

SCUDDER'S POND SUBWATERSHED PLAN

PART 1. REVIEW OF EXISTING DATA

This Part 1 report was prepared in accordance with the guidelines provided in the Scudder's Pond Subwatershed Plan Request for Proposals and the Project Scoping Meeting (Task 1) held on November 3, 2004. EEA has conducted an initial records review of all previous studies and documents available from the HHPC, as well as additional data collected from the Village of Sea Cliff and Nassau County. This report summarizes the significant findings and recommendations of these previous studies pertinent to the Scudder's Pond subwatershed, such as characterization of the ponds and contributory watershed area, and water quality. This summary report serves as Part 1 of a three part final document.

Overview of Previous Documents

The following section provides a summary of significant findings and preliminary recommendations for Scudder's Pond protection and restoration, based on a review of previous studies. The information is compiled in chronological order below, to enable a timeline comparison of evolving conditions and recommendations. As the documents were reviewed, EEA noted that many of the recommendations made in early studies were repeated in later studies, underscoring the continuing need for watershed improvements. The following narratives were further compressed into a tabular format (Table 1.1) for ease of reference, and attached to the rear of this report. EEA, Inc. and Cameron Engineering (CEA) met with the Village of Sea Cliff and the HHPC on February 25, 2005 to discuss the preliminary recommendations in Table 1.1. The purpose of our meeting was to determine what, if any, improvements had already been implemented, and whether these previous recommendations were still feasible. Based upon our discussions, a preliminary feasibility assessment was made and included in Table 1.1.

June 1973, Nassau County Department of Health, "Biological Survey of Scudder's Pond, Sea Cliff"

Biological field sampling was conducted on Scudder's Pond and the upper pond, which included plankton tows, fish, water and sediment sampling. Surveys revealed relatively low species diversity with only one fish species, the banded killifish (*Fundulus* spp.); seasonal algal blooms with a high percentage of blue-green algae indicating an enriched system; high nutrient levels and sediment build-up. All are indicators typical of a eutrophic pond system under ecological stress.

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May 27, 1975 Letter to Lester Cook (Chairman of the Scudder's Pond Task Force) from the Nature Conservancy:

1. Establish a Conservation Easement for Scudder's Pond, as employed by TNC for preserving West Meadow Creek in Stony Brook.

June 3, 1976 Letter to Scudder's Pond Task Force from Ernest Frank (Chairman of the Scudder's Pond Task Force):

1. The front of Scudder's Pond should be maintained as a pond rather than allow the area to move to the bog stage. The rear pond is already in a bog-like condition; it should be changed to assist in maintaining the front pond, but otherwise left as is.
2. The anthropogenic factors that are accelerating eutrophication of Scudder's Pond should be controlled or eliminated. These include:
 - a) Silt entering the rear pond should be trapped up-gradient;
 - b) The Littleworth Lane drain delivers animal feces, road debris, leaves, asphalt fragments, detergents, oils fertilizers, etc. Solids should be allowed to settle out before delivery to the front pond, or flows should be diverted away from Scudder's Pond;
 - c) Eliminate random dumping of trash and debris into and surrounding the pond.
3. Intervention in the natural aging process, which is required for restoration, should be undertaken with the intention of enhancing Scudder's Pond ecology and integrity of the pond and to leave it in as natural a state as possible (e.g., don't create a park).
4. Create a settling basin in the pond area;
5. Create a dam across the pond to raise the water level about 1'2" to elevation 9, and excavate behind the dam to allow settling of the Littleworth Lane runoff;
6. Dredge the front pond to a depth of 4 feet;
7. Temporarily divert Littleworth Lane drainage to see what effect this would have on water elevations in Scudder's Pond;
 - a) If the runoff from Littleworth Lane contributes little to the pond, it should be permanently diverted;
 - b) If the runoff from Littleworth Lane is contributing significantly, then the 30" pipe and ditch should be replaced with a designed settling basin.

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July 1976, H2M Corp. "The Impact of Stormwater Drainage on Scudder's Pond"

The H2M report provides a nice historical overview on the creation of Scudder's Pond, existing environmental conditions, impacts related to the increase in surrounding development and subsequent changes to the surface area of the waterbodies in the Scudder's Pond subwatershed. According to this report, "the total watershed area is over 190 acres, and except for a few catch basins on Shore Road, there is presently very little stormwater control in the watershed". Interestingly, the terrestrial community structure described in this 1976 report mimics 2005 field conditions, with the major exception of the current preponderance of invasive/alien ground covers. This is described further in the following Part 2 report covering Site Reconnaissance.

