description Assess culverts and bridges using the North Atlantic Aquatic Connectivity Collaborative (NAACC) protocol. This protocol identifies road-stream crossings that impede aquatic connectivity and are at risk to flooding impacts. Malfunctioning or inappropriately-sized culverts can lead to flooding, erosion, sedimentation, and wash-out. NAACC certified surveyors are necessary to conduct culvert assessments.



Scientists with the U.S. Fish and Wildlife Service inventorying and assessing barriers for fish passage removal. Photo source: USFWS

Benefits Identify culverts in need of replacement to increase habitat connectivity and reduce risk of flooding and sedimentation.

Partners NAACC, SWCD, NYSDEC, Trout Unlimited, USFWS

Resources Tools and regional collaboratives focused on aquatic organism passage and fragmentation of river and stream ecosystems can be found at the [Aquatic Connectivity Portal](#), maintained by the North Atlantic Connectivity Collaborative (NAACC). This includes an aquatic barrier prioritization tool and HUC12 prioritization tool to identify subwatersheds that may have priority for field survey of crossing assessments.

3.6.2 Collaboration, Partnerships, & Outreach

7. Expand Training Programs for Local and County Highway Departments

Description The training program should utilize classroom, shop, and on-the-road components to train operators on proper plowing, salting techniques, ditch and culvert design, streambank stabilization, hydroseeding, and erosion control.

Benefits Allows for a place to introduce new technologies and advances in road deicing, erosion control, and stabilization techniques to allow for proper and appropriate winter road maintenance.

Partners NYSDOT, County Highway Departments, Local Public Works Departments, Cornell Local Roads Program

3.6.3 Municipal & Programmatic Actions

8. Secure Funding for Regional Culvert Replacement Program

Description Secure continuous funding to address undersized, shallow, and culverts facing restricted flow that causes ponding and flooding or impedes habitat and connectivity. Replacing culverts with properly installed, sized, and placed culverts should allow for fish, wildlife, and floods to pass so that stream flows and velocities are unaltered. Projects where severe barriers have been identified by NAACC assessments should be prioritized.

Benefits Improved habitat, habitat connectivity, and drainage.

Partners Town and County DPW Budget Committees, NYSDOT, County Highway Departments, Municipal Highway Departments, Local Public Works Departments, SWCD, USACE

9. Create a Road Salt Reduction Task Force

Description Create a task force with NYSDOT, local public works departments, County Highway Departments, and researchers to design and implement a pilot program to reduce the use of salt on state roads in the watershed; monitor and report.

Benefits Reduced impacts environmental, infrastructure, and automobile impacts to road salt contamination and exposure.

Partners NYSDOT, County Highway Departments, Municipal Highway Departments, Municipalities, APA, Adirondack Watershed Institute, Cornell Local Roads Program

10. Assist municipalities with reviewing their local laws to reflect best practices to control nonpoint source pollution

Description Review the **St. Lawrence River Watershed Local Laws and Programs Affecting Water Quality** with municipal representatives to identify gaps and areas for improvement. Specific topics to address water quality concerns may include:

- Compliance with SPDES Stormwater Construction Permit requirements
- Lakeshore/riparian overlay districts
- Sediment and erosion control
- Limitations on impervious cover
- Steep slope development restrictions
- Riparian setbacks

Despite the significant differences among watershed municipalities in land use, population, and local laws, a consistent approach to addressing nonpoint source pollution would benefit the watershed.

- Benefits** Adoption of appropriate tools and ordinances to reduce risk of nonpoint source pollution from development activities.
- Partners** Municipalities, County Planning, NYSDOS, Development Authority of the North Country (DANC), North Country Regional Economic Development Council (NCREDC)
- Resource** NYSDOS, 2019. Model Local Laws for Resilience.

11. Support Community Participation in the Climate Smart Communities Program

- Description** Climate Smart Communities (CSC) is a NY program that helps local governments inventory and reduce greenhouse gas emissions and adapt to a changing climate.
- Benefits** Altering the built and natural environment will help alleviate the adverse impacts of climate change
- Partners** Municipalities, NYSERDA, NYSDEC, NYSDOS

3.7 Water and Wastewater Management

Adequate water and wastewater infrastructure play an essential role in water quality. Drinking water and wastewater infrastructure are in constant need of maintenance, repair, and updating to protect the health of our streams, rivers, and lakes. Infrastructure must also be resilient to the impacts of climate change, including increased precipitation, sea level rise, stronger and more frequent storms, flooding, and periods of little precipitation.

Household water must undergo treatment to remove nutrients and pathogens prior to being released back into the environment to avoid negative impacts on receiving water quality. Municipal wastewater is either treated at a municipal treatment facility or is subject to on-site treatment (i.e., septic systems). On-site septic systems can provide adequate treatment and disinfection of wastewater when subject to regular inspection and maintenance. These systems are governed under Title 10 of NYS Codes, Rules, and Regulations, Public Health Law 201(1)(1). At present, onsite septic systems are managed at the municipal level within this watershed, with on-site inspections occurring if a problem occurs and/or is reported.

On-site septic systems are cited as a contributor of pathogens and nutrient loads to adjacent waterbodies, particularly around lakes that have experienced a transition from seasonal camps to full time residences.

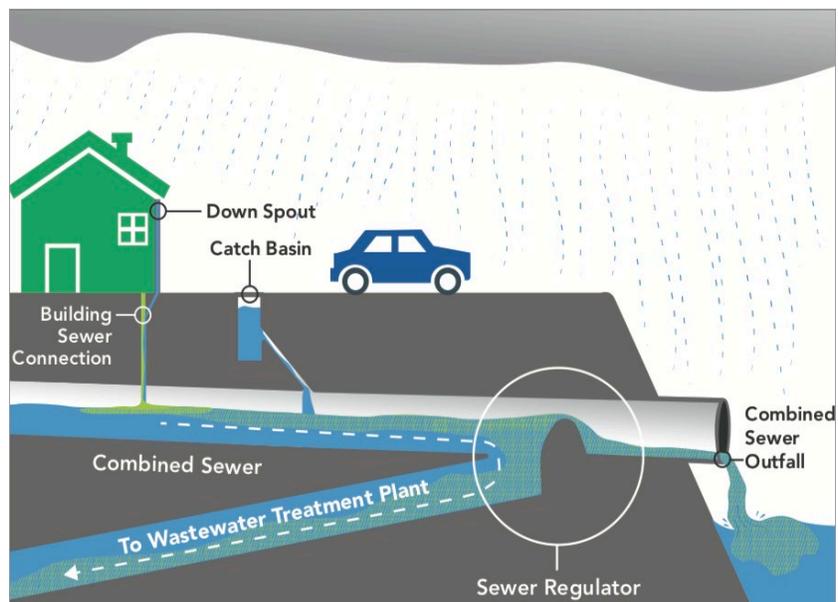
Recommendations for improved wastewater management to reduce nutrient and pathogen inputs to receiving waters include the following strategies:

- address combined sewer overflows
- address on-site septic systems,
- prepare infrastructure to meet climate change needs and flooding, and
- protect drinking water source waters as identified by the [NY water mapper](#) (current water systems in the St. Lawrence River watershed include the St. Lawrence River (main stem) which serves as the source for Alexandria Bay, Massena, and Ogdensburg, the Oswegatchie River which serves Gouverneur, the Raquette River which serves Potsdam, Tupper Lake, Little Simon Pond, and groundwater serve the Village of Tupper Lake, and groundwater wells at Fort Drum).

3.7.1 Restoration & Protection Actions

1. Address Combined Sewer Overflows (CSO)

Description Some older sewerage systems were designed to carry both wastewater from commercial, industrial, and residential properties and stormwater in a single pipe, and direct the combined flow to a wastewater treatment plant. In events of intense rainfall and runoff, the capacity of these collection systems is exceeded, and a mixture of stormwater and wastewater is discharged to waterways through relief points called combined sewer overflows (CSOs). Measures should continue to minimize discharge from CSOs through development and implementation of a facility's Long-Term Control Plan.



Wet weather conditions in a combined sewer system.
Photo source: NYCDEP

Where Municipalities with CSOs (City of Ogdensburg, Villages of Massena, Clayton, Tupper Lake, Gouverneur, and Potsdam)

- Benefits** Reduce pollution to waterways and protect public health.
- Partners** City and Village WWTPs, NYSDEC, County Planning Departments
- Resources** The Sewage Pollution Right to Know Law requires that publicly owned treatment works report sewage spills to the public within four hours of discovery. Enroll in the [NY-alert system](#) to receive sewage discharge alerts. Information on wastewater discharges to waterways and compliance with Clean Water Act permitting is available from [USEPA's Enforcement and Compliance History Online \(ECHO\)](#) database.

2. Improve Existing Municipal Wastewater Treatment Systems

- Description** Make necessary improvements to existing municipal wastewater treatment systems to ensure compliance with SPDES permits, accommodate populations served, and remove nutrients. Encourage municipalities to secure adequate funding for infrastructure maintenance and asset management.
- Benefits** Compliance with SPDES permits, minimize nutrient and pathogen discharge.
- Partners** County Planning, Municipalities, Citizens, POTWs

3. Develop a Septic Management & Monitoring Program

- Description** Work with County and local municipalities to develop funding options and an active program for identifying failing septic systems. The program should include incentives to induce residents and/or commercial establishments with substandard onsite septic systems to upgrade and/or consolidate to meet current standards of design and operation. The program could also aid homeowners in testing septic leaks making decisions regarding their septic systems.
- Benefits** Identify and address failing septic systems
- Partners** County Planning/SWCD/DOH, NYSDEC, Municipalities, Development Authority of the North Country (DANC), Lake Associations, local Housing Councils, Not-for-profits

3.7.2 Collaboration, Partnerships, & Outreach

4. Educate Local Elected Officials

- Description** Develop and deliver to all local governments in the watershed, education and training to all planning boards and code enforcement officials to raise the level of understanding of the local authority and responsibility for onsite septic system monitoring.

Benefits Increase awareness of existing issues and develop strategies and funding to address wastewater management.

Partners NYSDEC, County Planning/SWCD/DOH, Municipalities, DANC.

5. Educate Homeowners

Description Implement community based educational programs for homeowners and others on septic system maintenance and to reduce the introduction of contaminants to storm sewer systems (pet waste, lawn clippings and landscaping, solid waste management)

Benefits Increase awareness of existing issues and increase adoption of efforts to minimize pollution.

Partners NYSDEC, County Planning/SWCD/DOH, Municipalities, Lake associations

6. Initiate and Advertise Pharmaceutical Take-Back Programs

Description Programs to collect old, unused, unneeded, or expired medicines. These locations safely and securely gather and dispose of pharmaceuticals, including controlled substances. Drug Take Back Days, temporary drug collection sites should be set up in communities for safe disposal of prescription drugs.

