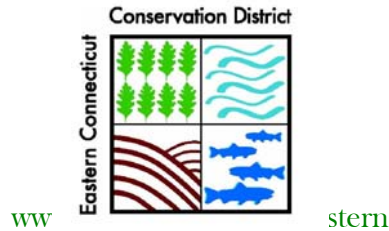


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Contract 07-16 Spaulding Pond Water Quality Improvements Eastern Connecticut Conservation District

Task 1.e – Decide on best strategies to improve water quality and pursue implementation

The Eastern Connecticut Conservation District conducted an extensive investigation and evaluation of Spaulding Pond, located in the Town of Norwich, Connecticut. The purpose of this effort was to identify the source(s) of bacteria that occasionally reaches unhealthy levels in the pond, and determine what practices would most effectively address the problem. A full reporting of this investigation and evaluation is included in the Spaulding Pond abbreviated Watershed Based Plan.

The ultimate goal for Spaulding Pond is to control the bacteria loading, to prevent the levels of E. coli from exceeding Health Department limits. To achieve this goal, the management strategies (Best Management Practices) recommended by the Watershed Based Plan must be implemented. After careful evaluation of the sources and loading mechanisms affecting Spaulding Pond, a team of stakeholders led by ECCD decided on the best management strategies for controlling the bacteria loading to Spaulding Pond. Those strategies are listed below.

Existing NPS Management Strategies to Achieve Load Reduction Goals

1. Structural Controls:

- a. Three (3) Aquamaster Master Series 5hp aerators. In recent years, the Norwich Department of Public Works has installed three aerators in Spaulding Pond to increase oxygenation and promote water movement.
- b. Beach maintenance BMPs to remove waste left by waterfowl. During the summer months, the swimming beach is raked several times during the day by Recreation Department staff to remove waterfowl droppings from the beach and shoreline. Waste is deposited in nearby waste containers.
- c. Installation of municipal sewer lines in the upper watershed by Norwich Public Utilities. In response to problems with existing septic systems in the upper watershed, NPU has been installing sewer lines on Flyers Avenue and Lambert Avenue.

*This project is funded in part by the CT DEP through a
US EPA Nonpoint Source grant under §319 of the Clean Water Act.*

- d. Installation of municipal sewer lines in the upper watershed by Norwich Public Utilities. In response to problems with existing septic systems in the upper watershed, NPU has been installing sewer lines on Flyers Avenue and Lambert Avenue.

2. Nonstructural Controls:

- a. Posted restriction for no diapers in water and accessible sanitary facilities at swim area. Norwich DPW has clearly posted the beach area with signs prohibiting diapers in the water, and has provided easily accessible sanitary facilities (portalettes).
- b. Posted restriction on walking dogs in Mohegan Park. Norwich DPW has posted signs prohibiting dogs throughout Mohegan Park.
- c. Dog waste/general maintenance BMPs at Animal Control Facility. Kennels are cleaned daily and the solid waste is removed and placed in a waste container.

Additional NPS Management Strategies Needed to Achieve Load Reduction Goals

1. Structural Controls:

- a. Installation of a vegetative buffer north of the beach area. Vegetative buffers along shorelines are effective in discouraging the establishment of Canada geese nesting and feeding areas.
- b. Installation of retractable fencing along beach. Retractable fencing has proven effective in preventing geese from utilizing shoreline areas and can be used to prevent waterfowl from using the beach area at night during the swimming season and during the off-season. For more information, see http://www.virginialakemanagement.com/goose_d-fence.php.
- c. Installation of a pond circulator to circulate stagnant water in swimming cove. The swimming beach is located in a small cove on the east side of Spaulding Pond. The main flow of water through the pond is north to south on the west side of the pond. Installation of a pond circulator may increase flow the cove to the main channel of the pond and reduce stagnation and the possible concentration of bacteria in the cove area.
- d. Replacement of aging aerators. The existing aerators have been in use for several years and breakdowns are common due to heavy use.
- e. Completion of sewer hookup currently underway on Lambert and Flyers Drives. Hook-up of failing septic systems in the upper watershed to the municipal sewer lines will reduce potential for bacterial contamination in the upper watershed.
- f. Identify/repair/replace failing septic systems in non-sewered areas. Bacterial loading due to failing septic systems will be reduced if systems are identified and repaired.