- a) Drainage from groundwater sources is contaminated by cesspool leachate and fertilizer;
- b) Stormwater runoff from the golf course contains large amounts of ammonia;
- c) Scudder's Pond acts as a settling basin for most of the stormwater in the watershed; and
- d) Approximately 64% of the stormwater entering the pond comes from Littleworth Lane.

The H2M plan proposes to divert the stormwater from Littleworth Lane into one of two engineered treatment systems prior to discharge into Hempstead Harbor, as follows:

- a) Installation of a de-gritting system consisting of a settling chamber and micro-strainer in series, and a final chlorination chamber; or
- b) Installation of a swirl concentrator and chlorination chamber.

Either system would discharge into Hempstead Harbor through multi-port diffusers, located a minimum of 500 feet from the shoreline to enable adequate dilution. The systems would be designed to capture and treat the first flush and a two-year frequency storm, and integrates a bypass system for larger storm events. The side slopes of the ditch below the Littleworth Lane outfall would be re-graded or structurally stabilized to reduce further scour and sediment deposition into Scudder's Pond.

Additional recommendations from the H2M plan include:

1. Leaching pools designed to capture and treat 1-year frequency storms would treat the drainage from Glen Lawn Avenue and Park Avenue separately.
2. Scudder's Pond would be dredged to a 5-foot depth, maintaining as steep side slopes as possible to minimize re-encroachment of emergent vegetation. The dredge spoils would be placed in the former "sand pit" bordering the golf course to stabilize the steep bank.
3. Installation of a filter berm surrounding Scudder's Pond where adequate protection from stormwater runoff does not currently exist. This berm would serve a dual purpose for stormwater treatment, and the surface would provide a recreational walkway.

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1980, "Coastal Resource Survey of Scudder's Pond Area, Sea Cliff"

This report describes the creation of Scudder's Pond and upper spring-fed ponds (see attached map, Figure 1.2), the historic use of Scudder's Pond for ice-skating, and details of a subsurface investigation for aboriginal burial grounds, campsites and archeological relics. The report cites the historic (circa 1920) placement of fill along the northerly edge of the pond as the residential area developed, while the southerly edge remained essentially unaffected. The report also stated that the icehouse, the rear pond and the small upper "trout" ponds are considered significant cultural resources worthy of protection.

February 1980, Seelye Stevenson Value & Knecht, Inc., "Contract and Specifications for Dredging and Construction of Improvements at Scudder's Pond"

This document covers the Contract to:

- a) Dredge 2,500 cu. yds. from the Upper Pond;
- b) Dredge 10,000 cu. yds. from Scudder's Pond to deepen the eastern edge of to a depth of 4 feet;
- c) Re-dredge 6,500 cu. yds. from the Upper Pond to remove overflow material resulting from the spoil area;
- d) Widening and deepening the western side of a sand pit located up-gradient with respect to the Upper Pond to enable the placement of 300 cu. yds. of dredge spoil;
- e) Reconstruction of the existing concrete dam between the Upper Pond and Scudder's Pond using gabions;
- f) Excavation of a settling basin (12' wide x 70' long x 3' deep) immediately below the 30" CMP Littleworth Lane outfall; and
- g) Construction of a gabion weir, approximately 70' south of the Littleworth Lane outfall.

1982, Envirodyne Engineers Inc., "Final Report: Scudder's Pond Restoration Project"

This report examined the pre-and post-dredging condition of Scudder's and the Upper Pond systems. According to this report, the 1980 dredging contract for Scudder's Pond was reduced due to cost limitations, to the following:

- a) Dredge 2,000 cu. yds. from the Upper Pond;
- b) Dredge 5,000 cu. yds. from Scudder's Pond;
- c) Creating dredge spoil placement area;
- d) Reconstruction of dam;
- e) 100 cu. yds. excavation for settling basin; and
- f) Construction of a settling basin well.

The dredging of Scudder's Pond and the Upper Pond commenced in November 1980. Dredging resulted in removal of approximately 7,000 cu. yds. of sediment, and the following characteristics:

Surface area:	1.8 acres
Maximum Depth:	4.5 ft.
Volume:	4.33 ac-ft.

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Mean Depth: 2.3 ft
Hydraulic Retention: 2 yr. Peak discharge – 10.24 mins.
5 yr. Peak discharge – 8.13 mins.

This study also examined the feasibility of the 1976 H2M plan to treat the Littleworth Lane drainage with a de-gritting system and chlorination chamber, but dismissed these due to an unfavorable cost-benefit ratio.