Benefits Reduce the input of Contaminants of Emerging Concern into water systems

Partners NYSDOH, County Planning/SWCD/DOH, USDOJ Drug Enforcement Administration, local law enforcement

Resources [US Food and Drug Administration: Where and How to Dispose of Unused Medicines](#)

7. GIS Mapping of Sewered Areas

Description Develop a GIS map showing sewered and non-sewered areas, areas that are being contemplated to receive new sewer service through improvement or extension projects. Use this map to communicate updates of added connections and improvements to the sewer district.

Benefits Useful for watershed planning efforts and when considering extending public sewer systems.

Partners DANC, County Planning, NYSDEC

3.7.3 Municipal & Programmatic Actions

8. Adopt Uniform Sewer Ordinances/Sanitary Law

Description Currently, septic system regulation is dependent on township with most towns within the Adirondack Park adopting some septic system regulations for new development involving depth to groundwater table and bedrock, slope, waterbody

setback, and percolation rate. Municipalities should update, or enact, sewer ordinances to protect water quality from private treatment systems (e.g., distance to waterbody, maintenance, provisions to allow alternative wastewater disposal methods). Residences within 500 ft of a lake and/or 150 ft from tributaries should be considered in a "critical environmental zone" and subject to more frequent inspection.

Benefits Reduce nutrient and pathogen input to groundwater and surface waters

Partners NYSDOH, SWCDs, Water Quality Coordinating Committees, County Health Department, County Planning, Municipalities, Lake associations

Resource NYSDOS, 2019. Model Local Laws to Increase Resilience

9. Consider Extending Public Sewers or Alternatives

Description There are areas within the St. Lawrence River watershed where individual on-site wastewater treatment systems are at a higher risk of failure. Where density allows, increase the number of residences served by the existing municipal systems. Encourage the use of alternative treatment systems such as cluster/community-based septic systems, especially in areas where lot sizes do not meet minimum on-site septic system requirements.

Benefits Extended sewer systems will reduce the risk to public health and the environment of inadequately treated wastewater reaching downgradient receiving waters.

Partners County Planning Departments, Municipalities, Citizens

10. Engage in and Support Cost-Share Programs to Replace Failing Septic Systems

Description



Wet patches and patches of lush green grass are signs of a failing leach field.
Photo source: Septic Installation Pros

Foster a cost-share program to repair or replace failing septic systems. All counties should continue to support the acquisition of NYS Statewide Septic System Replacement program administered through NYS EFC for high priority ranking watersheds/sub-basins. For the Counties that have an allocation from this program, the Counties should continue to work to replace failing septic systems. In addition to engagement, support for the development of administrative funds to support the NYS Statewide Septic System Replacement Program funding. Due to the program structuring, the grant outreach/education, a current-system evaluation, and project oversight performed are not covered by grant funds. There is a significant need for these funds to assist in the process of identifying the septic systems that need repair or replacement.

- Benefits** Incentivize repairs by assisting homeowners and counties with the cost of replacement and administration of the program.
- Partners** NYSDEC, County Planning/SWCD/DOH, Municipalities, Development Authority of the North Country (DANC), NYS Environmental Facilities Corporation Septic System Replacement Program
- Resources** USHUD - [Community Development Block Grant Program](#)
NYSEFC – [State Septic System Replacement Program](#)

11. Develop Source Water Protection Plans

- Description** Work with stakeholders to develop source water protection plans based on the [NYS Drinking Water Source Protection Program \(DWSP2\)](#) Framework. DWSP2 is a four-agency initiative co-led by NYSDEC and NYSDOH in collaboration with NYSDAM and NYSDOS.
- Benefits** Drinking water source protection plans help communities develop a long-term protection plan for source water(s) that protect public health and safety, and the environment. The plan helps municipalities make informed decisions to avoid preventable drinking water treatment costs, prevent pollutants from entering a drinking water supply, increase community confidence in their local water supply, create partnerships that support implementation, and utilize a broad array of existing funding sources to aid with project implementation costs.
- Partners** NYSDEC, NYSDOH, NYSDAM, NYSDOS, state-hired consultants, regional planning boards, New York Rural Water Association (NYRWA), local municipalities, local stakeholders
- Resource** [NYSDEC Drinking Water Source Protection Program Website](#), includes recommended framework and template for creating a Drinking Water Source Protection Program Plan and data summary sheets to assist in plan development.

3.8 Water Quality Research & Monitoring

There are numerous and diverse pollutants and sources affecting water quality in the St. Lawrence River watershed. Coordinated efforts are essential to successful monitoring and research programs. Therefore, recommendations for water quality research and monitoring include elements to leverage existing stakeholders, encourage citizen science, and foster collaboration to gain better understanding of the existing conditions and develop innovative techniques and technologies to restore the watershed. Key elements include:

- monitoring trends in water quality,
- encouraging participation in citizen science programs, and
- supporting research to inform future watershed management.

3.8.1 Restoration & Protection Actions

1. Monitor Legacy Contamination Remediation Efforts

- Description** Continue tracking implementation plans and status of legacy contaminated sites (Superfund, Brownfield). Superfund sites fall under jurisdiction of an USEPA program intended to restore the nation's worst hazardous waste sites. Brownfield sites, which

are typically former industrial areas where chemical pollutants have infiltrated the soil, fall under NYS jurisdiction. These sites are remediated to reduce the risk of contamination reaching environmental receptors.

- Where** Superfund and Brownfield sites
- Benefits** Improved environmental quality.
- Partners** NYSDEC, Municipalities, SRMT, Responsible Parties

3.8.2 Collaboration, Partnerships, & Outreach

2. Develop a Water Quality Data Repository and Collaborative

- Description** Develop or engage with a centralized public water quality data repository.
- Benefits** A central platform for water quality data will inform watershed projects, modeling, planning, implementation, and tracking efforts. Over time, the information will provide new insights into changing conditions across the watershed.
- Partners** River Network, Izaak Walton League of America-Water Data Collaborative, SWCDs, NYSDEC, USGS, USDA-NRCS

3. Encourage Citizen Engagement and Citizen Science

- Description** Citizen volunteers are invaluable resources for tracking water quality trends, sharing information, engaging others, and making projects happen. Citizen engagement in NYSDEC water quality programs such as CSLAP, PEERS, and WAVE allows residents and scientists to observe water quality status and trends. Continue and increase engagement in the Adirondacks Lake Assessment Program. Volunteers can target and map invasive species, assist in HABs monitoring, plant trees for riparian buffers, and much more.



CSLAP volunteer measuring the depth of water clarity with a secchi disk.
Photo source: NYSDEC

- Benefits** Volunteer watershed monitoring help reduce costs, provide site-specific information on the status of emerging issues, and contribute to science literacy.
- Partners** NYSDEC, Adirondack Watershed Institute, Lake Associations, citizens, students, high-school science programs, Indian River Lakes Conservancy, Save the River, APIPP, SLELO, CCE, iMap Invasives, River Institute

3.8.3 Municipal & Programmatic Actions

4. Continue Funding for USGS Gauges

- Description** Continue financial support for all stream gauges within the St. Lawrence River watershed.
- Benefits** These gauges and resulting data are essential for tracking water levels and flow rates. Ultimately these data can support calculations of water residence time and pollutant loading rates that can provide a more quantitative basis for setting priorities and tracking progress.
- Partners** USGS, Municipalities, NYS

5. Secure Funding for Drinking Water Testing Program

- Description** Secure funding to establish and advertise a water testing program for residential wells, particularly in areas considered vulnerable to salt contamination from road applications or bacteriological contamination from wastewater or manure handling.
- Benefits** Gives homeowners access to water testing to warn them of risks to health of people and livestock.
- Partners** SWCDs, Adirondack Watershed Institute

3.9 Watershed Planning, Management, & Outreach

The success of this plan depends on an ongoing commitment of funding, planning and other resources to support protection and restoration initiatives. Therefore, recommendations for watershed management and outreach include elements of adaptive management to measure and track effectiveness of implementation efforts and adjust as needed. In addition, public awareness of the importance of water resources are necessary to build public support to fund implementation. Key strategies include:

- identifying effective collaborations and funding sources to implement recommendations,
- developing mechanisms to track and evaluate implementation efforts, and
- engaging stakeholders and the public to foster appreciation of watershed resources and support for the plan.

3.9.1 Restoration & Protection Actions

1. Designate and Support a Circuit Rider for the St. Lawrence River Watershed

- Description** A circuit rider will work with municipalities to identify gaps in local land use tools and regulations that aid in protecting water quality and natural resources. The circuit

rider will aid municipalities in adopting and writing needed measures to guide development and protect natural resources and assist with grant applications and implementation.

Benefits Directs resources and capacity to priority areas or those in need of aid to implement the Plan.

Partners SLRWP, DANC, NCREDC, Planning Departments, SWCD, NYSDEC, NYSDOS

2. Enforce Existing Regulations Impacting Water Quality and Protection

Description Despite local laws to protect water quality and flood-prone areas, enforcement varies widely across the watershed. Improved training of Codes Enforcement Officers and Planning Boards is needed.

Benefits Protect public health, environmental quality, and infrastructure.

Partners Code Enforcement Officers, County Planning Departments, Local Municipal Planning and Zoning Boards, NYSDEC, NYSDOH

3. Develop an Implementation Reporting and Tracking System

Description Establish an online, public inventory to record implemented BMPs, their status, and effectiveness with periodic reviews. A responsible party should be identified to review and update data annually.

Benefits Result in the development of subsequent strategic plans to focus institutional energies and priorities to benefit the entire watershed.

Partners County Planning, SWCDs, County DOH, NYSDEC, Municipalities

4. Use Media to Relay Information and Engage the Public on Plan Implementation Efforts

Description Utilize the St. Lawrence River Watershed Project website, social media, and traditional news outlets to communicate progress and issues across the watershed. An annual report on implemented projects and outcomes related to the Revitalization Plan can be shared through these networks.

Benefits Public outreach builds community support for actions and investments to implement the recommended actions.

Partners SLRWP, SWCD, NYSDEC, North Country Public Radio, North Country Now

5. Initiate a St. Lawrence River Watershed Annual Conference

Description An annual conference with municipalities, researchers, lake and river organizations and other not-for-profits, NYS state agencies, agricultural support agencies, planners, federal partners such as USGS and IJC, and other interested parties. The goal would be to update progress toward recommended actions, promote water

quality monitoring efforts, describe relevant research findings, and foster collaboration. Partnering with a University or College to host the annual conference should be considered; this model is used for the Mohawk River and Black River watersheds, which also encompass a broad area with multiple resource management issues.

Benefits Encourage data sharing, public outreach, and form collaborative partnerships within the watershed.

Partners NYSDEC, County Planning/SWCD/DOH, Municipal departments, lake associations, NYSDOS, Adirondack Watershed Institute, Universities, Environmental Organizations, APIPP, SLELO, USGS, IJC

6. Develop Watershed Curriculum and Associated Teacher Training

Description Support development of a watershed-based curriculum and teacher training that encompasses pollution prevention and watershed protection. Expand participation of Cornell in the Classroom (CCE program) and encourage other types of classroom education on natural resources.



