

“The State of Deal Lake - 2007”

An Environmental Status Report and Plan of Action for Deal Lake, Monmouth County, NJ

Prepared by the Deal Lake Commission

(Working Draft – as of 6/20/2008)

Deal Lake Commission 550 Main Street Loch Arbour, NJ 07711

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Commission Members for 2008:

Allenhurst Borough – Bruce Fromer

Borough of Deal – Jim Rogers

City of Asbury Park – Len Rokaw, Vice-Chairman

Interlaken – Lynn Parry, Treasurer

Neptune Township – Jerry Meyer

Ocean Township – John Everson, Chairman

Village of Loch Arbour – William Kiss

Professionals:

Environmental Consultant – Dr. Steven Souza, Princeton Hydro, L.L.C.

Engineer – Peter Avakian, Leon S. Avakian, Inc.

Attorney – Hunt Parry, Esq.

PURPOSE OF REPORT

This report focuses attention on the critical environmental problems of Deal Lake and its tributaries. The report offers the best cost-effective solutions and emphasizes the need to bring municipalities, county departments and state agencies together to find funding and resources to implement these solutions.

For decades the emphasis has been to clean the ocean without regard for the polluted coastal lakes and their impact on the ocean. This report lays the foundation to restore Deal Lake by identifying all the issues and proposing realistic solutions. Some solutions are contrary to existing state regulations.

Members and professionals of the Deal Lake Commission contributed to creation of this report. This is the Commission's first published comprehensive "State of Deal Lake" report.

SUMMARY OF CONCLUSIONS

1. The environmental state of Deal Lake is extremely poor. Pollutants exceed state mandated levels. **In many sections of the lake the water is unfit for human contact.**
2. Western sections of the lake are in desperate need of organic material removal and dredging. Many areas will be filled in within 10 years if proper maintenance is not funded and performed.
3. The Deal Lake Commission's budget is inadequate to meet basic maintenance needs of the lake. The Commission's budget needs to be increased at least two fold, preferably three. Local municipalities will be asked to provide additional funding even though this may be difficult due to budget cap restrictions. Monmouth County Freeholders will be requested to match the contributions given by each local town. Actually, county taxes generally match local government taxes so this makes sense for the county to support the Commission on an equal basis. This would allow the Commission to better establish annual maintenance projects and fund necessary studies.
4. Stormwater regulations now require municipalities to clean storm basins on a regular basis. No requirement has been made to require periodic cleaning of the areas of the lake where streams and large outfall pipes transport large amounts of silt and debris. Several areas of the lake, especially in western sections, need to be reclassified as regional stormwater basins and the DEP needs to create an easy permit process for cleaning.
5. All new development is now covered by Phase II Stormwater regulations; however, many major redevelopment projects are not covered. Local rules must be tightened to bring redevelopment projects in line with stormwater regulations that new projects must comply with.
6. The State of New Jersey and Monmouth County needs to assume the responsibility of providing disposal sites for organics (weeds and leaves) and dredge spoils removed from the lake.
7. The highway infrastructure needs several large basins to retain stormwater to help control flooding, stream scouring, and silt migration. Studies must be funded to determine the best locations and best methods to build several large regional stormwater retention basins.
8. Due to the lack of large stormwater retention basins in the watershed, the Commission and local municipalities are forced to regulate the lake level by opening and closing the flume gates during major rain events. Electrification of the flume gate mechanisms is a mandatory project.
9. The flume protective grate needs to be redesigned to minimize the formation of debris dams. A secure catwalk needs to be added so workers can safely remove debris from the grate. The current grate could allow a small logs and boards as well as debris and floatables. Should a debris jam ever occur within the flume itself, the most serious flooding to properties around Deal Lake could occur.
10. Monmouth University's Urban Coast Institute completed a multi-year study that has identified potential sources of bacterial contaminants present in Deal Lake. The most disturbing finding is that about 25% of the e-coli analyzed are potentially from human fecal coliform. Local and county health departments could team with university students to test outfalls and identify possible leaky sanitary sewers.
11. Sections of the lake bulkhead located in Asbury Park, Loch Arbour, and Interlaken are in need of repair or replacement. Vegetation growth on and in the bulkhead must be removed and an annual herbicide program be established.