This report summarizes the post-dredging conditions of Scudder's Pond as providing limited recreational, educational and aesthetic opportunities. The depth of the pond was not adequate to support a self-sustaining sport fishery and would freeze to the bottom each winter. Nutrient inputs had not been reduced, so that periodic treatment with algaecides during the peak-growing season might be necessary. A routine maintenance program to reduce detrital and nutrient inputs needed to continue, including:

- 1) Clean-out of the Littleworth Land catch basins after each rainfall event;
- 2) Conduct periodic visual inspections;
- 3) Maintain an improved access to the settling basin to permit backhoe access, so that 5 cu. yds. of debris can be removed quarterly.

September 1986, Cashin Associates, "Final Report Village of Sea Cliff Shoreline Study"

This study takes a comprehensive look at the conditions of shoreline natural and man-made features, flood zones, wetlands, sanitary collection and stormwater drainage structures, and land uses throughout the shorefront in the Village of Sea Cliff. Limited sections refer to the Scudder's Pond subwatershed, but contain numerous recommendations that are applicable:

1. Update the watershed characteristics of the Envirodyne Engineer's Report dated September 1982 (e.g., exclude the Woodridge and Orchard Lane drainage areas).
2. Identify the vacant lands in relation to the contributing subwatershed for the Ponds.
3. The Village should take a closer look at management of nonpoint pollution sources and improve on-lot subsurface wastewater disposal systems.
4. Conduct further water quality sampling below the North Shore Country Club.
5. Define the contributing subwatershed for the Littleworth Lane stormwater outfall.
6. Identify potential pollutant sources within the Scudder's Pond watershed.
7. Develop a mitigation plan for the Littleworth Lane drain to reduce sediment and bacterial/pathogen loads.
8. Define the Scudder's Pond watershed and characterize the land uses.
9. Create a Scudder's Pond Watershed Overlay District.
10. Require mandatory dye testing for sanitary systems within the Overlay District.
11. Prohibit the cutting, clearing of vegetative buffers within 50 feet of the average water elevation.
12. Develop and adopt BMPs within the District.
13. Coordinate and assist the Nassau County Department of Health with water quality monitoring.

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14. Develop and distribute educational materials.
15. Encourage use of slow release fertilizers rather than highly soluble inorganic fertilizers.
16. Implement measures to reduce point loading in effluents carried by individual stormwater discharges.
17. Adopt BMPs and educational initiatives and implement throughout the watershed.
18. Catch basins located south of cottages at NSCC – one is functional, the other was full of sediment. Pipes discharge directly into Scudder's Pond. Replace basins and investigate private overflows.
19. The road end and curb gutters south of the NSCC cottages increase scour and deliver sediment to Scudder's Pond. Install a catch basin with silt trap to reduce sediment loads.
20. Elevated coliform levels at the Littleworth Lane outfall indicate potential sanitary cross-connections. Also, the ditch below the outfall is eroding into Scudder's Pond. These conditions warrant further investigation and improvement.
21. The weir overflow from the upper sedimentation pond to Scudder's pond requires frequent trash removal to ensure function. Also elevations should be checked at the top of the weir and basin bottom to ascertain sediment-trapping capacity.
22. Adopt a local erosion & sediment control law that includes the following typical standards:
 - a) No net discharge of stormwater generated from developing sites;
 - b) No direct discharge to natural surface waters or wetlands;
 - c) Runoff from developing properties must be filtered to remove sediments;
 - d) No diversion of stormwater offsite, all net increases in stormwater generated by development must be controlled and disposed of on-site;
 - e) Temporary erosion control measures must be in place during the active construction period;
 - f) Avoid development on slopes in excess of 20% and control disturbances on slopes of 10-15 %;
 - g) Immediately re-vegetate or otherwise stabilize disturbed soils after construction;
 - h) Retain 50 foot wide, undisturbed natural buffers surrounding waterbodies and wetlands;
 - i) Control clearing and grubbing on developing sites so that no site is left unvegetated for longer than 30 days;
 - j) Utilize natural land features to collect and recharge stormwater runoff;
 - k) Set maximum limits on percentage of impervious surfaces allowed near waterbodies and wetlands;
 - l) Prohibit alterations in stream channels and flood plains that would restrict their ability to contain runoff and flood waters;
 - m) Minimize cuts and fills and maximize retained vegetation on developing properties;
 - n) Require that grading on the periphery of developing properties blend into the adjoining properties;