2. Nonstructural Controls:

- a. Posting of “Don't Feed Waterfowl” signs at strategic locations in Mohegan Park. Feeding the waterfowl is a popular activity at Mohegan Park. Posting informational signs at strategic locations throughout the park informing visitors why feeding is not healthy for waterfowl may help reduce flock size and reduce bacterial loading.
- b. Distribution of “Do Not Feed Waterfowl” literature at Mohegan Park and Recreation Office. Providing informational brochures educating the public why feeding waterfowl is detrimental to their health may help reduce flock size and reduce bacterial loading.
- c. Reduction in flock size
 - o Consultation with CT DEP Wildlife Division/Migratory Birds Program regarding migratory Canada Geese and resident mallard flock management strategies.
 - o Recruitment of Master Wildlife Conservationist volunteers or others to monitor flock size and conduct geese tagging for resident geese.

- Development of a flock management strategy that may include techniques such as egg addling, if resident Canada geese flock size appears to be increasing.
- d. Implementation of homeowner BMPs for septic system maintenance. Good septic system maintenance, including regular pump outs, ensures septic systems are functioning properly, allows for detection of malfunctions and extends the life of septic systems.
- e. Enforcement of “no diapers in water” policy at beach. Soiled diapers contribute directly to bacteria loading of the water.
- f. Enforcement of "no food" policy in beach area. Discarded or dropped food attracts wildlife, which may defecate while scavenging on the beach.
- g. Location of trash cans away from beach. Locating trash away from the beach area discourages wildlife foraging in the beach area.
- h. Enforcement of dog walking ban in park.
 - Evaluation of enforcement of the existing policy excluding dogs from Mohegan Park.
 - Enlistment of staff or volunteers to distribute informative “warning tickets” to educate public about Spaulding Pond water quality issues and dog restriction policy

Additional NPS Management Strategies Needed to Achieve Watershed Goals

Below are descriptions of additional management measures that will need to be implemented to achieve additional watershed goals identified watershed-based plan.

1. Conduct laboratory testing to identify the species from which the *E. coli* originates.
2. Continue water quality monitoring program at beach area at Spaulding Pond, increase from bi-weekly to weekly.
3. Expand water quality monitoring program to include sampling the unnamed stream that flows into Spaulding Pond.
4. Expand water quality monitoring of Spaulding Pond and stream to include sampling immediately after rainfalls of 1” or more.
5. Implement periodic use of optical brightener pads to detect presence of laundry detergents in the unnamed stream.
6. Expand monitoring area to bracket potential sources if optical brightener pad testing is positive.
7. Facilitation of dye testing for area homeowners if future optical brightener pad testing is positive.
8. Conduct wet weather water testing of yard drains at the Ox Hill Road residence.
9. Perform dye testing of septic system of Ox Hill Road residence if wet weather testing of yard drains indicates the presence of high *E. coli* bacteria levels.
10. Continue aerator use. Although no data has been collected to support the effectiveness of the aerators in reducing bacteria levels, park managers feel that the addition of the aerators has coincided with a reduction in the number of beach closures due to high bacteria levels.
11. Purchase a back-up aerator pump to avoid delayed installation if a pump should fail.
12. Develop a dog park area in an upland section of Mohegan Park in an area down gradient from Spaulding Pond.

The next objective for ECCD was to coordinate with stakeholders to decide what strategies could and should be pursued. When costs and other factors allowed, ECCD worked with the town to implement the strategies. For longer term projects, initial planning took place.

Spaulding Pond and a large portion of its watershed, including the land surrounding the pond, are owned by the City of Norwich. As a result of the pond being in public ownership, those with authority and responsibility for the area are governmental agencies. In addition to the Eastern Connecticut Conservation District, the stakeholders included the Norwich Department of Recreation (swimming beach management and maintenance), the Department of Public Works (park grounds maintenance), the Uncas Health District (water testing), and Norwich Public Utilities (sewer construction in the watershed). Other project participants included the Connecticut Department of Environmental Protection (Wildlife and Water Protection and Land Reuse), Norwich Animal Control (dog shelter management), local students (waterfowl survey), and park visitors.