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LAKE HIGHLIGHTS FOR 2007-08

1. Flume gate actuators repaired and serviced.
2. Planned weed harvesting was not accomplished due to the unavailability of a qualified contractor, scheduling conflicts with local municipalities needed for on shore loading and transport, and difficulty in finding a DEP approved disposal site. Weed treatment and harvesting are planned for 2008. A qualified contractor has been secured and the Commission has entered into a weed harvesting contract with that contractor to complete the work during the summer of 2008.
3. Regional Stormwater Management Plan has been completed by the Commission and submitted to DEP waiting for final review process.
4. The grassroots group, Friends of Deal Lake, has reorganized and will help in many lake matters and lobby government at all levels in support of necessary lake studies and projects.
5. The Commission took a leadership role in the Geese Peace program and helped coordinate efforts around the lake to control the Canadian Geese population. The Commission will continue to coordinate the expansion of the Geese Peace program to all sections of the lake.
6. The Commission has assumed responsibility for the flume gate house electrical service.
7. A private property owner on Harvey Brook had to armor about 200 feet of a stream bank to prevent the continuous loss of land due to scouring during peak flow events. This project cost approximately \$100,000 and was borne entirely by the property owner. A major benefit of this project prevents the scouring of several hundred cubic yards of silt each year into the Northern section Deal Lake.
8. The Asbury Park Fishing Club and other citizen groups organized several lake clean-ups removing tons of debris and floatables from the lake. The Rotary Club of Asbury Park continues to collect trash on State Highway 66 several times a year under the Adopt-A-Highway program. Monmouth County prisoners have helped in our annual Spring clean-up. Runoff from the Route 18, 66, and 35 highway corridors, county roads, local streets, and shopping malls are the major sources of floatables entering the stormwater collection system.
9. The public works departments of Asbury Park, Ocean Township and Neptune Township have played a major role in helping to keep Deal Lake clean. The City of Asbury Park has provided a dumpster for each lake clean-up and takes care of disposal. The City sweeps their streets weekly and also opens and closes the flume gates to help regulate lake levels during storm events. Ocean Township has provided equipment and manpower for clean-ups and several of the dredging projects. Ocean Township, through a Clean Communities Grant, has a full-time person who cleans litter and floatables from township streets and state highways. Neptune Township removed debris dumped near Hollow Brook. Monmouth County Mosquito Commission has helped with de-snagging projects.
10. Legislation is being prepared to request about \$400,000 from the State of New Jersey for several high priority projects and studies. These projects and studies include Flume Gate Electrification for better flood control. Redesign of the flume protective grate to prevent the formation of debris dams. Fund studies to determine precise sources of human fecal coliform entering the lake. Encourage public and private partnerships to locate and build Regional Stormwater Retention Basins. The remainder of the money is needed to Hydro-rake the dangerously shallow sections of the lake to remove 50 years of built-up organic materials including leaves and weeds.

MAJOR HISTORICAL ACCOMPLISHMENTS

Major projects completed by the Commission include

- Phase I and Phase II Environmental Studies in 1984.
- Harvey Brook section dredging completed in 1988.
- Hollow Brook section dredged completed in 1994.
- Terrace Pond section dredged completed in 2003 with additional maintenance in 2006.
- Assumed responsibility for Deal Lake's Regional Stormwater Management Plan in 2004.
- Flume Gates mechanisms refurbished in 2007.

Major projects effecting Deal Lake completed by other public entities

- Flume under Ocean Avenue replaced by DEP in 1986.
- Flume repaired and extended 400 feet after beach replenishment by DEP in 2006.
- Main Street (Highway 71) bridge replaced 1995? by NJ DOT.
- Park Avenue Bridge replaced in 1997? by Monmouth County.
- Monmouth Road Bridge replaced 2002 by Monmouth County.
- Wickapecko Drive Bridge over Hollow Brook replaced 2003 by Monmouth County.
- Lake bulkhead sections replaced by Loch Arbour in 2000 and 2004.
- Harvey Brook corridor armored by Deal Golf & Country Club in 2007.