Save The River has teamed up with North Country school districts to develop a program that connects students directly to the St. Lawrence River to better understand through hands-on curriculum activities and educational "On-the-Water" field trips.

Photo source: Save The River

Benefits Expand opportunities for students to gain local knowledge of watershed-related issues, encourage STEM education, and improve scientific literacy.

Partners Cornell Cooperative Extension, Adirondack Watershed Institute, Indian River Lakes Conservancy, The Nature Conservancy

3.9.2 Municipal & Programmatic Actions

7. Coordinate Funding and Other Resources to Implement Watershed Priorities

- Description** A subcommittee of the watershed collaborative should be established to tap existing resources and pursue new sources of funding to implement watershed priorities. Members should represent each geographic area of the watershed and have a range of affiliations to provide insight on priorities and knowledge of funding sources.
- Benefits** Additional funding sources would improve and speed up restoration efforts and could support implementation of best management practices.
- Partners** SLRWP, County Planning Departments, County DOH, SWCDs, NYSDEC, NYSDOS

8. Establish an Ongoing Collaborative for Plan Implementation

- Description** Establish a central hub for collaboration on water resource issues throughout the watershed. Representatives from watershed municipalities and agencies responsible for land and water management should be active participants. The group should develop annual work plans and an organizational structure that allows for efficient implementation of the recommendations provided in this *St. Lawrence River Watershed Revitalization Plan*. A standard communication protocol for all organizations involved should be developed. The collaborative should provide an annual report to share information with the public regarding trends in resource management and ongoing progress with implementing the Plan's recommendations.
- Benefits** A coordinated effort is necessary for the Plan to be implemented, tracked, and evaluated.
- Partners** SLRWP, County Planning/SWCD/DOH, NYSDEC, Municipalities

9. Increase County Soil and Water Conservation Districts and Planning Departments Staffing to Implement Projects

- Description** SWCDs, Planning Departments, and associated technical staff are the boots-on-the-ground agency focusing on many issues related to resource management. SWCD staff communicate with farmers, collaborate on development and implementation of AEM programs and CNMPs, survey and restore streambanks and roadway drainage, obtain funding for water quality projects, and lead coordination efforts on many water quality-related issues. Planning Departments help communities plan and manage development and mitigate environmental impacts.
- Benefits** Increased capacity to implement projects that reduce soil erosion and nutrient pollution.
- Partners** Municipalities, SWCDs, County Planning Departments

4 Subwatershed Priority Focus Areas

Although implementing all the recommendations will improve conditions, resources of time, funding, staff, and local match are finite. This section outlines specific focus areas to implement the recommendations tabulated above. The NYSDEC Waterbody Inventory and Priority Waterbodies List (WI/PWL) was used to identify stresses and associated sources for each HUC10. Recommendation priorities were determined for each HUC10 based on the current watershed issues, existing partnerships, and vulnerabilities.

Tables 2 and 3 provide an overview of the key issues (stressors and sources) and priority recommendations for each HUC10. This section identifies high, medium, and low priority subwatersheds within each HUC8 watershed, and their respective key issues and priority recommendations. Subwatershed priority was assigned according to the result of the overall weighted score; high priority is assigned to subwatersheds with scores 56-85, medium priority subwatersheds represent those scoring 36-55 and lower priority subwatersheds had scores below 35.

4.1 Summary of Subwatershed Stressors and Sources

Table 2
Summary of Subwatershed Stressors and Sources

	Unassessed Streams ¹	Unassessed Lakes ¹	Priority Organics	Acidification	Mercury	Nutrients	Sediment	Algal/Plant	Pathogens	Atmospheric Deposition	Industrial Contamination	Agriculture	Septic Systems	Municipal WWTPs	Storm Runoff	Streambank Erosion
HUC10	Assessment	NYSDEC WI/PWL Cited Stressors							NYSDEC WI/PWL Suspected Sources							
Upper St. Lawrence River																
0415030101		●	●			●	●	●	●		●	●	●			
0415030102			●			●	●				●	●	●			
0415030103			●								●					
Oswegatchie River																
0415030201				●	●					●						
0415030202		●	●	●					●	●	●		●			
0415030203				●						●						
0415030204				●	●					●						
0415030205				●						●						
0415030206		●				●			●			●	●			
0415030207						●	●					●				●
0415030208	●	●				●	●	●	●			●	●	●	●	●
0415030209	●		●			●					●	●		●	●	
0415030210	●		●			●	●				●	●			●	
Indian River																
0415030301					●			●		●						

	Unassessed Streams ¹	Unassessed Lakes ¹	Priority Organics	Acidification	Mercury	Nutrients	Sediment	Algal/Plant	Pathogens	Atmospheric Deposition	Industrial Contamination	Agriculture	Septic Systems	Municipal WWTPs	Storm Runoff	Streambank Erosion
HUC10	Assessment	NYSDEC WI/PWL Cited Stressors								NYSDEC WI/PWL Suspected Sources						
0415030302	●					●	●					●			●	
0415030303						●	●					●			●	●
0415030304					●					●						
0415030305	●					●		●	●			●	●	●		
Grasse River																
0415030401				●						●						
0415030402	●															
0415030403						●	●					●			●	
0415030404						●						●			●	
0415030405			●			●	●				●	●	●	●		●
Raquette River																
0415030501				●	●					●						
0415030502				●						●						
0415030503				●	●	●			●	●			●		●	
0415030504	●	●		●	●				●	●			●			
0415030505	●			●	●					●						
0415030506	●	●				●	●					●				
0415030507			●			●			●		●	●	●	●		
Saint Regis River																
0415030601				●	●					●						
0415030602	●	●		●		●				●						

	Unassessed Streams ¹	Unassessed Lakes ¹	Priority Organics	Acidification	Mercury	Nutrients	Sediment	Algal/Plant	Pathogens	Atmospheric Deposition	Industrial Contamination	Agriculture	Septic Systems	Municipal WWTPs	Storm Runoff	Streambank Erosion
HUC10	Assessment	NYSDEC WI/PWL Cited Stressors								NYSDEC WI/PWL Suspected Sources						
0415030603		●		●		●		●		●		●				
0415030604	●		●	●		●		●	●	●	●	●	●			
Salmon River																
0415030701				●			●	●		●						
0415030702																
0415030703						●	●	●	●			●	●		●	●
Chateaugay-English River																
0415030801	●				●					●						
0415030802																
0415030803	●															

Notes:

1. A dot in the unassessed streams or lakes column is used to designate HUC10s with greater than 50% unassessed waters, covering over 100 miles or 1000 acres, respectively.
2. Source: NYSDEC, WI/PWL

4.2 Subwatershed Specific Recommendations

Table 3
Specific Subwatershed Priority Recommendations

HUC10	Agricultural BMPs	Manure Storage & Pasture Management	Engage with AEM	Stormwater BMPs	Address CSOs	Create & Restore Wetlands	Shoreline & Floodplain Protection	Streambank Assessment & Restoration	Road Salt BMPs	Culvert Assessment & Restoration	Protect & Restore Habitats	Invasive Species	Improve WWTP Infrastructure	Address Septics	Consider Clustering / Expanding Connections	Address Development through Local Laws	Water Quality Assessment
Upper St. Lawrence																	
0415030101	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
0415030102	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
0415030103	●		●	●		●	●	●	●			●				●	●
Oswegatchie River																	
0415030201												●	●				
0415030202														●			●
0415030203											●						
0415030204											●						
0415030205											●						
0415030206														●			●
0415030207	●		●					●									
0415030208	●	●	●	●	●	●		●	●	●		●	●	●			●
0415030209	●	●	●	●		●	●	●			●	●	●		●	●	●
0415030210	●	●	●	●	●	●	●	●	●		●		●			●	●
Indian River																	
0415030301												●					
0415030302				●					●	●			●				●

HUC10	Agricultural BMPs	Manure Storage & Pasture Management	Engage with AEM	Stormwater BMPs	Address CSOs	Create & Restore Wetlands	Shoreline & Floodplain Protection	Streambank Assessment & Restoration	Road Salt BMPs	Culvert Assessment & Restoration	Protect & Restore Habitats	Invasive Species	Improve WWTP Infrastructure	Address Septics	Consider Clustering / Expanding Connections	Address Development through Local Laws	Water Quality Assessment
0415030303	●	●	●	●		●		●	●		●		●		●	●	
0415030304	●		●				●					●	●				
0415030305	●	●	●			●					●	●	●	●	●		●
Grasse River																	
0415030401								●									
0415030402								●									●
0415030403	●		●	●				●	●	●	●					●	
0415030404	●	●	●	●		●		●	●		●		●				
0415030405	●		●	●	●		●	●	●		●		●	●	●	●	
Raquette River																	
0415030501								●				●					
0415030502								●									
0415030503				●		●		●				●					
0415030504				●	●				●	●		●	●	●			●
0415030505							●					●					●
0415030506							●	●				●	●			●	●
0415030507	●	●	●	●	●		●	●	●		●	●	●	●	●	●	
Saint Regis River																	
0415030601												●					
0415030602									●	●							●
0415030603	●		●						●	●		●	●				●
0415030604									●	●		●	●	●			●

HUC10	Agricultural BMPs	Manure Storage & Pasture Management	Engage with AEM	Stormwater BMPs	Address CSOs	Create & Restore Wetlands	Shoreline & Floodplain Protection	Streambank Assessment & Restoration	Road Salt BMPs	Culvert Assessment & Restoration	Protect & Restore Habitats	Invasive Species	Improve WWTP Infrastructure	Address Septics	Consider Clustering / Expanding Connections	Address Development through Local Laws	Water Quality Assessment
Salmon River																	
0415030701								●				●					
0415030702	●	●	●			●											
0415030703	●	●	●	●		●		●	●	●		●	●	●	●	●	
Chateaugay-English River																	
0415030801								●	●	●	●	●	●	●		●	●
0415030802	●	●	●			●			●	●	●		●				
0415030803	●		●			●			●	●							●

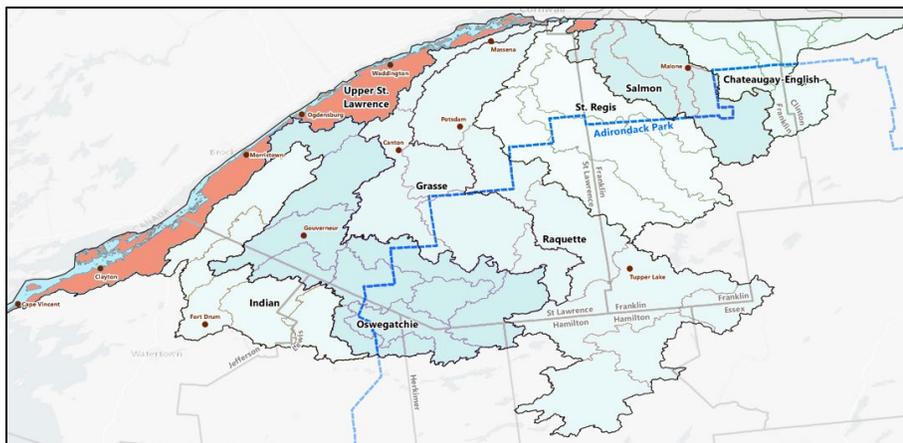
4.3 Upper St. Lawrence (04150301)

The Upper St. Lawrence River watershed is located at the most northern portion of the basin along the St. Lawrence River.

