

**LONG
ISLAND
SOUND
STUDY**

A Partnership to Restore and Protect the Sound

**2002 CCMP
IMPLEMENTATION
REVIEW**

Tier I

1999, 2000, 2001

**THE
LONG
ISLAND
SOUND
STUDY**

January 31, 2002

ACKNOWLEDGMENTS

This report was prepared by the Long Island Sound Study in response to EPA Office of Water, Oceans and Coastal Protection Division guidance memorandum from Suzanne Schwartz to NEP Program Directors dated December 6, 2001, *FY2002 Implementation Review of Post-CCMP NEPs*. This report covers the period from the period ending the 1999 EPA Headquarters Biennial Review, April 1999-December 2001. The Long Island Sound Study wishes to recognize and thank the many management conference partners for their contributions to this report.

Introduction

The cleanup and restoration of Long Island Sound, which encompasses New York and Connecticut waters, necessitates a cooperative bi-state, multi-agency, public/private partnership effort. The Long Island Sound Study (LISS) Comprehensive Conservation and Management Plan (CCMP) was developed and written to include the many ongoing Federal, state and local management programs directed to clean up and restore Long Island Sound, as well as future actions necessary to that effort. No comprehensive management program would have been complete without the partnership and extensive ongoing efforts of the states of New York and Connecticut, the 169 Connecticut towns, New York City, the three Long Island Sound coastal New York counties, and many New York villages, townships, boroughs, and cities with jurisdiction and interests in the clean up and restoration of the Sound. This report is reflective of the bi-state cooperation and multi-agency support for Long Island Sound management programs.

I CCMP IMPLEMENTATION

a. Summary of Efforts on Priority Actions and Description of How Progress is Measured.

Summary of Priority Action Efforts. The LISS CCMP identified six major areas requiring management action: 1) hypoxia; 2) toxic contamination; 3) pathogen contamination; 4) floatable debris; 5) living resources and their habitats; and 6) public awareness and education. A seventh area, continuing the management conference, was included as a CCMP priority area to emphasize that the partnership of Federal, state, interstate, and local governments, educational institutions, the scientific community, industry, environmental organizations, and private individuals would ultimately be critical to successful implementation.

1. **Hypoxia.** The CCMP called for reductions in the point and nonpoint source nitrogen loading to the Sound to improve water quality and reduce impairments. After the LISS adopted the Phase III Nitrogen Reduction Targets in February 1998 (see Attachment 1), the states of Connecticut and New York developed and EPA approved a nitrogen *Total Maximum Daily Load (TMDL)* for Long Island Sound in April 2001 (see Attachment 2). The TMDL established an enforceable schedule for point and nonpoint nitrogen reductions to LIS over a 15 year period ending in 2014 (N.B.: TMDL document is posted on the LISS web site: <http://www.epa.gov/region01/eco/lis>). The TMDL is, arguably, the most comprehensive and complex one developed in the Nation to date. Pursuant to the

TMDL, Connecticut proposed a general permit under Public Act 01-180 to incorporate nitrogen load limits for participating publically owned treatment works (POTWs) in the LIS watershed. This Act also created a new nitrogen credit trading program in concert with the TMDL limits that will set a historic precedent in finding new ways of meeting water quality standards and protection while keeping costs down for taxpayers. New York is proposing a bubble permit for LIS dischargers and is scheduled to public notice the permit by April 2002. Further, New York City has agreed to spend \$1.35 billion over the next few years for capital improvements to its 4 upper East River STPs for biological nutrient removal (BNR), including an accelerated schedule to upgrade Newtown Creek STP for secondary treatment by 2007 instead of 2010. The NYSDEC Consent Order enforcing this agreement is posted on the NYSDEC website at: http://www.dec.state.ny.us/website/dow/nyc_orders.html. Progress against the TMDL will be measured and limits adjusted as necessary, in 5 year increments over the life of the TMDL. As described further below under **II. c. Environmental Trends**, there has been a steady decline in point source nitrogen loads to LIS since the baseline year of 1990, with an overall reduction of more than 45,000 lbs/day reported by the states.

2. Toxic Contamination. The LISS CCMP targeted source reduction and prevention to address toxics in LIS. Toxic contamination in LIS is on the decline. As measured in 2000, over 95% of the 84 Connecticut STPs discharging into the Sound or its tributaries passed toxicity testing. This is a 26% increase from 1999 in the number of facilities that discharge treated waste water that is safe for most aquatic life. New York incorporates toxics limits in its state permit process, developing limits for chlorine in 15 STPs in the LIS watershed in 2000. During the most recent period measured, 1998-99, no New York municipal treatment facilities discharging to the Sound exhibited toxicity.

3. Pathogen Contamination. Phased combined sewer overflow (CSO) abatement projects to alleviate pathogen problems continued in both states. Connecticut anticipates spending \$560 million over the next 15 years to complete these CSO projects. New York City continues its \$1.5 billion program to abate CSOs; NYC's comprehensive sewer abatement program is scheduled for completion between 2001 and 2006. New York has increased capture of CSOs from 18 percent to 40 percent, and is in almost complete compliance with EPA's minimum standards for CSO controls.

4. Floatable Debris. Efforts to control combined sewer overflows (CSOs) and improve stormwater management also reduce the amount of litter reaching the

Sound. Communities around the Sound are adopting watershed management approaches to control sources of pollution entering the Sound, including point and nonpoint sources, CSOs, and land use practices. Many communities have formed watershed management committees or groups to work together in addressing environmental management problems, which have no jurisdictional boundaries.

5. Living Marine Resources and Habitat. In 1998 the LISS completed its *Habitat Restoration Strategy*, (see Attachment 3) which established goals of restoring 2000 acres of habitat and opening 100 river miles to anadromous fish passage within 10 years. As of September 2001, the LISS has restored over 685 acres of habitat (34 percent of goal) and opened 38 (38 percent of goal) river miles to fish passage. In September 2000 the LISS executed a *Memorandum of Understanding -- Restoration of Coastal Habitats of Long Island Sound*, that was signed by eleven principal Federal, state and local agencies and environmental organizations. (see Attachment 4) These agencies committed to specific actions to implement the *Strategy*.

Save the Sound, Inc., the National Audubon Society of New York State, and the Regional Plan Association sponsored a series of ten public hearings from May-June 2000, *Listen to the Sound 2000*, to gather public input for the creation of a Long Island Sound reserve system (see Attachment 5). More than 500 people attended the hearings and over 200 people testified in support of the proposed reserved system, the purpose of which is to identify and protect key sites for recreation, public access, open space, and underwater habitats in the Sound.

6. Public Awareness. The LISS produced and distributed many thousands of copies of its LIS newsletter, *UPDATE*, as well as fact sheets, publications, and brochures covering timely and critical LIS topics. Many of these documents were posted on the LISS web page: <http://www.epa.gov/region01/eco/lis>. The LISS webpage continued to be one of the most visited pages on the EPA New England Region website, with over 90,000 hits recorded in 2001.

The LISS outreach and education programs continued to conduct many meetings, conferences and workshops attended by hundreds of public officials and concerned citizens. LISS program staff continued to: provide Long Island Sound displays at annual public events, such as Earth Day and Long Island Sound Day in Connecticut and New York; address scores of teachers, educators, school children, groups and classes; and issue press releases, produce public service

announcements, and give radio and press interviews on Long Island Sound issues.

The LISS provided funding support for the Long Island Sound Educators Conference, which was held in March 2000 in cooperation with the Maritime Aquarium in Norwalk, Connecticut. Over 220 educators attended the conference that featured 40 exhibitors and 25 workshops on a variety of critical LIS areas of concern.

The LISS continued to explore methods to increase local and municipal participation in CCMP implementation. The LISS conducted a second municipal conference in June 2000, which was co-hosted by the City of Stamford and the City of Glen Cove, Long Island and held at the University of Connecticut.

The very successful small grants program, administered by New York Sea Grant continued for a seventh year. Based on its popularity and positive results, the funding level was increased from \$50,000 to \$70,000 in FY99 and continued at that level through FY01, bringing the seven-year total to \$290,000. Through 2001, the LISS Small Grants Program has provided funds for 58 educational, informational and construction projects totaling over \$211,000 (the balance of funds has not yet been expended). These projects assisted hundreds of teachers and thousands of school children, and produced over 20,000 pieces of LIS literature.

The CT DEP Long Island Sound License Plate Fund awarded \$80,000 in grants for education projects, including development of a teacher resource guide to environmental education programs, public education for septic system maintenance, groundwater contamination and nonpoint source protection and community-based programs at Cove Island Park in Stamford, creating 100 year-round environmental education activities about the Sound for a wide range of age groups.

Crosscutting Areas. Research – The LISS initiated a research program in FY99 in cooperation with the *New York* and *Connecticut Sea Grant College* programs to study natural and anthropogenic processes affecting the Sound. The research program is an important contributor to the LISS monitoring program, and the results obtained from LISS-sponsored research will help in answering basic questions about the Sound, and assist senior managers in decision-making. The LISS research program focuses on: 1) nutrient and phytoplankton dynamics; 2) factors controlling the timing, intensity and fate of primary production; 3) mechanisms by which hypoxia develops; 4) benthic processing and elemental

cycling; 5) impacts of sea level rise; submerged aquatic vegetation, and 6) other innovative research. The LISS initiated three research projects in FY00 to study: 1) the cause(s) of the 1999 lobster mortality event(s) in LIS (UConn/Dr. French); 2) environmental change in LIS over the last 400 years (Wesleyan U/Dr. Varekamp; and 3) trace metals, organic carbon and other nutrient effects on phytoplankton growth (SUNY Stony Brook/Dr. Sanudo-Wilhelmy). These two-year projects are underway as of this writing, the results of which will be available after September 2002. The LISS is continuing its research program in 2002, approving 5 research projects totalling \$623,232.

Watershed Protection – A growing number of communities in the Long Island Sound watershed are adopting watershed management-based approaches to controlling point and nonpoint sources of pollution to the Sound. Many communities have formed watershed management committees or groups that cross local, municipal, or even state jurisdictions, to work together in addressing environmental management problems that have no boundaries. New York and Connecticut utilize CWA §319 nonpoint source grants to support watershed management efforts, including demonstration projects, technical assistance, and public education and outreach, many of which are targeted at reducing nonpoint sources of nitrogen. The LISS supports implementation of the Norwalk River Watershed Action Plan, guided by the Norwalk River Watershed Advisory Committee, with representatives from EPA, the Natural Resource Conservation Service (NRCS), CTDEP, the seven watershed communities, several citizen groups, and area residents. The LISS supported the University of Connecticut Cooperative Extension System (UConn/CES) to continue its Nonpoint Education for Municipal Officials (NEMO) program in Long Island Sound coastal tributary watersheds. The original program targeted seven towns in the Norwalk River watershed, and now includes towns and watersheds in other parts of Fairfield County and in Westchester County, NY. In 2000, the NEMO program was expanded to include a new coordinator and office in SUNY Stony Brook, New York. The New York NEMO program is working with the Hempstead Harbor and Manhasset Bay Protection Committees in briefing local boards and commissions and in conducting NEMO workshops for municipal officials in those communities. The LISS NEMO program conducted 110 workshops reaching more than 2,400 participants in approximately 30 communities. NRCS, in partnership with the EPA ORD Atlantic Ecology Division in Narragansett, Rhode Island, developed watershed technical assistance workshop materials, conducted six workshops, and provided guidance to new and existing community-based watershed planning efforts within the LISS project area boundaries.

The 1999, 2000, and 2001 LISS work plans (see Attachment 6, pp. 1-4; Attachment 7, pp. 2-7; and Attachment 8, pp. 2-8) describe in detail the major accomplishments of the LISS for each year since the 1999 EPA Biennial Review.

Progress Measures. The LISS measures progress through an annual CCMP Implementation Tracking Report (see Attachments 9 and 10) that highlights progress on CCMP implementation. The LISS presents the report to the LISS Citizens Advisory Committee (CAC) for critical input and self-assessment. As discussed in detail below, the LISS has refined the report format to better integrate new and evolving actions and relate progress to environmental results.

b. Summary of Major Stakeholders' Contribution to CCMP Implementation.

The states of Connecticut and New York, as the major partners in implementation of the LISS CCMP, provide valuable resources and expertise through their ongoing environmental management, enforcement, and regulatory programs directed to Long Island Sound. Additional important Federal and regional partners contribute their expertise and knowledge of national or regional programs and issues affecting the Sound, within the LIS watershed and outside the New York and Connecticut state boundaries. The Commissioners of the *New York State Department of Environmental Conservation* (NYSDEC) and the *Connecticut Department of Environmental Protection* (CTDEP) and the EPA Region I and II Administrators make up the LISS Policy Committee, which provides overall direction and guidance to the program. The LISS Management Committee includes the *Interstate Environmental Commission* (IEC); *New York City Department of Environmental Protection* (NYCDEP); the *New York State Department of State* (NYSDOS); the *US Fish & Wildlife Service* (FWS); the *National Marine Fisheries Service* (NMFS); the NRCS; the *New York and Connecticut Sea Grant College Programs*; and the *New York and Connecticut CAC* co-chairs. The *US Geological Survey* (USGS) contributes to CCMP implementation through its ongoing agency mission and programs affecting surface and ground water in the Long Island Sound watershed. The CAC provides an essential public perspective on progress and priorities. Many CAC organizational members conduct informational and educational programs as well as assist in implementing key aspects of the CCMP. The annual CCMP Implementation Tracking Reports (reference Attachments 9 and 10) list the many specific contributions of these LISS partners.

c. Summary of Shifts in Priorities and Process for Making Shifts.

The LISS maintains its focus on the six principal CCMP priorities. In September 2000 the Policy Committee directed the management conference to update the 1996

Long Island Sound Agreement that was signed by the Governors and EPA Administrator. (see **Attachment 11**) The agreement will reaffirm executive-level support and further describe and prioritize specific targets and time frames for CCMP implementation. The Agreement will better define desired outcomes of CCMP actions in measurable, trackable terms, better link monitoring/research and environmental indicators to environmental goals and results, maintain momentum for CCMP implementation, reaffirm implementation priorities, and address emerging issues.

Pursuant to this direction, the Management Committee has developed a draft *Long Island Sound Agreement*. (see **Attachment 12**) The draft *Agreement* sets forth a broad vision to restore the ecological health of the Sound by 2014. It reaffirms the CCMP goals to address water quality impairments, including hypoxia and toxic and pathogen contamination; assure healthy ecosystems and abundant and diverse flora and fauna; assure continued public access to the Sound, and increase understanding of the science of the Sound through an effective biological and ecological research program. While the formal signing of the *Agreement* has been unavoidably delayed due to the tragic events of September 11, as of this writing, the LISS Policy Committee has endorsed the draft *Agreement*, and the Management Committee anticipates that a formal ceremony marking this event will be scheduled in early 2002.

II ENVIRONMENTAL RESULTS FROM IMPLEMENTATION

a. Summary of Environmental Monitoring Program; Changes or Improvements and Barriers to More Effective Monitoring

Ambient Monitoring – The LISS conducts a deep water water quality monitoring program that includes 3 components: 1) CTDEP monitors 48 stations around the Sound (see **Attachment 13**) year-round, with bi-weekly trips during the peak hypoxic season, June-September. The program collects data on dissolved oxygen (DO), temperature, salinity, and visibility. In special circumstances or as needs are identified, other parameters are monitored, e.g., *Pfiesteria*, benthic communities, etc. 2) IEC monitors 21 stations in the Western Sound, collecting temperature, salinity, and DO data weekly and *Chlorophyll a* bi-weekly since 1991 and weekly since 1998. This activity is funded under an EPA CWA §106 grant from Region II; 3) NYCDEP monitors 3 stations in the Western Sound for parameters according to the LISS monitoring plan.

Since 1998, the *University of Connecticut* (UCONN) has operated a real-time water quality monitoring demonstration program pursuant to EPA's *Environmental Monitoring for Public Access and Community Tracking (EMPACT)* program. UCONN's MYSOUND

program monitors dissolved oxygen, salinity, temperature, and other selected parameters at 6 fixed stations both in embayments and offshore around the Sound (See *MYSOUND* website at: <http://www.mysound.uconn.edu> for details).

In addition to the agency monitoring programs, a number of volunteers and environmental organizations monitor selected embayments in the Sound. The results of the volunteer and state monitoring program are summarized by *Save the Sound, Inc.*, in an annual *Water Quality Report* (see **Attachment 14 and 15 for 1999 and 2000 reports**). In November 2001 in cooperation with the Ocean Conservancy, the LISS sponsored a two-day volunteer monitoring workshop to provide technical assistance and support to the volunteer groups working around the Sound (see **Attachment 16**).

These monitoring efforts were bolstered by CTDEP and NYSDEC participation in the EPA/NOAA-sponsored Coastal 2000 program in Summer 2000/2001, providing additional data in key embayments and stations in the Sound. These efforts will be continued under this program, now known as the National Coastal Assessment.

Pollutant Load Monitoring – Point source nitrogen levels are monitored by the states through their delegated state programs under the *National Pollutant Discharge Elimination System* (NPDES) program through Discharge Monitoring Reports (DMRs) submitted monthly by the permittee to the states. The LISS periodically requests summary information from the states on total point source nitrogen load for the annual LISS *CCMP Implementation Tracking Report* (ref. **Attachments 9 and 10**). Major tributary loads are monitored by the USGS stream gauge program. The LISS is cooperating with and providing partial funding in 2001 (see **Attachment 8, p.12, c.**) to USGS to refine the national SPARROW model for New England. This will improve estimates of out-of-state LIS watershed inputs. Toxic contaminants and pathogens from STPs are monitored by CTDEP, NYSDEC, and IEC. Monitoring for pathogens at beaches is the responsibility of the local town health departments in Connecticut, and the county health departments in New York state. CTDEP monitors state-operated beaches in Connecticut.

Changes, Improvements, Barriers to Effective Monitoring. The LISS water quality monitoring program has traditionally relied on a hypoxia-based monitoring plan to assess progress. That plan had been successful in gaining attention to and support for the many management actions necessary to improve the water quality of the Sound. A continued focus on hypoxia alone may not be sufficient to meet future management challenges and to address the many complex and variable factors affecting water quality. Therefore in March 2002, the LISS is convening a water quality monitoring workshop to begin developing a conceptual framework for transitioning from a hypoxia-focused

approach to an ecosystem-based approach to monitoring (see Attachment 17). The LISS has also modified its water quality monitoring plan to include monitoring for phytoplankton during normal station runs, and has reinstituted Secchi Disc readings for visibility. The LISS is also coordinating with IEC the analysis of its frozen stock of historical phytoplankton samples taken in key Long Island Sound embayments during past monitoring cruises.

b. Environmental Indicators Developed/Used to Evaluate Progress; Plans for Future Indicator Use/Development

Indicators Developed. The LISS has developed 43 environmental indicators of the health of LIS (see Attachment 18). These indicators are available in a web-based report at <http://www.epa.gov/region01/eco/lis>. Using a subset of these indicators, the LISS released its first comprehensive report on the ecological health of the Sound in April 2001. The report, *Sound Health 2001*, (see Attachment 19) uses this suite of environmental indicators to assess progress in the clean up and restoration of the Sound. The report was released in seven coastal area newspapers in New York and Connecticut with over 470,000 copies circulated to the general public. Teachers from around the Sound have requested additional copies of the report for their classrooms, and the LISS website has experienced increased traffic for access to the report.

Progress Evaluation and Future Plans. These indicators are used by the management conference partners as a guide to assess the effectiveness of policies and programs directed at the particular area being monitored. Longer term trends in indicators such as dissolved oxygen levels, native bird counts, fish stocks, and others can provide insight to managers into the effectiveness of management programs. The LISS is exploring ways to better link environmental indicators with the CCMP and other management actions, but this is a longer-term and complex process. In many cases, the outcome of one indicator cannot be immediately determined because longer-term data is needed to confirm trends. Often, one indicator's outcome is dependent on a prerequisite indicator's outcome. In its *2001 CCMP Implementation Tracking Report*, which is currently under development, the program will integrate environmental progress and trends with management actions. This will better link assessments of CCMP implementation progress to environmental results.

c. Highlights of Environmental Results and Trends; Environmental Results Attributable to (Directly/Indirectly) CCMP Actions

Environmental Results/Trends. Point source nitrogen loads to the Sound from the 104 STPs and 4 industrial dischargers have declined by over 45,000 lbs/day since the

base year of 1990. (see Attachment 10, p. H-1, Figure 1). The maximum areal extent of hypoxic events in the Sound has also declined over time and the duration of hypoxic events has also been on the decline (see Attachment 10, p. H-1 Figure 2). In 2001 the maximum hypoxic area was estimated to be 133 square miles extending over a maximum period of 66 days, comparing favorably with the 15 year averages of 201 square miles and 56 days. As noted below, year-to-year variations may be due to cyclical natural events such as El Niño/La Niña or storm events, including rainfall levels.

Continued significant progress is being made in restoring critical habitats, with over 685 acres of tidal and other marsh restored since the LISS goal of restoration of 2000 acres by 2008 was established in 1998. Since establishing the goal of restoring 100 river miles to anadromous fish passage over the same time frame, more than 38 river miles have been reopened through dam removals, breachings, installation of fish ladders/fishways, or by other physical means. (see Attachment 10, p. LR&H-1) The management conference partners have used many sources of funding to implement these projects, and have worked extensively with property owners in obtaining permission to access and/or restore critical habitat on private lands. While the LISS is on target to achieve its habitat restoration goals, unexplained tidal marsh losses have recently been identified by the states as an area of concern to be studied. The LISS will consider proposals to study these losses in FY 2002.

After rising to record levels in 1997 (see Attachment 20, **LIS lobster harvest results, 1970-2000**), the Long Island Sound lobster population suffered a major mortality event in Fall 1999, and increased instances of shell disease in the eastern basin were observed. In Fall 2001, lobstermen across the Sound again found dead and dying lobsters in their pots. The cause(s) of these events are not yet known; however the states and Federal government are researching possible causes for the die-off and shell disease outbreaks using a combination of Federal and state grant funding. A *Lobster Steering Committee* has been established under the auspices of the Atlantic States Marine Fisheries Commission, with the LISS as a primary partner, to monitor and direct research efforts.

Toxic contamination of the Sound continues to decline in both releases to the environment as well as sediment levels and bioaccumulation. Releases of toxic substances in Connecticut and New York have declined significantly according to EPA Toxic Release Inventory data (see Attachment 19, p. 7). Toxic contaminant trends in mussels have also declined or shown no trend, with the exception of Port Jefferson Harbor with an increasing trend for Arsenic. Mercury concentrations in sediment are also on the decline. (see Attachment 19, page 7.)

