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ANCHOR QEA

Memorandum

January 29, 2024

To: Amanda Barber, District Manager, Cortland County Soil & Water Conservation District

From: Liz Moran, Planning and Restoration Specialist

Re: Audit of the 2017 Little York Lake Management Plan

1. Introduction and Scope

The Cortland County Soil & Water Conservation District (CCSWCD) engaged Anchor QEA to audit the 2017 Little York Lake Management Plan (the 2017 Plan) on behalf of the Little York Lake Protection and Rehabilitation Advisory Board. Little York Lake is classified as a Class B waterbody, suitable for water contact recreation and fishing. The goal of the 2017 Plan was to identify strategies and techniques for lake rehabilitation and protection, while recognizing the influence of the natural eutrophication process, human activities, and changing climate on Little York Lake.

The 2017 Plan cited three primary objectives needed to realize the plan's goal. These objectives included:

- Reduce sediment and sedimentation,
- Manage aquatic vegetation, and
- Establish a sustainable framework for lake management.

The team developing the 2017 Plan identified and evaluated nine lake management tools for their applicability to meet the objectives; from this evaluation, the team adopted five specific recommendations. This 2023 Audit reviews progress toward implementing the recommendations of the 2017 Plan and the extent to which they advance the stated objectives. We reviewed current conditions and trends in Little York Lake, considered emerging knowledge in lake and watershed management, and drew on examples from similar programs to develop a resource list. `

Overall, the Anchor QEA team concluded that the 2017 Plan is technically sound and focused on protection and rehabilitation of the primary ecosystem services that the lake provides. The community continues to make substantial progress with managing aquatic vegetation and building institutional partnerships. Challenges remain, notably related to the first objective of reducing sediment and sedimentation. This 2023 Audit offers an updated list of recommendations for consideration by the Little York Lake Protection and Rehabilitation Advisory Board.

2. Information Sources

The Anchor QEA project team reviewed prior studies of Little York Lake completed by SŌLitude Lake Management, Princeton Hydro, University of North Carolina (Dr. Gary Miller), Baystate Environmental, and recent projects of SUNY-ESF students and faculty. We discussed current concern and initiatives with Cortland County SWCD District Manager Amanda Barber. Other data sources include Citizen Statewide Lake Assessment Program (CSLAP) reports and regulatory permits related to herbicide application and dam operation. Responses from New York State Department of Environmental Conservation (NYSDEC) fisheries staff regarding stocking practices were considered, as were comments from Cortland County Department of Health regarding wastewater management. A map of the Little York Lake Special Taxing District was reviewed. In addition to these site-specific sources, Anchor QEA staff drew our experience with other regional lake management initiatives.

3. Current Conditions and Trends

3.1 Lake Water Quality

Little York Lake has participated in the CSLAP program since 2009. Water quality conditions have remained relatively consistent over the past 15 years. The lake is classified as mesotrophic, with relatively low to moderate concentrations of total phosphorus (TP) and chlorophyll-a, an indicator of phytoplankton abundance. Little York Lake waters are alkaline (basic) and extremely hard, consistent with the quality of the underlying aquifer of this kettle lake.

The most recent CSLAP report available for review (2022) noted a trend toward decreasing total phosphorus concentrations and color in the upper waters. These water quality trends are consistent with Little York Lake's evolution toward a macrophyte-dominated ecosystem. Ammonia-nitrogen in the deep water and pH levels are increasing. No occurrences of cyanobacterial blooms were reported in 2022. Cyanotoxin levels remain below regulatory standards for water contact recreation.

<u>Recommendations: Lake Water Quality</u>

- *Continue participating in CSLAP.*
- *Investigate possibility of collecting profiles of water temperature, dissolved oxygen, and specific conductance from the lake's deepest point.*
- *Train additional citizen scientists on the use of iMap Invasives and the NYSDEC's Harmful Algal Bloom reporting site.*

3.2 Macrophyte Management

Boat Wash Station and Launch Stewards

Since 2016, a boat steward program has been in place at the public launch in Dwyer Park. This initiative is a partnership with the Cortland-Onondaga Federation of Kettle Lake Associations (C-OFOKLA). In addition to inspecting boats for invasive species, the lake steward program builds awareness among the boating public on the importance of prevention.