Municipalities wholly or partially within this subwatershed include:

City of Ogdensburg,
Villages of Cape Vincent,
Clayton, Alexandria Bay,

Morristown, Waddington, and Towns of Cape Vincent, Orleans, Alexandria, Hammond, Morristown, Clayton, Lisbon, and Waddington. The subwatershed consists largely of agricultural lands, forests, wetlands, and developed areas. The area is home to the largest cattle population present within the St. Lawrence River watershed, estimated at 22,500 head. The St. Lawrence River is an important economic asset for the community, drawing residents and tourists to the area.



Upper St. Lawrence River watershed highlighted in pink.

High Priority Subwatersheds and Key Issues:

- Chippewa Creek (0415030101)
 - » Nutrients and sediment from agricultural runoff and streambank erosion
 - » Excessive algal and weed growth
 - » Water levels, flooding risk, and stormwater management
 - » Pathogens and nutrients from failing septic systems
 - » Contaminated migratory fish
- Sucker Brook (0415030102)
 - » Nutrients and sediment from agricultural runoff and streambank erosion
 - » Water levels, flooding risk, and stormwater management
 - » High livestock density
 - » Contaminated migratory fish
- Robinson Creek (0415030103)
 - » Contaminated sediment (Massena-Akwesasne Area of Concern)
 - » Water levels and flooding risk
 - » Hydromodification and streambank erosion

*Priority Recommendations: see **Table 2**, **Table 3**, and **Appendix D** for more detailed recommendations for each HUC10.*

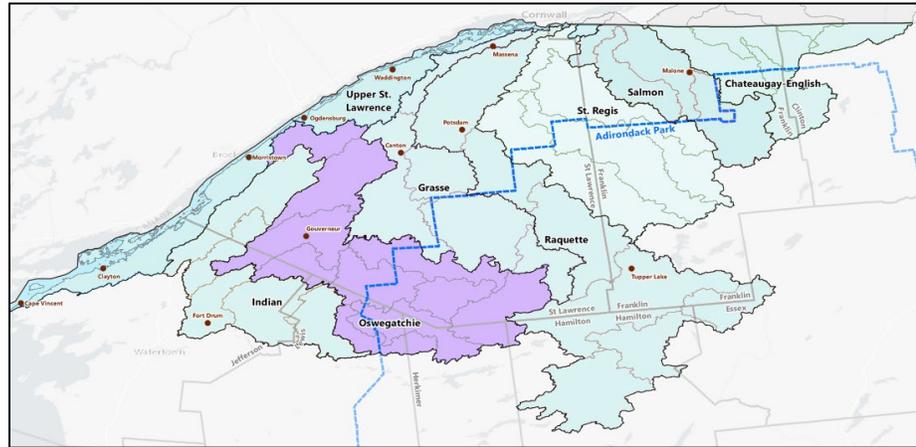
- Implement agricultural BMPs in watersheds impaired by agriculture that enhance nutrient and sediment retention on agricultural lands and prepare for a changing climate and extreme weather events
- Install manure storage facilities (that meet NRCS standards) to prevent winter spreading and allow for optimal timing of manure application
- Increase engagement with AEM and work with SWCDs to implement Tier III management plans
- Survey streambanks and restore unstable streambanks to preserve natural hydrology and reduce erosion
- Limit or restrict development in flood-prone areas and adopt shoreline setback regulations
- Review and update floodplain and/or flood damage protection regulations to increase resiliency to rising water levels, storm surge, and flooding
- Perform a detailed assessment of flood-prone tributaries, including critical culverts and bridges
- Participate in the National Flood Insurance Program's (NFIP) Community Rating System to enforce floodplain management activities
- Map areas at risk of flooding using topographic survey, hydrological assessments, and GIS mapping in collaboration with FEMA
- Protect floodplains and wetlands
- Address combined sewer overflows (CSOs)
 - » City of Ogdensburg maintains 17 CSOs and the Village of Clayton maintains 2 CSOs. The City of Ogdensburg has recently experienced several overflow events. Efforts should be made to separate stormwater and sewer lines, implement green infrastructure to reduce runoff into the combined system, or construct/expand storage capacity.
- Address failing septic systems
- Prepare public water and wastewater infrastructure to meet needs for a changing climate and extreme weather events
- Consider expanding connections to public wastewater infrastructure
- Incorporate effective stormwater management practices and programs
- Prepare and adopt stormwater drainage plans and incorporate green infrastructure
- Continue remediation activities and plans in the Massena-Akwesasne Area of Concern

4.4 Oswegatchie River (04150302)

The Oswegatchie River originates in the Adirondack Mountains and flows north to the St. Lawrence River.

Municipalities wholly or partially within the subwatershed include:

City of Ogdensburg,
Villages of Antwerp,
Harrisville, Gouverneur,
Richville, Rensselaer



Oswegatchie River watershed highlighted in purple.

Falls, Huevelton, and Towns of Fine, Clifton, Pitcairn, Edwards, Fowler, Gouverneur, Dekalb, and Oswegatchie. The headwaters are in protected forested lands within the Adirondack Park with few cited impairments, therefore recommendations focus on protection. Downstream segments are used primarily for agriculture with multiple dairy farms and a substantial row-crop production (mainly corn grown for silage). The lowlands scored higher in the subwatershed assessment, meaning that efforts should be focused on restoration of the watershed. Significant lakes within this HUC10 include Cranberry Lake, Crooked Lake, Star Lake, and Moon Lake. The Oswegatchie River is known for excellent fishing

High Priority Subwatersheds and Key Issues:

- Boland Creek (0415030208)
 - » Nutrients and sediment from agricultural runoff and streambank erosion
 - » Excessive algal weed/growth of lakes impairs recreation and aquatic habitat
 - » Invasive species management of recreational, high-use lakes (Eurasian watermilfoil in Moon Lake)
 - » Nutrients and pathogens from failing septic systems
 - » Flooding risk
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Beaver Creek (0415030209)
 - » Nutrients and sediment from agricultural runoff and streambank erosion
 - » Stormwater management
 - » Flooding risk
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Lisbon Creek (0415030210)
 - » Nutrients and sediment from agricultural runoff and streambank erosion

- » Stormwater management
- » Flooding risk

Medium Priority Subwatersheds and Key Issues:

- Headwaters Oswegatchie River (0415030201)
 - » Acidified waters
 - » Road salt pollution
- Little River (0415030202)
 - » Contaminated sediment from improper industrial disposal
 - » Acidified waters
 - » Failing/inadequate septic systems
 - » Road salt pollution
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Stammer Creek (0415030206)
 - » Pathogens and nutrients from failing septic systems
 - » Nutrients from agricultural runoff create eutrophic conditions in streams
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Matoon Creek (0415030207)
 - » Nutrients and sediment from agricultural runoff, streambank erosion, and improper manure management

Lower Priority Subwatersheds and Key Issues:

- Middle Branch (0415030203)
 - » Acidified waters
 - » Road salt pollution
- Upper West Branch (0415030204)
 - » Acidified waters
- Lower West Branch (0415030205)
 - » Acidified waters

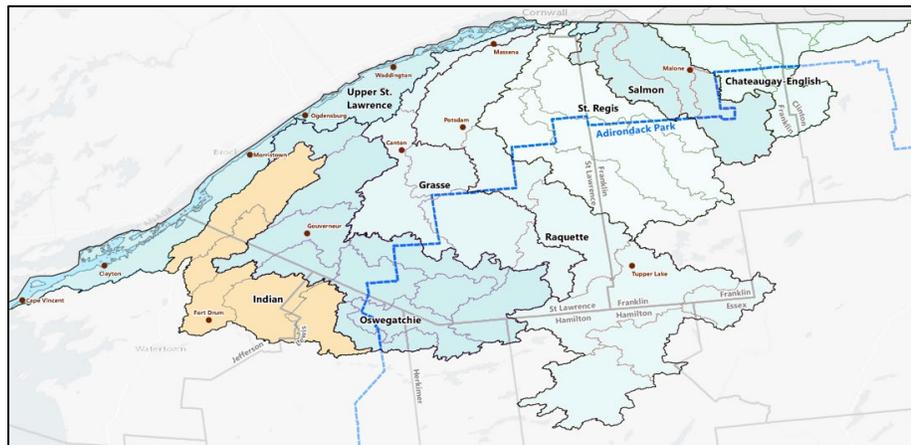
*Priority Recommendations: see **Table 2**, **Table 3**, and **Appendix D** for more detailed recommendations for each HUC10.*

- Implement agricultural BMPs to enhance nutrient and sediment retention on agricultural lands and prepare for a changing climate and extreme weather events
- Install manure storage facilities to reduce the need for winter spreading and allow for optimal timing of manure application

- Increase engagement with AEM and work with SWCDs to implement Tier III management plans
- Address agriculture on steep slopes
- Survey streambanks and restore unstable streambanks to preserve natural hydrology and reduce erosion
- Protect floodplains and wetlands
- Incorporate green infrastructure and stormwater management techniques
- Implement road salt BMPs to reduce road salt transport and pollution
- Address failing or inadequate septic systems with a priority on septic systems along shorelines
- Address CSOs by separation, green infrastructure, or enhanced storage
- Invest in upgrades to public water and wastewater infrastructure to prepare for a changing climate and extreme weather events
- Review and update floodplain and/or flood damage protection regulations to increase resiliency to rising water levels, storm surges, and flooding

4.5 Indian River (04150303)

The Indian River watershed supports a mixture of land uses, with dense forest lands at the headwaters, urban areas surrounding the US military base Fort Drum, and agricultural lands within the lowlands. Municipalities wholly or partially within this subwatershed include:



Indian River watershed highlighted in yellow.

Villages of Philadelphia, Evans Mills, Theresa, and Hammond, and Towns of Theresa, Antwerp, Philadelphia, Le Ray, Wilna, Croghan, Diana, Rossie, Macomb, and DePeyster. The subwatershed has 18 lakes; largest are Lake Bonaparte, Narrow Lake, Indian Lake, Red Lake, Millsite Lake, Muskellunge Lake, Butterfield Lake, and Black Lake. The watershed has no land within the Adirondack State Park.