More detail on LIS environmental trends may be found in the *Sound Health 2001* report or on the expanded web-based environmental indicator presentation.

Results Attributable to CCMP Actions. As a direct result of the LISS CCMP, many key indicators of environmental stress have been reduced or have improved, such as reductions in toxic contaminants in sediments and shellfish (ref. Attachment 19, pp. 6-7), decreases in the areal extent and duration of hypoxia, reductions in point source nitrogen loads (ref. Attachment 19, pp. 4-5), increases in viable habitat (ref. Attachment 19, pp. 12-13) and fish and wildlife populations (ref. Attachment 19, pp. 8-11). Documenting environmental response is more difficult. For any given year, for example, levels of dissolved oxygen in the Sound are affected by weather, including temperature, rainfall levels, or storm events. The weather, in turn, may be affected by natural global cycles such as El Niño/La Niña, volcanic activity, or sunspots, as well as by anthropogenic inputs. It is management's responsibility to sort out the facts and make judgments based on the best scientifically qualified information available. Longer term observations and monitoring will be required to further document response by the ecosystem to management actions.

III STATUS OF IMPLEMENTATION TRACKING SYSTEM

a. Description of Annual/Quarterly/Progress Reports

Annual Report. As noted above, the LISS produces an annual *CCMP Implementation Tracking Report* (reference Attachments 9 and 10) to help track and account for CCMP progress. Starting with the 2000 report, the LISS revised its reporting format, no longer tracking progress on each of the 232 individual actions in the CCMP. Rather, the report focuses on overall progress in each of 35 action areas under the seven major CCMP problem areas. Annual progress on each of the seven problem areas is described in Overview sections, and the report includes an Executive Summary.

The LISS decided to move toward a more streamlined version of CCMP reporting for several reasons. First, the old format focused on the 232 individual CCMP actions, which were further subdivided into 2 categories – *Ongoing Programs* (65) and *specific Actions* (167); these latter were further subdivided into *Commitments* (72) and *Recommendations* (95). This level of detail was found to be overly burdensome and the big-picture focus was lost both on the reader and manager. Second, many of the CCMP actions are not conducive to being “completed,” that is, actions such as monitoring are conducted on an ongoing basis. Finally, it was difficult to assess progress against major CCMP goals by looking at each individual action, and some actions have evolved over

time and have changed significantly from what was originally planned. It was harder to see how each individual action contributed to the whole or related to each other. To address these concerns, the LISS decided to “roll up” reporting into the 35 objectives under the original seven problem areas, de-emphasizing focus on individual actions. The new format provides flexibility on reporting actions to address the 35 objectives, seeks to focus on the “big picture,” and better link to environmental results and ecosystem indicators.

Quarterly Reporting. In addition to the written annual report, the *Management Committee* and *Implementation Team* meet quarterly to review ongoing progress and issues, to make decisions on program direction and funding, and to make recommendations to the policy committee. The policy committee meets at its discretion, last meeting in September 2000.

The LISS *Implementation Team*, consisting of key staff of the principal *Management Committee* members, meets at least quarterly and as necessary to develop program priorities and budgets and to otherwise implement the direction of the *Management Committee*. The Team develops the agendas for the committee meetings and assists in staffing out the quarterly CAC and CAC subcommittee meetings. The EPA LISO supports all of these quarterly meetings from agenda development through scheduling and completing minutes.

The LISS CAC meets quarterly to exchange information, review issues and CCMP progress, and make recommendations on the LISS and CCMP implementation to the *Management Committee*. The CAC *Tracking and Monitoring Subcommittee* reviews the draft and final *CCMP Implementation Tracking Report*, and provides its comments and recommendations on the development of the report. The CAC uses the report to make recommendations on priorities for the *Management Committee's* consideration (see **Attachments 21 and 22 for 1999 and 2000 letters**).

IV STATUS OF FINANCE STRATEGIES/LEVERAGING OF FUNDS

a. Summary of EPA Post-CCMP Funding Use Since Last Review

LISS work plans for FY1999, 2000 and 2001, (**Attachment 6, pp. 9-10; Attachment 7, pp. 12-13; and Attachment 8, pp. 16-17**) contain overview charts of post-CCMP funding by the following budget categories developed by the LISS: 1) Coordination and Reporting of Environmental Results; 2) Public Information and Education; 3) Monitoring, Modelling and Research; and 4) CCMP Implementation

Support and Technical Assistance. The Attachments show by category, the recipient organization, the final FY LISS budget amount that includes EPA President's Budget, NEP and Congressional LIS earmark appropriations; and the required match as appropriate. All but \$65,000 of LISS funding goes to CCMP implementation activities through grants and cooperative agreements, interagency agreements or contracts with LISS management conference partners or other eligible entities. The remaining funds support annual operations of the EPA LISO.

b. Summary of Other Sources/Types of Funding and Non-Financial Support

As indicated above, the LISS CCMP envisioned many and varied sources of funding for the clean up and restoration of Long Island Sound. Using a variety of Federal and state statutory authorities and funding sources, as well as local ordinances and funding, the LISS management conference partners have been successful in many areas of CCMP implementation. In addition to CWA §119 and §320 funding, the states have used §319 and §205b funds to support LISS CCMP goals for nonpoint source management; and the State Revolving Funds for STP upgrades. IEC uses CWA §106 funds for its western LIS monitoring program. The states use *Clean Vessel Act* funding for pumpout boats and stations around the Sound. *Coastal Zone Management Act* funding has been used for state coastal management programs.

In 1996, New York State approved the Clean Water/Clean Air Bond Act (Bond Act). The Bond Act authorizes up to \$200 million for projects to implement the Long Island Sound CCMP. As of March 31, 2000, more than \$83 million in Bond Act funding had been awarded for 71 water quality improvement projects in Suffolk, Nassau and Westchester Counties, and in New York City.

As described above, the New York and Connecticut Sea Grant College programs have contributed funds to the LISS research program in 1999, 2000 and 2001. EPA HQ and Regions I and II have awarded grants to LISS partners under such programs as the *Regional Applied Research Effects (RARE)* program, *EMPACT*, and *Coastal 2000*.

The US Army Corps of Engineers (ACOE) has funded elements of the LIS Environmental Impact Statement (EIS) for designation of dredged material disposal sites in LIS from its appropriations. The ACOE monitors active LIS disposal sites through its *Disposal Area Monitoring System (DAMOS)* program. NOAA/NMFS and USFWS have used their statutory authorities and appropriations for fisheries management and wildlife management programs in the LIS watershed. NOAA received special appropriations in FY2000 to address the 1999 lobster mortalities. The NRCS has leveraged LISS funding to develop nonpoint source public information and education programs and

demonstrations, and has provided staff time and resources to support the LISS. The USGS stream monitoring program and monitoring and analysis of LIS sediments have contributed significantly to the collective body of knowledge of the Sound.

c. Highlights of Successful Efforts and Challenges in Obtaining Funding; Likelihood of Continued State/Local Funding; Program Efforts to Obtain Dedicated State or Local Funding for the NEP; Likelihood of Obtaining Dedicated Funding

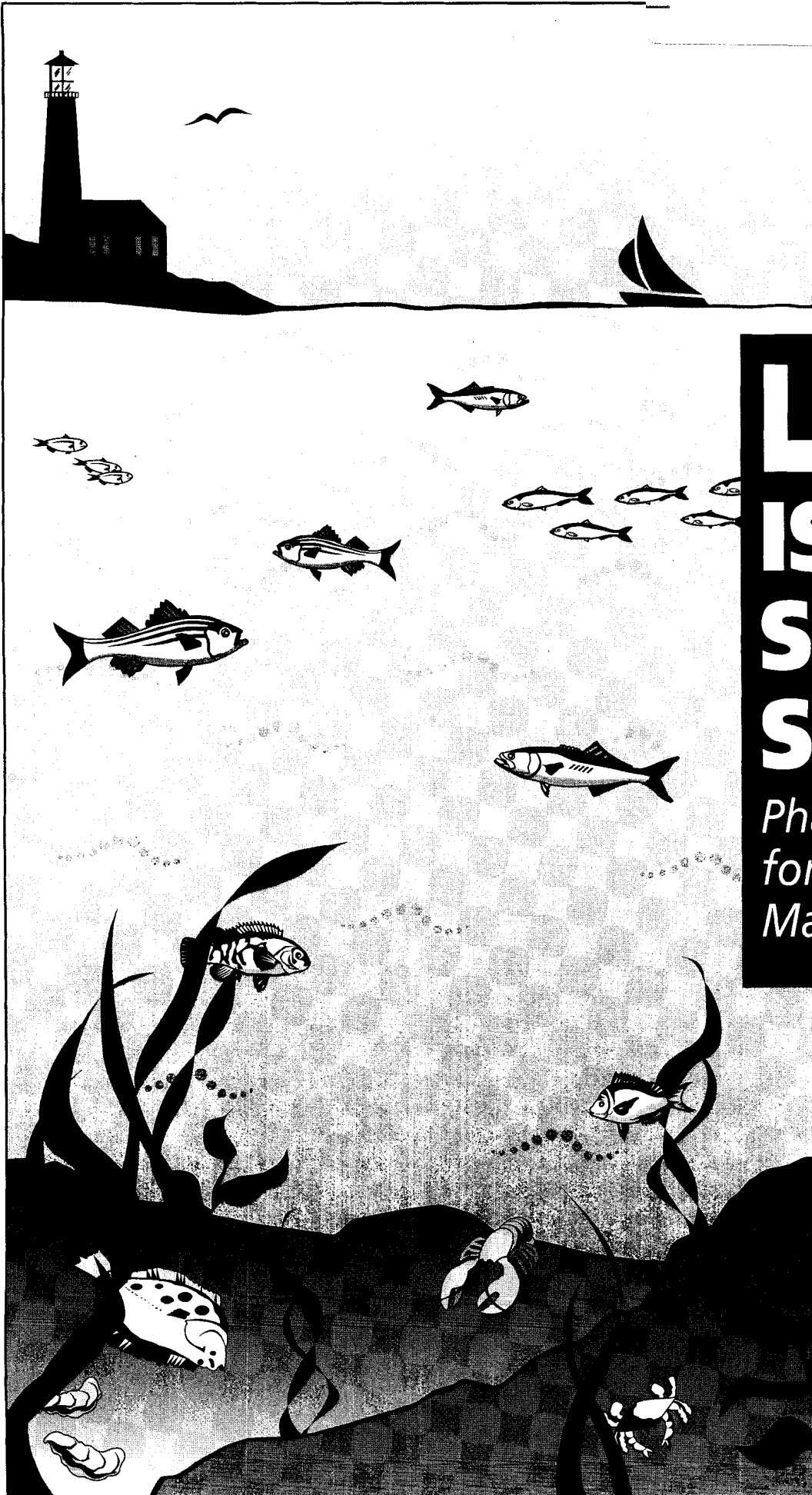
Successes. In 2000, the *Long Island Sound Restoration Act, Title IV* of P.L. 106-457 was enacted, which increased the authorization for the LISS to \$40 million annually, and extended the authorization of appropriations for the LISS through 2005. The New York State Clean Air/Clean Water Bond Act has reserved \$200 million for Long Island Sound projects. The Connecticut Long Island Sound License Plate fund continues to provide a valuable source of funds for Sound projects. These are important state funding sources that provide invaluable resources as state match funds for LISS Federal grant funds.

Challenges. The LISS and its partners are challenged by the same issue facing other NEPs, that is, maintaining sources of funding and public support for clean up and restoration programs. As Federal, state and local budgets become tighter, it is essential that programs continue to demonstrate measurable progress in achieving real environmental results in order to maintain public support and funding.

Continued & Dedicated Funding. The LISS CCMP was approved 1994, recognizing the many ongoing efforts of the states to address the major problems identified in Long Island Sound in how it was organized and written. The states will continue to carry out their legal authorities and responsibilities to clean up and restore Long Island Sound. The clean up and restoration of the Sound is a cooperative effort. Under the CCMP, many Federal, state and local government agencies share responsibility for implementation actions, and must pursue funding for these actions through their appropriate funding mechanisms. The states of New York and Connecticut have the primary role in CCMP implementation, having been partners in its planning, development, and coordination. As part of their ongoing environmental, regulatory, and enforcement programs, the states are primarily responsible for managing state waters, lands and watersheds, and have the legal authority, responsibility, and accountability to do so. Many Federal programs are delegated to the states, such as the NPDES permitting program. The CCMP envisioned a full partnership of Federal, state, and local agencies, boards, commissions, educational institutions, private industry, citizens and non-profit organizations to restore the Sound and called for many and varied sources of funding to implement the 232 actions it identified. The states will continue to implement state programs, functions and activities authorized under state statutes or delegated under Federal law; this is an integral aspect of the CCMP.

List of Attachments

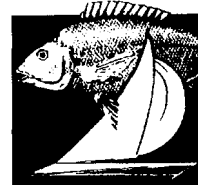
1. Phase III Actions for Hypoxia Management, July 1998
2. EPA TMDL Approval Letter, April 2001
3. LISS Habitat Restoration Strategy, February 1998
4. MOU - Restoration of Coastal Habitats of LIS, September 2000
5. Listen To The Sound 2000
6. 1999 LISS Work Plan
7. 2000 LISS Work Plan
8. 2001 LISS Work Plan
9. 1999 CCMP Implementation Tracking Report
10. 2000 CCMP Implementation Tracking Report
11. LISS Policy Committee Charge, September 2000
12. Draft Long Island Sound Agreement
13. LIS Monitoring Station Maps
14. 1999 Water Quality Report
15. 2000 Water Quality Report
16. Volunteer Estuary Monitoring Workshop, October 2001
17. Draft LIS Monitoring Conference Agenda, March 2002
18. Sound Health 2001 Environmental Indicators
19. Sound Health 2001 Report, April 2001
20. LIS Lobster Landings (NYSDEC), January 2002
21. 1999 CAC Policy Committee Letter
22. 2000 CAC Policy Committee Letter



LONG ISLAND SOUND STUDY

*Phase III Actions
for Hypoxia
Management*

July
1998



*A Partnership
to Restore and Protect
the Sound*

THE LONG ISLAND SOUND STUDY



ESTUARY OF NATIONAL SIGNIFICANCE

The Long Island Sound Study (LISS) is a partnership involving federal, state, interstate, and local agencies, universities, environmental groups, industry, and the public in a program to protect and restore the health of Long Island Sound. The LISS began in 1985 under the sponsorship of the U.S. Environmental Protection Agency (EPA) and the states of New York and Connecticut. At the request of the states of Connecticut and New York, EPA designated Long Island Sound an *Estuary of National Significance* in 1988 and convened a Management Conference. In 1994, the LISS Management Conference issued a Comprehensive Conservation and Management Plan (CCMP) to improve the health of the Long Island Sound, while ensuring compatible human uses. In September 1996, the Governors of New York and Connecticut and the EPA signed a Long Island Sound Agreement, reaffirming their commitment to the restoration effort.

PRIORITY AREAS OF CONCERN

The LISS has identified seven issues meriting special attention: (1) low oxygen conditions (hypoxia), (2) toxic contamination, (3) pathogen contamination, (4) floatable debris, (5) the impact of these water quality problems and habitat degradation and loss on the health of living resources, (6) public involvement and education, and (7) land use.

The LISS has focused its efforts and resources on the most pressing problem, the low oxygen levels affecting substantial areas of western Long Island Sound in late summer, and has identified overenrichment of nitrogen as the primary cause. Management has been proceeding in phases. In 1990, the EPA and the states of New York and Connecticut agreed to cap nitrogen loadings as Phase I. The 1994 CCMP contained commitments to begin to reduce the load of nitrogen to the Sound as Phase II. The EPA and the states of New York and Connecticut also committed to develop Nitrogen Reduction Targets for Long Island Sound to guide Phase III implementation.

PURPOSE OF THIS REPORT

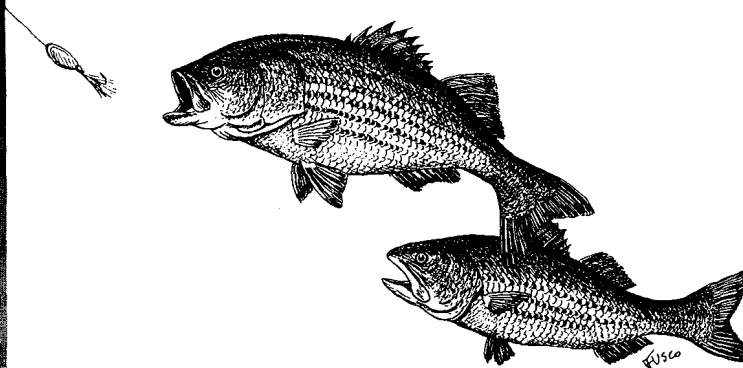
On February 5, 1998, after a year of public review, comment and revision, the Policy Committee for the LISS adopted the Phase III Actions for Hypoxia Management, including nitrogen reduction targets. This report updates the Phase III agreement, succeeding the August 1997 *Proposal for Phase III Actions for Hypoxia Management* (EPA 840-R-97-001). While most of the technical background in the 1997 report remains unchanged, it is repeated here in the interest of completeness. The most significant changes are contained in the strategy and schedule, which were negotiated and revised based on public comments received during the past year. Yet, those changes do not compromise or greatly alter the intent and timing of the original proposal, which enjoyed broad public support throughout the comment period. Questions about the Phase III strategy or the LISS may be directed to the EPA Long Island Sound Office at the following addresses:

EPA Long Island Sound Office
Marine Sciences Research Center
SUNY @ Stony Brook
Stony Brook, NY 11794-5000

EPA Long Island Sound Office
Stamford Government Center
888 Washington Blvd.
Stamford, CT 06904-2152



TABLE OF CONTENTS



A MATTER OF HYPOXIA	1
UNDERSTANDING HYPOXIA	3
Conditions	3
Causes	3
MANAGING HYPOXIA: A PROGRESS REPORT	5
Sources	5
Reductions	6
PHASE III FRAMEWORK	9
Oxygen Benchmarks	9
Cost-Effectiveness	9
Allocating Responsibility	11
PHASE III ACTIONS	13
Strategies	13
Timing	14
Cost	14
Financing	14
Effluent Trading	15
Enforcement	15
Evaluating Progress	16
BENEFITS OF THE PHASE III NITROGEN REDUCTION TARGETS	17
Ecosystem Health	17
Human Use Benefits	17
SUGGESTED READING	22
APPENDIX:	23
<i>Phase III Actions for Hypoxia Management</i>	
Adopted by the LISS Policy Committee	23

A MATTER OF HYPOXIA

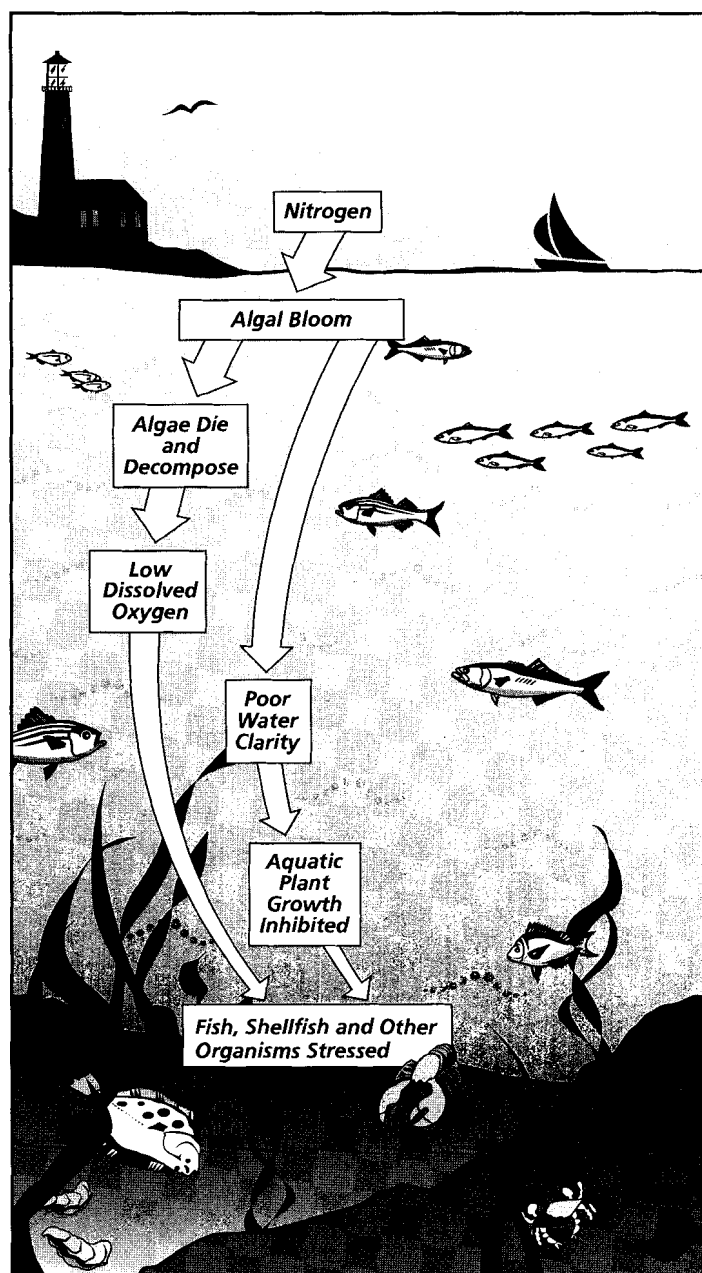


From mid-July through September, Long Island Sound and many of its aquatic inhabitants suffer from a condition called hypoxia—a technical term for low levels of oxygen in the water. During this period, oxygen levels in the bottom waters of Long Island Sound fall well below normal, to levels inadequate to support healthy populations of aquatic life.

But hypoxia is a symptom of a larger problem, the over fertilization of the Sound with nutrients, primarily nitrogen. While nitrogen is a necessary nutrient in a productive ecosystem—a building block for plant and animal tissue—too much nitrogen fuels the excessive growth of planktonic algae. The dense algae blooms cloud the water and shade the bottom. When the algae die and settle to the bottom of the Sound, they are decayed by bacteria, a process that uses up available oxygen. Like people and other air-breathing creatures, aquatic organisms need oxygen to breathe. Oxygen in short supply impairs the feeding, growth, and reproduction of the Sound's aquatic life. In extreme conditions, some organisms may suffocate and die, while others flee the hypoxic zones. The dense blooms also prevent enough light from reaching shallow water bottoms to support the growth of submerged aquatic vegetation, an important habitat for shellfish and juvenile fish. As a result, nitrogen—in excess—impairs the function and health of Long Island Sound (Figure 1).