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- o) Fill material shall be stockpiled no steeper than the angle of repose, and prohibited from watercourses, wetlands or floodways;
- p) Phase construction to minimize extent of site disturbance at any time;
- q) Require that stormwater control deficiencies be corrected as part of approval for any significant re-development site or improvement project;
- r) Require Erosion & Sediment Control Plans be developed and approved for any project with significant potential for soil erosion;
- s) Concentrated flow areas shall be stabilized with suitable vegetation or structural means to prevent erosion by high velocity flows;
- t) Provide stabilized construction entrances for all developing parcels;
- u) Implement routine street sweeping in the subwatershed;
- v) Develop and implement scheduled catch basin clean outs;
- w) Provide stabilized road shoulders throughout the watershed.

May 1998, Coastal Environmental Services, "Water Quality Improvement Plan for Hempstead Harbor, Nassau County, New York"

The Scudder's Pond complex occupies subwatershed #8, as identified in the Hempstead Harbor Water Quality Improvement Plan (WQIP). The Interstate Sanitation Commission (ISC) collects weekly samples during the summer months from the nearest water quality monitoring station (Station HD) to the Scudder's Pond outfall into Hempstead Harbor. For the period 1991 through 1996, the ISC reported that surface water dissolved oxygen levels (DO) at station HD were typically above the NYSDEC water quality criterion for DO of 5 mg/l. However, deep-water concentrations were more often below this criteria, hitting hypoxic levels below 3 mg/l every summer sampled between 1992 through 1996, with anoxic conditions (0.5 mg/l) reported once during the summer of 1994. According to the WQIP, the water column of Hempstead Harbor is relatively unstable and prone to full horizontal mixing, which typically ends the hypoxic conditions within several days. Elevated summer chlorophyll a concentrations (above 20 mg/m³) indicative of algal blooms were typical at Station HD during five of the six years sampled. The WQIP also ranked the Sea Cliff Subwatershed as second overall in total nonpoint source pollutant loading across all six parameters studied (i.e., total nitrogen, total phosphorous, total suspended solids, zinc, lead and petroleum hydrocarbons).

The WQIP includes the following recommendations for the Sea Cliff subwatershed:

1. The Village as part of the site plan review process should adopt a local law requiring Erosion & Sediment Control Plans;
2. Detention or retention type structures, vegetated swales and created wetlands should be promoted to intercept the runoff generated by the 1-year storm (e.g., 18 hours of detention time) and the first flush of larger storm events;
3. Village approval of larger projects should require a quantitative analysis of post-development pollution loads, the pollutant removal capability and maintenance schedule for all proposed BMPs;
4. Adopt a Septic Management Ordinance that requires septic tank inspections and pump-outs every three years;

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5. Develop and implement routine (minimum bi-annually) stormwater facility clean out schedules;
6. Minimize site disturbances within steep slope areas;
7. Develop an Integrated Pest Management (IPM) Ordinance to control fertilizer and pesticide use and irrigation practices within 300 feet of any waterbodies;
8. Encourage xeriscapes, native vegetation, and alternative ground covers that require less maintenance and chemical management than conventional lawns;
9. The Village of Sea Cliff Department of Public Works should investigate the utility of alternative de-icing products, such as calcium magnesium acetate, a combination of dolomitic limestone and acetic acid;
10. Implement routine street sweeping, debris removal for parking lots and storm drain clean-outs to reduce sediment, floatable and debris deliveries to receiving waters;
11. Install delivery reduction BMPs in Sea Cliff (i.e., stormwater quality basins, created wetlands, and water quality inlets) to control stormwater volumes and attenuate discharge rates. Extended detention times are required to achieve higher nutrient removal efficiencies;
12. Dredge Scudder's Pond, create an upstream ancillary retention basin, and install a silt trap at the confluence of the Littleworth Lane drain into Scudder's Pond.

October 1998, Ron Pritchard Golf Architect, "Long Range Restoration Master Plan for the North Shore Country Club Golf Course"

1. Minimize the reforestation of the golf course in close proximity to tees, fairways and greens, since tree root competition will stress the maintained areas, increasing the dependency on applied water, fertilizer and other nutrients.
2. Underbrush should be removed and/or thinned to reveal attractive stone walls and areas of deep woods;
3. Aquatic growth of the edges of some of the ponds and marsh areas should be eliminated to improve aesthetics;
4. Underbrush that impedes the flow of stormwater drainage should be cleared;
5. Replace irrigated and manicured rough areas with naturally irrigated, infrequently fertilized, native grasses, which are maintained at a height greater than 4";
6. Recommendations for improving Hole No. 11:404 yards include altering the two small ponds (at elevations 27.3 and 24.8) to improve drainage conditions and aesthetics of these water bodies; and to remove vines and brush to open views to the mature woodlands to the left of the golf hole.