BACKGROUND

Deal Lake is New Jersey's largest Coastal Lake surrounded by seven Monmouth County communities. Though it looks peaceful and serene on the surface, Deal Lake is severely stressed by the decades of urban development and inadequate lake maintenance due to minimal funding. Today, about 90% of the 4500 acre watershed has been developed without retention basins, debris traps, or advanced stormwater controls. In fact, several upper level ponds of our lake system have completely silted in and are now sources of "legacy" silt that migrate into the main body of the lake when scoured by flood waters.

Around 1885 when a developer sealed off the lake's ocean inlet and replaced it with a small flume, Deal Lake lost nature's daily cleansing of tidal flows. As the 4500 acre watershed developed through the years, all stormwater was simply piped directly into the lake or its tributaries creating a "super highway" for silt, trash, debris, fertilizer, animal waste, and leaky sanitary sewers. **In effect, Deal Lake became an inexpensive 155 acre regional stormwater basin for the seven surrounding towns, county roads, state highways and large shopping centers.** Until the 1950's the State oversaw the periodic dredging of the lake pumping spoils out to sea. The last major dredging may have taken place in the early 1960's.

The Deal Lake Commission was formed in 1974 by the lake's seven surrounding towns and proceeded to take responsibility to initiate lake maintenance projects. With limited funds and no taxing authority the Commission's real power has been to persuade local, county and state government officials to allocate the necessary resources and oversee the work. Today the Commission consists of seven members, one appointed from each municipality, a lake environmental consultant, a municipality engineer, legal council, and a state approved clerk.

Most coastal lakes are small, less than 10 acres in size and are one contiguous body of water. Deal Lake is different. It actually is a series of several ponds and distinct lake sections that have their own ecology and individual problems.

LAKE ISSUES

Flooding: The great flood of October 2005 demonstrated how vulnerable lake properties are. Besides the damage to property and vehicles, a sewer authority pumping station in Interlaken was almost breached which could have rendered portions of the sanitary system inoperable for a lengthy period. Currently, the flume gates operate on a manual basis making it difficult to react quickly when lake levels are rising. Electrification of these gates is one of the Commission's highest priorities.

Siltation: Silt migration is a natural process due to stormwater rushing over loose soils and unstable colloidal clay banks and carrying it into waterways. Hundreds of thousands of cubic yards of silt and sand have found their way into Deal Lake. Prior to the NJDEP's update of the stormwater management rules in 2004, there was limited enforcement of silt leaving construction sites little could be done to control the rate, volume or quality of stormwater discharged to streams and the lake. In fact, the lake was viewed as a stormwater management system, essentially the control point for all the runoff generated by the watershed. Construction of the major highways, several shopping centers, and housing developments contributed most of the silt and related pollutants, especially nitrogen and phosphorus, which fuel the lake's algae blooms and aquatic weed growth.

Since 2004, new stormwater regulations allow planning boards and code enforcement to require state-of-the-art controls and maintenance to drastically reduce silt, floatables, and pollutants. However, even with these changes in the rules governing stormwater management on new and redeveloped projects, the legacy sediments that are present in the streams and bank erosion continue to move silt into the lake. Currently, every major section of the lake is in need of dredging. About one million cubic yards of silt and organic material (mainly leaves) would have to be removed to return Deal Lake to pre 1960 conditions. But without the correction of the eroded, unstable stream banks and further measures to correct the improper stormwater management practices of the past, the lake will continue to refill with sediment.

Bank Stabilization: As highlighted above, improper stormwater management has caused many of the lake's tributary streams to become severely eroded. This erosion is a function of the scouring of the stream's banks and is promoted by the increased volume and rate of runoff attributable to the paving and development of the lake's watershed. Before flooding and siltation can be brought under control several large regional storm basins have to be built in key locations through out the watershed. These basins will hold back a significant volume of stormwater and release the water over time at rates that will have less energy and therefore be less prone to scour and gouge the streams. These basins will also trap silt, trash and debris, thereby enhancing the lake's water quality.