FIGURE 1

EFFECTS OF EXCESS NITROGEN



To address the problem, the Long Island Sound Study (LISS) has been proceeding with a phased approach to nitrogen reduction, allowing the program to move forward in stages as more information is obtained to support more aggressive steps.

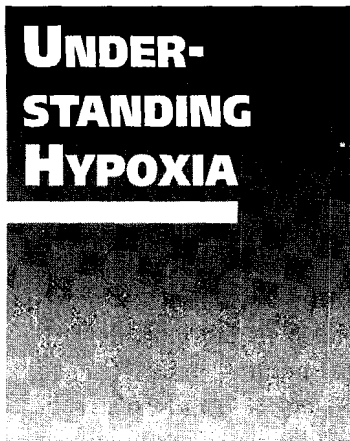
The LISS's first formal action to address the hypoxia problem took place in 1990 with the release of its *Status Report and Interim Actions for Hypoxia Management*. The report announced a freeze on point and non-point nitrogen loadings to the Sound in key geographic areas at 1990 levels—a move intended to prevent the hypoxia problem from getting worse. This constitutes what is now known as Phase I of the LISS hypoxia management program.

Phase II, which was adopted in 1994 upon release of the Long Island Sound *Comprehensive Conservation and Management Plan*, initiated actions to begin to improve oxygen levels in the Sound. This phase is being actively implemented in Connecticut and New York and will begin to reverse a 300 year trend of ever-increasing nitrogen loads to the Sound. Phase II reductions, while significant, will not restore the health of Long Island Sound. Therefore, the LISS made a commitment to identify a third phase of nitrogen controls to guide long-term management.

On February 7, 1997, the LISS released a proposal for *Phase III Actions for Hypoxia Management*, including nitrogen reduction targets for 11 "management zones" that comprise the Connecticut and New York portion of the Long Island Sound watershed.

The LISS prepared an earlier version of this report to present the proposal at a series of public meetings that were held in Connecticut and New York. Modifications were made to the proposal in response to public comment and the U.S. Environmental Protection Agency and the states of Connecticut and New York adopted the plan on February 5, 1998, fulfilling a stated commitment of the Long Island Sound *Comprehensive Conservation and Management Plan*.

In addition to identifying the nitrogen reduction targets, this report explains the framework within which the targets were established, discusses the benefits associated with achieving the targets, and recommends specific nitrogen control actions that need to be undertaken to help meet the targets.



CONDITIONS

While hypoxia in the Sound is not a new occurrence, a comparison of recent data with that collected since the 1950s suggests that it has become more severe and more common. Monitoring of Long Island Sound conducted since 1986 has recorded hypoxia occurrences each year. Natural variations from year to year in weather and other physical factors have affected the size of the impacted area, the length of time each event has lasted, and how low oxygen concentrations have fallen. Generally, hypoxia occurrences have spanned a period of 40 to 80 days from July through September (Figure 2). In 1989, about 40 percent of the Sound's bottom (more than 500 square miles) experienced unhealthy levels of oxygen during the late summer. As recently as 1994, 25 percent of the Sound was affected.

CAUSES

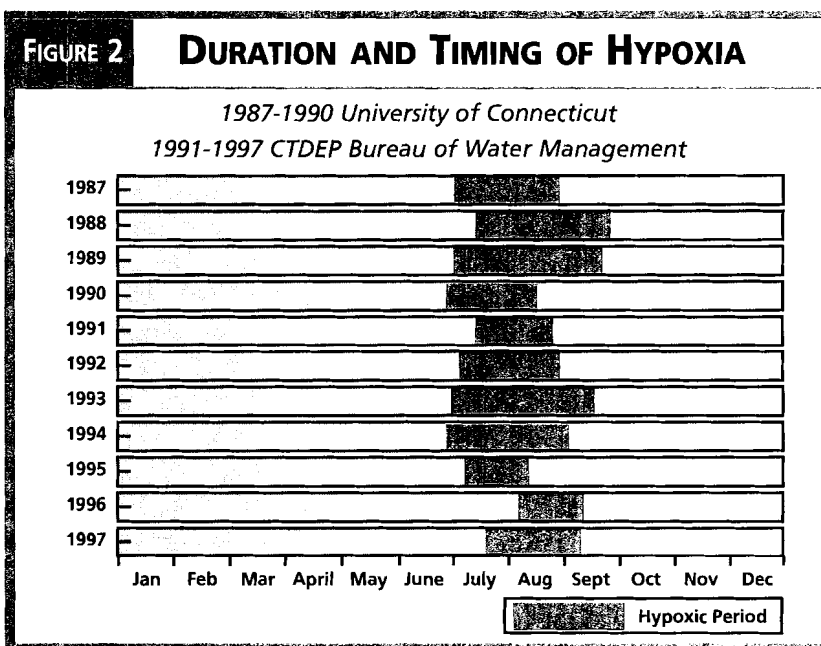
In order to understand the relationship between natural variations in weather and human-induced pollutant loadings, the LISS developed mathematical models of Long Island Sound. The computer modeling effort was designed to answer some fundamental questions:

- What causes low oxygen conditions?
- How much of the problem is caused by natural factors versus human influences?

- What can be done to manage the problem? How effective will different controls be?
- How much will it cost to correct the problem?
- How long will it take to see improvements?

The modeling, combined with field monitoring and laboratory studies, provided a level of detail to support some clear conclusions about hypoxia in the Sound, its causes, and its solutions. In addition, the models allowed the LISS to simulate water quality conditions as they were in the past, as they are today, and as they could be in the future under alternative nitrogen control scenarios.

FIGURE 2 DURATION AND TIMING OF HYPOXIA



THE LONG ISLAND SOUND MODELS

The LISS has relied heavily on computer modeling of the Sound to sort out the complex interaction between natural conditions and human influences in causing hypoxia. Two models, a water quality model that approximates the biological and chemical processes of the Sound and a hydrodynamic model that describes physical processes, have been developed. An intensive field program in Long Island Sound to collect data for the computer models was undertaken from April 1988 to September 1989. These data were used to calibrate and verify the models to ensure that they reproduce the important features of the Sound.

The water quality model, called LIS 2.0, provided needed insight into the causes of hypoxia and was the basis for actions to begin to reduce nitrogen discharges to the Sound. However, because it simulates the movement of the Sound's waters in only two dimensions (east-west and surface to bottom) and in a simplified manner, the LIS 2.0 model did not provide the best technical foundation for identifying the total level of reduction in nitrogen loads that should be attained or the most cost-effective means to achieve targeted reductions.

The hydrodynamic model, developed by the National Oceanic and Atmospheric Administration and completed in July, 1993, uses tide and current measurements to simulate the water's circulation in three dimensions (east-west, north-south, surface to bottom). It was coupled to the water quality model, to create LIS 3.0. The LIS 3.0 model provides an advanced tool to relate sources of nitrogen from specific geographic areas to the hypoxia problem in the western Sound. Because the impact of the nitrogen load from different management zones can be determined using LIS 3.0, the LISS can assign priorities for management to ensure that the most the cost-effective options are pursued.

upon the availability of nutrients. These blooms end when the pool of nitrogen available for continued growth is depleted.

- In pre-colonial days, natural, healthy biological activity brought oxygen levels below saturation due to the natural loadings of organic material and nitrogen, but oxygen levels probably fell below 5 mg/l only in limited areas and for short periods of time.
- Under today's higher nutrient and organic material loading conditions, minimum oxygen levels average approximately 1.5 mg/l. These levels are associated with severe hypoxia.
- By substantially reducing nitrogen loadings to the Sound, the minimum oxygen levels in the bottom waters during late summer can be increased to an average of about 3.5 mg/l, thereby significantly reducing the probability and frequency of severe hypoxia and reducing the area affected by hypoxia.
- Increases in nitrogen delivered to the Sound could significantly worsen the hypoxia problem, causing larger areas to have lower oxygen levels for longer periods of time. The probability of events like the summer of 1987, when anoxia (no oxygen) became a reality in the Sound, offshore of Hempstead Harbor, would also increase.
- The most oxygen that can be dissolved in Long Island Sound at summer water temperatures is about 7.5 milligrams per liter (mg/l) of water. This is known as the saturation level.
- Oxygen concentrations greater than 5.0 mg/l provide healthy conditions for aquatic life. Concentrations between 5.0 mg/l and 3.5 mg/l are generally healthy, except for the most sensitive species. When concentrations fall below 3.5 mg/l, conditions become unhealthy. The most severe effects occur if concentrations fall below 2.0 mg/l, even for short periods of time.
- The growth of algal blooms in Long Island Sound is dependent

MANAGING HYPOXIA: A PROGRESS REPORT



SOURCES

To improve the health of Long Island Sound, the estimated 99,900 tons of nitrogen that enters the ecosystem each year must be reduced. Of that amount, approximately 41,400 tons are from natural sources and not easily reduced by management activity. The remaining 58,500 tons of nitrogen are associated with human activities and have the potential to be reduced through management. (Figure 3).

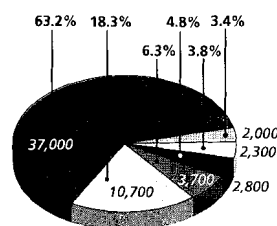
In some cases, human activities outside of the area can affect the amount of nitrogen entering Long Island Sound. For example, 10,700 tons of nitrogen per year enter the Sound through its boundaries — the East River in the west and The Race in the east. The tributaries flowing into Connecticut bring 2,300 tons of nitrogen per year from activities north of the state line. Deposition of nitrogen from the atmosphere from rain and dryfall is another significant source, contributing 6,500 tons of nitrogen per year, 3,700 tons of which fall directly onto the Sound and 2,800 tons onto the watershed. Of the 39,000 tons of nitrogen per year resulting from human activity in the Sound's drainage basin, point source discharges, primarily sewage treatment plants, contribute 37,000 tons of nitrogen and nonpoint source discharges, such as agricultural and stormwater runoff, contribute 2,000 tons of nitrogen. These loading estimates have been revised based on updated information since the 1994 *Comprehensive Conservation and Management Plan* was published.

FIGURE 3

SOURCES OF NITROGEN

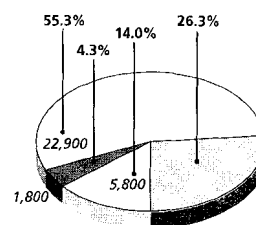
Human-Caused Load

58,500 tons/yr



Natural Load

41,400 tons/yr



In-Basin, Human-Caused Load

45,500 tons/yr

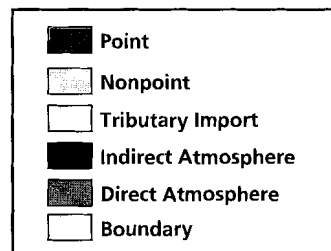
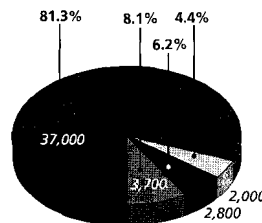
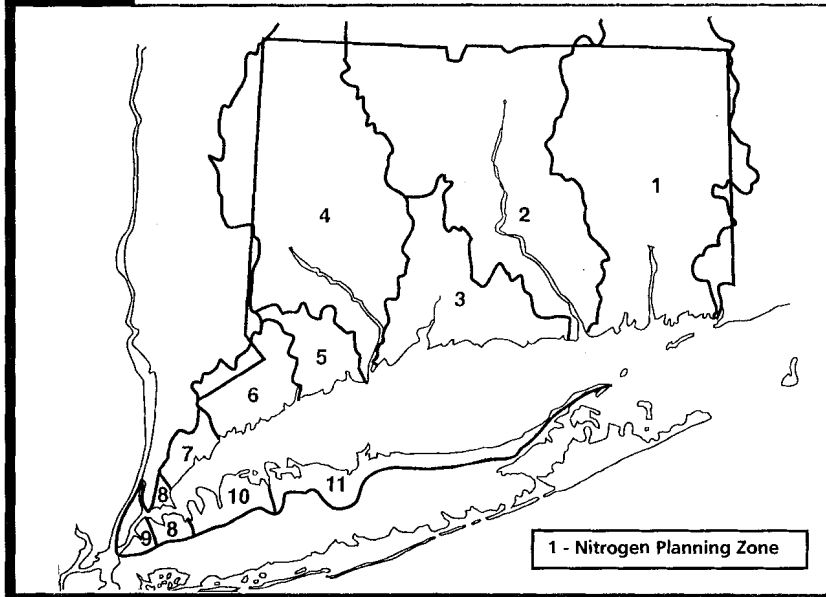


FIGURE 4

MANAGEMENT ZONES



BIOLOGICAL NUTRIENT REMOVAL

Conventional primary and secondary sewage treatment plants remove only small amounts of nitrogen and phosphorus from the wastewater. Biological nutrient removal (BNR) removes much greater amounts of nitrogen and phosphorus using natural breakdown processes. Relatively minor modifications (retrofitting) can be made to the equipment or operation of the sewage treatment plant to achieve nutrient removal, but only if the plant has excess capacity. Full BNR often requires reconstruction of the treatment plant at a high cost.

In BNR, biological organisms are used to remove the nitrogen from the wastewater. The basic principal is to have alternating anaerobic (no or little oxygen) and aerobic (oxygenated) zones or tanks within the treatment process. In the aerobic zones, nitrification occurs while in the anaerobic zones, denitrification occurs.

Nitrification is a process in which bacteria convert ammonia and organic nitrogen to nitrate. In sewage treatment plants, ammonia and organic nitrogen come from human wastes and dead plant and animal matter. The nitrifying bacteria are cultured for use at the plants to convert ammonia to nitrite and nitrate. Nitrification occurs naturally in ecosystems such as streams and salt marshes and plays an important role in the cycling of nitrogen through the earth's environment. In sewage treatment plants and in nature, nitrification requires the presence of nitrifying bacteria and high concentrations of dissolved oxygen, also referred to as "oxic" or "aerobic" conditions.

In the denitrification process, another type of bacteria extract oxygen from nitrates, causing harmless nitrogen gas to be released into the atmosphere. Like nitrification, denitrification also occurs naturally in salt marshes and other ecosystems but under low oxygen conditions, or "anoxic" conditions, in the presence of denitrifying bacteria, nitrates, and organic carbon.

The two processes are linked through the recycling of the wastewater in the anoxic and oxic zones of the tanks. Typically, bacteria and nitrates generated in the nitrification stage are cycled along with sewage from the secondary settling tanks to the anoxic denitrification zone to fuel the denitrification process just described.

Eleven watershed management zones, based on natural drainage basin and political boundaries, have been established to foster identification of nitrogen sources and comprehensive watershed planning (Figure 4).

REDUCTIONS

Since 1990, activities have been underway in New York and Connecticut to manage nitrogen from sources within the New York and Connecticut portions of the drainage basin, starting

with adoption of the Phase I "freeze" on loadings. The sewage treatment plants under the freeze are identified in Figure 5. In 1992, as a consequence of ending ocean disposal of sewage sludge from New York City, and the resulting need to treat some of the sludge at New York City sewage treatment plants discharging to the East River, the nitrogen load increased by 4,500 tons per year.

For Phase II, the LISS made a commitment in 1994 to reduce nitrogen discharges to the Sound from peak loadings by approximately 7,550 tons per year. This phase consists of incorporating a variety of low-cost nitrogen removal technologies at selected sewage treatment plants, which are identified in Figure 6. The states have moved aggressively to implement nitrogen control activities, using innovative strategies and seeking the cooperation of local governments.

In Connecticut, the goal was to achieve a reduction of 850 tons per year in nitrogen loads. The state of Connecticut has awarded more than \$15 million through its State Clean Water Fund to 11 southwestern sewage treatment plants to test and demonstrate the efficiency of upgrades for nitrogen treatment. In addition, the first plant in the state designed to denitrify has been constructed in Seymour. As of December 1997, the load of nitrogen from plants in the Phase II agreement has been reduced by almost 900 tons per year, exceeding the Phase II goal.

The state of New York revised the permits issued to sewage treatment plants, with the consent of local authorities, to establish nitrogen limits at 1990 levels. The permits include an aggregate load for facilities within Management Zones 7-11 (New York

FIGURE 5

SEWAGE TREATMENT PLANTS SUBJECT TO PHASE I FREEZE

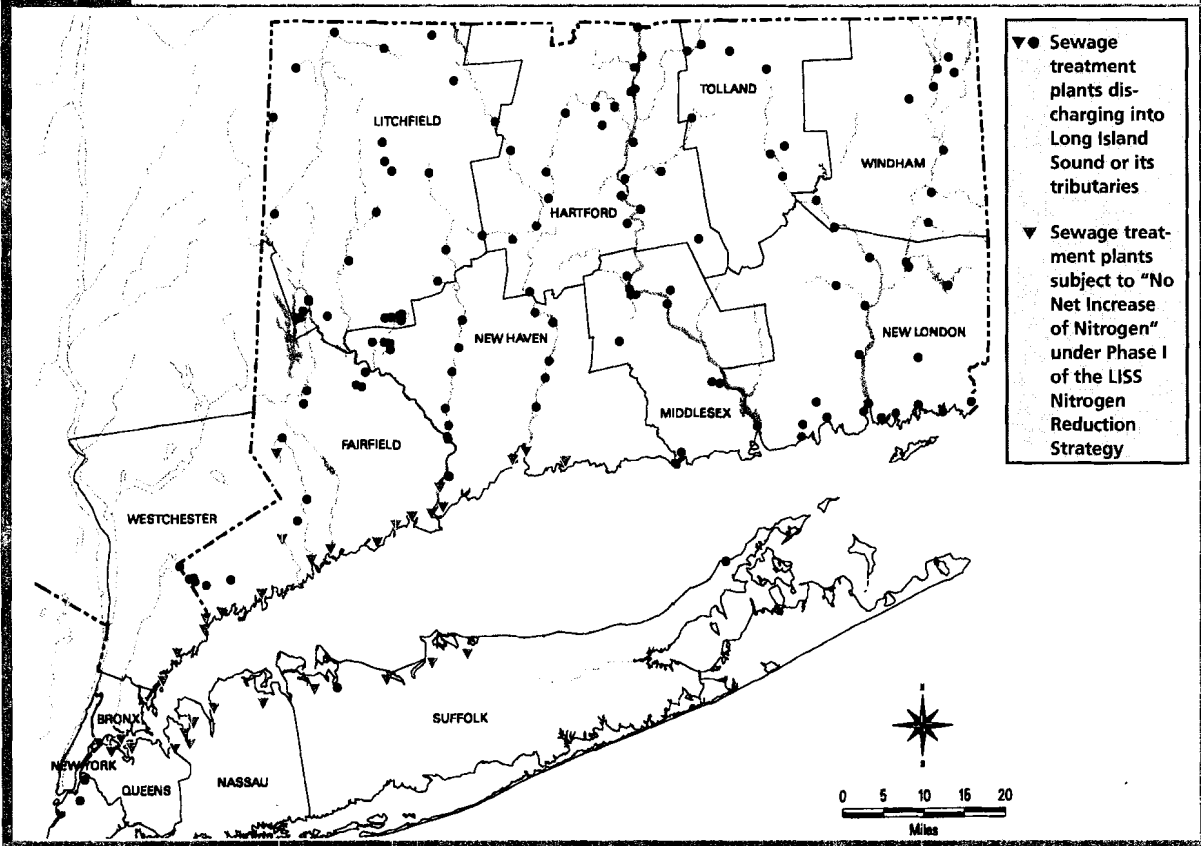
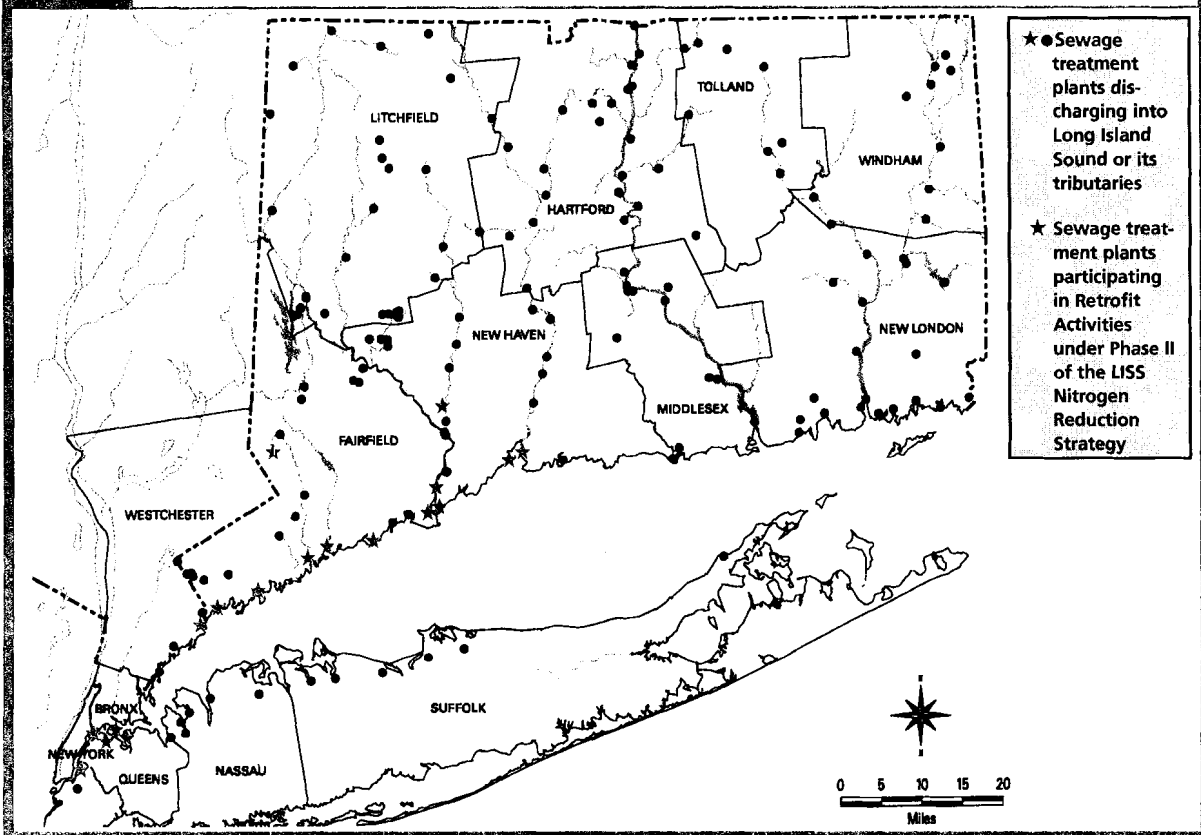


FIGURE 6

SEWAGE TREATMENT PLANTS SUBJECT TO PHASE II REDUCTIONS

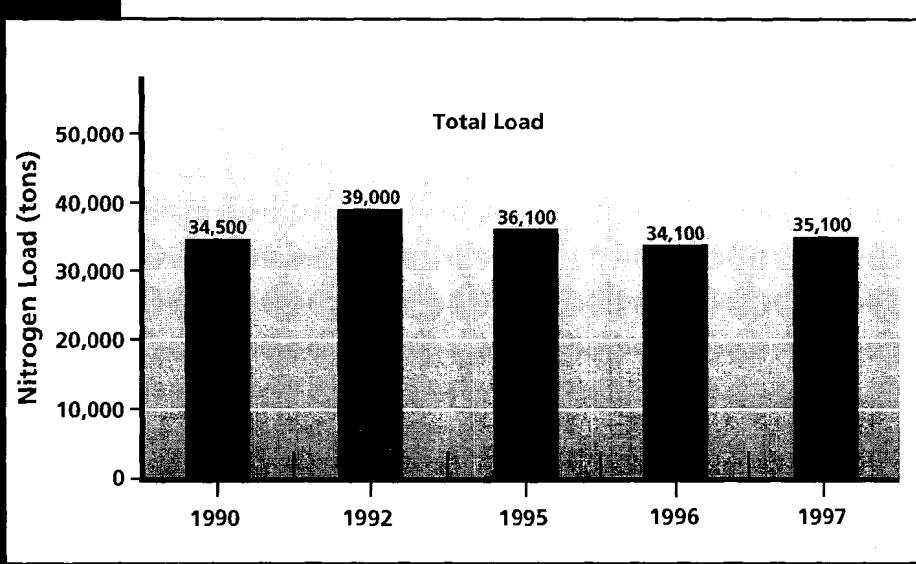


City, Westchester County, and Long Island). The New York goal was to reduce nitrogen loadings by 6,700 tons per year from peak loadings from actions to be completed by 2006. The goal of these actions was to compensate for the increased load due to sludge treatment and reduce loadings back below 1990 levels. As of 1997, one sewage treatment plant in Westchester County and four in New York City have implemented nitrogen removal technologies. New York City is required to implement additional nitrogen removal technologies at the upper East River sewage treatment plants. As of December 1997, the load of nitrogen from sewage treatment plants in New York had decreased by 3,000 tons per year from peak loadings. In addition, New York City has entered into a consent order to provide nitrogen removal at the reconstructed Newtown Creek facility, scheduled for completion in 2007.