In 2020, a waterless CD3 boat cleaning station was installed at the launch site. This compact boater-operated system provides tools for clean, drain and dry watercraft and trailers.

Annual Survey

The 2017 Plan recommended an annual survey of the lake's macrophyte community as a basis for tracking change in species richness, effectiveness of control measures, presence and abundance of invasive species, and persistence of the native plant community. While a formal annual survey has not been initiated, macrophyte species composition and abundance in regions of the littoral zone are surveyed to prepare permit applications for herbicide treatments.

Annual macrophyte surveys are typically conducted later in summer (mid-August through early September) to characterize the dominant species assemblage at maximum density. A widely applied approach is to overlay the littoral zone with a grid and define sampling points within the grid. Rake-toss surveys are a standard approach. Sample locations are georeferenced to enable comparable data collection over time. Both NYSDEC and the NY State Federation of Lake Associations (NYSFOLA) have resource guides with detailed methods for sample collection, sorting, and processing (links are provided in **Appendix 1**). The NYSDEC sampling design requires (at least) one rake toss location per hectare (2.2 acres) of the littoral zone. The NYSFOLA guidance recommends a sampling density of one location per acre. The final sampling design depends on areas of concern and target species. The littoral zone of Little York Lake is approximately 65 acres.

Aquatic herbicides

Beginning in 2019, selected areas of the lake's littoral zone have been treated with aquatic herbicides to manage invasive species (**Table 1**). A planned application of ProcellaCOR in 2023 was cancelled due to insufficient density of the target species.

Table 1. Aquatic herbicide treatments, Little York Lake, 2019- 2022

Year	Target Species	Chemical Applied	Acres Permitted for Treatment
2019	Variable-leaf watermilfoil	Navigate (2,4-D)	18.2
2020	Starry stonewort	Captain (copper)	11.2 (2 permits, 8.9 + 2.3)

Year	Target Species	Chemical Applied	Acres Permitted for Treatment
	Variable-leaf watermilfoil	ProcellaCOR	9.9
2021	Curly-leaf pondweed	Aquathol K	13
	Starry stonewort	Captain (copper)	10.9
	Variable-leaf watermilfoil	ProcellaCOR	5.7
2022	Variable-leaf watermilfoil	ProcellaCOR	3.4

Mechanical weed harvesting

This technique was included in the 2017 Plan as a tool to maintain access for navigation and recreation. Mechanical weed harvesting has been used in littoral regions of Little York Lake through a private contractor. An application to fund purchase of a weed harvester to share among members of the Kettle Lakes Association, including Little York Lake was submitted through the NYS Consolidated Funding Application process in 2023 but has not been selected as of the date of this report. Hydroraking is another tool accepted by NYSDEC to help rehabilitate areas where navigation has been impaired.

Benthic Barriers

The use of benthic mats was recommended in the 2017 Plan as a short-term tactical approach for limited areas in response to new invasive macrophyte species. Challenges related to a larger scale deployment of bottom barriers were identified following a small pilot program on Little York Lake in 2015. While use of benthic mats is allowed in New York State waters, it requires a permit. Permit conditions specify avoidance of environmentally sensitive areas such as fish spawning habitat. Additional conditions limit area of coverage and define timing of mat deployment and removal.

Benthic mats can be an effective rapid response to new invasive species and an enhancement for recreation. For example, the Town of Cazenovia manages a benthic mat program on behalf of shoreline residents. The Town coordinates the purchase, permitting, deployment, removal, and storage of the mats. Town and Village residents can have a mat deployed on their shoreline area for a modest annual rental fee. Another local example is Skaneateles Lake. The Skaneateles Lake Association has managed an extensive annual program of benthic mat deployment since 2007 in combination with hand harvesting. Links to program details are provided in **Appendix 1**.