Pollutants: NJ DEP has established standards for phosphorus levels in fresh water lakes. The maximum concentration is 0.05 mg/L. Most sections of Deal Lake have phosphorus concentrations that are well above the State mandated levels. Levels of fecal coliform (an indicator of fecal matter related bacteria) are also routinely above the NJDEP limit for contact recreation. The two main sources for this fecal coliform contamination are Canada geese and aging sanitary sewers that leak into the stormwater collection system. Human waste fecal coliform is 100,000 times more lethal than the equivalent avian fecal coliform.

Weed Growth: Excessive aquatic weed growth is a constant nuisance. Although the lake needs some assemblage of aquatic plants to support a vibrant fishery and be ecologically balanced, many of the weeds present in the lake are invasive, non-native species that create recreational use problems and negatively impact the lake's ecosystem. As noted above, excessive phosphorus loading stimulates a lot of the growth. Weed maintenance is required on a regular basis. Because of limited funds only small sections of the lake have been properly maintained. Also, because of a shortage of contractors having the correct types of harvesting and weed removal equipment, mechanical weed maintenance is more expensive and more difficult to implement.

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Lake Bulkheads: Much of the concrete bulkheads along Deal Lake's shoreline are in dire need of repair. Portions of Loch Arbour's bulkhead collapsed in 2000 and again in 2004 and were promptly repaired with Village of Loch Arbour and NJDEP funds. Sections of Asbury Park's lake walls have severely deteriorated and need immediate repairs to prevent collapse. Over the years, even before the problem was obvious, the DLC actively sought funding to correct this situation. We continue to do so, as the bulkhead's repair is extremely expensive. Vegetation growth in and on the bulkhead is a problem and will require annual herbicide treatments to control.

Shoreline Beautification: Most of Deal Lake's 27 mile natural shoreline has become overgrown with invasive, non-native vegetation. Some of the more pervasive weeds are knotweed, common reed, and purple loosestrife. These plants overgrow the more desirable native species, and often compromise the stability of the lake's shoreline and stream banks. Both public and private shorelines have been neglected and now are overgrown with excessive trees, weeds and invasive plants. A goal of the Commission is to educate property owners and public works departments as to the proper maintenance of the shoreline to keep it clear of invasive plant species, stabilize the banks with the proper native species and improve lake aesthetics.

With DEP's new 50' watercourse buffer rule, (25' for redevelopment), the re-entry of native vegetation will not only repair and strengthen the shoreline and stream banks but will beautify them as well. In areas where storm water directly enters then lake infiltration basins or "Rain Gardens" may be created to help filter pollutants and recharge stormwater back into the ground.

Another possible beautification project would be to rebuild small boat docks at the step-downs located along the lake wall in Asbury Park and Loch Arbour. These small docks would provide additional public access for boating, sailing, and sculling. Restoration of these facilities complies with the federal Clean Water Act recreation demand and public access demand to State waters.

RSWMP: Since the fall of 2004, a committee of more than 20 partner organizations, municipalities and local residents has been working to develop a Regional Stormwater Management Plan (**RSWMP**) for the Deal Lake Watershed. The Commission is spearheading the effort under a grant from the New Jersey Department of Environmental Protection's 319(h) Nonpoint Source Pollution Control and Management program. The goal of the project is to identify stormwater-related problems and develop cost-effective solutions to reduce pollution and flooding throughout the lake's watershed. No Section 319 funding is available until the RSWMP is approved by the NJDEP. We have identified and discussed with the NJDEP and the NJDOT a number of much needed stormwater management and retrofit projects. The final draft of the RSWMP has been submitted to the DEP and should be completed in early 2008. (**Addendum A** contains the latest RSWMP submission to the DEP.)

Flume Gate House: Besides the urgency to have the flume gates electrified and a new flume protection grate installed, the actual gate house structure needs rehabilitation. The concrete floor must be inspected and a new roof installed. The roof should be securely hinged to provide overhead access to the flume gate mechanisms. Possibly an Asbury Park developer might "adopt" the flume gate house and remodel it to blend into Asbury Park's new architecture.