In addition, both states have:

- Developed materials and conducted training for treatment plant personnel on nitrogen removal technologies and procedures.
- Required sewage treatment plants to identify in their plans how they will remove nitrogen, if required to do so.
- Required nutrient monitoring at sewage treatment plants to improve understanding of nitrogen sources and treatment plant capability.
- Increased the share of nonpoint source pollution control funds targeted to projects that reduce nitrogen loads to the Sound.
- Formulated Coastal Nonpoint Pollution Control Programs to address coastal nonpoint sources of nitrogen.
- Undertaken demonstration projects that address a variety of nonpoint source control issues and technologies (e.g., urban runoff treatment by artificial pond/wetland systems, parking lot runoff treatment, septic system technologies to treat and remove nitrogen, controlling runoff from agricultural land and from marinas).

FIGURE 7 CHANGES IN HUMAN-CAUSED NITROGEN LOADS



As of December 31, 1997, nitrogen loadings to the Sound from point and nonpoint sources within the New York and Connecticut portions of the watershed have been reduced as a result of these activities by 3,900 tons per year from peak loadings (Figure 7). The small increase in the 1997 load compared to 1996 was due to reconstruction activities in Connecticut that temporarily disrupted nitrogen removal and an increase from the upper East River facilities in New York.

PHASE III FRAMEWORK



While steps taken in Phases I and II will help to reduce the extent of hypoxia, additional nitrogen reduction is needed to restore the health of Long Island Sound. Phase III sets the course by setting specific nitrogen reduction targets for each of the 11 management zones around the Sound. An array of environmental and economic considerations were taken into account throughout the process. This chapter describes the process—step by step.

OXYGEN BENCHMARKS

The water quality standard for oxygen in Long Island Sound is 6 mg/l in Connecticut and 5 mg/l in New York. Modeling indicates that even if maximum nitrogen reduction technologies were implemented, the water quality standards for oxygen would not be achieved throughout the summer in all areas of the Sound. To help establish priorities for action, the LISS has identified oxygen conditions that will minimize adverse impacts on living resources of the Sound.

Two major research efforts have provided much of the information on how low oxygen conditions affect living resources in the Sound. The first of these was a study conducted by the EPA's Office of Research and Development. Species of fish and crustaceans (e.g., crab, shrimp, lobster) known to reside in the bottom waters of Long Island Sound

were exposed to low levels of oxygen in the laboratory. The effect of different concentration of oxygen on growth and survival was measured. Life stages known to be sensitive to low oxygen levels, such as the eggs and juveniles, were emphasized in the tests. In the second study, the Connecticut Department of Environmental Protection (CTDEP) collected bottom-dwelling fish and invertebrates and compared the quantity of organisms and number of species with the levels of oxygen in the water.

Both studies corroborated that severe effects occurred whenever levels of oxygen fell below 2.0 mg/l. The field surveys noted large reductions in the number and types of aquatic life present. The lab experiments recorded reductions in growth and increases in mortality. In both studies, effects became significant when oxygen levels fell below 3.5 mg/l, though some effects occurred at levels between 3.5-5.0 mg/l.

As a result, the LISS has determined that unhealthy conditions occur whenever oxygen levels fall below 2.0 mg/l at any-time or remain below 3.5 mg/l over a 24-hour period. Most adverse impacts can be prevented if oxygen levels exceed these conditions, and they have been used as benchmarks to assess the relative benefits of alternative management strategies for improving the health of Long Island Sound.

COST-EFFECTIVENESS

How do we maximize progress in improving water quality within the framework of existing technology and financial capability? The answer lies somewhere between where we are now (Phase II) and what is achievable if all currently available technologies were employed. LISS managers looked at a range of nitrogen reduction options for the three major sources of nitrogen in the watershed, sewage treatment plants, industrial facilities, and nonpoint source runoff, to answer that question

➤ **SEWAGE TREATMENT PLANTS:** As nitrogen removal requirements become more stringent, the cost of controls tends to increase. To identify a cost-effective level of treatment, LISS managers arrayed the possible nitrogen reduction options for all 70 sewage treatment plants in the 11 management zones and calculated the average oxygen improvement in the Sound per dollar spent. Improvements at

sewage treatment plants that had better than average cost-effectiveness at improving oxygen conditions in the Sound were identified. These actions, in total, could achieve a 62 percent reduction in loads, or 122,044 pounds/day.

➤ **INDUSTRIAL FACILITIES:** A limited number of industrial facilities directly contribute nitrogen to the Sound; all are located in Connecticut and contribute an estimated 6,717 pounds per day of nitrogen to the Sound. Because information on the cost of reducing nitrogen from industrial sources was not readily available, these facilities were not included in the cost analyses used for sewage treatment plants. Instead, the cost-effective level of treatment identified for sewage treatment plants, 62 percent, was applied to the industrial sources, resulting in a 4,165 pounds per day reduction for industrial facilities. This represents an aggressive but cost-effective level of nitrogen control for these sources.

OXYGEN IMPROVEMENT VERSUS COST FOR SEWAGE TREATMENT PLANTS

To find out how critical areas of the Sound would respond to specific management options, data on oxygen improvement versus cost were plotted on curves for three key areas in the Sound: western Narrows, offshore of New Haven, and offshore of Stony Brook. Figure 8 on page 12 shows the curve for the western Narrows. Each point on the curve represents a specific nitrogen reduction approach at a specific plant at an associated cost. The point at which the curve begins to level out represents the "knee" of each curve, the area where we begin to experience much less oxygen improvement for that region per dollar spent. This point separates those options that yield better than average cost-effectiveness from those with below average cost-effectiveness. This analysis was repeated for two other hot spots in the Sound. Actions with better than average cost-effectiveness in improving oxygen conditions in any one of the three locations were identified and the cost of the actions tallied. Based on the curves for the three response regions, environmental improvement can be maximized and costs minimized with nitrogen reductions of 62 percent reduction from sewage treatment plants (122,044 pounds/day) at a cost of around the \$650 million.

ESTIMATING POTENTIAL REDUCTIONS IN NONPOINT SOURCE RUNOFF

Current information on land cover in the watershed and the cost and effectiveness of best management practices (BMPs) to control nitrogen from that land cover was assessed. To determine a loading reduction level, BMP effectiveness was multiplied by the percent of land on which the BMPs are applied. For example, estimates suggest that BMPs reduce nitrogen runoff, on average, by 20 percent. If BMPs were applied to over 50 percent of the land, the level of nitrogen reduction would be 10 percent from the total nitrogen load from urban and agricultural sources. A maximum level of management (100% coverage) would be unrealistic. Thus, a 50 percent BMP application scenario, reflective of an aggressive nonpoint source program, was used to calculate the Soundwide nonpoint source reduction target. This resulted in a 10 percent reduction in nonpoint source nitrogen runoff.

➤ **NONPOINT SOURCES:** Decisions on controls of nonpoint source runoff must be made in the broader context of watershed management, since control measures will also help reduce suspended solids, toxic contaminants, pathogens, and floatable debris. The LISS recommends that aggressive controls of nonpoint source pollution be implemented for both existing and new development, through both habitat protection and restoration activities, and structural and nonstructural best management practices. This effort could result in a 10 percent reduction in the nonpoint source load from sources within the New York and Connecticut portions of the watershed, or 2,604 pounds per day.

Adding the potential nitrogen reductions from cost-effective controls on sewage treatment plants, industrial sources, and nonpoint runoff sources results in a total reduction of 128,813 pounds per day (23,500 tons per year). The next step is to allocate responsibility for achieving these reductions among the 11 management zones fairly.

ALLOCATING RESPONSIBILITY

The cost curve analysis provided an option for allocating nitrogen reductions

among the sewage treatment plants. Sewage treatment plant upgrades with greater than average cost-effectiveness would be implemented while upgrades with below average cost-effectiveness would not be implemented. However, the LISS decided that relying on the cost curve analysis alone would not be a fair or even feasible approach and would not provide the best solution to allocating nitrogen reduction.

There are several reasons for this conclusion. Most importantly, the cost estimates were general and not uniform in their development. More accurate cost estimates must await detailed facilities planning based upon a clear definition of the nitrogen discharge limits that will have to be met. In addition, local concerns and considerations such as the need to purchase land for expansion and to distinguish between costs for nitrogen removal versus ongoing maintenance, expansions for growth, and secondary upgrade needs (which were not included in the cost estimates) were not addressed evenly in the cost analysis.

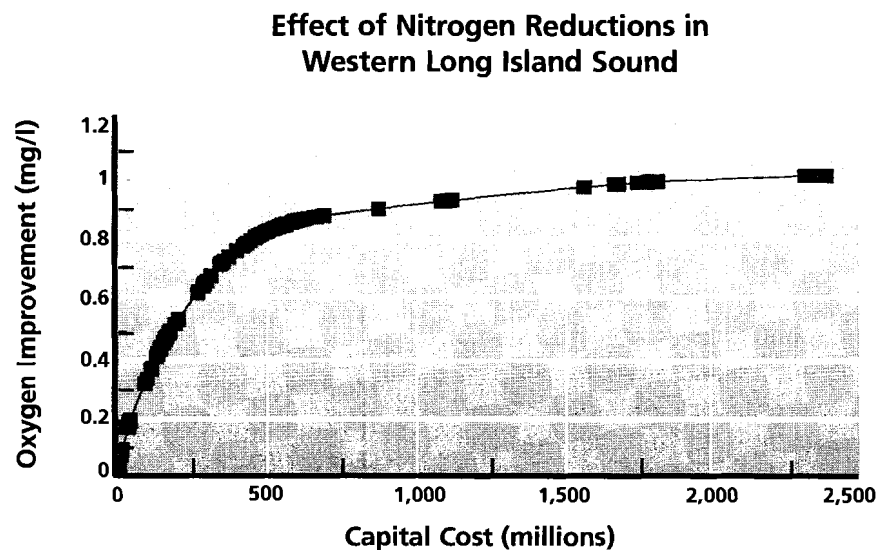
Cost considerations aside, it is necessary for all sewage treatment plants to share the burden of nitrogen removal. All sewage treatment plants contribute nitrogen to Long Island Sound, albeit with

different effect. All jurisdictions will benefit from improved water quality. Therefore, it is reasonable to expect all contributors to the problem to contribute to the solution.

For those reasons, LISS has assigned each management zone equal responsibility to reduce its share of the nitrogen load. To achieve a similar level of oxygen improvement from reductions allocated to each zone by the same percentage, the load reduction target was adjusted slightly to 23,800 tons per year from the original 23,500 tons per year. The total human-derived load coming from sewage treatment plants, industrial point sources, and nonpoint sources, including atmospheric depositions within the watershed, is 40,650 tons per year. Therefore, the Soundwide nitrogen target is a 58.5 percent reduction in the human-derived load from point and nonpoint sources in the watershed.

FIGURE 8

OXYGEN IMPROVEMENT VS CAPITAL COST OF SEWAGE TREATMENT PLANT UPGRADES



PHASE III ACTIONS



Phase III actions will minimize adverse impacts of hypoxia caused by human activities in a cost-effective manner, while ensuring that new information is gathered to refine and improve management over the long term. Using the framework described in the previous chapter, the LISS set a 58.5 percent reduction target for the enriched load of nitrogen from sources within the New York and Connecticut portions of the watershed. The specific Phase III Actions for Hypoxia Management are provided as an appendix to this report.

STRATEGIES

Attaining the nitrogen reduction targets will require aggressive control of point sources, such as sewage treatment plants and industrial sources, and nonpoint sources, such as on-site sewage systems and runoff from roads, parking lots, and construction sites. To achieve the reduction targets, the states, working with local governments, will select the mix of point and nonpoint source controls to be implemented in each management zone. Recognizing that each watershed is different, the plan provides the states and municipalities considerable flexibility in determining how nitrogen reduction actions are carried out within each zone.

By August 2000, the states will take the following actions:

- Develop watershed plans for each management zone that will set the course for achieving the targets as scheduled.
- Consistent with those plans, incorporate limits on the amount of nitrogen that can be discharged from sewage treatment plants and industrial sources into discharge permits.
- Conduct comprehensive nonpoint source management and habitat restoration activities.

Because the total nitrogen load entering the Sound from human sources is dominated by point source discharges, the plan emphasizes technologies that can be applied to sewage treatment facilities and industrial discharges.

In order to achieve significant reductions in the nonpoint source nitrogen load, home owners, farmers, businesses, municipalities, and the states will need to reduce current inputs of nitrogen to the watershed and restore and preserve the nitrogen removal capabilities of existing natural systems. These reductions can be achieved using a number of approaches—resource-based land use decisions at the local level, watershed-wide use of appropriate structural and nonstructural best management practices (e.g., stormwater detention ponds, artificial wetlands, streetsweeping, cleaning catch basins), habitat protection and restoration, and pollution prevention

management practices. All approaches will require a concerted education and outreach effort.

TIMING

The planning, financing, and construction of upgrades to sewage treatment plants necessary to achieve the 58.5 percent reduction target will require sustained effort and commitment over a long period of time. Therefore, the LISS recommends phasing-in the necessary reductions over 15 years:

- 40 percent in 5 years,
- 75 percent in 10 years, and
- 100 percent in 15 years.

COST

The *Comprehensive Conservation and Management Plan* identified that the cost of achieving maximum nitrogen removal from all point sources would range from \$6 to \$8 billion (\$5.1 to \$6.4 billion in New York state and from \$900 million to \$1.7 billion in Connecticut). Because of the successful demonstration of full scale nitrogen removal technologies at sewage treatment plants undertaken as part of Phase II, the estimated costs of capital improvements at sewage treatment plants have decreased. The estimated cost of achieving maximum nitrogen removal levels at the 70 treatment plants in New York and Connecticut is now about \$2.5 billion

Because of the cost-effective approach described in the previous chapter, the LISS nitrogen reduction strategy would not require all treatment plants to meet limit-of-technology reductions. As a result, the incremental capital cost of achieving the Phase III point source controls was estimated to be \$300 million for New

York state and \$350 million for Connecticut. These cost estimates have been questioned and will be revised as more detailed facility planning and design is performed. However, they show clearly that the potential cost of achieving our goals can be much less than originally estimated.

Nonpoint source controls will be implemented as part of broader watershed and habitat protection efforts. The cost of controlling nonpoint sources is more difficult to estimate than the cost of point source controls. Rather than one type of technology applied to a similar source, a variety of strategies can be applied to control a variety of nonpoint sources of nitrogen. As a result, the costs of achieving nonpoint nitrogen reductions will be addressed in the zone-by-zone plans developed by the states.

FINANCING

As recommended in the *Comprehensive Conservation and Management Plan*, the main source of funding for these wastewater treatment facility improvements will be the State Revolving Fund programs. The EPA, through the federal Clean Water Act, provides financing to support State Revolving Fund loan programs.

Connecticut uses the capitalization grant from EPA to leverage with state bond funds to provide grants and low interest loans, at 2 percent interest over 20 years, to finance improvements at municipal facilities. Connecticut provides about \$50 million per year in state bonding to supplement the \$15 million per year provided under the Clean Water Act. At this capitalization rate, Connecticut should be able to meet municipal financing needs to implement Phase III nitrogen reductions. During fiscal

year 1997, CTDEP awarded \$250 million from their Clean Water Fund to finance projects of benefit to Long Island Sound, including major sewage treatment plant upgrades in Norwalk and Waterbury.

New York state established its State Revolving Fund in the custody of the Environmental Facilities Corporation. This public corporation benefits local governments in New York state by offering below-market interest rate loans to municipalities to finance wastewater improvements. Currently, the interest rate is set at up to one-half of the market rate to be repaid in 20 years. Lower rates of interest, including zero interest loans, are available for communities that can demonstrate an inability to pay the standard subsidized rate. Another major source of funding in New York state is the \$1.75 billion Clean Water/Clean Air Bond Act approved by voters in November 1996. The Bond Act targeted \$200 million for Long Island Sound that will be available for sewage treatment upgrades, habitat restoration, nonpoint source control, and pollution prevention.

The possible funding sources for nonpoint source controls reflect the diversity of both the sources and the control options. Grant funding through federal and state water quality management, natural resources management, and coastal zone management programs is available for nonpoint source activities. The State Revolving Fund loan program is also available to fund stormwater management and habitat restoration projects but has not been used to a great extent for these types of activities due to the magnitude of existing point source funding needs in Connecticut and New York.

EFFLUENT TRADING

To provide further flexibility and incentives for maximizing the timeliness and cost-effectiveness of nitrogen reduction

actions, the LISS is investigating the feasibility of allowing effluent trading. Trading, if employed as part of the nitrogen reduction effort, may be an innovative way to use market forces to more efficiently meet water quality goals. The LISS is developing a trading proposal and will convene a public forum for federal, state, and local water quality officials, together with public and private interests, to evaluate its potential.

ENFORCEMENT

The provisions of the federal Clean Water Act provide a vehicle for ensuring that nitrogen reduction targets are legally enforceable. Section 303(d) of the Act requires the identification of a Total Maximum Daily Load for pollutants that will result in the attainment of water quality standards. Once a Total Maximum Daily Load has been established, the act calls for reductions to be allocated to sources so that the load target is met.

New York and Connecticut and EPA will use their authorities to provide an enforceable foundation for achieving the nitrogen reduction targets. By August, 1998 the states will propose a Total Maximum Daily Load designed to meet state oxygen standards. The current Long Island Sound standards were developed with limited data on how low oxygen levels affect aquatic life in Long Island Sound. EPA is currently developing regional marine oxygen criteria that will provide a more scientifically valid basis for the development of oxygen standards. Based on this information, the states may, in the future, modify their oxygen standards.

While LISS managers predict significant improvement in water quality as the nitrogen reduction targets are implemented, the attainment of current water quality standards at all times and in all areas is not expected. For this reason, the

LISS will continue to assess what other kinds of actions will be needed to bring the Sound into full compliance with water quality standards.

These actions may include control of nitrogen and carbon sources outside of the Long Island Sound basin (e.g., tributary import from point and nonpoint sources north of Connecticut, atmospheric deposition, boundary import from point and nonpoint sources affecting New York Harbor and The Race). Alternatives to nitrogen reduction, such as aeration, will need to be considered as a possible means to achieve water quality standards in remaining areas.

EVALUATING PROGRESS

The LISS will track, monitor, and report on progress in meeting the nitrogen reduction targets annually. In addition, a formal review of the goals and objectives of the program will be performed every 5 years, coinciding with the progress checkpoints for nitrogen reduction. The review will consider:

- Progress and cost of implementation, including a reevaluation of the knee-of-the-curve analysis used to establish the Phase III nitrogen reduction targets,
- Improvements in technology, including the results of quality controlled pilot projects,
- The regional dissolved oxygen criteria to be published for comment,
- Water quality standards,
- Refined information on the ecosystem response to nitrogen reductions,
- The results of peer reviewed modeling, and
- Research on the impacts of hypoxia to living resources and their habitats.

Each of these factors will be considered in a balanced manner in the reevaluation process. As a result of the review, the LISS may recommend improvements that could result in changes in how the overall program will be implemented.

BENEFITS OF THE PHASE III NITROGEN REDUCTION TARGETS



ECOSYSTEM HEALTH

Phase III will yield significant ecological and environmental benefits. The maximum area of the Sound that is unhealthy for marine life will be reduced by an estimated 75 percent (Figures 9 and 10). The period during which unhealthy conditions exist in the Sound is predicted to be reduced by 85 percent, from more than 50 days to 6.5 days.

By limiting the area and duration of unhealthy conditions, overall biological effects will be greatly reduced Soundwide.

In the western Narrows:

- Death rates of larvae of marine life sensitive to hypoxia will be reduced by 67 percent;
- Adverse impacts on fish abundance will be reduced by 97 percent;
- Adverse impacts on scup (porgy) abundance will be reduced by 61 percent and on winter flounder abundance by 99 percent. Effects on lobster abundance will be eliminated.

In the waters off of New Haven, Connecticut:

- Mortality of sensitive larvae will be reduced by 65 percent;
- Adverse impacts on fish abundance will be eliminated.

In the waters off of Stony Brook, New York:

- Larval mortality will be reduced by an estimated 84 percent;
- Adverse impacts on fish abundance will be eliminated.