Hand Harvesting

Hand harvesting of invasive plants was also recommended in the 2017 Plan. While labor-intensive, hand harvesting offers selective removal of target species. The technique has been used on lakes within the Adirondack Park and has been another component of the Skaneateles Lake efforts to manage Eurasian watermilfoil.

Recommendations: Macrophyte Management

- *Continue boat steward program and boat washing station*
- *Develop an annual macrophyte survey program, targeted for August.*
- *Continue herbicide treatment program to control starry stonewort, other newly introduced invasive species, and priority nuisance macrophyte species that interfere with designated uses.*
- *Continue mechanical harvesting to manage access for recreation and navigation.*
- *Consider centralizing resources to support a benthic mat program for interested shoreline residents.*
- *Continue focus on early detection and rapid response to new invasive species.*
- *Expand public information and awareness efforts including iMap Invasives, boat launch steward, informational signage, and other tools*
- *Continue participating in PRISM, NYSFOLA, NALMS, and other organizations to track emerging techniques in macrophyte management.*

3.3 Sedimentation

One of the primary objectives cited in the 2017 Plan was reduction of sediment and sedimentation, and a primary recommendation was to implement a dredging program. An analysis of the feasibility, costs, and benefits of a dredging program should begin with a realistic set of expectations. Deposition of sediment within an impoundment is inevitable. Damming the outlet of Little York Lake has profoundly modified the ecosystem. Prior management plans and sampling results document the depositional environment, expansion of littoral areas, and accumulation of silts, clays, and organic material. Restoring the lake is not a realistic expectation; we recommend a focus on rehabilitation. Restoration implies a return to pre-disturbance conditions, while rehabilitation implies repair and replacement of essential ecosystem structures and functions to achieve specified objectives (Cooke 2009). A targeted dredging program designed to protect ecologically important terrestrial, wetland, and aquatic habitat while improving recreational access remains a realistic recommendation. However, dredging is a complex and costly endeavor.

Sediment Removal by Dredging: Technology Selection

The 2017 Plan referenced a prior dredging feasibility study (Baystate Environmental Consultants, Inc. 1997) in evaluating various approaches to dredging. The technology assessment remains valid; dredging can occur by hydraulic pumping or mechanical excavation. A summary of advantages and limitations of the approaches is presented below, based on a 2015 Engineering Design Manual prepared by the US Army Corps of Engineers (USACOE 2015). Several factors influence the selection of dredging equipment and methods for a site, including the following:

- Physical characteristics of the material to be dredged
- Quantities and physical layout of the material to be dredged
- Dredging depth

- Location of dredged areas and distance to sediment handling/dewatering/disposal sites.
- Contamination level of the sediments

Hydraulic Dredging: Advantages (USACOE 2015)

- Ability to efficiently excavate and pump most types of material and compacted deposits
- Ability to operate on an almost continuous dredge cycle, which can increase production rates and result in the project execution being more economical and efficient
- Availability of dredges of various sizes, some capable of dredging to water depths of approximately 3 feet, and some to depths greater than 100 feet
- Capability of pumping dredged material long distances to upland placement areas
- Production of less material re-suspension during dredging, limiting the spread of contamination

Hydraulic Dredging: Limitations (USACOE 2015)

- The pipeline and dredge can potentially cause navigation issues in smaller, busy waterways
- Hydraulic dredges (if not self-propelled) may require tugboats or barges to move between areas

Mechanical Dredging: Advantages (USACOE 2015)

- Ability to remove most types of bottom materials, and ability to move larger objects and debris from the dredge area
- Availability of dredges of various sizes

  Dredging depth (dependent on length of excavator arm) can range from depths shallower than 1 foot, up to approximately 80 feet on larger machines

- Requires less room to maneuver in the work area compared to most other types of dredges
- Ability to perform precisely controlled excavation, so there is less risk of removing material from the foundation of docks or piers when dredging near these structures
- Frequently used when placement areas are beyond the pumping distance of pipeline dredges because barges can transport material to the placement areas
- Ability to excavate sediment at density almost equal to its in-situ density, resulting in less volume of excess water in the barges