Floatables: With each rain event trash and debris from residential and commercial properties along with roadside waste find its way into the stormwater system and into the lake. Under new stormwater regulations all storm drain heads are to be a new eco-design that prevents most trash from entering the storm drain. With over 6000 storm heads in the watershed, less than 2% complies with current regulations. Over 80% of all floatables enter the stormwater collection system by way of 10% of the storm basins. Retrofitting these basins with new eco-design drain heads could reduce lake floatables by 80% or more.

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Emergency Lake Access: The Wanamassa Fire Department has brought to the Commission's attention that Deal Lake lacks safe access points for rescue activity in the western sections of the lake. There are no access points for the Hollow Brook section, the Martin's Creek section, the Iron Mill Creek section and the Harvey Brook section. The access point to the Sunset section of the lake needs rehabilitation. The Terrace Pond section and Lollipop pond sections do have adequate access. Delayed rescue launch activity could be the difference in a life or death situation.

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RECOMMENDATIONS

As noted above under RSWMP, the DLC has identified and conceptually designed a number of much needed stormwater management projects throughout the lake's watershed. We are working closely with the municipalities, County and NJDEP to bring these projects to fruition. The following are some of the most needed projects: (The most recent RSWMP submission may be found in Addendums A & B.)

LEGISLATIVE RECOMMENDATIONS:

Zero Silt Run-off Ordinances: We are proposing that each municipality adopt a Zero Silt Run-off ordinance. Current stormwater regulations only require 80%. Effectively, every residential and commercial property owner is required to keep all disturbed dirt and sand contained on their property. Any silt leaving a property and entering either the stormwater system, a tributary or the lake itself would be subject to a stiff fine and an assessment calculated using a 3x factor of the going dredge rate on a per cubic yard basis. The fine would be payable to the municipality and the assessment would be payable to the Deal Lake Commission. Cost: Break-even

Low Phosphate Fertilizer Ordinances: Have each community adopt a low or no phosphate fertilizer ordinance requiring all commercial lawn care companies to comply as well as local retailers sell only compliant products for lawn fertilization.

REGULATORY RECOMMENDATIONS: *(More regulatory items in Addendum A)*

Water quality management buffer:

- 50' to 100' wide at all streams and headlands
- Same requirement for residential or non-residential development
- Reforestation/remediation permitted
- Clearing/adding impervious coverage not permitted

Canada goose management program:

- \$ for signage
- education absolutely necessary
- humane egg addling program encouraged

Site development review:

- Of all (? – major or minor) applications before any Planning Board or
- Board of Adjustment of the member communities by the Deal Lake Commission
- Report by Commission required before approval
- Fees to be borne by developer or applicant

Special sediment control measures

- Different for small vs. big?
- Redevelopment within the watershed within buffers must have 110% recharge or mitigate

Mitigation

- Primarily in the same watershed or next closest area
- Commission must be allowed to specify mitigation project and area
- Must be stormwater related

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PROJECT RECOMMENDATIONS

Mayer Dam at Harvey Brook: Located near the intersection of Roseld Ave and Wickapecko Dr on Harvey Brook, is an old, but still relatively intact dam, referred to as the Mayer Dam in honor of Donald Mayer the first chairman of the DLC. The project calls for the refurbished Mayer Dam to create a large in-stream regional stormwater detention basin. Cost: \$750k

Regional Stormwater Basin for Seaview Mall: The Commission is proposing a study to look into a joint public-private project to construct one or more regional stormwater retention basins on Seaview Mall property. It is very likely that the regional basins could be created by renovating the existing stormwater basins presently located at the mall site along the lake's Terrace Pond tributary. These basins could hold large amounts of stormwater generated not only by the mall, but by developed lands to the west of the mall, including portions of Route 18. Cost of Study: \$25k. Cost of Basin(s): ~\$400k

Regional Stormwater Basins for Route 35, 66 & 18: Presently there are no stormwater retention basins with the ability to correctly control the rate, amount or quality of runoff generated from any of the State of NJ Highways that transverse the Deal Lake watershed. The Commission is proposing a study to research the possibility of building several stormwater basins on DOT land and also retrofit all storm drains with devices capable of better trapping sediment, road debris, litter and particulate pollutants that are currently flushed from these roads into the lake with no means of mitigation or reduction. Cost of Study: \$25k. Cost of Basins: ~\$800k