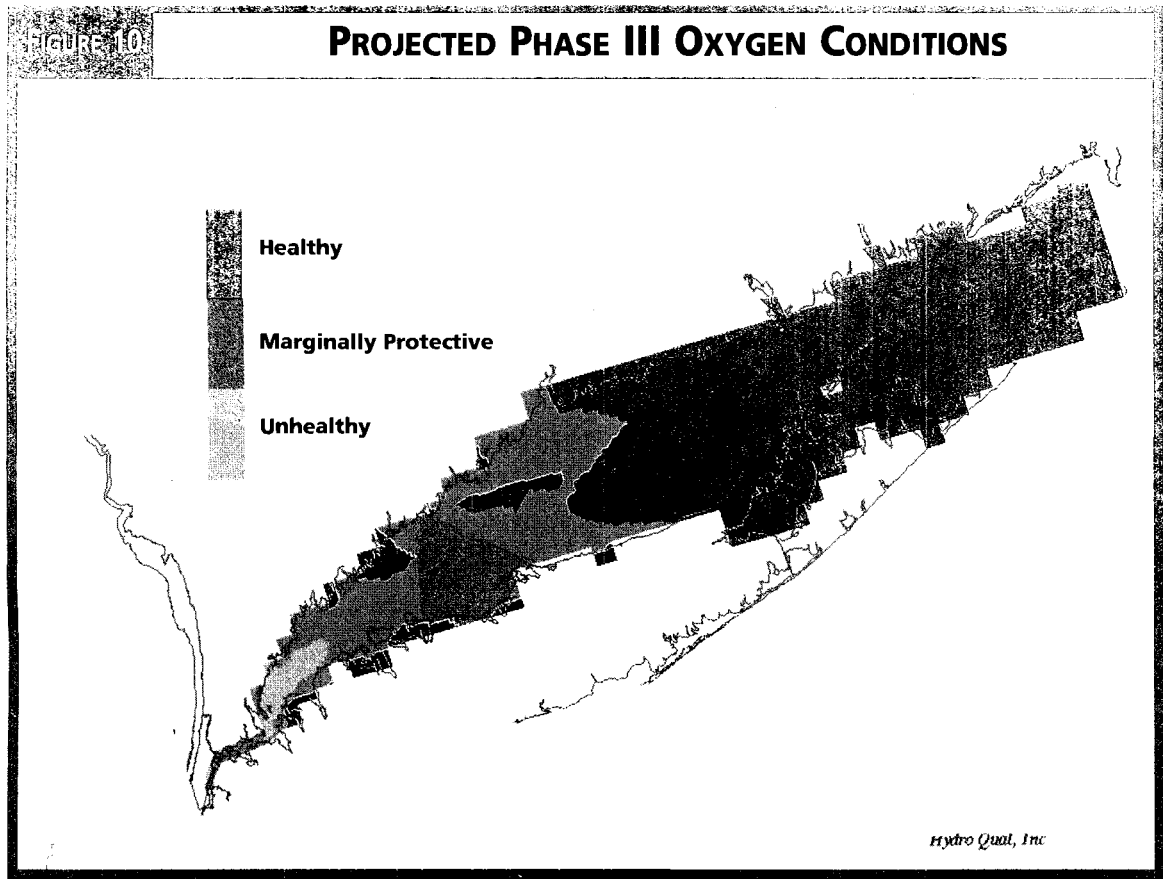
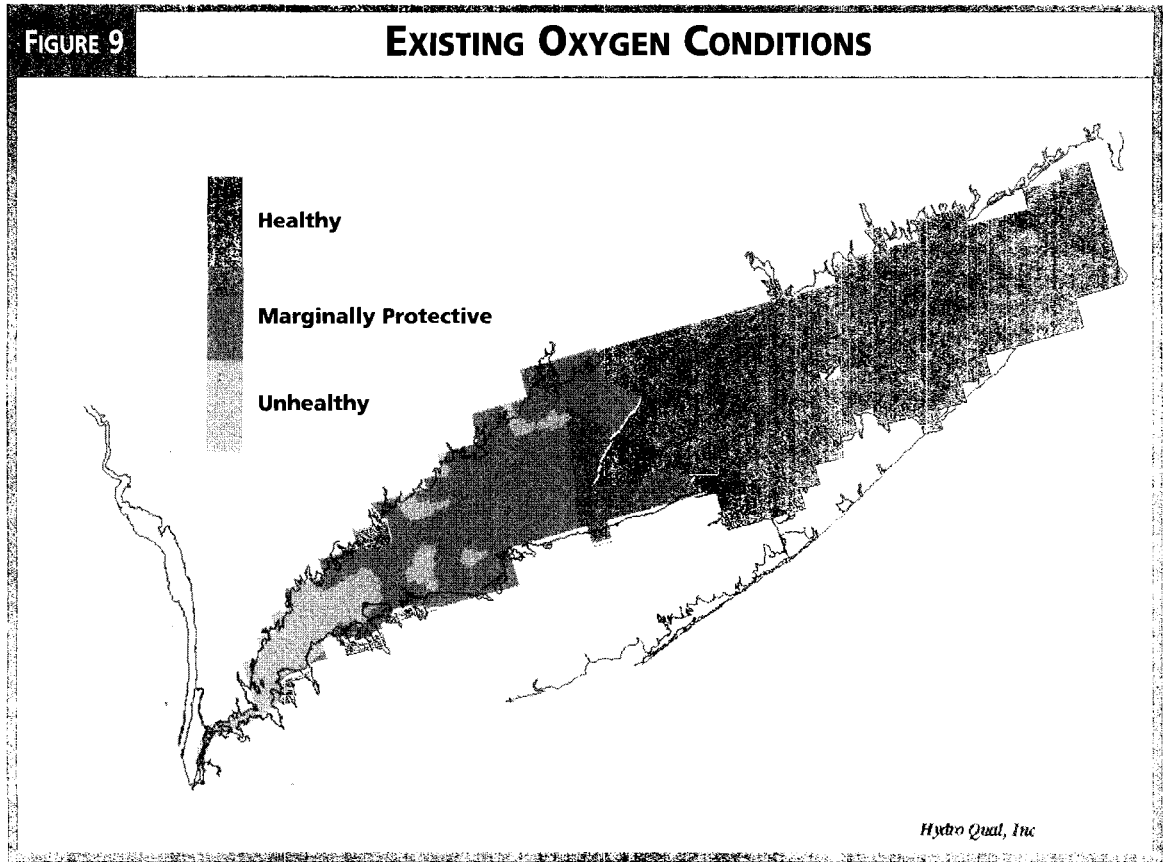
While the model analysis was intended to analyze the open waters of the Sound, improvements are expected in harbors, embayments, and near shore waters as well. These waterways are flushed with water from the Sound as a result of tidal action. As the quality of water from the Sound improves, we can expect improvement in the harbors, embayments, and near shore waters as well. Improved visibility of waters will also expand the amount of shallow water area conducive to the growth of submerged aquatic vegetation, an important habitat that has diminished in range from historical levels.

HUMAN USE BENEFITS

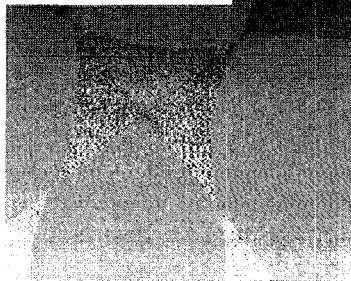
Research commissioned in 1990 by the LISS estimated that more than \$5 billion are generated annually in the regional economy from boating, commercial and sport fishing, swimming, and beachgoing. Actions that result in improved oxygen levels in the Sound, besides increasing habitat that is healthy for aquatic life, will also benefit people who live around and use the Sound. Other expected

benefits from improved water quality resulting from nitrogen reduction in the Sound would include:

- **BOATERS:** By reducing nitrogen loadings to the Sound, algal blooms will be reduced or prevented. By reducing or preventing algal blooms, the clarity and aesthetics of the water will be improved, increasing enjoyment for boaters.
- **SWIMMERS:** Swimmers will notice better water clarity, as a result of less severe algal growth. Less nitrogen will also bring growth of seaweed back into balance.
- **ANGLERS:** Because finfish actively avoid unhealthy waters with low oxygen levels, the Phase III nitrogen reductions will benefit anglers by increasing the area of the Sound in which fish are likely to be found.
- **SCUBA DIVERS AND SNORKELERS:** Scuba divers and snorkelers will benefit from improved visibility underwater as a result of reduced algal blooms, as well as the presence of more abundant and healthier marine life.
- **BIRDWATCHERS AND SIGHTSEERS:** Although birds and wildlife that use the shore area are not directly affected by oxygen levels, many of them feed on marine life, such as small fish, shellfish (e.g., mussels), and crustaceans (e.g., crabs). By improving the health of the waters of the Sound, birds and wildlife will have a greater supply of food, and will be more likely to use the shoreline areas. Therefore, birdwatchers and sightseers will benefit from Phase III nitrogen reductions because shorebirds, waterfowl, and wildlife will be more abundant along the shoreline.
- **COMMERCIAL FISHING AND SHELLFISHING:** The healthier the condition of the Sound, the more fish and shellfish will prosper, which means that more of them will be available for harvest by people. The value of commercial fishing in Long Island Sound during 1990 was more than \$148 million.
- **TOURISM:** Visiting the beach, fishing and diving charters, sightseeing trips, and other leisure pastimes contribute to the local economy, both directly to the tourism industry and to other businesses that support the tourist trade (e.g., restaurants, gas stations, sporting goods stores).
- **REAL ESTATE:** Studies have shown that the value of properties used for recreation (e.g., seasonal cottages) drop in value in response to decreasing water quality. It is likely that improved water quality in the Sound will increase property values along the shore.



SUGGESTED READING



T

he following list represents selected reports available from the Long Island Sound Office that provide additional information.

1. Altobello, M.A. 1992. The Economic Importance of Long Island Sound's Water Quality Dependent Activities. University of Connecticut.
2. CTDEP. 1995. A study of Marine Recreational Fisheries in Connecticut. Federal Aid to Sport Fish Restoration. F54R Final Report.
3. Howell, P., D. Simpson. 1994. Abundance of Marine Resources in Relation to Dissolved Oxygen in Long Island Sound. *Estuaries*. 17:394-402.
4. HydroQual. 1991. Water Quality Modeling Analysis of Hypoxia in Long Island Sound. Prepared for the Management Committee of the Long Island Sound Study and the New England Interstate Water Pollution Control Commission. Job #NENG0012.
5. HydroQual. 1996. Water Quality Modeling Analysis of Hypoxia in Long Island Sound Using LIS 3.0. Prepared for the Management Committee of the Long Island Sound Study and the New England Interstate Water Pollution Control Commission. Job #NENG0035.
6. HydroQual. 1997. Evaluation of Nutrient Management Scenarios Using LIS 3.0. Prepared for the Management Committee of the Long Island Sound Study and the New England Interstate Water Pollution Control Commission. Job #NENG0035.
7. Long Island Sound Study. 1990. Status Report and Interim Actions for Hypoxia Management. 40 pp. U.S. Environmental Protection Agency.
8. Long Island Sound Study. 1994. Comprehensive Conservation and Management Plan. 168 pp. U.S. Environmental Protection Agency, LIS Office, Stamford Connecticut.
9. Long Island Sound Study. 1997. Framework for Developing the Proposed Phase III Nitrogen Reduction Targets. 19 pp. U.S. Environmental Protection Agency, LIS Office, Stamford Connecticut.
10. Miller, D.C., S.L. Poucher, L. Coiro, S. Rego, W. Munns. 1995. Effects of hypoxia on Growth and Survival of Crustaceans and Fishes of Long Island Sound. In: *Proceedings of the Long Island Sound Research Conference: Is the Sound Getting Better or Worse? New York Sea Grant Institute*. NYSGI-W-94-001
11. Parker, C.A., and J.E. Reilly. 1991. Oxygen Depletion in Long Island Sound: A Historical Perspective. *Estuaries*. Volume 14, No. 3.
12. U.S. EPA. 1996. Draft Framework for Watershed-Based Trading. U.S. Environmental Protection Agency, Office of Water. Washington, DC

APPENDIX

PHASE III ACTIONS FOR HYPOXIA MANAGEMENT ADOPTED BY THE LISS POLICY COMMITTEE

February 5, 1998

PHASE III NITROGEN REDUCTION TARGETS

Based upon currently available estimates of treatment performance and costs of nitrogen reduction technologies, a “knee-of-the-curve¹” analysis was performed to determine appropriate levels of nitrogen reduction to alleviate hypoxia in the Sound. As a result of this analysis, USEPA, NYSDEC, and CTDEP recommend:

1. A 58.5 percent² reduction in the total enriched load¹ of nitrogen to Long Island Sound from point and nonpoint sources within the New York and Connecticut portion of the watershed within 15 years³.
2. Each of the eleven watershed-based management zones established by the LISS be allocated a 58.5 percent reduction.
3. To administer and enforce the nitrogen reduction targets consistent with the Clean Water Act, the LISS will develop a Total Maximum Daily Load/Wasteload Allocation/Load Allocation necessary to meet standards for dissolved oxygen in Long Island Sound.
 - A. CTDEP and NYSDEC will work with EPA to develop, by July 1998, a TMDL necessary to meet the dissolved oxygen standards. NYSDEC and CTDEP will propose the TMDL in August 1998 and submit the TMDL, as appropriate, to EPA by December 1998 for approval. EPA will develop the TMDL if it is disapproved, as required by the CWA.
 - The TMDL will include point and nonpoint source controls in the New York and Connecticut portion of the watershed to meet the 58.5 percent reduction target.
 - The TMDL will also include future actions and schedules beyond the 15-year Phase III plan for achieving water quality standards, such as the control of carbon and nitrogen from outside of the LISS management area, including point and nonpoint sources north of Connecticut in New England, atmospheric deposition, point and nonpoint sources affecting import from New York Harbor and The Race, and other alternatives, such as aeration and load relocation.
 - The TMDL will include a provision for periodic review every five years and revision as appropriate.
 - B. CTDEP and NYSDEC will develop zone-by-zone plans (WLA/LA) by August 1999 to achieve the nitrogen reduction target, highlighting a mix of quantifiable

1. As defined in the January 1997 LISS's *Framework for Developing the Proposed Phase III Nitrogen Reduction Targets*.

2. From pre-nitrogen management conditions, defined as the 1990 baseline plus centrate from the cessation of ocean dumping.

3. From August 1999, the date by which the states will develop zone-by-zone plans to achieve the target.

point and nonpoint source controls to be implemented in each management zone.

- C. CTDEP and NYSDEC will propose modifications to NPDES permits for point source discharges by August 2000.

- incorporating nitrogen loading limits to achieve the point source component of the five-year load reduction target, and
- requiring that plans and implementation schedules be developed to achieve the point source component of the nitrogen reduction targets within 15 years.

- D. August 2000, CTDEP and NYSDEC will commit to the quantifiable actions necessary to achieve the nonpoint source reduction component of the five-year load reduction target.

- E. Any new permits issued within this interim period must specifically address A-C, above.

- F. The states will report on progress on the nitrogen reduction targets as part of the annual Management Conference reporting requirements.

4. 15-year, phased, enforceable schedule, commencing after completion of zone by zone plans, be established to assure steady progress in achieving the nitrogen reduction targets

- 40 percent progress toward the 58.5 percent target reduction within five years
- 75 percent progress toward the 58.5 percent target reduction within ten years
- 100 percent progress toward the 58.5 percent target reduction within 15 years

5. Five years after adoption of the nitrogen reduction targets and every five years thereafter, the LISS will formally evaluate the nitrogen reduction targets, considering the:

- progress and cost of implementation, including a reevaluation of the knee-of-the-curve analysis used to establish the Phase III nitrogen reduction targets,
- improvements in technology, including the results of quality controlled pilot projects,
- the regional dissolved oxygen criteria to be published for comment,
- water quality standards,
- refined information on the ecosystem response to nitrogen reductions,
- the results of peer reviewed modeling, and
- research on the impacts of hypoxia to living resources and their habitats.

Each of these factors will be considered in a balanced manner in the reevaluation process.

- A. During each five year period, the LISS, through the advice of the TAC and CAC, will encourage continued monitoring, modeling, and research necessary to provide critical information to support the reevaluation of the nitrogen reduction targets.

- B. EPA will complete a report on deriving regional protection limits for dissolved oxygen.

- C. The states will review and revise their water quality standard for dissolved oxygen.





A Partnership to Restore and Protect the Sound

The
of the U.S. Environmental Protection Agency

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<http://www.epa.gov/region01/eco/lis/>

APR 03 2001

Arthur J. Rocque, Jr.
Commissioner
Connecticut Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Erin Crotty
Commissioner
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-3508

Dear Mr. Rocque and Ms. Crotty:

In 1990, the states of New York and Connecticut took a major step toward addressing hypoxia in Long Island Sound by adopting a no-net increase policy for nitrogen loads. In the decade since that step, a sustained commitment to address the problem has resulted in other significant milestones. None was more important than the 1998 agreement to reduce the amount of nitrogen from the Connecticut and New York portions of the Long Island Sound watershed by 58.5 percent, and to implement that agreement through the development of a Total Maximum Daily Load (TMDL) in conformance with Section 303(d) of the Clean Water Act. Your leadership was fundamental to that agreement and to the preparation of the TMDL--*A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound*.

Connecticut's complete TMDL package, dated December 28, 2000, was received by EPA on January 8, 2001. New York submitted the TMDL to EPA on January 8, 2001 and the public responsiveness document on February 1, 2001. As documented in the enclosed review, the final submittal includes all of the required elements of a TMDL and is designed to ensure the attainment of water quality standards for dissolved oxygen in the Long Island Sound. The U.S. Environmental Protection Agency has determined that the TMDL meets the requirements of §303(d) of the Clean Water Act, and EPA's implementing regulations (40 CFR Part 130) and hereby approves Connecticut's and New York's final TMDL for dissolved oxygen in the Long Island Sound.

Stamford Government Center
888 Washington Boulevard
Stamford, CT 06904-2152
203 977-1541
203 977-1546 Fax

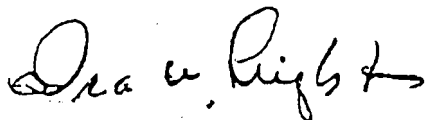


Marine Sciences Research Center
State University of New York at Stony Brook
Stony Brook, NY 11794-5000
631 632-9216
631 632-8216 Fax

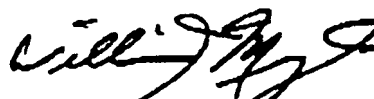
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We recognize the challenge posed by integrating an adaptive ecosystem management approach with the core elements of the TMDL program. We believe the TMDL is a model for how this can be accomplished -- and a challenge to EPA, Connecticut, and New York to work together to ensure that the commitments and schedules within the TMDL are implemented. We want to thank you and your staffs for your willingness to work with EPA during its development.

Sincerely,



Ira W. Leighton
Acting Regional Administrator
EPA-New England



William J. Muszynski, P.E.
Acting Regional Administrator
EPA Region 2

Enclosure

EPA NEW ENGLAND AND EPA REGION 2 TMDL REVIEW

TMDL: Long Island Sound, Connecticut and New York

STATUS: Final

IMPAIRMENT/POLLUTANT: Hypoxia (low dissolved oxygen) due to excess nitrogen

BACKGROUND: CTDEP and NYSDEC released the draft TMDL for public comment in November 1999. EPA provided comments in a letter dated April 6, 2000. CTDEP and NYSDEC submitted the final TMDL in letters signed by CTDEP on December 28, 2000 and NYSDEC on January 8, 2001.

REVIEW ELEMENTS OF TMDLs

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R.. § 130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.

1. Description of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

*The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyll *a* and phosphorus loadings for excess algae.*

A. Description of Waterbody

The TMDL contains an adequate description of Long Island Sound and its watershed. Long Island Sound covers about 1,300 square miles, measuring 100 miles from east to west and about 21 miles wide at its widest point between New Haven, Connecticut and Port Jefferson, New York. Mid-Sound depths range from 60 to 120 feet. Long Island Sound is an estuary, where salt water from the ocean mixes with fresh water from rivers and runoff from the land. Like other estuaries, the Sound provides feeding, breeding, nesting, and nursery areas for diverse animal and plant life. But Long Island Sound is unique in other ways. Unlike most other estuaries, the Sound does not have one connection with the sea – it has two. Rather than having a major source

of fresh water at its head, flowing into a bay that empties into the ocean, Long Island Sound is open at both ends. Lower salinity waters enter the western Sound from New York Harbor through two tidal straits, the East River and Harlem River, and higher salinity waters enter at its eastern end through Block Island Sound and The Race. Most of its fresh water comes from several south-flowing rivers, including the Connecticut, the Housatonic, and the Thames, whose drainages reach as far north as Canada. The largest source of fresh water is the Connecticut River, which enters the Sound at its eastern end and contributes approximately 70 percent of the more than six trillion gallons of fresh water that enters the Sound each year. The Long Island Sound drainage area is approximately 16,000 square miles in size and includes most of the land area of Connecticut, and portions of New York (including New York City), Massachusetts, Vermont, New Hampshire, and the Canadian province of Quebec. The Sound lies within the most densely populated region in the United States. More than eight million people live in the Long Island Sound watershed, and millions more travel there each year to take advantage of the many recreational and economic opportunities it provides.

Long Island Sound combines this multi-inflow/outflow system with a highly convoluted shoreline and a complex bottom topography. Taken together, they produce unique and complex patterns of tides and currents. EPA recognizes that these physical characteristics, combined with the impacts of human population growth and urban development, make managing the Sound's water quality a highly complex task.

B. Pollutant of Concern

The TMDL clearly establishes nitrogen as the principal pollutant that is preventing the attainment of the states' water quality standards for dissolved oxygen in Long Island Sound. This determination is based on the findings of the 15-year Long Island Sound Study (LISS), part of EPA's National Estuary Program, which included extensive ambient water quality monitoring, water circulation studies, research into the effects of low dissolved oxygen on marine organisms, and monitoring of sewage treatment plant effluents, CSOs, atmospheric deposition, and nonpoint sources. The results of this intensive monitoring and research program were used to help develop water quality and hydrodynamic models, which in turn were coupled to create a time variable, three-dimensional, hydrodynamic/water quality model, called LIS 3.0. The LIS 3.0 model was used to measure the relative impact of nutrients and organic carbon on dissolved oxygen (DO) conditions in the Sound. While organic carbon loadings play a role, the studies show that nitrogen is the principal pollutant of concern for meeting DO standards in Long Island Sound.