Mechanical Dredging: Limitations (USACOE 2015)

- Relatively low production rates compared to hydraulic cutter head dredges due to using barges to transport dredged material
- Difficulty retaining soft, semi-suspended, fine-grained materials in the bucket, often resulting in higher suspended sediment concentrations

Sediment Removal by Dredging: Process and Permitting Requirements

A dredging project to rehabilitate impaired regions of Little York Lake would require a detailed process for implementation. The SEQR process must be complete prior to filing regulatory permits and approvals. The process would include:

- Determine lead agency and identify affected stakeholders
- Delineate project boundaries—dredging locations and target depths
- Hold a public meeting to describe the plan
- Update bathymetric survey within the areas to be dredged to confirm volumes for removal
- Test sediments for indicators of contamination, in accordance with NYSDEC guidance
- Identify sediment dewatering site
- Determine strategy for beneficial reuse or ultimate disposal of dredged material.
- Engage an engineering firm to develop preliminary and final design documents and prepare the bid package for contractors
- Identify and pursue all opportunities for funding assistance
- Comply with SEQR requirements to evaluate benefits, potential environmental impacts, and mitigation measures
- Once the SEQRA process is complete, file for regulatory permits and approvals:
    - Joint Application (NYSDEC and ACOE)- including Section 401 (water quality certification) and Section 404 (disposal of dredged material)
    - Stormwater permit (NYSDEC)- Staging area, dewatering site
    - Cultural resources survey (NYSHPO)
    - Navigation Aid Permit (for hydraulic dredging)- US Coast Guard
    - Any local permits for site plan review
- Once permits are in place, issue contractor bids

Sediment Removal by Dredging: Available Information and Data Gaps

Some of the data required to implement a dredging program have been gathered. In 2019, SŌLitude Lake Management updated the bathymetric survey of Little York Lake. The field team delineated the littoral zone (water depths less than 15 ft.) as part of an evaluation of areas where shallow depths and sediment accumulation may impair navigational use. In addition, the field team probed sediments within four cove areas (designated as north, east, southeast, and south) to characterize the depth of the layer of soft sediment and organic material. Core samples were collected within the upper depositional layer and analyzed for texture (particle size distribution) and organic matter. The SŌLitude team prepared maps with estimates of surface area and volume of sediment within the four cove areas (SŌLitude 2019).

Analysis of dredging feasibility and costs will also require testing sediments for a suite of potential contaminants (including heavy metals and organic compounds). NYSDEC classifies sediments removed for navigational dredging as uncontaminated (Class A), moderately contaminated (Class B),

or contaminated (Class C) based on presence and concentration of the indicator metals and organic compounds (NYSDEC 2004). Results will affect sediment handling and ultimate disposal options.

Recommendations: Dredging

- *Delineate priority areas for dredging, focused on use attainment and preservation of sensitive habitat areas.*
- *Test sediments in priority areas for compliance with NYSDEC screening criteria.*
- *Discuss potential dewatering and ultimate disposal sites with Cortland County Highway Dept and other stakeholders.*
- *Update analyses of dredging approach, sediment handling and disposal sites, permit requirements, and costs.*
- *Review application requirements of potential funding sources for implementation and modify annual workplans as possible in preparation.*

Measures to Reduce Sediment Inflow to Little York Lake

Sediment enters Little York Lake through its major tributary inflows, the West Branch of the Tioughnioga River/Goodale Lake outlet and the outlet stream from Green Lake. Agriculture is a major land use in the Cortland Valley. Rainfall intensity has increased significantly in the northeast in recent years; this trend is projected to continue as the climate continues to change. Hydrologic resilience is an essential tool to minimize erosion from cultivated lands and reduce scour of stream beds and banks. While the focus of this 2023 Audit of the 2017 Plan is on in-lake measures, preventing sediment from entering the lake is an essential component of long-term management. Measures to retain sediments on the landscape are recommended; examples of best management practices (BMPs) and potential sites for their implementation were referenced in the 2017 Princeton Hydro report. The recommendations in the 2017 report related to upstream BMPs should continue to be prioritized, given the significant costs and challenges associated with a dredging program.