March 20, 2001, Email from Steve Lorence of NYSDEC to Lynn Oliva, former Executive Director of HHPC

1. Reduce Coliform bacteria loading by increasing the freshwater retention time.
2. Renovate the flapper valve at Hempstead Harbor outfall and raise the weir height in the Pond, only if basements of surrounding homes would not be flooded.
3. Sediment analysis necessary for dredging feasibility.
4. Identify sediment sources into pond.

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August 2004, Cashin Associates, "Harbor Management Plan for Hempstead Harbor"

No site-specific recommendations that pertain to Scudder's Pond.

Preliminary Data Gap Analysis & Recommendations

The following is a preliminary list of data gaps identified during completion of Task 2. These preliminary data gaps have been combined with others identified by the project team during completion of subsequent Tasks of the subwatershed plan. The final watershed recommendations are provided in the Part 3 – Task 4 report.

- Several reports describe the surface area and characteristics of Scudder's Pond, however, detailed bathymetry data is lacking. Maximum and minimum water depths were discussed and generalized pre-dredging and post-dredging sketches were included in the 1982 Envirodyne Engineers report. However, more recent bathymetric survey maps were not found. A current, detailed bathymetric survey would provide valuable baseline information, such as: identifying the depositional areas; points of scour; and deep-water pockets that could provide temperature moderation in the summer and wintering retreats for fish. Detailed bathymetric data would also enable a qualitative assessment for potential fish habitat enhancement, and would enable a quantitative assessment of the future dredging needs. Furthermore, accurate bathymetric data would enable projections of the sediment trapping capacity of Scudder's and the upper pond, dredging needs and costs, and information valuable to a long-term monitoring program.
- Nassau County Department of Health (NCDH) has been collecting water samples from Scudder's Pond and analyzing for total and fecal Coliform levels since 1995. However, routine water quality monitoring for total suspended solids (TSS), nutrient and pollutant loads has only been conducted sporadically for the past 30 years (i.e., 1973 by NCDH, 1976 by H2M Corp., 1996 by Cashin Associates). Since the 2000 NYSDEC Priority Waterbodies List cites priority organics and pathogens as primary pollutants, and oxygen demand, nutrients, sediments, oil and grease as secondary concerns for Hempstead Harbor, additional water quality data including such parameters as volatiles, semi-volatiles (e.g., oils), dissolved oxygen (DO), total phosphorous (TP), total nitrogen (TN), and TSS should be collected routinely for major effluent points, such as the Scudder's Pond overflow.
- Scudder's Pond turnover frequencies and water exchange are also unknown.
- Based on the project team's initial field reconnaissance, there appears to be errors in the Nassau County Drainage Features map. For example, the Nassau County Drainage Features Map indicates numerous circular spot symbols in the upper reaches of the subwatershed (e.g., Ransom Avenue at Marden Avenue) indicating the presence of drainage structures such as manholes or catch basin inlets; however the project team's site reconnaissance revealed that these are not evident in the field. This map should be field verified to correct existing data, update and collect additional drainage features.

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- Numerous small drains are evident along the southern bank of Scudder's Pond, in close proximity to the NSCC cottages. While some of these are indicated on the April 1973 "Updated Drawing of Scudder's Pond Area", their origin and current function are still unknown. According to the NSCC, these small drains were waste drains that were discontinued long ago. All sewerage from the NSCC cottages currently enters a mainline that runs parallel to the pond shoreline and is connected into a pumping system that pumps the sewerage uphill to a septic tank. This septic tank is emptied twice yearly (Personal Communication, John Streeter, April 2005). However, based on the project team's initial field reconnaissance, several of the small drains have been observed as providing continual flows to Scudder's Pond. While it is likely that these drains are currently being used to outlet sump pumps that alleviate basement flooding, the type and quality of discharge water is currently unknown. Further observation and sampling of these drains is necessary.
- The Village of Sea Cliff indicated that it did not have details on all of the sanitary systems surrounding Scudder's Pond. A Village file records review is necessary to determine which systems have been upgraded to include septic tanks in series with cesspools.
- A Memorandum of Understanding should accompany any improvements undertaken on the NSCC property by the VSC. The types of maintenance required should be clearly spelled out along with an agreed to schedule for conducting such maintenance.