C. Pollutant Sources

The TMDL provides a detailed description of the many sources of nitrogen, including their relative magnitude and location, that affect dissolved oxygen levels in Long Island Sound. Of the approximately 100,436 tons of nitrogen that are estimated to be delivered to the Sound each year, about one-third enters through the two ocean boundaries at The Race to the east and the East River to the west. The TMDL presents the current contributions of nitrogen as being about 42 percent of the load from point sources, including sanitary and industrial wastewater

discharges within the Long Island Sound drainage basin, and about 13 percent from nonpoint sources, including runoff from urban and agricultural land and septic systems. The remaining 12 percent of the load is from atmospheric deposition, including nitrogen deposited directly on the Sound and nitrogen delivered to the Sound from deposition on the drainage basin.

The TMDL has distinguished between point and nonpoint sources of nitrogen, to the extent practicable, considering the geographic scale of the Long Island Sound watershed and the land use-based approach used to estimate nonpoint source loadings. EPA recognizes that currently it is not feasible to distinguish between the stormwater loadings from point source stormwater discharges and CSOs in Connecticut, on the one hand, and nonpoint source runoff on the other hand, because of the overlap that exists between these two source categories and the lack of stormwater and CSO monitoring data. For example, the TMDL used nonpoint source load estimates derived from runoff coefficients applied to specific land uses. This methodology provides an overall nonpoint source load estimate that includes nitrogen delivered through point source stormwater discharges, overland runoff, and groundwater flows. Additional monitoring and modeling would be necessary to identify the portion of the total nonpoint source load estimate that is delivered through the point source stormwater discharges versus other delivery routes. Therefore, EPA agrees that it is reasonable, in this case, to include all such stormwater related loadings in the nonpoint source category.

D. Priority Ranking

The TMDL was developed in response to the high priority placed on this waterbody by Connecticut, New York, and EPA. Since 1992, Long Island Sound has been identified by both states on their biennial lists of impaired waters, developed and submitted to EPA pursuant to section 303(d) of the Clean Water Act. Both states identified the Sound on their 1998 303(d) list as a priority for TMDL development by April 1, 2000. The purpose of this TMDL is to establish the legal foundation on which the states will base nitrogen load reductions, and other management strategies, necessary to meet the states' water quality standards for dissolved oxygen. The TMDL document provides a detailed description of the link between nitrogen loads and low dissolved oxygen, or hypoxia, the extensive monitoring and modeling program on which this determination was based, and the rationale for targeting nitrogen as the pollutant of concern.

In summary, EPA finds that the TMDL meets the requirements for describing the waterbody, pollutant of concern, pollutant sources, and priority ranking.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be

developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.

A. Applicable WQS and Designated Use(s)

The TMDL adequately describes the applicable water quality standards for Long Island Sound, including a description of the designated uses, and numeric water quality criteria for dissolved oxygen (DO). Specifically, the TMDL includes the relevant standards in both New York state's water quality standards identified in NYSCRR, title 6, Chapter X, Parts 701 and 703, and Connecticut's *Water Quality Standards*¹. The applicable designated uses for each marine classification are presented, including general spatial and areal descriptions for each surface water classification, in TMDL Sections III.B and III.C).

B. Numeric Criteria

As discussed in the TMDL, hypoxia (low dissolved oxygen) is linked to an overabundance of nitrogen combined with the natural occurrence of density stratification of the water column in Long Island Sound (Sections I.B and III.A). Nitrogen has been established as the limiting nutrient for algal growth in Long Island Sound and has been identified as the primary factor leading to low DO levels and subsequent loss of designated uses. In the absence of criteria for nitrogen in estuarine environments, and given the established relationship between excessive nitrogen and its ultimate effects on dissolved oxygen, the TMDL for nitrogen is translated from DO criteria.

EPA agrees with this approach given the demonstrated effect that excessive nitrogen has on algal growth and its relationship to dissolved oxygen in aquatic environments². Also, EPA agrees with applying DO criteria since a well-calibrated model and ambient water quality data demonstrate that depletions of dissolved oxygen in Long Island Sound are the result of excessive loadings of nitrogen³.

The TMDL references EPA's new *Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras (November 2000)* and states that the saltwater oxygen criteria presented in this document, and any revisions to state water quality standards based on these new criteria, will be evaluated during the planned five-year review periods, and in any future revision(s) to the TMDL. However, as noted in TMDL Section VII.F, the EPA saltwater DO criteria and any subsequent revisions to New York and Connecticut water quality standards for saltwater DO criteria will not affect the necessity of the Phase III nitrogen reduction targets for in-basin sources. Based on modeling analyses performed to date, it will still be necessary to meet, at minimum, the Phase III (in-basin) nitrogen reduction targets to attain water quality standards for DO derived from EPA's new saltwater DO criteria. Thus, it is clear that future revisions to the TMDL based upon the saltwater DO criteria would not affect the need to achieve Phase III nitrogen reductions targets (also see Section 3 - Loading Capacity).

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 C.F.R. § 130.2(f)). The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. § 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.

In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.

A. Loading Capacity

TMDL Section VI.G identifies a nitrogen loading capacity (LC) of 72,239 tons per year. A summary of the component allocations comprising the LC is provided in Table 1. This nitrogen LC is based on concomitant carbon reductions achieved as a consequence of the nitrogen control program. The LIS 3.0 model provides a sound basis for concluding that Long Island Sound will achieve water quality standards for DO during critical conditions if nitrogen loading is limited to 72,239 tons of nitrogen per year and the loading capacity of Long Island Sound to assimilate nitrogen is added through non-treatment alternatives, such as adding oxygen to certain segments of the Sound.

Table 1. Long Island Sound Nitrogen Loading Capacity (tons/year)			
	In-Basin	Out-of-Basin	Total
WLA	15,556	2,243	17,799
LA	8,410	46,030	54,440
Total	23,966	48,273	72,239

As discussed in Section V.C.2 of the TMDL, the LIS 3.0 model predicted that after executing Phase III and Phase IV reductions, approximately 125 model segments would still not meet water quality standards for DO criteria. The TMDL recommends the use of non-treatment alternatives (Phase V) to attain water quality standards. One of the alternatives identified is mixing/aeration. Based on an analysis of this alternative, it was estimated that the addition of at least 10,000 lbs/day of oxygen to each of the 125 model segments, combined with the nitrogen and associated

carbon reductions identified in Phase III and Phase IV of the TMDL, could attain DO standards. A couple of the other alternatives, such as seaweed farms and tide gates, may also function to increase loading capacity, but the details of these options are not sufficiently developed to allow for a specific increase to be identified.

Table 8 of the TMDL illustrates the overall effect of each phase on DO concentrations, and the ultimate achievement of water quality standards for DO concentrations. EPA agrees that the nitrogen LC identified for each phase, in particular Phase III and Phase IV, in combination with Phase V non-treatment alternatives (e.g., mixing/aeration), will ultimately achieve water quality standards for the Long Island Sound. Also, as written in TMDL Section VII, EPA especially recognizes CTDEP's and NYDEC's commitment to evaluate and implement Phase V non-treatment alternatives to attain water quality standards.

Although loadings are typically expressed as daily loads, a daily measure is not necessarily appropriate for all waterbodies, all impairments, or all pollutants. EPA regulations require only that a TMDL be "expressed in terms of mass per time, toxicity, or other appropriate measure" {40CFR §130.2(I)}. For the purposes of this TMDL, maximum annual loadings were established. As explained in the TMDL Sections V.C and VI.F, nitrogen loadings occur throughout the year, contributing to the total pool of nitrogen available for phytoplankton uptake. Hypoxia, resulting from the decay of the organic matter produced by the phytoplankton, is not sensitive to daily or short term nitrogen loadings; rather, it is a function of annual loading. Therefore, EPA agrees with expressing the TMDL as an allowable annual load of nitrogen (tons per year) given the demonstration, based on the LIS 3.0 model, that DO levels are a function of the total pool of available nitrogen and annual nitrogen loadings.

B. Cause-and-Effect Relationship between Numeric Target and Pollutant

As described in TMDL Section V.C, the LIS 3.0 model was developed to examine the dynamics of dissolved oxygen in the Long Island Sound, and to evaluate the range of options for improving conditions. This model is a three-dimensional, time variable hydrodynamic/water quality model that incorporates physical, chemical, and biological processes relating nutrients and carbon-based pollutants to phytoplankton dynamics and DO. The LIS 3.0 model was used to simulate the DO levels in Long Island Sound under varied nutrient loadings. Based on LIS 3.0 modeling results and data analyses, nitrogen was determined to be the primary limiting nutrient.

EPA concludes that the application of the LIS 3.0 model adequately establishes the cause-and-effect relationship between DO and nitrogen. EPA agrees that the model is well calibrated because of the established agreement between the observed data with the modeled results. Further, as described in Section V, EPA agrees with the conclusion that this model was properly calibrated and thus represents the relationship between nitrogen loading and its effect upon DO concentrations in the Long Island Sound.

As previously discussed, the principal pollutant of concern in this TMDL is nitrogen. However, organic carbon also contributes to oxygen depletion. While organic carbon is not specifically targeted for reduction, nitrogen reduction technologies for both point and nonpoint sources will

also reduce carbon loadings to the Long Island Sound. The LIS 3.0 model was used in the TMDL analysis to predict improvements in dissolved oxygen resulting from both nitrogen and organic carbon reductions. The TMDL does not include allocations based on organic carbon; however, the predicted improvements in dissolved oxygen are based on both organic carbon and nitrogen reductions.

Finally, the LIS 3.0 model was subjected to extensive peer input and comment. In fact, an independent Model Evaluation Group, composed of national water quality modeling experts, was established to provide constructive input and recommendations during the development and application of this water quality model. The Model Evaluation Group offered approval of this model in November 1994⁴.

C. Critical Condition(s)

Environmental and ecological processes that ultimately lead to critical hypoxic conditions in the Long Island Sound are adequately described on pages 1 and 2 in the TMDL document. Additionally, based on ambient water quality monitoring surveys, the period between 1988 and 1989 was identified as the most severe period of recorded hypoxic conditions in the Sound. The data generated during this critical period was used to calibrate the LIS 3.0 model. Model simulations were run with reduced nitrogen loads to project water quality conditions resulting during the same physical conditions that existed during the 1988-1989 period.

Based on EPA's review of the LIS 3.0 model, in particular TMDL Section V.C, which included a discussion of the model's calibration under the severe hypoxic period, we conclude that calibration was adequate given the agreement between the observed data with the modeled results. Also, EPA agrees that the application of the 1988-1989 data for model calibration, and its application to calculate levels of nitrogen reduction during this critical period, is appropriate because it represents a more conservative approach for estimating levels of nitrogen reductions to meet water quality standards as compared to modeled results based on average conditions. EPA concludes that the critical condition is appropriately described and applied in the LIS 3.0 model, and, subsequently, in development of the TMDL.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 C.F.R. § 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. § 130.2(g)). Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.

If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.

The TMDL, summarized in Section VI.G, includes in-basin nitrogen reductions and out-of-basin nitrogen reductions for point and nonpoint sources. The existing nonpoint source loads are described in the TMDL Section V.B and include pre-colonial (i.e., natural background), terrestrial, and atmospheric loads.

The TMDL includes the following load allocations: a LA (based on Phase III nitrogen targets) of 8,410 tons/yr of nitrogen for in-basin nitrogen sources and a LA (based on Phase IV nitrogen targets) of 46,030 tons/yr of nitrogen for out-of-basin nitrogen sources and atmospheric loads (in-basin and out-of-basin). The total LA is 54,440 tons/yr.

A. Phase III Nonpoint Source Reductions

The Phase III nitrogen targets are based on an overall 58.5 percent reduction, which has been applied to the cumulative point and nonpoint source nitrogen loads from urban and agricultural land uses within each of the 11 management zones. The process for deriving the 58.5 percent reduction target is described in Section V.C.2.

Table 6 of the TMDL submittal identifies the wasteload and load allocations within each of the 11 management zones. The load allocations are based on achieving a 10 percent reduction in the total nonpoint source loads from urban and agricultural land uses. Appendix A of the TMDL document provides the supporting information on the calculation of the existing nonpoint sources loads and the 10 percent reduction target used to derive the LA.

B. Phase IV Nonpoint Source Reductions

The TMDL identifies load allocations for out-of-basin nitrogen loads (i.e., tributary loads) that would be achieved through the implementation of Phase IV reduction targets. For nonpoint sources, the Phase IV targets include a 10 percent reduction in urban and agricultural loads throughout the Long Island Sound basin north of Connecticut, and an 18 percent reduction in atmospheric nitrogen loads. These reductions are based on the clear role that these nonpoint sources have on water quality in Long Island Sound.

Some public comments on the draft TMDL questioned whether states have the authority to assign allocations to sources in other states. In this case, EPA is not approving the out-of-basin nitrogen reductions as formal allocations but rather as reasonable assumptions on which the in-basin reductions are based. EPA believes that states have some flexibility to make assumptions about improvements in water quality beyond their jurisdictions. If they base a TMDL on such assumptions, states must clearly explain why the assumptions are reasonable. In this case, the states' estimated 10 percent reduction in urban and agricultural nonpoint source loads is reasonable for the same reasons that were identified for the 10 percent reduction to the in-basin urban and agricultural loads. These reasons are detailed in the Reasonable Assurances section of this review. The estimated 18 percent reduction in atmospheric nitrogen loads is reasonable because it was taken from EPA estimates of the effect of implementation of CAA controls and its enforceable requirements, similar to the in-basin reductions of atmospheric nitrogen loads. EPA believes that these estimates of future reductions make sense. Moreover, as discussed in the

Reasonable Assurance section below, EPA is committed to working with the three northern states to address nitrogen loads affecting Long Island Sound through their nonpoint source management programs.

C. Phase V Nonpoint Source Reductions

Additionally, the TMDL document identifies Phase V non-treatment alternatives which are necessary to achieve the water quality standard for DO. As described under the WLA section, point sources will be required to implement advanced treatment for nitrogen removal. However, even with advanced treatment and aggressive nonpoint source reduction plans, water quality standards may not be fully achieved during the summer in the bottom waters of the Long Island Sound. Therefore, the TMDL identifies non-treatment alternatives as actions to attain water quality standards. Some of these alternatives, such as artificial wetlands and seaweed farms, may function to further reduce nonpoint source loads. Others, such as oxygen injection discussed above, could add loading capacity. Use of non-treatment alternatives to achieve water quality standards is permitted under 40 CFR 125.3(f). The TMDL includes a schedule for evaluating and implementing the non-treatment alternatives (Section VII, Table 13). The evaluation of these alternatives is scheduled to begin in January 2001.

EPA concludes that the TMDL has identified load allocations for background and nonpoint sources of nitrogen. The allocations and assumptions for nonpoint sources are reasonable and can be achieved through an aggressive nonpoint source program. The TMDL provides for evaluation and reassessment of the control actions needed to achieve water quality standards.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

A. Phase III Point Source Reductions

The TMDL identifies the sum of the WLAs for each of the 11 management zones in Table 6 of the TMDL document. The draft TMDL document (October 1999) made available for public

comment did not provide the individual facility WLAs. The final TMDL now identifies the facility-specific WLAs for sources in the Connecticut and New York portions of the watershed in Appendix C. The WLAs are based on advanced treatment for nitrogen removal. The process for selecting the appropriate level of treatment for point sources is described in Section V.C.2.

The draft TMDL also characterized CSOs and stormwater outfalls as nonpoint sources and assigned load allocations to them. EPA commented that CSOs and certain stormwater discharges are point sources for which WLAs must be established. Under the TMDL regulations, wasteload allocations are required to be developed for point sources subject to the NPDES permit program. Discharges that are not subject to the NPDES permit program, such as certain stormwater discharges, are not clearly required to be assigned wasteload allocations. Consequently, a state may in its discretion assign either WLAs or LAs to such discharges.

The final TMDL addresses these issues in Section V.B.4. As discussed above, it is not currently feasible to separate point source stormwater discharges from nonpoint source runoff for an area of this geographic scope, where estimates are necessarily based on land use and runoff coefficients, and because of the lack of stormwater monitoring data. Therefore, EPA agrees that it is reasonable, in this case, to include stormwater in the nonpoint source loadings, and to assign load allocations rather than wasteload allocations. As noted in the TMDL, development of the NPDES Stormwater Phase II permitting program will provide opportunities to determine the load from stormwater sources and identify appropriate wasteload allocations.

The final TMDL categorizes New York City CSO loads as point sources. The final TMDL still does not specifically identify point source loads from CSOs in Connecticut. Rather, the aggregate loads from all Connecticut CSOs continue to be split between the point and nonpoint categories, as explained in the more detailed rationale in Section V.B.4. In essence, the stormwater related loads that would be discharged through the Connecticut CSO outfalls are included in the overall estimates of nonpoint source (stormwater) loads for each zone. The non-stormwater related pollutants (i.e. the sanitary waste normally treated at the POTWs) that would be discharged during CSO events are reflected in the loads presented for the various Connecticut POTW point sources. The reductions in the stormwater component of the CSO discharges that will result from nonpoint source controls in the CSO drainage area are reflected in the zone by zone load allocations of the TMDL. Connecticut has taken this approach because there are limited monitoring and modeling data for the Connecticut CSOs. In the absence of such data, the State is unable to meaningfully separate the CSO loads from the existing point and nonpoint source load estimates. EPA is approving the TMDL as being reasonable under the circumstances, given the lack of data and the difficulty in estimating what portion of the stormwater related loads would be discharged through the CSOs rather than through other stormwater pipes and via runoff. Significant to EPA's approval is the TMDL's recognition that this approach to CSOs is temporary. As described in Section V.B.4, the State is committed to developing municipal CSO control programs. These programs will provide opportunities to identify the actual CSO loads and appropriate wasteload allocations. As appropriate wasteload allocations are identified for CSOs, the TMDL must be revised to reflect these wasteload allocations.

The TMDL provides for the opportunity to implement trading programs (Section VI.A.1). EPA's April 6, 2000 letter commenting on the draft TMDL provided guidance to the States on revising TMDLs/WLAs/LAs through trading. The final TMDL document reflects EPA's policy on trading. With regard to revisions in WLAs, EPA would not require that a new TMDL be established to reflect the revised WLAs as long as the new allocations resulted in equal or greater water quality improvements, as defined by the use of the equivalency factors identified in the Table 7 of the TMDL. The equivalency factors comprise river delivery factors (the amount of nitrogen discharged to a river segment that makes it the mouth of the river) and Long Island Sound transport efficiencies (the relative impact of nitrogen discharged from a management zone on the hypoxic hotspots). EPA must be notified annually of any changes in the WLAs through reallocations or trading. The following conditions determine whether allocations could be revised without resubmitting the TMDL for review and approval:

- Within a management zone and tier, reallocations among facility-specific WLAs can be modified without resubmitting a revised TMDL.
- Among management zones and tiers, reallocations among facility-specific WLAs can be modified without resubmitting a revised TMDL as long as the new allocations resulted in equal or greater water quality improvements, as defined by the use of the exchange ratios identified in Table 6 of the TMDL document.
- Any reallocations of LAs among management zones or tiers, or reallocations between WLAs and LAs within and among management zones and tiers, must be reflected in a revised TMDL to ensure that there is a reasonable assurance that the modified LAs could be achieved.
- A revised WLA shall not be established if it causes localized adverse water quality impacts.

The final TMDL document also addresses EPA's comments regarding future growth. While the draft TMDL did not discuss future growth, TMDL Section VI.A.1 indicates that the Phase II reduction targets represent a cap on nitrogen discharges. Any increased loads due to population growth and development would need to be offset by additional load reductions, most likely through increased treatment. However, the TMDL also notes that only modest population growth is anticipated.

B. Phase IV Point Source Reductions

The TMDL identifies wasteload allocations for out-of-basin nitrogen loads (i.e., tributary loads) that would be achieved through the implementation of Phase IV reduction targets. Specifically, the Phase IV targets include a 25 percent reduction in point source nitrogen loads, based on the clear role that these sources have on water quality in Long Island Sound.

As discussed above, EPA is not approving the out-of-basin nitrogen reductions as formal allocations but rather as reasonable assumptions on which the in-basin reductions are based. In

this case, the states' estimated 25 percent reduction in nitrogen loads from point sources (primarily POTWs) is reasonable because this level of reduction has been demonstrated as feasible through Biological Nutrient Removal (BNR) retrofits of existing facilities. These low cost retrofits were implemented at numerous Connecticut POTWs during Phase II of the Long Island Sound nitrogen reduction program. The reductions achieved by these retrofits support the predicted 25 percent reduction by out-of-basin sources. EPA believes that these estimates of future reductions make sense. Moreover, as discussed in the Reasonable Assurance section below, EPA is prepared to use its authorities when issuing NPDES permits to dischargers in Massachusetts and New Hampshire, and in overseeing permit issuance in Vermont, to translate the nitrogen reductions into facility specific requirements in order to achieve the overall 25 percent reduction level. EPA has already begun to include nitrogen monitoring requirements in Massachusetts permits.

C. Phase V Point Source Reductions

One of the non-treatment alternatives discussed in Phase V is outfall relocation from the East River to the Atlantic Ocean. If implemented, this would result in revised wasteload allocations for the current East River outfalls and reductions in point source loadings to the Sound.

In summary, the TMDL establishes WLAs and LAs for nitrogen, the primary pollutant of concern. As previously described under Section 3.B of this document, nitrogen removal technologies will also result in a reduction in organic carbon, a pollutant which also depletes oxygen. Thus, although the TMDL does not include LAs and WLAs for organic carbon, organic carbon reductions are reflected in the predicted improvements that are expected to result in meeting the dissolved oxygen standard. In addition to WLAs and LAs for nitrogen (and the concomitant organic carbon reductions), the TMDL relies upon assumptions for improvement in water quality from out-of-basin sources, and on the implementation of one or more non-treatment alternatives in order to meet the water quality standards for dissolved oxygen.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

The TMDL document describes the margin of safety in Section VI. D. The TMDL utilizes an implicit MOS through the use of conservative assumptions, which include the use of the 1988-1989 worst case scenario as the base condition and safety factors in the calculation of aeration levels.

The base condition of 1988-89 represents the most severe hypoxia period observed from 1986 to 2000 by the ambient monitoring program. By establishing the loading capacity and load reductions necessary to attain water quality standards during conditions similar to this critical

period, the TMDL provides a margin of safety in meeting water quality standards during years with more typical water quality conditions.

Second, in the event that mixing/aeration is relied upon to increase loading capacity, an additional margin of safety exists with respect to the recommended levels of oxygen introduced into the Sound. The TMDL document indicates that safety factors were used in calculating the amount of aeration to bottom segments needed to meet the DO standard. The memo referenced in the TMDL identifies a preliminary estimate derived from work performed during the development of the Harbor Eutrophication Model of 8,000 lbs/day of oxygen within each of the predicted 125 model segments that do not attain DO standards at the TMDL's LC to disrupt stratification in the water column. The 10,000 lbs/day aeration per model segment used in the TMDL represents an additional 2,000 lbs/day of aeration to account for uncertainty and provide a margin of safety.