Anchor QEA staff conducted a site visit of lake inlets in December 2023. There are opportunities to improve riparian vegetative cover and stabilize streambanks upstream of Little York Lake (**Figure 1**).

Figure 1. Lake inlet riparian area

In addition to upland BMPs, there may be opportunities to install sediment basins within streams as they flow through Dwyer Memorial Park. Nature-based methods to slow velocity of sediment-laden inflows and allow sediment to settle from the water column can advance the goal of reducing sediment and sedimentation. Routine maintenance and removal of sediment deposits upstream of the lake can be more cost-effective than lake dredging, and many be within local resources for equipment, trained personnel, and disposal options. As shown in **Figure 2**, there are remnants of in-water structures that appear to have been in place for decades. Note the accumulation of deposited materials.

Figure 2. Existing in-water structures within Dwyer Park

Any planned modification to the streambed and riparian areas within Dwyer Park must consider the many ways that the parkland is used. Access to the stream for recreation benefits visitors of all ages. Vegetated banks help mitigate flood risk and provide shade and refuge to the aquatic community. Community discussion of ways to improve the stream corridor and other areas within the Park would provide a forum for environmental education,

<u>Recommendations: Reduce Sediment Loading</u>

- *Survey inlet streams (including application of the Stream Visual Assessment Protocol) to identify potential locations for modification to enhance sediment deposition upstream of the confluence with Little York Lake.*
- *Delineate potentially suitable areas and discuss with NYSDEC, ACOE, USFWS, Cortland County Highway Dept. and other stakeholders.*
- *Conduct public information sessions to educate the community and solicit feedback.*
- *Continue efforts to implement recommendations of the 2017 Princeton Hydro report for BMPS, including both upstream BMPs and measures within Dwyer Park.*

Modification to Dam Operations

The dam impounding Little York Lake is owned by Cortland County and operated by the Cortland County Highway Department. Operation of the dam is permitted and regulated by NYSDEC. The dam's Hazard Potential Classification is listed as 'Significant', meaning that dam failure or mis-operation could cause economic loss and/or environmental damage. The dam is operated as a 'run of river' impoundment; water leaves the lake over the face of the dam (spillway) when inflows exceed volumetric capacity. The current operating permit (dated December 2020) allows Cortland County to conduct an annual lake drawdown in the fall to help manage invasive aquatic macrophytes. There are specific criteria cited in the NYSDEC permit for timing of drawdown and refill and a requirement to maintain flow through both channels of the lake outlet.

Members of the Little York Lake Protection and Rehabilitation Advisory Board have raised the possibility of modifying dam operations to maximize downstream transport of sediment during high flow events. Under current dam operations, inflows are retained in the impoundment long enough for sediment particles to settle. The upper waters flowing over face of the dam are less turbid than water deeper in in the lake. Operating the sluice gates to release water from deeper in the impoundment could slow the rate of sediment accumulation and loss of lake volume. Additional investigations of the technical feasibility, potential environmental impacts, and regulatory issues are recommended. From review of the dam specifications, it appears that opening the sluice gates during high inflow events is technically feasible. Confirmation from the design engineers is recommended.

The issue of downstream impacts also has data and information gaps. The downstream channel capacity needs to be evaluated. In addition, habitat assessment using the Stream Visual Assessment Protocol as recommended for the influent streams would support this evaluation. The presence of critical habitat or protected areas downstream needs to be evaluated.

If the Little York Lake Protection and Rehabilitation Advisory Board decides to pursue this alternative, we recommend a preliminary discussion with Cortland County Highway Committee members and the Highway Department. If no operational impediments are identified, discussion with NYSDEC would be advisable. This discussion would gauge the regulatory perspective on the relative risks and benefits of modifying dam operations to enhance sediment export from the impoundment. The agency can outline the analyses and levels of detail that would be required for a permit modification.