High Priority Subwatersheds and Key Issues:

- Otter Creek (0415030303)

- » Nutrients and sediment from agricultural runoff, streambank erosion, and improper manure management
- » Construction and development
- » Stormwater runoff and hydromodification
- Black Lake (0415030305)
 - » Excessive algal/plant growth impairs recreational use of lakes (Black Lake, Grass Lake, Millsite Lake, Butterfield Lake)
 - » Invasive species management (Eurasian watermilfoil, curly leafed pondweed, European frogbit, common carp, zebra mussels)
 - » Eutrophic conditions and frequent algal blooms
 - » High public access increases vulnerability to invasive species
 - » Nutrient and sediment pollution from agricultural runoff, streambank erosion, and septic systems
 - » Waters are largely unassessed within NYSDEC WI/PWL
 - » Stressed aquatic habitat

Medium Priority Subwatersheds and Key Issues:

- Headwaters Indian River (0415030301)
 - » Invasive species management (Eurasian watermilfoil)
 - » Excessive algal/plant growth impacts recreational use of lakes
- Black Creek (0415030302)
 - » Nutrients and sediment from agricultural runoff and streambank erosion
 - » Stormwater runoff and hydromodification
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Red Lake (0415030304)
 - » Nutrients and sediment from agricultural runoff
 - » Flooding risk

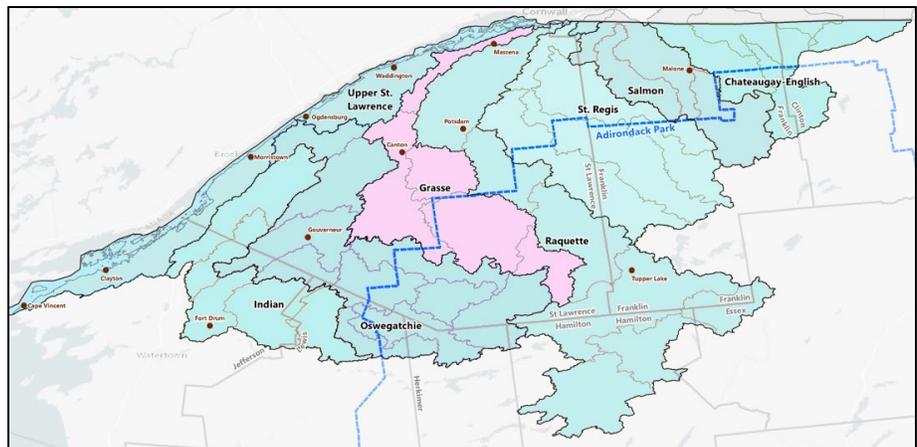
*Priority Recommendations: see **Table 2**, **Table 3**, and **Appendix D** for more detailed recommendations for each HUC10.*

- Incorporate effective stormwater management practices into new construction
- Implement agricultural BMPs to enhance nutrient and sediment retention on agricultural lands and prepare for a changing climate and extreme weather events
- Increase engagement with AEM and work with SWCDs to implement Tier III management plans

- Address failing or inadequate septic systems with a priority on septic systems along shorelines by implementing inspection programs and developing educational materials on proper maintenance
- Install boat wash stations and staff with watershed stewards on high-use days to educate the public on invasive species
- Implement aquatic vegetation management (Butterfield Lake, Millsite Lake)
- Encourage all lakes to participate in the Citizens Statewide Lake Assessment Program (CSLAP) to document trends in water quality
- Establish a HABs monitoring network and train the public, especially lakefront homeowners, on HABs identification and reporting to the state NYHABs program.
- Review and update floodplain and/or flood damage protection regulations to increase resiliency to flooding and extreme weather events
- Prepare and adopt stormwater drainage plans and incorporate green infrastructure
- Survey streambanks and restore unstable streambanks to preserve natural hydrology and reduce erosion
- Harden public water and wastewater infrastructure to prepare for a changing climate and extreme weather events
- Incorporate green infrastructure and stormwater management techniques
- Develop and implement a TMDL for Black Lake (NYSDEC 303d List – Part A waterbody) in coordination with communities and organizations in the watershed

4.6 Grasse River (04150304)

The Grasse River consists of two main branches of streams and ponds known as the Upper Branch and the Lower Branch that meet in the Town of Russell and flow north to enter the St. Lawrence River near Massena. Municipalities wholly or partially within this watershed include



Grasse River watershed highlighted in pink.

the Villages of Canton, and Massena and the Towns of Colton, Hermon, Canton, Russell, Clare, Pierrepont, Madrid, and Louisville. The watershed drains urban (3% including Massena and Canton), forested, and agricultural land. About 40% of the watershed is within the Adirondack State Park. Major resource concerns are related to forestry and recreational development in the watershed.

High Priority Subwatersheds and Key Issues:

- Lower Grasse River (0415030405)
 - » Nutrient and sediment pollution from agricultural runoff and streambank erosion
 - » Contaminated sediment from legacy industrial pollution at the Massena-Akwesasne Area of Concern
 - » Flooding risk
 - » Stormwater management

Medium Priority Subwatersheds and Key Issues:

- Upper Grasse River (0415030402)
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Little River (0415030403)
 - » Nutrient and sediment pollution from agricultural runoff
 - » Hydromodification and streambank erosion
 - » Stormwater management
- Middle Grasse River (0415030404)
 - » Nutrient and sediment pollution from agricultural runoff
 - » Hydromodification and streambank erosion
 - » Stormwater management

Lower Priority Subwatersheds and Key Issues:

- Headwaters Grasse River (0415030401)
 - » Acidified waters
 - » Road salt pollution

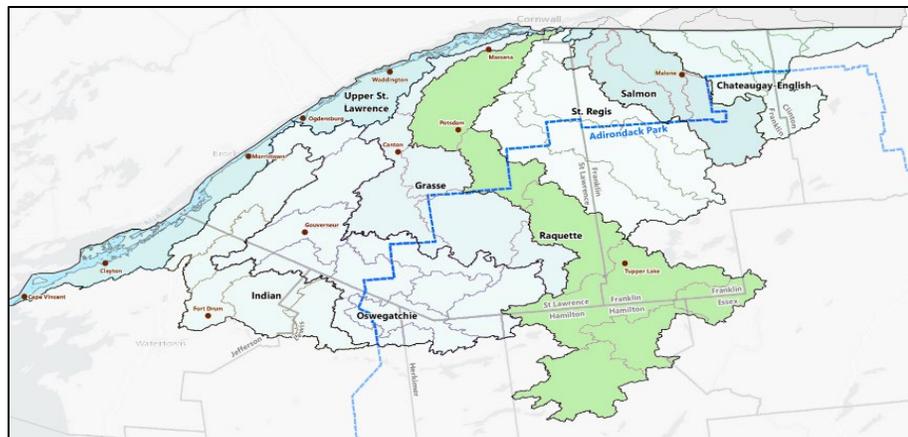
*Priority Recommendations: see **Table 2**, **Table 3**, and **Appendix D** for more detailed recommendations for each HUC10.*

- Implement agricultural BMPs to enhance nutrient and sediment retention on agricultural lands and prepare for a changing climate and extreme weather events
- Increase engagement with AEM and work with SWCDs to implement Tier III management plans
- Survey streambanks and restore unstable streambanks to preserve natural hydrology and reduce erosion
- Review and update floodplain and/or flood damage protection regulations to increase resiliency to flooding and extreme weather events

- Protect shorelines and wetlands and preserve open space by incorporating public parks and trails that limit development
- Prepare and adopt stormwater drainage plans and incorporate green infrastructure
- Prepare public water and wastewater infrastructure to prepare for a changing climate and extreme weather events
- Consider extending sewer districts to serve additional properties in critical areas
- Address combined sewer overflows (CSOs) by separation, green infrastructure, and expanded storage.
- Map areas at risk of flooding using topographic survey, hydrological assessments, and GIS mapping in collaboration with FEMA
- Implement road salt BMPs to reduce road salt transport and pollution
- Continue remediation activities and plans in the Massena-Akwesasne Area of Concern
- Collaborate with NYSDEC to update WI/PWL and assess waters

4.7 Raquette River (04150305)

The Raquette River watershed is the largest, most extensively forested, and least agriculturally intensive watershed in the St. Lawrence River basin. Much of the land (75%) resides within the Adirondack State Park offering it some protections.



Raquette River watershed highlighted in green.

Municipalities that are wholly or partially within the watershed include the Villages of Speculator, Tupper Lake, Norwood, and Potsdam and the Towns of Webb, Lake Pleasant, Long Lake, Arietta, Inlet, Indian Lake, Newcomb, North Elba, Harrietstown, Tupper Lake, Piercefield, Parishville, Potsdam, Norfolk, and Massena.

Medium Priority Subwatersheds and Key Issues:

- Raquette Lake (0415030501)
 - » Acidified lakes
 - » Invasive species
 - » High recreational use

- » Nutrients and pathogens from failing/inadequate septic systems
 - » Road salt pollution
- Big Brook (0415030503)
 - » Acidified waters
 - » Nutrients and pathogens from failing/inadequate septic systems
 - » Stormwater management
- - » Road salt pollution
- Tupper Lake (0415030504)
 - » Acidified waters
 - » Invasive species
 - » High recreational use
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Jordan River (0415030505)
 - » Acidified waters
 - » Waters are largely unassessed within NYSDEC WI/PWL
 - » Flooding risk
- Parkhurst Brook (0415030506)
 - » Acidified waters
 - » Nutrients and sediment from agricultural runoff and streambank erosion
 - » Flooding risk
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Raquette River (0415030507)
 - » Nutrients and sediment from agricultural runoff and streambank erosion
 - » Pathogens and nutrients from failing/inadequate septic systems
 - » Flooding risk
 - » Contaminated sediment in the Massena-Akwesasne Area of Concern

Lower Priority Subwatersheds and Key Issues:

- Cold River (0415030502)
 - » Acidified waters

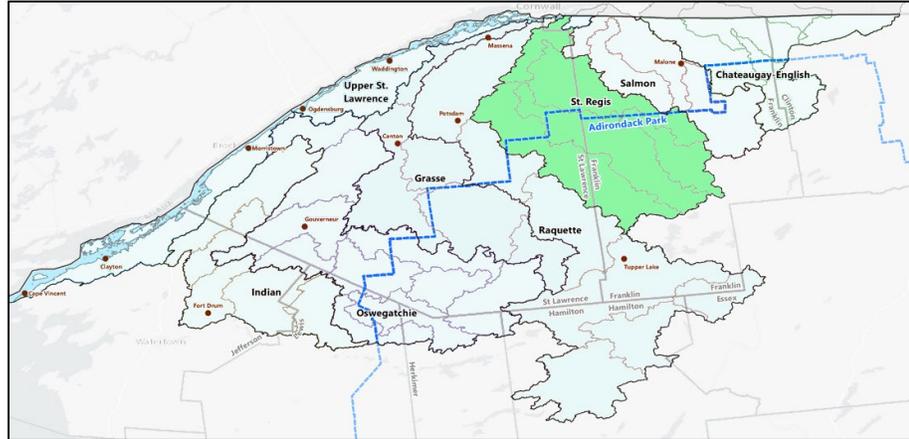
*Priority Recommendations: see **Table 2**, **Table 3**, and **Appendix D** for more detailed recommendations for each HUC10.*

- Protect floodplains and wetlands
- Incorporate smart growth policies that guide development and prevent erosion and nonpoint source pollution

- Address failing or inadequate septic systems with a priority on septic systems along shorelines by implementing inspection programs and developing educational materials on proper maintenance (Long Lake)
- Implement road salt BMPs to reduce off-road transport and pollution of surface and ground waters
- Survey streambanks and restore unstable streambanks to preserve natural hydrology and reduce erosion
- Educate landowners on best forestry management practices
- Install boat wash stations with watershed stewards on high-use lake days to educate the public on invasive species
- Implement aquatic vegetation management at Long Lake
- Encourage all lakes to participate in the Citizens Statewide Lake Assessment Program (CSLAP) to monitor water quality and document trends
- Establish a HABs monitoring network and train the public, especially lakefront homeowners, on HABs identification (Long Lake) in collaboration with the NYHABs reporting program
- Investigate the feasibility of extending public sewers into regions with small lots and inadequate soils for waste disposal (Raquette River)
- Collaborate with NYSDEC to update WI/PWL and assess waters
- Invest in public water and wastewater infrastructure to prepare for a changing climate and extreme weather events
- Prepare and adopt stormwater drainage plans and incorporate green infrastructure
- Consider clustering/expanding connections in sewerred areas
- Protect shorelines and wetlands and preserve open-space by incorporating public parks and trails that limit development
- Review and update floodplain and/or flood damage protection regulations to increase resiliency to flooding and extreme weather events
- Implement Northeast Regional TMDL for mercury and acidification in coordination with northeast states to address local water quality impairments

4.8 St Regis River (04150306)

The St. Regis River watershed drains over 800 miles of extensively forested lands. About 60% of the watershed is within the Adirondack Park. Agriculture tends to be clustered in the northern half of the watershed along the St. Lawrence plains.