ECCD initiated and facilitated communication with and between the various stakeholders throughout the investigation and evaluation of Spaulding Pond. As the Watershed Based Plan was being developed, input was solicited and received. In the final stages, ECCD held a meeting of the stakeholders where the strategies were reviewed to insure all parties were in agreement with the plan.

Some of the strategies in the Watershed Based Plan (WBP) were implemented prior to the start of this project, and this has been noted both in the plan and earlier in this report. In these cases, the plan's recommendation is to continue the existing practice. The following is a status report on the efforts taken to date toward implementing management strategies recommended in the WBP which had not been implemented prior to the start of this project.

- **“Do Not Feed Waterfowl” signage:** Signs were acquired by ECCD from CT DEP and provided to Norwich DPW. Signs have been put up in strategic locations around the park
- **“Do Not Feed Waterfowl” brochures:** ECCD acquired and distributed brochures on both weekday and weekend visits. Future distributions are a WBP recommendation.
- **Waterfowl flock size management:** Stakeholders agree this strategy may be necessary to achieve the goal. However, it is recognized that current techniques are controversial. Town representatives are very reluctant to pursue this strategy further until waterfowl is confirmed as the source responsible for the bacteria, through water quality monitoring efforts.
- **Riparian Buffer Installation:** The target area is the grass area on the north side of the pond, which would eliminate the only attractive grass/water interface at the pond. There is tentative agreement among stakeholders to install a buffer. An initial, low cost step would be to discontinue mowing the grass in the area and install explanatory signage. Further steps necessary, such as securing funding and technical support, are detailed in the WBP. ECCD is willing to provide technical assistance and partial funding for the buffer.
- **Increased enforcement of dog prohibition in the park:** Currently, some visitors bring dogs to the park in spite of the prohibition and non-aggressive enforcement by park maintenance personnel. However, stakeholders agree that presently, the amount of feces left by the few dogs that visit the park is probably not a significant contribution to the bacteria load. It was agreed that the strategy should remain a recommendation in the WBP, but further pursuit would not be cost effective unless dogs become more prevalent at the park, or water quality monitoring identifies dogs as a significant contributor to the bacteria load.

- **Develop a dog park:** This strategy would involve developing a dog park nearby, but outside of the Spaulding Pond watershed, as an alternative to walking dogs in Mohegan Park. Town representatives advised that a dog park had been proposed sometime in the past, and there was strong public objection to the proposal. Also, as mentioned above, dogs are not suspected as being a significant source of bacteria at this time. It was agreed that the strategy should remain a recommendation in the WBP, but pursuit will be deferred until it is thought that a dog park would result in a meaningful reduction of the bacteria load.
- **Increased enforcement of diaper prohibition:** The current policy of “No diapers in water” is meant to preclude children from wearing disposable diapers in the pond, because they disintegrate in the water. However, it is not uncommon for children who are not toilet trained to be in the water wearing diapers designed for swimming or simply a swimsuit. This could be a source of bacteria loading. The Norwich Department of Recreation is aware of this situation and stakeholders agreed that at least the prohibition on diapers should be consistently enforced. It will be up to the Recreation Department to follow through on this situation.
- **Improve water circulation in cove:** Stakeholders agreed that improving the water circulation in the cove could help reduce the levels of bacteria in the swimming area. (There is no scientific evidence of this, but there is anecdotal evidence.) The Department of Recreation is willing to install a circulation device, and the only obstacle appears to be funding.
- **Replace existing, aging, aerator(s):** Spaulding pond has very little natural flow. Three aging aerators facilitate the majority of the water movement in the pond. Stakeholders agreed that the WBP should include a recommendation that operation of the aerators should continue, and the need to replace them needed to be included in the financial requirements section of the WBP.
- **Complete hookups to new sewer lines in watershed:** North of (upstream of) Spaulding Pond, Norwich Public Utilities (NPU) is extending sewer lines to Flyers and Lambert Drives. This neighborhood is over 50 years old, and made up of homes on small lots with no room for new septic systems. The soils are not ideal for on-site septic, and some of the systems are beginning to fail. Although NPU can initiate a process to require owners to hook up to the new lines, NPU reports that their voluntary hookup rate exceeds 99%. Completion of the hookups in this neighborhood is included in the WBP as an important recommendation. Completion of the hookups will take time, but stakeholders agreed that the percentage of hookups should be reviewed in one year.
- **Repair or replacement of failing septic systems:** Even with the expanded sewer service, quite a few septic systems will still exist within the Spaulding Pond watershed. Uncas Health District will continue to be the entity responsible for ensuring that septic systems are in proper working order. Water quality monitoring (described below) will assist Uncas Health District with identifying any failing systems.
- **Utilize temporary waterfowl barrier between swimming beach and water:** This recommendation is based on the premise the waterfowl want quick and easy access to the water when on shore. The Department of Recreation has agreed to erect a snow fence or similar obstacle across the beach frontage for the off-season. The WBP further recommends that the barrier be erected each night during the swimming season. This will require that the barrier be