3.4 Wastewater Management

Septic system management was referenced in the 2017 Plan. To further explore this issue, the Anchor QEA team reviewed parcel data from the Special Taxing District. The number of parcels that abut the lake, and the associated real property classification code were used to evaluate the potential water quality significance of on-site wastewater disposal systems. The District encompasses 127 parcels; the majority are single-family residential homes occupied year-round (**Table 2).**

Table 2. Properties within Special Taxing District

NYS Property Class Code	Description	Count
210	Single family residence, year-round occupancy	93
220	Two-family residence, year-round occupancy	1
260	Single family residence, seasonal occupancy	19
270	Mobile home	1
280	Residential, multi-purpose	1
281	Multiple residences	2
311	Residential land, vacant	2
312	Residential land, no dwelling	3
314	Rural vacant, less than10 acres	2
322	Rural vacant, greater than 10 acres	1
411	Apartment building	1
484	Multi-use (single occupant)	1

NYSDEC has recently published a spreadsheet model, Loading Estimator of Nutrient Sources (LENS), to support their clean water planning efforts across the state (Stainbrook et al. 2022). The LENS tool has been applied to multiple regional lakes, including those in the NYSDEC 2018 series of HABs Action Plans. We applied the septic system calculations embedded in LENS to estimate the potential magnitude of this source to Little York Lake using information summarized in Table 2. The LENS calculation assumes an average number of residents per single family household (2.6 persons), average daily phosphorus excretion (1.5 grams/person/day), seasonal phosphorus uptake rate (0.4 grams/person/day, May - October), days of seasonal occupancy (May – October), and the percent of systems with deficiencies (default 25%). There are insufficient data to support specific assumptions related to wastewater system performance on the Little York Lake properties.

Based on the default assumptions in the LENS tool, annual wastewater phosphorus input to Little York Lake is approximately 33 kg. This value is likely to be very low relative to phosphorus input from the contributing watershed. However, wastewater management efforts are recommended as a component of the management plan for several reasons:

- Phosphorus seepage into Little York Lake associated with on-site wastewater systems is primarily dissolved phosphorus, which is highly available to the plankton community.
- Wastewater seepage can also be a source of microbial contamination with potential to adversely impact public health.
- There are general regulatory requirements in place for on-site wastewater systems such as technology and setback distance from waterways. These requirements apply to properties abutting Little York Lake. However, existing systems may be 'grandfathered' in. Cortland County Health Department staff shared examples of potential issues of concern (*email correspondence, December 1, 2023)*.
    - Cottages being renovated can replace their wastewater disposal systems with similar technology, even a dry well, if the building size or occupancy is not increased.
    - Some cottages are being expanded for higher occupancy with conventional systems that may not comply with setback standards,
    - Many property owners own land across the road but cite a deed restriction preventing them from pumping septage to the other side; the Department of Health notes this deed restriction as 'unconfirmed.'
    - Alternative systems have not been used or recommended because of the need for electricity and monitoring/maintenance requirements.

The analysis supports retaining recommendations related to on-site wastewater management to address issues of concern. The focus of the recommendations is on education and providing financial incentives and resources to upgrade substandard on-site systems.

<u>Recommendations: Wastewater Management</u>

- *Continue efforts on public education and outreach to maximize performance of on-site systems.*
- *Consider adopting a septic inspection program at the County level as a mechanism to assess needs for repairs and/or upgrades to current performance standards. Nearshore properties could be prioritized for support through NYS programs such as the Environmental Facilities Corp. septic system replacement fund.*

4. Implementation

Several recommended actions are included in this Audit (**Table 3**) along with relative priority for implementation. Consistent with the 2017 Plan, priorities are indexed to timeline for implementation: High (1-3 years); Moderate (3-5 years) and Low (over 5 years). This table is included to guide discussion among stakeholders to develop consensus regarding feasibility, timing, and partners.