Flume Gate Electrification: In order to respond quicker to significant rain events and prevent flooding, the open and closing mechanism of the flume gates should be automated. During significant storm events when tidal surges occur, it becomes necessary to close the gates quickly to minimize ocean water infiltrating into the lake. The normal level of Deal Lake is only 3.2 feet above mean high tide. Cost: ~\$60k

Flume Protective Gate Upgrade: The current grate that prevents large debris from entering the flume and ocean needs to be redesigned and upgraded. The present stainless steel grate actually traps large floating objects which creates serious debris dam situations. A "V" design would help divert objects to the side of the flume spillway and a sturdy catwalk on the inside of grate will safely enable public works employees to clear jams which usually occur during storms and under windy conditions. Cost: ~\$14k

Weed and Organic Material Removal: A new cost effective stop-gap method to restore life to a lake is the use of an "Aquamog". An Aquamog is a specialized aquatic machine that can remove very dense growths of invasive weeds and years of leaves layered on the lake bottom. There is only one such machine in operation in New Jersey. We are working closely with the operator of that machine to develop a cost-effective program for the systematic reduction in invasive weed growth throughout the lake. Cost: ~250k.

Eco-design Drain Head Retrofits: Most floatables are entering the lake through a small percentage of storm drains within the watershed. Many of these storm drains are located on County and NJ DOT properties. Upgrading these storm drains with Eco-design Drain Heads will eliminate large amounts of trash and floatables from entering the stormwater system. Initial upgrades could be accomplished with cost-effective plastic inserts. Cost: To Be Determined.

Create Flood Level Flow Controls: A simple and inexpensive redesign of the spillways at Hollow Brook, Terrace, and Lollipop Ponds could slow the rate that flood waters enter the main body of Deal Lake. A simple notched weir could hold back 20 acre-feet of flood water. Cost: 30k for design and implementation.

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Firemen’s Memorial Pond: This small pond on Wickapecko Drive can barely be seen when driving by due to excessive tree and weed growth on its banks. The Commission would like to restore Firemen’s Pond and make it a showcase for how to thin excessive tree and weed growth, beautify shoreline, stabilize banks, and restore lake vitality. With citizen’s groups willing to adopt the pond after rehabilitation this effort should be given a high priority.

Lower Harvey Brook: Remediate the eroded stream channel between Roseld and Monmouth Road. A private land owner completed a large stream bank restoration and armor project that cost \$100,000 in engineering, permits and construction.

Harvey Brook Basin: Create a regional basin just west of Monmouth Road.

Hollow Brook Basin: Create a regional stormwater basin south of Asbury Avenue behind Coca Cola plant.

Establish Access to Basins Defined within Lake: At each stream entry point, ensure access is available for maintenance dredging as needed. Access points can also be used by emergency personal for quick rescue access

Signage: Identify the Deal Lake Watershed boundaries. Post signs to educate public about wildlife, over fertilization, littering, leaf and brush placement. Cost: \$6,000

Dredging: When regional retention basins are on line and functioning, the final effort and most expensive solution is a complete dredging of the entire lake. A large disposal site must be created by Monmouth County or the State of New Jersey. Cost: \$5m

ADDENDUMS

*Due to space limitations and on going updates, we have **not** included our complete **Deal Lake Regional Stormwater Management Plan Regulatory Standards and Voluntary Measures**. Please on on-line to www.DealLake.org and download the latest versions of Addendum A and B available.*

ADDENDUM A

MILESTONE 4A: REGULATORY STANDARDS FOR THE DEAL LAKE WATERSHED REGIONAL STORMWATER MANAGEMENT PLAN (Download latest from www.DealLake.org)

ADDENDUM B

MILESTONE 4B: VOLUNTARY MEASURES FOR THE DEAL LAKE WATERSHED REGIONAL STORMWATER MANAGEMENT PLAN (Download latest from www.DealLake.org)