St. Regis River highlighted in green.

Municipalities wholly or partially within the watershed include: Towns of Santa Clara, Hopkinton, Waverly, Brighton, Duane, Brandon, Dickinson, Lawrence, Moira, Brasher, and Stockholm.

Medium Priority Subwatersheds and Key Issues:

- West Branch (0415030602)
 - » Nutrients and sediment from streambank erosion
 - » Acidified waters
 - » Waters are largely unassessed within NYSDEC WI/PWL
- Deer River (0415030603)
 - » Nutrients from agricultural runoff and streambank erosion
 - » Invasive species management (Eurasian watermilfoil)
 - » Excessive plant and algal growth impact recreational use and habitat
 - » Occasional shoreline algal blooms
 - » Acidified waters
- St Regis River (0415030604)
 - » Acidified waters
 - » Nutrients and sediment from agricultural runoff and streambank erosion
 - » Contaminated sediment from improper industrial disposal
 - » Nutrients and pathogens from failing/inadequate septic systems
 - » Algal blooms and harmful algal blooms
 - » Excessive plant and algal growth impact recreational use and habitat

Lower Priority Subwatersheds and Key Issues:

- East Branch (0415030601)

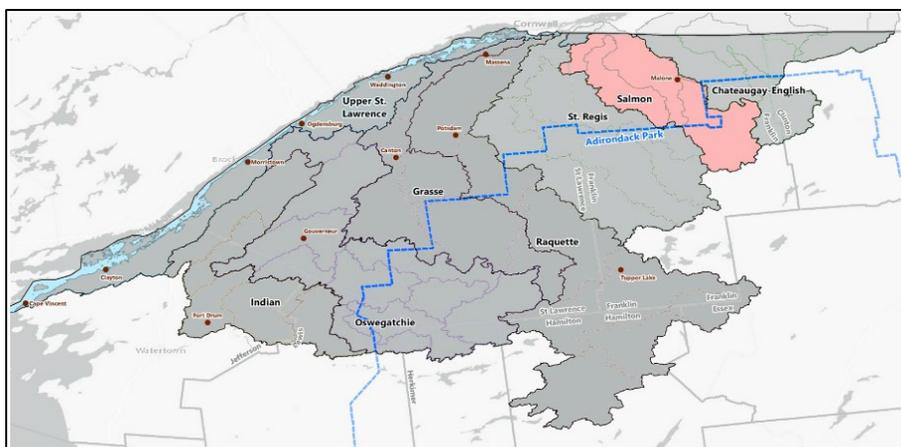
» Acidified waters

Priority Recommendations: see **Table 2**, **Table 3**, and **Appendix D** for more detailed recommendations for each HUC10.

- Implement agricultural BMPs to enhance nutrient and sediment retention on agricultural lands and prepare for a changing climate and extreme weather events
- Increase engagement with AEM and work with SWCDs to implement Tier III management plans
- Educate landowners on best forestry management practices
- Survey streambanks/shorelines and restore those in need to preserve natural hydrology and reduce erosion
- Implement road salt BMPs to reduce the risk of pollution of surface water and groundwater
- Encourage participation in the Citizens Statewide Lake Assessment Program (CSLAP) to monitor water quality and document trends
- Address failing or inadequate septic systems with a priority on septic systems along shorelines
- Harden public water and wastewater infrastructure to prepare for a changing climate and extreme weather events
- Install boat wash stations and staff with watershed stewards on high-use days to educate the public on invasive species
- Encourage all lakes to participate in CSLAP to document trends in water quality
- Establish a HABs monitoring network and train the public, especially lakefront homeowners, on HABs identification and reporting to the NYHABs program
- Continue remediation activities and plans in the Massena-Akwesasne Area of Concern
- Collaborate with NYSDEC to update WI/PWL and assess waters

4.9 Salmon River (04150307)

The Salmon River watershed drains approximately 400 miles of forested and agricultural lands from the Adirondack foothills to the international border. The watershed supports a world-class fishery of wild brook and brown trout



Salmon River watershed highlighted in pink.

populations. Municipalities wholly or partially within the watershed include: Villages of Brushton and Malone, and the Towns of Franklin, Malone, Bangor, Bombay, Fort Covington, and Westville.

High Priority Subwatersheds and Key Issues:

- Salmon River (0415030703)
 - » Nutrients and sediment from agricultural runoff, manure spreading, and streambank erosion
 - » Sedimentation and altered habitats due to hydromodification and potential releases from dams
 - » Erosion from new construction in the area
 - » Excessive plant and algal growth
 - » Decreasing riparian vegetation
 - » Nutrients from failing/inadequate septic systems

Medium Priority Subwatersheds and Key Issues:

- Headwaters Salmon River (0415030701)
 - » Sedimentation and altered habitats due to hydromodification and potential releases from dams
 - » Streambank erosion
 - » Nutrient pollution from failing/inadequate septic systems
 - » Acidified waters
 - » Invasive species management
 - » Excessive plant and algal growth in Mountain View and Indian Lakes
- Little Salmon River (0415030702)
 - » Waters are largely unassessed within NYSDEC WI/PWL

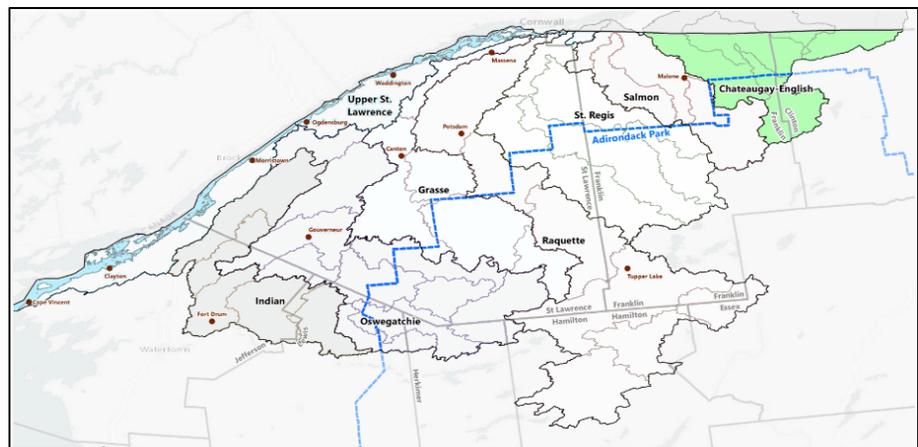
*Priority Recommendations: see **Table 2**, **Table 3**, and **Appendix D** for more detailed recommendations for each HUC10.*

- Implement agricultural BMPs to enhance nutrient and sediment retention on agricultural lands and prepare for a changing climate and extreme weather events
- Install manure storage facilities to prevent winter spreading and allow for optimal timing of manure application
- Increase engagement with AEM and work with SWCDs to implement Tier III management plans
- Survey streambanks/shorelines and restore those in need to preserve natural hydrology and reduce erosion

- Assess and identify dams in need of restoration or dredging to prevent sediment release
- Encourage all lakes to participate in CSLAP to monitor water quality and document trends
- Incorporate smart growth and land use policies to guide development and minimize erosion and nonpoint source pollution
- Address failing or inadequate septic systems with a priority on septic systems along shorelines
- Work with landowners to increase riparian buffer areas along streambanks
- Protect shorelines and wetlands and preserve open-space by incorporating public parks and trails that limit development

4.10 Chateaugay-English (04150308)

The Chateaugay-English watershed is located in the northeastern corner of the basin, spanning across Clinton and Franklin counties. This subwatershed includes comparatively small areas of lakes and streams. The southern half of the watershed



Chateaugay-English River watershed highlighted in green.

within the Adirondack Park remains mostly forested, while the northern half supports agricultural uses along the river plain. Municipalities that are wholly or partially within the watershed include the Villages of Chateaugay and Burke, and the Towns of Belmont, Dannemora, Ellenburg, Constable, Burke, Chateaugay, Clinton, and Mooers.

Medium Priority Subwatersheds and Key Issues:

- Headwaters Chateaugay River (0415030801)
 - » Excessive plant growth impacts recreational uses of Chateaugay Lake
 - » Invasive species management (Eurasian watermilfoil)
 - » Road salt pollution
 - » Nutrients and sediment from agricultural runoff, manure spreading, streambank erosion, and stormwater runoff
 - » Culvert assessment and restoration
 - » Protect and restore habitats
 - » Address septic

- » Address development through local laws
- » Waters are largely unassessed within NYSDEC WI/PWL
- Upper Chateaugay River (0415030802)
 - » Waters are largely unassessed within NYSDEC WI/PWL
 - » Nutrients and sediment from agricultural runoff
- Trout River (0415030803)
 - » Waters are largely unassessed within NYSDEC WI/PWL
 - » Nutrients and sediment from agricultural runoff

Lower Priority Subwatersheds and Key Issues:

- English River (0415030804)
 - » Waters are largely unassessed within NYSDEC WI/PWL

*Priority Recommendations: see **Table 2**, **Table 3**, and **Appendix D** for more detailed recommendations for each HUC10.*

- Implement agricultural BMPs to enhance nutrient and sediment retention on agricultural lands and prepare for a changing climate and extreme weather events
- Install manure storage facilities to prevent winter spreading and allow for optimal timing of manure application
- Increase engagement with AEM and work with SWCDs to implement Tier III management plans
- Encourage all lakes to participate in the Citizens Statewide Lake Assessment Program (CSLAP) to document water quality conditions and trends
- Improve public water and wastewater infrastructure to prepare for a changing climate and extreme weather events
- Install boat wash stations staffed with watershed stewards on high-use days to educate the public on invasive species
- Secure funding for invasive species management efforts
- Encourage watershed stewardship and pollution prevention practices
- Collaborate with NYSDEC to update WI/PWL and assess waters

5 Implementation Strategy & Schedule

This chapter connects general recommendations to the identified focus areas for each HUC10 subwatershed by providing greater geographic detail on site-specific projects through an **Implementation Strategy and Project Matrix**.