Table 3. Summary of Recommendations and Priority

Category	Recommended Action	Suggested Priority
Lake Water Quality	*Continue participating in CSLAP*	High
	Collect profiles of field parameters at lake's deep location	Moderate
	Expand use of iMap Invasives and NYS HABS reporting site	Moderate
Macrophyte Management	*Conduct an annual macrophyte survey*	High
	Continue herbicide treatment program to control invasive species that interfere with designated uses	High
	Continue mechanical harvesting to manage access	High
	Support a benthic mat program for shoreline residents	Moderate
	Continue early detection/rapid response to invasive species	High
	Continue to build community awareness using iMap Invasives, boat launch steward, informational signage, and other tools	High
	Continue organizational partnerships focused on lake management and invasive species	High
Sediment and Sedimentation: Dredging	*Delineate priority areas for dredging, focused on use attainment and preservation of sensitive habitat areas*	Moderate
	Test sediments in priority areas for compliance with NYSDEC screening criteria	Moderate
	Review potential dewatering and ultimate disposal sites with Cortland County Highway Dept and other stakeholders	Moderate
	Update analyses of dredging approach, sediment handling and disposal sites, permit requirements, and costs	Moderate
	Review requirements of potential funding sources and gather required information	Moderate
Sediment and Sedimentation: Upstream Capture	*Survey inlet streams to identify potential locations for modification to enhance upstream sediment deposition*	High
	Delineate potentially suitable areas, review with NYSDEC, ACOE, USFWS, Cortland County Highway Dept. and other stakeholders	High

Category	Recommended Action	Suggested Priority
Sediment and Sedimentation: Upstream Capture (continued)	*Conduct information sessions to educate the community and solicit feedback on feasible BMPs that support multiple uses*	High
	Continue efforts to implement recommendations of the 2017 Princeton Hydro report for BMPS in Dwyer Park outside of riparian corridors (e.g., parking lot)	Moderate
	Continue efforts to design and implement BMPs for upstream watershed areas including agricultural parcels, and roads and ditches	High
Sediment and Sedimentation: Downstream Release	*Review dam operations with Cortland County Highway Dept. and design engineer, confer with Cortland County Legislature's Highway Committee*	High
	Confer with NYSDEC regarding the data and information required for a permit modification to change dam operations	High
	Gather required data and information on downstream capacity and habitat conditions to support request for permit modification, if modification is technically feasible and could meet regulatory requirements	Moderate
Wastewater Management	*Ongoing education and incentives for wastewater management improvements*	High
	County-wide adoption of enhanced wastewater inspection requirements	Moderate

5. References

Cooke, G. D. 2005. Ecosystem rehabilitation. Lake and Reservoir Management. 21(2): 218-221.

New York State Department of Environmental Conservation (NYSDEC). 2004. In-Water and Riparian Management of Sediment and Dredged Material. Technical & Operational Guidance Series 5.1.9. Albany NY. 77 pp.

Stainbrook, K., C. Ross, C. Davis, and L. Townley. 2022. Developing a watershed screening tool to estimate relative contribution of phosphorus to guide management planning, Journal of Environmental Management. 312 (2022) 114937 https://doi.org/10.1016/j.jenvman.2022.114937

USACE (U.S. Army Corps of Engineers), 2015. *Engineering and Design – Dredging and Dredged Material Management.* Engineering Manual EM 1110-2-5025. July 31, 2015.

APPENDIX: Resource Links

Benthic Mat programs:

Skaneateles Lake Association | SLA 2023 SPECIAL REPORT

Town of Cazenovia Benthic Map Program

Rake toss survey: NYSFOLA guidance

Rake Toss Aquatic Vegetation Surveys (nysfola.org)

Septic system inspection examples:

New Septic System Inspection Program Is Official! | Lake George Association

Septic System Installation & Inspection | Cayuga County, NY

Dredging Resources

NYSDEC Dredging Guidance- Sampling Plan

ACOE: Dredging and Dredged Material Management