fairly easy to set up and take down. The Department of Recreation is willing to pursue this part of the recommendation also.

- **Water Quality Monitoring:** Uncas Health District has conducted monitoring at the swimming beach, as is required for a public swimming area. In addition, ECCD and Uncas HD conducted additional monitoring during the course of the Spaulding Pond investigation in order to determine if failing septic systems were contributing to the bacteria load. The results were inconclusive. Stakeholders agreed that additional and expanded water monitoring is essential to learning more about the source of the bacteria. A key factor in BMP implementation is almost always funding, so it is important to understand that the City of Norwich is logically unwilling to invest in BMPs when there is a question as to whether the source of bacteria is waterfowl or human in origin. Therefore, the WBP includes a set of water quality monitoring recommendations. The status of their implementation is listed below:
 - **Laboratory testing of bacteria to determine species of origin:** Stakeholders agreed that having certainty around the species causing the bacteria problem would be the singularly most valuable information to obtain. This testing would be done by a qualified laboratory using the ribosomal RNA typing method, or one of the other of several methods used for microbial source tracking. ECCD is willing to investigate the possibility of contracting for this testing, and if the cost is within reason, ECCD is willing to pay for the testing.
 - **Expand WQ testing to include the unnamed brook leading into Spaulding Pond:** Septic leachate from the Flyers Drive and Lambert Drive neighborhood entering Spaulding Pond would transit this brook. There is also another residence along this brook from which septic leachate could be originating. Uncas Health District has agreed to expand its testing to include this brook.
 - **Utilize Optical Brightener Pads:** This recommendation involves the periodic placement of Optical Brightener Pads in the unnamed brook leading into Spaulding Pond as an additional test to determine if septic leachate is entering the brook and, in turn, Spaulding Pond. Uncas Health District is aware of this recommendation, but there are no firm plans for implementation.
 - **Expand WQ testing if other testing yields positive results:** If water quality testing or optical brightener testing in the unnamed brook indicates septic failures, the WQ testing should be expanded to “bracket” (narrow down the location) the problem. Uncas Health District indicated willingness to follow through on this recommendation.
 - **Expand water quality monitoring program to include sampling Ox Hill Road residence:** An unexplained pipe has been observed on the property of a residence on Ox Hill Road. There is evidence of wet weather flow from this pipe, and there is mold growing in and around the outfall. It is uncertain if this pipe is an illicit discharge. Uncas Health District is investigating and will test as necessary.
 - **Dye Test Septic System at Ox Hill Road residence:** This recommendation is a follow-up to the recommendation above. If Uncas Health District testing indicates the

presence of E. coli bacteria at the residence listed above, the recommendation is to perform dye testing of the septic system.

Conclusion:

The City of Norwich is would like very much to see an end to the beach at Spaulding Pond closures due to excess bacteria, and therefore the stakeholder Norwich agencies will be the ones most interested in further pursuit of BMP implementation. In addition, the Eastern Connecticut Conservation District has informed them of its willingness to participate.

Respectfully submitted,
Eastern Connecticut Conservation District