EPA concludes that the TMDL incorporates an adequate margin of safety.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)).

Seasonal variation is described in Section VI. E of the TMDL document. The LIS 3.0 model was calibrated over an 18-month period, thereby covering all seasons of the year. Seasonal variations attributed to dry- and wet-weather conditions were considered by the model. Hypoxia conditions in the Long Island Sound typically occur during the summer from June through September. As previously described, the TMDL uses the minimum hourly DO concentrations simulated by the model during the summer hypoxic conditions to assess the reductions necessary to meet water quality standards. This analysis therefore accounts for seasonal variations and critical conditions to ensure that water quality standards are achieved throughout the year.

8. Monitoring Plan for TMDLs Developed Under the Phased Approach

EPA's 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001), recommends a monitoring plan when a TMDL is developed under the phased approach. The guidance recommends that a TMDL developed under the phased approach also should provide assurances that nonpoint source controls will achieve expected load reductions. The phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. EPA's guidance provides that a TMDL developed under the phased approach should include a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards.

Section V.A of the TMDL provides details of ambient monitoring efforts, and illustrates the intensive monitoring efforts that continue in Long Island Sound. Data collected include temperature, salinity, DO, chlorophyll, nutrients and other chemical analyses, conductivity and

depth profiles. The ambient monitoring program provides substantial temporal and spatial coverage adequate to assess the response in water quality to nitrogen load reduction.

In addition to ambient water quality, substantial efforts are underway to monitor and model nutrient loads from point, nonpoint, and atmospheric deposition. TMDL Section VI.A.2 briefly describes the Connecticut and New York plans to monitor nonpoint sources. Connecticut plans to monitor nonpoint source implementation activities to ensure that nonpoint source management progress is meeting the TMDL requirements. New York will monitor the application of BMPs and use existing monitoring networks to ensure that the TMDL nonpoint source nitrogen reductions are achieved. The water quality model recently developed by the CTDEP using funds provided by EPA New England will provide a tool to assess the effect of best management practices and watershed restoration programs on nutrient loading. The cooperative watershed monitoring program conducted by USGS will provide continued trend data on tributary loads. In addition, EPA New England's work with USGS to develop the SPARROW model should provide additional benefits to estimating the effect of source controls on out-of-basin sources. Monitoring of point sources will be provided in the requirements of NPDES permits to help assess the efficiency of nitrogen removal efforts.

Based on existing and future monitoring efforts by LISS, CTDEP, NYCDEP, the Interstate Environmental Commission, citizen volunteer monitoring programs, and projected NPDES monitoring requirements, EPA concludes that adequate data will be collected to validate whether or not the load reductions required by the TMDL are achieved and whether they result in attainment of water quality standards in Long Island Sound.

9. Implementation Plans

On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA's approval of TMDLs.

Although an implementation plan is not a requirement for approving a TMDL, the TMDL identifies implementation actions and scheduling frameworks for each phase of the TMDL. Details for implementation are found in Section VII of the TMDL, including a "schedule of commitments" to attain water quality standards. Briefly, the commitments include 1) achieve Phase III nitrogen reduction target for in-basin sources, 2) establish and implement Phase IV actions for out-of-basin sources, 3) evaluate and implement Phase V non-treatment alternatives, as necessary, to attain water quality standards; and 4) refine management actions, as appropriate, based on new information. EPA recognizes, and supports the commitment for the implementation of each phase to ultimately achieve water quality standards (also see Section 3,

Loading Capacity). EPA will transmit more detailed comments on specific aspects of the implementation of each phase under separate cover.

10. Reasonable Assurances

EPA guidance calls for reasonable assurances when TMDLs are developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for EPA to determine that the load and wasteload allocations will achieve water quality standards.

In a water impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, States/Tribes are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State/Tribe implementation plans and "may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs."

The TMDL targets the largest share of nitrogen reductions to sewage treatment plants. Biological Nutrient Removal (BNR) projects implemented to date demonstrate that the overall level of nitrogen reduction allocated to sewage treatment plants can be attained. Reasonable assurance that nitrogen reductions from sewage treatment plants will occur is offered through the NPDES requirements for those treatment facilities identified in Appendix C of the TMDL. The NPDES permits issued to each of the treatment facilities are legally enforceable, thus offering reasonable assurance that controls will be implemented. There is also reasonable assurance that sources regulated under the NPDES Phase II Stormwater and Concentrated Animal Feeding Operation (CAFO) permitting programs will be addressed.

The load allocations are based upon achieving a 10 percent reduction in the total nonpoint source load from urban and agricultural land covers, which assumes the application of best management practices with an average nitrogen removal efficiency of 20 percent on 50 percent of the urban and agricultural land. It is reasonable to expect that this level of reduction can be attained through an aggressive nonpoint source control program that includes regulatory, nonregulatory, and incentive-based components. TMDL Section VI.A.2. describes how reasonable assurance is provided for meeting the in-basin load allocation. The primary basis for the reasonable assurance that the in-basin load allocation will be achieved is the inclusion of nitrogen reduction strategies in the states' Nonpoint Source Management Programs, developed under section 319 of the Clean Water Act, and their Coastal Nonpoint Pollution Control Programs, developed pursuant to section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990. Both states' Nonpoint Source Management Programs underwent substantial upgrades during 1999-2000, which were subsequently approved by EPA, and now include specific, quantifiable goals for reducing nitrogen and other pollutant loads from different nonpoint source categories (e.g., urban, agriculture, hydromodification) as well as detailed descriptions of how these goals will be achieved. For example, Connecticut's upgraded program calls for the implementation of nutrient management on 50 percent of the state's dairy operations by 2004, and on all of them by 2014. Cooperative efforts by the USDA Natural Resources Conservation Service and University of

Connecticut Cooperative Extension System already have resulted in nutrient management plans being implemented by 20 percent of the state's dairy farms and are expected to meet the 50 percent goal by 2004. The states' Coastal Nonpoint Pollution Control Programs, which were conditionally approved by EPA and NOAA in 1998, describe nonpoint source management programs targeting sources that affect their coastal waters. Final approval, which is largely dependent on the states confirming that they have the authorities necessary to require the implementation of best management practices for different categories of land use, is expected to be granted by late 2001. Both programs were developed and approved consistent with EPA guidance, and together describe best management practices, strategies, policies, programs, and enforceable mechanisms designed to address a wide range of nonpoint source problems. EPA records indicate that both states have invested significant resources in programs and projects aimed at reducing nonpoint sources of nitrogen, and that both states are committed to continuing to do so.

Section VI.B.2. states that the technical basis for the reasonable assurance that the out-of-basin load allocation will be achieved is the same as that for the in-basin load. It further states that EPA will work with Connecticut, New York, and the three other Connecticut River basin states (Massachusetts, New Hampshire, and Vermont) to coordinate the development and implementation of out-of-basin load reduction strategies. EPA supports this approach and is committed to working with the three northern states to address nitrogen loads affecting Long Island Sound through their nonpoint source management programs. Further, EPA is already participating with the affected states and New England Interstate Water Pollution Control Commission to conduct a nutrient monitoring program. The scoping and development of that project is underway and demonstrates our commitment to achieving nonpoint source reductions.

EPA finds that the level of reduction of atmospheric deposition of nitrogen used in the TMDL is reasonable since it is taken from EPA estimates on the effect of implementation of CAA controls and its enforceable requirements. TMDL Section VII.D provides details of the CAA and its contribution to the goals of nitrogen reduction for the Sound.

In addition to the pollution reductions described above, non-treatment alternatives are needed to fully attain water quality standards. Section V.C of the TMDL identifies the different alternatives available, provides perspective on the viability of each, and identifies the process and schedule for evaluating, demonstrating, and implementing a viable non-treatment alternative(s) to attain water quality standards. The TMDL uses one of the non-treatment alternatives, mixing/aeration, as an example of how water quality standards can be attained. The TMDL cites feasibility studies that suggest that certain "hotspot" areas of the Sound not attaining DO standards after the Phase III and Phase IV nitrogen and carbon load reductions are achieved could be aerated to attain DO standards. However, additional study is required before it can be determined with confidence which non-treatment alternatives are viable options and whether they would result in full attainment of water quality standards when implemented.

EPA concludes that the preliminary analysis described in the TMDL supports the view that non-treatment alternatives are technically feasible and, in the case of mixing/aeration, could result in the full attainment of water quality standards. Furthermore, the TMDL identifies clear

commitments by the States to assess, select, and implement the preferred alternative based on a consideration of environmental and economic factors. However, if additional assessment of non-treatment alternatives concludes that none is a viable option for attaining water quality standards, then the TMDL would need to be revised to identify additional pollutant reductions that would result in attainment of water quality standards. EPA recognizes that the TMDL is based on the phased implementation of controls and reassessment of management goals throughout the implementation plan. A key component of the TMDL is its reassessment (Table 14 of the TMDL document) using enhanced water quality models and monitoring data to assess improvements in DO as a result of control actions, adoption and revision of DO criteria based on EPA's salt water DO criteria (by 2003), and the assessment of non-treatment alternatives. The TMDL will be revised, as necessary, by 2004 and will provide more detailed implementation plans and schedules for Phase IV and V, including the selection and implementation of a non-treatment control technology. The selection of the Phase V non-treatment alternative will be based upon the improvements in ambient DO levels resulting from control actions that have been implemented, the impact of adopting the EPA salt water DO criteria, improved model analyses, and the results of the analyses of the non-treatment alternatives themselves (including issues of feasibility and potential adverse environmental consequences).

11. Public Participation

EPA policy is that there must be full and meaningful public participation in the TMDL development process. Each State/Tribe must, therefore, provide for public participation consistent with its own continuing planning process and public participation requirements (40 C.F.R. § 130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval must describe the State/Tribe's public participation process, including a summary of significant comments and the State/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. § 130.7(d)(2)).

Inadequate public participation could be a basis for disapproving a TMDL; however, where EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

A. Phase III Actions for Hypoxia Management

The states, in cooperation with the Long Island Sound Study (LISS), utilized a variety of outreach mechanisms to solicit public input during the development of the *Phase III Actions for Hypoxia Management*, which established the "in-basin" nitrogen reduction target 58.5 percent and subsequently became the central component of the TMDL. In addition to mailing more than 4,000 copies of the Phase III plan to municipalities, environmental organizations, and interested citizens, the Long Island Sound Study conducted a series of 12 public meetings in September 1997 to present and answer questions about the plan. A total of 125 people attended the six New York meetings, and 91 attended the six Connecticut meetings. The states also conducted several targeted meetings for municipal representatives; in Connecticut, more than 50 municipalities sent representatives to the meetings and heard presentations by CTDEP and EPA staff on the Phase III strategy and implications for their communities. Although the LISS did not conduct a formal public comment period, it did receive some written comments which were considered by the states during development of the TMDL.

B. Draft TMDL

In November 1999, CTDEP and NYSDEC mailed the draft TMDL to municipalities, environmental organizations, and interested citizens and established a 45-day public comment period (through January 9, 2000). The comment period was subsequently extended to January 28 by CTDEP and February 9 by NYSDEC in response to several requests for more time. In December 1999, the states conducted a series of public meetings to present the draft TMDL and answer questions about the plan. In Connecticut, afternoon and evening sessions were held at three locations for a total of six meetings. In addition, fact sheets with background information on the TMDL were made available at the meetings and mailed to municipal officials, sewage treatment plant operators, regional planning organizations, and state and federal legislators. CTDEP also posted the TMDL, fact sheets, and public meeting schedule on its website. As a result of these efforts, NYSDEC received 13 comment letters and CTDEP received 20, for a total of 33 comment letters. EPA also submitted comments to the states outside the formal public comment period.

In response to these comments, the states included in the final TMDL the individual WLAs, shifted the New York City CSO loads from the nonpoint to the point source category, enhanced the rationale for splitting the Connecticut CSO load between the point and nonpoint source categories, and provided more detailed descriptions of attenuation factors, the potential benefits of a nitrogen credit trading program, and the Phase IV actions (reductions in out-of-basin tributary and atmospheric deposition loads). They also wrote responses to individual comments received during the public comment period and from EPA which are provided as part of the TMDL submittal package.

C. Connecticut WLAs

Connecticut also conducted a separate public participation process to support development of the WLAs for Connecticut point sources. CTDEP conducted six public meetings that were attended by 120 people, and received 24 comment letters. The approximately 105 individual comments were organized into 15 general categories, responses to which are also provided as an addendum to the TMDL submittal package.

In response to these comments, CTDEP did alter the WLA for the Newtown sewage treatment facility because the 1997-99 average flows used to establish the baseline did not accurately reflect the fact that it was a new facility that was still expanding its service area during that time period.

In summary, Connecticut and New York have conducted an extensive public participation process and taken all comments into consideration either through revisions to the TMDL document or through their respective "response to public comments" and "response to EPA comments" documents.

D. Comments submitted to EPA

In addition to the comments on the TMDL submitted to the states, EPA received a January 17, 2001 letter from Nixon Peabody LLP on behalf of the Sound Nitrogen Management Coalition, a group of small municipal wastewater agencies on the north shore of Long Island. The letter questions the application of equivalency factors, which were presented in TMDL Section VI.A.1, to the north shore embayments. The letter states that the equivalency factors that would govern any reallocation of allocations among different geographic areas were developed based on the assumption that nitrogen discharged into the head of the embayments is delivered into the open waters of the Sound without attenuation (by assuming that nothing happens to the nitrogen as it travels through the bay and, as a result, “incorrectly penalize the dischargers to the embayments on the north shore of Long Island.”

There are three points in particular that EPA believes are relevant to this issue. First, the water quality model from which the equivalency factors were developed does not assume that nitrogen discharged into the head of the embayments is delivered into the open waters of the Sound without attenuation. The LIS 3.0 model includes segments within the embayments. Nitrogen entering a segment representing an embayment is subject to the modeled physical, chemical, and biological processes. These processes include uptake by phytoplankton, burial of organic matter in sediment, and denitrification. These processes alter the forms of nitrogen and the amount of nitrogen exchanged with adjacent model segments. As a result, EPA believes that the LIS 3.0 model accurately and adequately represents the effect of nitrogen discharges from different geographic areas on oxygen levels in the Sound. Second, the equivalency factors represent the impact of the cumulative discharge of nitrogen from a management zone relative to other management zones; the impact of individual dischargers within a management zone was not calculated and would vary from the average assigned to the zone.

Finally, the TMDL highlights a number of areas where additional work is warranted to reduce uncertainties in the analysis. Any embayment-specific modeling or studies that would refine the equivalency factors should be incorporated into the next TMDL analysis.

12. Submittal Letter

A submittal letter should be included with the TMDL analytical document, and should specify whether the TMDL is being submitted for a technical review or is a final submittal. Each final TMDL submitted to EPA must be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final submittal, should contain such information as the name and location of the waterbody, the pollutant(s) of concern, and the priority ranking of the waterbody.

CTDEP signed its complete TMDL on December 28, 2000 (received by EPA on January 8, 2001). NYSDEC submitted the TMDL to EPA on January 8, 2001 and the public responsiveness document on February 1, 2001.

References

1. State of Connecticut, Department of Environmental Protection. 1996. Water Quality Standards. CTDEP, Hartford, CT.
2. Clean Coastal Waters: Understanding and Correcting Nutrient Pollution. National Research Council. 2000.
3. Water Quality Modeling Analysis of Hypoxia in Long Island Sound using LIS 3.0. Prepared for the Management Committee of the Long Island Sound Study and the New England Interstate Water Pollution Control Commission. HydroQual. 1996.
4. November 4, 1994 letter from Jay Taft, Chair, LISS Model Evaluation Group to Mark Tedesco, EPA Long Island Sound Office.

Strategy for Restoring Habitats in Long Island

1. Problem Definition

Loss of habitat in Long Island Sound and its watershed has negatively impacted the Sound's living resources. In addition, loss of natural areas contributes to nitrogen loading to the Sound through loss of assimilative capacity. The habitats which remain have been degraded by hydro- modifications like impoundments and ditches, input of pollutants, and invasive species like common reed (*Phragmites australis*). This degradation limits the carrying capacity of the Sound for fish and wildlife resources.

2. Specific Problem Causes

Habitats have been lost through resource harvesting, increased runoff, and alteration for development. These activities around the Sound have resulted in measurable loss of habitat.

- 70% loss of forested cover in Connecticut since the 1700's
- 30% total loss of tidal wetlands Sound-wide
- Complete disappearance of eelgrass from central and western bays

In addition, there has been reduction in the quality of remaining habitats due to alteration of hydrology, invasive plant species, and input of pollutants.

3. Progress to Date

- Formation of an interagency restoration partnership to assist in the development and review of work products and participate in the implementation of restoration projects. Partners include:

U.S. Army Corps of Engineers	NYS Department of State
U.S. Fish and Wildlife Service	NY City Department of Environmental Protection
U.S. Environmental Protection Agency	NY City Department of Parks and Recreation
NOAA National Marine Fisheries Service	New York Sea Grant
Connecticut Department of Environmental Protection	Long Island Sound Study Citizens Advisory Committee
NYS Department of Environmental Conservation	Save the Sound, Inc.

- Identification of 12 priority habitat types

Tidal Wetlands	Riverine Migratory Corridors
Freshwater Wetlands	Intertidal Flats
Coastal Grasslands	Cliffs and Bluffs
Beaches and Dunes	Shellfish Reefs
Coastal and Island Forests	Estuarine Embayments
Submerged Aquatic Vegetation	Rocky Intertidal Zones

- 450 nominations resulting in over 400 potential restoration sites (see ATTACHMENT 1)
- Compilation of a Habitat Restoration Geographic Information System
- Identification of potential funding sources for restoration (see ATTACHMENT 2)
- Held 9 public information meetings regarding the habitat strategy and incorporated public comments

- 50% completion of a habitat restoration manual for use by partner agencies, not-for-profit groups, and municipalities in implementation of the Habitat Restoration Initiative.
- Formulation of site ranking criteria and ranking of sites received prior to public meetings (see ATTACHMENTS 1&3)

4. **Recommended actions:**

A. ***Pursue habitat restoration by continuing the active partnership described above.***

Specifically, the above named entities will aggressively seek funding and implementation of the high priority sites. Use of this partnership will leverage limited federal, state and local funds and make the best use of existing expertise in habitat restoration. The above named entities will seek to formalize roles and responsibilities in the Habitat Restoration Initiative through adoption of a Memorandum of Agreement which will help ensure the status of habitat restoration as a high priority throughout budget cycles and staffing/administration changes.

B. ***Pursue the following goals:***

- Restore the ecological functions of degraded and lost habitats
- Restore at least 2000 acres and 100 river miles of habitat within the first ten years of the initiative.
- As more funding becomes available, pursue restoration beyond the 10 year goal.

C. ***Through the Memorandum of Agreement, the partnership entities will commit to the following:***

- Begin restoration projects as soon as possible
- Secure stakeholder and landowner support
- Adopt the above goals as internal policy
- Pursue appropriate funding sources and partnership opportunities for high priority sites
- Identify further research needs
- Provide for monitoring of restored sites
- Maintain restored sites as necessary
- Review the strategy every five to ten years and revise as necessary

5. **Implementation**

The key to effective implementation is to continue funding two staff positions, one in each state, to oversee the implementation strategy. This will allow each state to have a dedicated staff person to pursue funding and planning dollars for the proposed projects. The habitat restoration manual, one of the key products, will be completed by the existing staff positions by September of 1998. The staff persons will foster habitat restoration efforts at the municipal level; assist in planning commissions like those in Oyster Bay and the Norwalk River; as well as coordinate the restoration efforts at the state and federal level, including applying for and administering grants and state funds. In addition, the CTDEP staff person will be responsible for designing some habitat restoration projects, particularly the tidal wetland restoration sites to be implemented by the CTDEP.