5.1 Implementation Strategies and Projects

The **Implementation Strategy and Project Matrix (Appendix D)** lists specific strategies and projects needed to protect and restore the watershed. Although each of the recommendations would improve conditions, implementation involves significant resources in terms of time, funding, staff, and support. Therefore, **Table 2** and **Table 3** identify the most significant issues in each HUC10 and give priority to implementation strategies and projects that address those focus areas. At this time, recommended projects focus on restoration and protection actions to reduce erosion and nonpoint source pollution, restore natural hydrology, build resiliency, and provide structure for future planning. Specifically, watershed implementation goals include:

- Control agricultural nonpoint sources
- Reduce nonpoint source pollution from residential property and community landscapes
- Address invasive species issues
- Reduce nonpoint source pollution from municipal activities
- Adopt or amend local regulations designed to reduce nonpoint source pollution
- Provide for ongoing collaboration, implementation, and planning
- Develop an appreciation for watershed services through educational campaigns
- Increase resiliency to flooding, climate change, and emerging threats
- Support community and habitat revitalization

Appendix D: Implementation Strategy and Project Matrix includes recommended actions, strategies/goals, priority subwatersheds, potential partners, implementation timing, and approximate costs. Projects and strategies are presented by category (i.e., agricultural management, invasive species management, etc.). Each recommended action denotes which of the above goal(s) the respective action aims to accomplish. Cost ranges for recommended actions and practices are presented as follows in tables throughout this chapter:

\$	Up to \$25,000
\$\$	\$25,000 - \$50,000
\$\$\$	\$50,000 - \$100,000
\$\$\$\$	\$100,000 - \$500,000
\$\$\$\$\$	Greater than \$500,000

Projects were gathered with input from the Watershed Advisory Committee and watershed stakeholders. High-scoring subwatersheds tend to have projects oriented towards addressing point and nonpoint sources of pollution to improve degraded water quality, habitat, and recreational opportunities. Recommended actions for low-scoring subwatersheds center around protection of waters and related natural resources.

Some recommendations aim to advance collaborations, partnerships, and outreach to enhance opportunities that will maximize capacity and resources needed for implementation. Consequently, *advancing those collaborations and partnerships should be considered amongst the highest of priorities. In addition, advancing municipal and programmatic actions that promote sustainability, reduce risk of flood damage, and revitalize communities should also be adopted as soon as possible by municipalities, with a priority focus on shoreline communities that are frequently impacted by flooding.*

Due to COVID-19, many State, County, and local budgets have taken significant cuts that are expected to put a fiscal restraint on upcoming budget years. Therefore, the project timeline is meant to be used as a guide to implementation, with the understanding that plan implementation and progress is dependent on available funding, capacity, engagement, and interest of local stakeholders, municipalities, and organizations. In times of budgetary constraints, it is important to advance implementation by prioritizing projects that serve multiple benefits, leverage existing investments, and emphasize partnerships and sharing of resources.

5.2 Potential Funding Sources

Many potential funding sources exist to aid in implementation of the St. Lawrence River Watershed Revitalization Plan; most are federal, state, and local (program-specific). An overview of selected funding sources and eligible activities is presented in **Table 4**. Additional information on agricultural conservation funding programs can be found in the [Black River Watershed Management Plan, Part II: Appendices, Section 8.7.1](#) (Bergmann Associates, 2010).

Table 4
Key Programs and Resources to Support Recommendations

Funding Source	Program	Description	Related St Lawrence River Watershed Recommendations
STATE			
NYS Dept of Agriculture and Markets (NYS DAM)	Agricultural Nonpoint Source Abatement and Control Program (ANSACP)	Financial assistance program for projects led by SWCDs that involve planning, designing, and implementing priority BMPs. The program also provides cost-share funding to farmers to implement BMPs. For more info visit https://www.nys-soilandwater.org/aem/nonpoint.html .	Agricultural Practices and Management

Funding Source	Program	Description	Related St Lawrence River Watershed Recommendations
	Agricultural Environmental Management (AEM) Program	SWCDs engage local partners such as Cooperative Extension, NRCS, AEM Certified Planners, Certified Crop Advisors, USDA Technical Service Providers, and agri-businesses to assist farmers in farm planning to reduce runoff and erosion.	Agricultural Practices and Management
	Community Resiliency Training Program	Provides community and municipality-based training events to increase resiliency to future flooding and outbreaks of harmful algal blooms in high-risk waterbodies.	Floodplain and Stormwater Management, Pollution Control
	County Agricultural and Farmland Protection Planning Grants	Financial assistance for the development of County Agricultural and Farmland Protection Plans and assist implementation of such plans.	Agricultural Practices and Management, Infrastructure & Development
NYS Dept of Environmental Conservation (NYSDEC)	Water Quality Improvement Project Program (WQIP)	For projects that reduce runoff, improve water quality, and restore habitat. Eligible applicants include municipalities, municipal corporations, and Soil and Water Conservation Districts	Infrastructure and Development, Pollution Control
	Climate Smart Communities (CSC) Grants	Provides 50/50 matching grants to municipalities for eligible climate mitigation and adaptation projects. This includes projects aimed at reducing flood-risk, increasing natural resiliency, extreme-event preparation, relocation or retrofit of critical infrastructure, and improving emergency preparedness.	Floodplain and Stormwater Management, Infrastructure and Development
	Invasive Species Grant Program	Designed to support projects that target both aquatic and terrestrial invasive species. The program allows applications for two new categories: Lake Management Planning and Aquatic and Terrestrial Invasive Species Research.	Invasive Species
	Trees for Tribes	Provides schools with free trees to plant on school property.	Floodplain and Stormwater Management

Funding Source	Program	Description	Related St Lawrence River Watershed Recommendations
	Water Quality Management Planning Programs: Clean Water Act, Section 604(b) Funding	Funding is available to implement regional comprehensive water quality management planning activities, including tasks to determine the nature, extent and causes of point and nonpoint source water pollution problems, and to develop plans to resolve these problems.	Infrastructure and Development, Water and Wastewater Management, Pollution Control
NYSDEC, OPRHP, Empire State Development Corporation, NYSDOS, NYSDAM	Environmental Protection Fund	Funds capital projects that protect the environment and enhance communities. Eligible projects include conserving farmland, restoring habitat, controlling invasive species, upgrading municipal sewage treatment plants, cleaning up waterfront property and creating public parks, purchasing land for the NYS Forest Preserve, and restoring historic sites.	Invasive Species, Infrastructure and Development
NYSDEC, NY Sea Grant	NY's Great Lakes Basin Small Grants	Support stakeholder-driven efforts to restore and revitalize the state's Great Lakes region and demonstrate successful application of ecosystem-based management.	Floodplain and Stormwater Management, Invasive Species, Pollution Control
NYSDEC / NYS Environmental Facilities Corporation (NYSEFC)	Clean Water State Revolving Fund	Provides interest-free or low-interest rate financing for wastewater and water quality improvement projects to municipalities. Eligible projects include construction or restoration of sewers and wastewater treatment facilities, stormwater management, landfill closures, as well as habitat restoration and protection projects.	Water and Wastewater Management, Floodplain and Stormwater Management, Infrastructure and Development
NYS Environmental Facilities Corporation (NYSEFC)	Drinking Water State Revolving Fund	Provides market-rate and below market-rate financing for the construction of eligible public water system projects for the protection of public health. Eligible projects include upgrade or replacement infrastructure needed to achieve or maintain compliance with federal or state health standards, and provide the public with safe, affordable drinking water.	Water & Wastewater Management

Funding Source	Program	Description	Related St Lawrence River Watershed Recommendations
<p>NYS Environmental Facilities Corporation (NYSEFC)</p>	<p>Clean Water Infrastructure Act (CWIA) Grants</p>	<p>Funds municipalities to perform capital projects to upgrade or repair wastewater treatment plants and to abate combined sewer overflows, including projects to install heightened nutrient treatment systems.</p> <p><i>Inter-Municipal Water Infrastructure Grant Program</i> funds municipalities, municipal corporations, and SWCDs for wastewater plant construction, retrofit of outdated stormwater management facilities, and installation of municipal sanitary sewer infrastructure.</p> <p><i>Consolidated Animal Feeding Operation Waste Storage and Transfer Program Grant</i> funds SWCDs to implement comprehensive nutrient management plans through the completion of agricultural waste storage and transfer systems on larger livestock farms.</p> <p><i>CWIA Source Water Protection Land Acquisition Grant Program</i> funds municipalities, municipal corporations, SWCDs and not-for-profits (land trusts) for land acquisition projects providing source water protection. This program is administered as an important part of the WQIP program.</p>	<p>Water and Wastewater Management, Agricultural Practices and Management, Infrastructure and Development, Pollution Control</p>
	<p>Integrated Solutions Construction Grant Program</p>	<p>Provides funding for projects that incorporate green infrastructure into Clean Water State Revolving Fund (CWSRF) projects that remove stormwater from combined, sanitary, or storm sewers. This funding is available only in conjunction with CWSRF financing.</p>	<p>Floodplain and Stormwater Management, Water and Wastewater Management</p>
	<p>Green Innovation Grant Program (GIGP)</p>	<p>Provides municipalities, state agencies, private entities, as well as SWCDs with funds to install transformative green stormwater infrastructure.</p>	<p>Floodplain and Stormwater Management, Infrastructure and Development</p>

Funding Source	Program	Description	Related St Lawrence River Watershed Recommendations
	Wastewater Infrastructure Engineering Planning Grant	Available to municipalities with median household income equal to or less than \$65,000 according to the United States Census. Priority is usually given to smaller grants to support initial engineering reports and plans for wastewater treatment repairs.	Water and Wastewater Management
	Septic Replacement Fund	Provides participating counties with funds to reimburse a property owner for up to 50% of the costs (up to a max of \$10,000) of their eligible septic system project. Eligible projects include replacement of a cesspool with a septic system; installation, replacement or upgrade of a septic system or components; installation of enhance treatment technologies.	Water and Wastewater Management
NYS Environmental Facilities Corporation (NYSEFC) and USFWS	Clean Vessel Assistance Program (CVAP)	A reimbursement grant program that aids marinas in the installation, renovation, and replacement of pump-out stations for the removal and disposal of recreational boater septic waste.	Pollution Control
NYS Dept of State (NYSDOS)	Local Waterfront Revitalization Program (LWRP)	Funded projects match grants to revitalize communities and waterfronts. These projects may include green infrastructure components.	Floodplain and Stormwater Management, Infrastructure and Development, Water Quality Research, Waterbody Assessments, Habitat Restoration, Watershed Stewardship Programs, Planning and Monitoring
NYS Dept of Transportation (NYSDOT)	Transportation Alternatives Program	Provides funding for roadway improvements and culvert and bridge replacements, as well as pedestrian and bicycle paths.	Infrastructure and Development
NYS Office of Parks, Recreation and Historic Preservation (NYSOPHRP)	Environmental Protection Fund Municipal Grants Program	Provides funding for acquisition, preservation, planning, development, and improvement of parks, historic properties, and heritage areas. Funding is available through the following grant categories: Park Acquisition, Development and Planning Program; Historic Property Acquisition, Preservation and Planning Program; Heritage Areas System Acquisition, Development and Planning Program.	Infrastructure and Development

Funding Source	Program	Description	Related St Lawrence River Watershed Recommendations
NYS Office of Homes and Community Renewal	Community Development Block Grant (CDBG) Program – Small Cities	Funds may be utilized to address construction or renovation of various infrastructure projects such as water, wastewater and solid waste facilities, streets, and flood control projects.	Water and Wastewater Management, Floodplain and Stormwater Management, Infrastructure and Development
FEDERAL			
Federal Emergency Management Agency (FEMA)	Hazard Mitigation Grant Program	Helps communities implement hazard mitigation measures to protect against life and property damages.	Floodplain & Stormwater Management
US Dept of Agriculture, Farm Service Agency (FSA)	Conservation Reserve Program (CRP)	A voluntary program for agricultural landowners that provides farmers with annual rental payments and cost-share assistance to establish long-term, resource covers on eligible farmland.	Agricultural Practices & Management
	Conservation Reserve Enhancement Program (CREP)	In exchange for removing environmentally sensitive land from production and introducing conservation practices, farmers, ranchers, and agricultural landowners are paid an annual rental rate and incentive payments.	Agricultural Practices & Management
	Farmable Wetlands Program	Voluntary program designed to restore previously farmed wetlands and wetland buffer to improve both vegetation and water flow.	Agricultural Practices & Management, Floodplain & Stormwater Management
US Dept of Agriculture, Natural Resources Conservation Service (USDA-NRCS)	Agricultural Conservation Easement Program (ACEP)	Provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits.	Agricultural Practices & Management, Floodplain & Stormwater Management
	Agricultural Management Assistance (AMA) Program	Provides financial and technical assistance to agricultural producers to voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation into their farming operations.	Agricultural Practices & Management. Pollution Control
	Conservation Stewardship Program (CSP)	Voluntary program that provides financial and technical assistance to implement conservation practices on agricultural and forested lands.	Agricultural Practices & Management, Forestry Management

Funding Source	Program	Description	Related St Lawrence River Watershed Recommendations
	Environmental Quality Incentives Program (EQIP)	Voluntary program that provides financial and technical assistance to agricultural producers to plan and implement conservation practices that improve soil, water, plant, animal, air and related natural resources on agricultural land.	Agricultural Practices & Management, Forestry Management
	Wildlife Habitat Incentive Program (WHIP)	Voluntary program that provides financial and technical assistance to help participants develop fish and wildlife habitat on private agricultural land, non-industrial private forest land, and Indian land.	Invasive Species
US Dept of Agriculture, Rural Development	Water & Waste Disposal Loan & Grant Program	Provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas.	Water and Wastewater Management
	Community Facilities Direct Loan & Grant Program	Provides funding to develop essential community facilities in rural areas.	Water and Wastewater Management
US Environmental Protection Agency (USEPA) and US Forest Service	Great Lakes Restoration Initiative	Funding to implement green infrastructure projects that improve habitat and other ecosystem function in the Great Lakes are eligible for funding.	Floodplain and Stormwater Management, Infrastructure and Development
US Fish and Wildlife Service (USFWS)	Partners for Fish and Wildlife Program	Assists landowners with technical and financial assistance to help protect, enhance, and restore wildlife habitat on privately owned lands. Activities include restoring wetlands, grasslands, in-stream habitats, stream banks, riparian and floodplain areas.	Floodplain and Stormwater Management, Infrastructure and Development
	National Fish Passage Program	Restore aquatic organism passage at man-made barriers including dams and culverts; priorities include projects restoring habitat to freshwater mussels, brook trout, lake sturgeon, Atlantic salmon, and American eel.	Infrastructure and Development

Funding Source	Program	Description	Related St Lawrence River Watershed Recommendations
US Environmental Protection Agency (USEPA)	Clean Water Act Section 319 Nonpoint Source Management Program	Funding to support a variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects and monitoring to assess the success of specific nonpoint source implementation projects.	Water Quality Research, Planning and Monitoring, Pollution Control; Collaboration, Partnerships and Outreach
	EPA Environmental Education Grants	Supports environmental education projects and promote environmental awareness and stewardship.	Collaboration, Partnerships, and Outreach
LOCAL			
Municipalities	Municipal budgets	Provide labor and equipment from Departments of Highways and/or Public Works to do tasks such as clean debris from streams, culverts, storm drains, etc.	All

Note: See [USEPA's Water Finance Clearinghouse](#) for more information.

6 Ongoing Implementation Framework

Once appropriate restoration and protection measures are identified (see **sections 2, 3, and 4**), the next step is to develop an implementation framework to ensure that these recommendations are put into place. An effective implementation strategy provides the framework to accomplish these four primary activities:

- establish an implementation team,
- develop an implementation tracking and evaluation framework,
- prepare a work plan, and
- communicate efforts and achievements.

Implementation of the Plan will be an ongoing process that will continue for many years. The St. Lawrence River Watershed Revitalization Plan is envisioned as a “living document”, adaptive to evolving needs and conditions of the watershed. These recommendations represent an initial round. Other projects will be added by the local partners as the Plan is implemented, conditions change, and priorities shift. Periodic re-assessments are essential to reflect changes in water quality, new opportunities for funding and partnerships, and emerging issues within the watershed. Future actions should continue to be prioritized and implemented in a manner consistent with the watershed vision and goals.

6.1 Implementation Team

To manage ongoing implementation, the St. Lawrence River Watershed Project will establish a Steering Team comprised of representatives of the watershed’s Soil & Water Conservation Districts, regional and county planning departments, NYSDOS and NYSDEC representatives, and state and local stakeholders as appropriate. The Steering Team will meet on an “as needed” basis to accomplish the following:

- develop and maintain a comprehensive planning and implementation program,
- coordinate activities and funding opportunities among stakeholders, counties, and local municipalities,
- provide public outreach and education to develop support for watershed management, and
- track plan implementation, evaluate progress, and determine future priorities.

In addition, the Steering Committee is responsible for identifying key focus groups to harness local expertise around priority issues facing the watershed. Potential focus areas include groups to address the following issues: agricultural nonpoint source pollution, non-agricultural nonpoint source pollution, invasive species, and flooding/water levels. These groups will include local watershed experts on the respective issue and be responsible for the development of annual work plans, further discussed in **Section 6.3**.

6.2 Mechanisms for Tracking Implementation and Evaluating Progress

Tracking progress of implementation efforts and watershed conditions is essential to watershed management. Periodic reviews allow managers to document progress and adjust to changing water resource issues. The subwatershed assessment used to set priority subwatersheds should also be repeated as new data become available and water quality and community needs change.

An effort should be made to document management efforts into a geographic-based (HUC12-level preferable) tracking and monitoring system for use with the subwatershed assessment scores and environmental data to evaluate the implement strategy. Eventually, GIS could capture this information and document progress. Another important metric is the amount of funding directed to the watershed projects. Tracking progress using a tool capable of visualization will help stakeholders evaluate progress, both in number and types of projects, measurable results, and geographic locations. Recent developments in watershed planning rely more heavily on watershed modeling and site-specific management, therefore integrating this knowledge into a GIS-based system would be a proactive step toward future watershed planning efforts.

Implementation strategy activities will be monitored and tracked through an **Implementation Strategy Tracking Template** that includes details such as action, project HUC10, goal, responsible party, funding sources, estimated cost, project status/progress, and project outcomes. It is also important to incorporate in-water or land-based metrics that allows the implementation effort to be easily communicated and evaluated. Therefore, these elements should be quantifiable and directly related to the management goal it is aiming to accomplish. Examples include:

- Percent of farms implementing respective BMP (i.e., reduced tillage, cover crops)
- Percent of farms engaged with AEM
- Linear feet of restored streambanks,
- Acres of restored/created riparian buffer
- Lake acres treated with herbicide
- Number of boat wash stations
- Number of failing septic systems repaired or replaced
- In-lake or in-stream water quality metrics
- Number of municipalities that adopt shoreline buffer setbacks

This effort should be made in coordination with other sampling and data collection efforts to build upon and enhance existing datasets. Some examples include the Citizens Statewide Lake Assessment Program, Trees for Tribs program, and the Adirondack Lake Assessment Program. Stakeholders are encouraged to work NYSDEC's Water Quality Monitoring and Assessment Program to evaluate changing water quality conditions over time and outcomes of implemented projects. Like the

neighboring Black River Watershed, the St. Lawrence River Watershed should plan to evaluate implementation and identify new recommendations 10-years post finalization of this plan.

6.3 Developing Work Plans

As discussed in **Section 6.1**, focus groups will be responsible for developing annual work plans. These work plans will provide a short-term management plan to implement recommendations within this Plan by detailing more specific objectives and determining how the objectives can be achieved through programs and activities. In addition to providing an effective way to measure progress, work plans can be especially helpful templates for preparing grant applications to fund watershed management plan implementation activities.

The annual work plans should be consistent with the format used to present general recommendations by categorizing recommendations into 1) restoration and protection actions, 2) collaboration, partnerships, and outreach, and 3) municipal and programmatic actions. The work plan should identify the planned activity, lead and supporting agencies, and indicate how results of the activities can be measured to assess program success. The chair of each group, whenever possible, should be a member of the Steering Committee. All work plans should be reviewed by the Steering Committee.

6.4 Communicating Efforts and Achievements

Equally important to developing, implementing, and tracking watershed management efforts is communicating those efforts to the public. Communication is essential for building trust, public support, and buy-in from local stakeholders; all are essential components.

Most stakeholders are interested in two questions: 1) what actions are being taken to mitigate an issue, and 2) is it working? Results of implementation efforts can be presented in various ways, including press releases, annual newsletters, radio broadcasts, and community meetings or conferences. Annual reports are useful in detailing efforts, typically providing a copy of the current work plan, achievements, resources used for implementation, future plans, and an estimate of future resources needed. Among the key stakeholders are municipal and County officials, elected local and state officials, and other local decision-makers who have garnered support and local resources for implementation. Efforts should be made to engage these stakeholders routinely through watershed education and progress updates. As communication of the Plan, its progress, and achievements increase, the amount of stakeholder engagement will increase as more people become aware and involved to ensure the plan is a success.

7 References

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