Site Name or Location	Habitat Type	State	Town
Branford Harbor	TW	CT	Branford
Branford River	TW	CT	Branford
Branford River tributary marsh	TW	CT	Branford
Farm River	TW	CT	Branford
Farm River tributary marsh	TW	CT	Branford
Flying Point/Prospect Hill Rd.	TW	CT	Branford
Lindsey Cove	TW	CT	Branford
Pages Cove north(Short Beach)	TW	CT	Branford
Pages Cove(Killan's Point)	TW	CT	Branford
Pine Orchard golf course	TW	CT	Branford
Sybil Creek	TW	CT	Branford
Three Elms Rd.	TW	CT	Branford
Tilcon Dock	TW	CT	Branford
Ward's Millpond/Branford River W.M RMC/FW		CT	Branford
between Pleasant Point and Juniper	TW	CT	Branford
lower Branford River	TW	CT	Branford
Black Rock Harbor	TW	CT	Bridgeport
Grover Hill	TW	CT	Bridgeport
Pleasure Beach	BD	CT	Bridgeport
Pequonnock River	RMC	CT	Bridgeport
Yellow Mill Channel to Stillman Pond	RMC	CT	Bridgeport
Carini Preserve	FW/TW	CT	Chester
Champman's Pond Dam	RMC	CT	Clinton
Clinton Harbor	SAV	CT	Clinton
Clinton Harbor	SR	CT	Clinton
Clinton Harbor	TW	CT	Clinton
Hammonasset River tributary	TW	CT	Clinton
Indian River	TW	CT	Clinton
Indian River south of rr track	TW	CT	Clinton
Hammock River	TW	CT	Cltn/Wstbrk
Gorhams Pond	EE	CT	Darien
North Scott Cove-Arrowhead Way	TW	CT	Darien
Chapman Pond	TW	CT	E. Haddam
Caroline Creek btwn Minor and Stan	TW	CT	East Haven
Morris Creek, Sibley Lane	TW	CT	East Haven
Brides Brook Culvert	RMC	CT	East Lyme
Crescent Park and Indian Pond	TW	CT	East Lyme
National Guard camp	TW	CT	East Lyme
Old Black Point Spit	BD/F	CT	East Lyme
Upper Pattagansett River	TW	CT	East Lyme
Niantic River	SAV	CT	East Lyme/Wtfd
Scantic River	RMC	CT	East Windsr/Enfield
Great Meadows	TW	CT	Essex
Thatchbed Island	TW	CT	Essex
Horse Tavern Creek	TW	CT	Fairfield
Mill River - Samp Mortar Lake Dam	RMC	CT	Fairfield
Mill River - Tide Mill Dam	RMC	CT	Fairfield

Penfield Reef	OR	CT	Fairfield
Perrus Millpond	TW	CT	Fairfield
Pine Creek East	TW	CT	Fairfield
Sasco Brook	TW	CT	Fairfield
Sasco Hill Beach	SAV	CT	Fairfield
South Benson Marina	TW	CT	Fairfield
South Pine Creek	TW	CT	Fairfield
Veterans Park @ Fairfield Beach Rd	TW	CT	Fairfield
W of marina/mouth of Ash Creek	TW	CT	Fairfield
between Penfield and Beach Roads	FW	CT	Fairfield
Ash Creek, near Mount Grove Ceme	TW	CT	Fairfield/Bridgeport
Byram Harbor	SR	CT	Greenwich
Greenwich Cove Dr.	TW	CT	Greenwich
Greenwich Point Park	TW	CT	Greenwich
Indian Field Road/Bruce Park	TW	CT	Greenwich
Birch Plain Creek	TW	CT	Groton
Bluff Point	F	CT	Groton
Bluff Point Coastal Reserve	TW	CT	Groton
Bluff/Bushy Point Beach	BD	CT	Groton
Mumford Cove	BD	CT	Groton
Spencer Point	TW	CT	Groton
Willow Point	TW	CT	Groton
Beach and Pleasant View Aves.	TW	CT	Guilford
Faulkner's Island	CB	CT	Guilford
Grass Island	TW	CT	Guilford
Guilford Point, mouth of East River	TW	CT	Guilford
Leetes Island	TW	CT	Guilford
Lost Lake	TW	CT	Guilford
Old Quarry Rd./Hoadley Neck	TW	CT	Guilford
Sluice Creek	TW	CT	Guilford
Vineyard Haven	TW	CT	Guilford
West River	RMC	CT	Guilford
upper West River	TW	CT	Guilford
Higganum Creek	RMC	CT	Haddam
Salmon River	RMC	CT	Hdm/EHdm
Hamburg Cove	SAV	CT	Lyme
Nott Island	TW	CT	Lyme
east of Nott Island	TW	CT	Lyme/Old Lyme
East River	TW	CT	Madison
Fence Creek	TW	CT	Madison
Fence Creek Coastal Barrier	TW/BD	CT	Madison
Hammonasset River	TW	CT	Madison
Hammonasset S.P.	TW	CT	Madison
Windy Brook Lane	TW	CT	Madison
Windy Brook Lane/east of golf cours	TW	CT	Madison
golf course/ Surf Club Road	TW	CT	Madison
Starr Millpond-Coginchaug River	RMC	CT	Middletown
Bayview area, Welches Point Rd.	TW	CT	Milford
Beaver Brook	TW/FW	CT	Milford

Calf Pen Meadow School	TW	CT	Milford
Calf Pen River and East Ave.	TW	CT	Milford
Charles Island	F	CT	Milford
Fowler Island	TW	CT	Milford
Great Creek Marsh	TW	CT	Milford
Great Flat	TW	CT	Milford
Hilldale Road area	TW	CT	Milford
Howard Ct./Morehouse Ave.	TW	CT	Milford
Indian River marsh between I-95 and	TW	CT	Milford
Milford Point	BD	CT	Milford
Reef Rd, Milford Harbor Tributary	TW	CT	Milford
Seabreeze Ave. and Millard Dr.	TW	CT	Milford
Wheeler Marsh	TW	CT	Milford
east of Great Flat	TW	CT	Milford
west of Beard Sand and Gravel	TW	CT	Milford
west side of Gulf Pond	TW	CT	Milford
Oyster River, Paul Braun Ct.	TW	CT	Milford/WH
Quinnipiac River Marsh	TW	CT	NH/Hamdn
New Haven airport	TW	CT	NH/NoH NH/EH
Quinnipiac River Marsh	TW	CT	NH/NoH/Hm
New Canaan Nature Center	FW	CT	New Canaan
Hemingway Creek	TW	CT	New Haven
Mill River, north of I-91	RMC/FW	CT	New Haven
Morris Creek	TW	CT	New Haven
Nathan Hale Park	CB	CT	New Haven
New Haven Harbor	IF	CT	New Haven
Quinnipiac River Marsh	TW	CT	New Haven
east bank of Mill River, south of rr tra	TW	CT	New Haven
west bank of Mill River	RMC/FW	CT	New Haven
Mitchell College	BD	CT	New London
Quinnipiac River	TW	CT	North Haven
Chimon Island	F	CT	Norwalk
Flock Process Dam	RMC	CT	Norwalk
Harborview	TW	CT	Norwalk
Indian River	RMC	CT	Norwalk
NE Wilson Cove	TW	CT	Norwalk
Norwalk Harbor	TW	CT	Norwalk
Norwalk River-Perry Ave. flood gate	RMC	CT	Norwalk
Sheffield Island	RI	CT	Norwalk
Sheffield/Plains/Shea Island Comple	F	CT	Norwalk
Upper Norwalk Harbor	RMC	CT	Norwalk
Village Creek	RMC/EE	CT	Norwalk
Trading Cove	EE	CT	Norwch/Montville
Big Pond	TW	CT	Old Lyme
Black Hall River	TW/Other (scalops)	CT	Old Lyme
Calves Island	TW	CT	Old Lyme
Connecticut River	RMC	CT	Old Lyme
Duck River	TW	CT	Old Lyme
Goose Island	TW	CT	Old Lyme

Great Island	TW	CT	Old Lyme
Griswold Point	BD	CT	Old Lyme
Lieutenant River	TW	CT	Old Lyme
Pond Road/Soundview	TW	CT	Old Lyme
Saltworks Point	TW	CT	Old Lyme
Upper Mill Dam	RMC	CT	Old Lyme
White Sands Beach, east	TW	CT	Old Lyme
White Sands Beach, west	TW	CT	Old Lyme
north section of Great Island area	TW	CT	Old Lyme
west of Hawks Nest Beach, end Brig	TW	CT	Old Lyme
Beamon Creek	TW	CT	Old Saybrook
Cold Spring Brook (Chalker Beach)	TW	CT	Old Saybrook
Ferry Rd./CT River	TW	CT	Old Saybrook
Ferry Rd./north of I-95(Ragged Rock	TW	CT	Old Saybrook
Hagar Creek	TW	CT	Old Saybrook
Knollwood, east	TW	CT	Old Saybrook
Lynde Point	BD	CT	Old Saybrook
North Cove	TW	CT	Old Saybrook
Old Saybrook Pt.	TW	CT	Old Saybrook
Otter Cove	TW	CT	Old Saybrook
Ragged Rock	TW	CT	Old Saybrook
Ragged Rock Creek	TW	CT	Old Saybrook
Saybrook Pt.	TW	CT	Old Saybrook
South Cove	EE	CT	Old Saybrook
South Cove, north section	TW	CT	Old Saybrook
Poquetanuck Cove	F/G	CT	Preston
wetland north of Route 2A bridge	TW	CT	Preston
Poquetanuck Cove	EE	CT	Preston/Ledyrd
Derby Dam on Housatonic	RMC	CT	Shltn/Derby
Beard dredge sites	RMC	CT	Shltn/Mlfd/Ornge/Drby
Holly Pond	RMC	CT	Stamford
Noroton River at I-95	RMC	CT	Stamford
Stamford Marine Center (Magee Ave	TW	CT	Stamford
Quiambog Cove	TW	CT	Stonington
Ram Island	F	CT	Stonington
Stony Brook south of Flanders Point	TW	CT	Stonington
Wamphassuc Neck-Lords Point	TW	CT	Stonington
west of Edwards Point	TW	CT	Stonington
Bridgeport Airport	TW	CT	Stratford
Carting, Peacock, Long and Pope Isl	TW	CT	Stratford
Farmill River	TW	CT	Stratford
Ferry Creek	TW	CT	Stratford
Fourth Ave. Pond	TW	CT	Stratford
Great Meadows, west - N of Lordshi	TW	CT	Stratford
Long Beach	BD	CT	Stratford
Peck's Millpond	FW	CT	Stratford
Russian/Lordship beach	BD	CT	Stratford
Sikorsky marsh and south of Rte. 15	TW	CT	Stratford
north of Frash Pond and baseball fie	TW	CT	Stratford

Wallace Dam/Community Lake/Quinn	RMC	CT	Wallingford
Wharton Brook S.P.	F/G	CT	Wallingford
Alewife Cove	EE/SAV	CT	Waterford
Goshen Cove	EE	CT	Waterford
Millstone Point, west side	FW	CT	Waterford
White Point	TW	CT	Waterford
east of Niantic River spit	TW	CT	Waterford
eastern tip of Harkness Memorial S.	TW	CT	Waterford
north of Quaker Hill	TW	CT	Waterford
west of Jordan Cove and residential	TW	CT	Waterford
Cove River	TW	CT	West Haven
Old Field Creek	TW	CT	West Haven
Oyster River, north of New Haven Av	TW	CT	West Haven
W.H. STP	TW	CT	West Haven
West River	TW/RMC	CT	West Haven
west bank of lower West River	TW	CT	West Haven
Menunketesuck River	TW	CT	Westbrook
Menunketsuck Island	BD	CT	Westbrook
Middle Beach	TW	CT	Westbrook
Patchogue River	TW	CT	Westbrook
Patchogue River	TW	CT	Westbrook
Quotonset Beach	TW	CT	Westbrook
Westbrook town beach	BD	CT	Westbrook
Cockenoe Island	F	CT	Westport
N Sherwood Millpond	TW	CT	Westport
North of Sherwood Millpond and I-95	TW	CT	Westport
Sasco Brook Dam	RMC	CT	Westport
Saugatuck River N of Route 1	TW	CT	Westport
Sherwood Island State Park/New Cr	TW	CT	Westport
Sherwood Millpond	EE	CT	Westport
W Sherwood Millpond	TW	CT	Westport
W Sherwood Millpond	TW	CT	Westport
Bronx Oyster Reefs	SR	NY	Bronx
Bronx River Trailway	TW/FW/F/RMC	NY	Bronx
Bronx River mouth	TW/F/RMC	NY	Bronx
City Island Marsh	TW	NY	Bronx
Eastchester Bay	TW	NY	Bronx
Ferry Point Park	G/BD	NY	Bronx
Ferry Point Park Shoreline	TW	NY	Bronx
Hutchinson River - DOT property	TW	NY	Bronx
Oak Point Freightyards	TW/IF/Other	NY	Bronx
Palmer Inlet	TW	NY	Bronx
Pelham Bay Park Lagoon	TW/F	NY	Bronx
Pugsley Creek	TW	NY	Bronx
Rice Stadium Wetlands	TW/G/F	NY	Bronx
Seton Falls Park	FW/F/CB	NY	Bronx
Soundview Park	TW	NY	Bronx
Turtle Cove	TW	NY	Bronx

Westchester Creek	TW	NY	Bronx
Weir Creek	TW	NY	Bronx
Aunt Amy's Creek	FW/TW	NY	Brookhaven
Cedar Beach	BD	NY	Brookhaven
Cedar Beach boat ramp - east side	BD/TW/IF	NY	Brookhaven
Former Old Man's Boatyard site	TW	NY	Brookhaven
Hagerman Landing Road Groin	BD/CB/IF	NY	Brookhaven
McAllister County Park	FW/BD/FW/IF	NY	Brookhaven
Mount Sinai Harbor	TW/EE/IF	NY	Brookhaven
North Shore Horse Showgrounds	TW/IF	NY	Brookhaven
Pipe Stave Hollow - Chandler Estate	TW/FW/CB/F/IF	NY	Brookhaven
Port Jefferson Village Beaches	BD	NY	Brookhaven
Satterly Landing	TW	NY	Brookhaven
Setauket Mill Pond	FW/F/IF/TW	NY	Brookhaven
Setauket Silt Retention Basin	FW/TW/IF	NY	Brookhaven
Shoreham Plant Wetlands	TW/BD	NY	Brookhaven
Stony Brook Creek & Pond	TW/FW	NY	Brookhaven
Unnamed Creek & Pond	FW	NY	Brookhaven
Wading River	TW/F/FW/BD/IF	NY	Brookhaven
Wading River Wetland #W9	FW	NY	Brookhaven
West Meadow Beach	BD	NY	Brookhaven
West Meadow Creek	TW/IF/EE	NY	Brookhaven
Shoreham Point	TW	NY	Brookhaven/Riverhead
Wading River	TW/RMC/F/FW	NY	Brookhaven/Riverhead
Wading River Wetland #W7	FW	NY	Brookhaven/Riverhead
Betty Allen Nature Park	FW/TW	NY	Huntington
Cold Spring Harbor	TW/BD/F/CB/IF	NY	Huntington
Crab Meadow	TW/FW/BD/IF	NY	Huntington
Hecksher Park Pond	FW	NY	Huntington
Lloyd Harbor Wetland #L10	FW	NY	Huntington
Lloyd Harbor Wetland #L17	FW	NY	Huntington
Twin Ponds Park	TW/FW	NY	Huntington
Huntington - Northport Harbor Comp	SR	NY	Huntington
Huntington - Northport Harbor Comp	SAV	NY	Huntington
Cold Spring Ponds (wetland #H-1)	FW	NY	Huntington
Harbor Island Park	TW	NY	Mamaroneck
Hommock Marsh	TW	NY	Mamaroneck
Glover Field	FW	NY	Mount Vernon
Echo Bay	TW/SR/IF/RI	NY	New Rochelle
Former Dickerman's Pond	FW	NY	New Rochelle
Nature Study Woods	F/FW	NY	New Rochelle
Pryer Manor Marsh	TW	NY	New Rochelle
Baxter Estates Pond	FW	NY	North Hempstead
Colonial Parkway, Manhasset Bay	TW	NY	North Hempstead
Hempstead Harbor Shoreline	TW/F/IF	NY	North Hempstead
Lake Success	FW	NY	North Hempstead
Leed's Pond	FW	NY	North Hempstead
Lower Silver Pond	FW	NY	North Hempstead
Manhasset Bay	CB/IF/TW	NY	North Hempstead

Manhasset Bay (east side)	EE/TW/IF	NY	North Hempstead
Mill Pond	FW	NY	North Hempstead
Mitchell Creek	TW/FW	NY	North Hempstead
Mott's Cove	TW	NY	North Hempstead
Prospect Point to Sands Point Preserve	BD/CB	NY	North Hempstead
Roslyn Pond Park	FW	NY	North Hempstead
Sands Point Preserve	BD/CB/TW	NY	North Hempstead
Sea Cliff Gravel Pit Wetlands	FW	NY	North Hempstead
Sea Cliff Wetlands #SC-2/SC-3	FW	NY	North Hempstead
Sheets Creek	TW	NY	North Hempstead
Sheets Creek Preserve	TW	NY	North Hempstead
Whitney Pond Park	FW	NY	North Hempstead
Hempstead Harbor	EE/IF/TW	NY	North Hempstead / Oyster Bay
Bayville Wetland #B-7	TW/FW	NY	Oyster Bay
Beaver Brook/Shu Swamp	RMC	NY	Oyster Bay
Beaver Lake	FW/RMC	NY	Oyster Bay
Beekman Beach	BD/TW/IF/SAV	NY	Oyster Bay
Centre Island Beach	BD/TW	NY	Oyster Bay
Cold Spring Harbor	TW/F/BD/IF/SAV	NY	Oyster Bay
Cold Spring Harbor - Huntington Wetland	TW/IF/FW	NY	Oyster Bay
Glen Cove Creek	TW	NY	Oyster Bay
Goose Point Marsh	TW/IF	NY	Oyster Bay
Hicksville Mill Pond	FW	NY	Oyster Bay
Huntington Wetland #H-7	FW	NY	Oyster Bay
Huntington Wetlands #H2-H6	FW	NY	Oyster Bay
Mill Pond	FW/CF	NY	Oyster Bay
Oyster Bay Mill Pond	FW	NY	Oyster Bay
Oyster Bay NWR	TW	NY	Oyster Bay
Red Spring Point Bluffs	CB	NY	Oyster Bay
Scudders Pond	FW	NY	Oyster Bay
Stehli Beach / Frost Creek Wetlands	TW/BD/IF	NY	Oyster Bay
West Pond	TW	NY	Oyster Bay
West Shore Road Wetlands	TW/IF/Other	NY	Oyster Bay
Huntington Wetland #H7	FW	NY	Oyster Bay
Glover Field	TW	NY	Pelham
Alley Pond Park	FW/TW	NY	Queens
Aurora Pond	FW/F	NY	Queens
Bowery Bay	TW	NY	Queens
Bowne Park Lake	?	NY	Queens
College Point Creek	TW	NY	Queens
College Point tidal connection	TW	NY	Queens
Flushing Airport	FW/G/F	NY	Queens
Flushing Bay Timber Structures	other (fisheries habitat)	NY	Queens
Flushing Bay/Flushing Creek	TW	NY	Queens
Flushing Meadow-Corona Park- Willis	TW/FW/CB	NY	Queens
Forest Park Shrub Swamp	FW	NY	Queens
Fort Totten	TW/FW/CB/IF	NY	Queens
Francis Lewis Park	?	NY	Queens
Hallets Cove	TW	NY	Queens

Kissena Park	G	NY	Queens
Kissena Park Lake	?	NY	Queens
Little Bay	EE/TW	NY	Queens
Little Bay Park	?	NY	Queens
McNeil Park	?	NY	Queens
Powell's Cove Park	?	NY	Queens
Powell's Cove Shoreline	TW/BD	NY	Queens
Steinway Creek Enhancement	TW	NY	Queens
Tallman Island	TW	NY	Queens
The Alley@Alley Pond Park	FW/F/TW/CB/IF	NY	Queens
Tropicana Property	TW	NY	Queens
Udall's Cove Ravine	F/FW/CB	NY	Queens
Western College Point creeks	TW	NY	Queens
World's Fair Marina	?	NY	Queens
Mattituck Wetland #MT-1	FW	NY	Riverhead
Blind Brook	FW	NY	Rye
Edith G. Read Wildlife Sanctuary	TW/F/EE/FW	NY	Rye
Marshlands Conservancy	TW/F/IF	NY	Rye
Beaver Swamp Brook	FW	NY	Rye
Beaver Swamp Brook - Cowperwood	FW	NY	Rye
Harrison Pond Town Park	FW/RMC/TW/F	NY	Smithtown
Sweetbriar Nature Center	G/TW/FW	NY	Smithtown
Callahan's Beach	CB	NY	Smithtown
Landing Avenue Town Park	TW	NY	Smithtown
Long Beach and Schubert Beach	BD	NY	Smithtown
Nissequogue River - Riviera Dr., Kin	TW/FW/RMC	NY	Smithtown
Nissequogue River - Village of Nisse	TW/FW/RMC	NY	Smithtown
Old Dock Bluff Town Park	CB	NY	Smithtown
St. James Wetland #SJ16	FW	NY	Smithtown
Stony Brook Harbor	TW/IF	NY	Smithtown/Brookhaven
Stony Brook Harbor (southern end)	TW	NY	Smithtown
Sunken Meadow Creek	TW/BD/IF	NY	Smithtown
Young's Island	TW/IF	NY	Smithtown
Bailie's Beach Park	BD/TW	NY	Southold
Clark's Beach/Inlet Pond	BD/CB	NY	Southold
Darby Cove	TW	NY	Southold
Goldsmith Inlet Beach	BD/TW/F/IF	NY	Southold
Great Pond	FW	NY	Southold
Greenport Wetland #GP11	FW	NY	Southold
Hay Harbor	TW/BD/CB/RI/SAV	NY	Southold
Lilly Pond	FW	NY	Southold
Mattituck Creek	TW/IF	NY	Southold
Mattituck Hills Wetlands #MH1&MH2	FW	NY	Southold
Mattituck Wetland #MT20	FW	NY	Southold
Orient Point Park	G/F/CB/RI	NY	Southold
Orient Wetland #O1	FW	NY	Southold
Orient Wetland #O14	FW	NY	Southold
Peconic Dunes Wetland Complex	FW	NY	Southold
Southold Wetland #SO28	FW/F	NY	Southold

Southold Wetland #SO30	FW/F	NY	Southold
Wolf Pit Lake	FW	NY	Southold
Bronx River Trailway	TW/FW/F/RMC	NY	Bronx
Bronx River mouth	TW/F/RMC	NY	Bronx
Ferry Point Park	G/BD	NY	Bronx
Ferry Point Park Shoreline	TW	NY	Bronx
Hutchinson River - DOT property	TW	NY	Bronx
Pelham Bay Park Lagoon	TW/F	NY	Bronx
Rice Stadium Wetlands	TW/G/F	NY	Bronx
Seton Falls Park	FW/F/CB	NY	Bronx
Soundview Park	TW	NY	Bronx
Turtle Cove	TW	NY	Bronx
Westchester Creek	TW	NY	Bronx
Mount Sinai Harbor	TW/EE/IF	NY	Brookhaven
West Meadow Beach	BD	NY	Brookhaven
West Meadow Creek	TW/IF/EE	NY	Brookhaven
Betty Allen Nature Park	FW/TW	NY	Huntington
Cold Spring Harbor	TW/BD/F/CB/IF	NY	Huntington
Twin Ponds Park	TW/FW	NY	Huntington
Cold Spring Ponds (wetland #H-1)	FW	NY	Huntington
Nature Study Woods	F/FW	NY	New Rochelle
Hempstead Harbor Shoreline	TW/F/IF	NY	North Hempstead
Mitchell Creek	TW/FW	NY	North Hempstead
Beaver Brook/Shu Swamp	RMC	NY	Oyster Bay
Beaver Lake	FW/RMC	NY	Oyster Bay
Cold Spring Harbor	TW/F/BD/IF/SAV	NY	Oyster Bay
Cold Spring Harbor - Huntington We	TW/IF/FW	NY	Oyster Bay
Huntington Wetland #H-7	FW	NY	Oyster Bay
Alley Pond Park	FW/TW	NY	Queens
Flushing Airport	FW/G/F	NY	Queens
Flushing Bay/Flushing Creek	TW	NY	Queens
Flushing Meadow-Corona Park- Will	TW/FW/CB	NY	Queens
Forest Park Shrub Swamp	FW	NY	Queens
Kissena Park	G	NY	Queens
The Alley@Alley Pond Park	FW/F/TW/CB/IF	NY	Queens
Edith G. Read Wildlife Sanctuary	TW/F/EE/FW	NY	Rye
Beaver Swamp Brook	FW	NY	Rye
Harrison Pond Town Park	FW/RMC/TW/F	NY	Smithtown
Sweetbriar Nature Center	G/TW/FW	NY	Smithtown
Nissequogue River - Village of Nisse	TW/FW/RMC	NY	Smithtown
Bailie's Beach Park	BD/TW	NY	Southold
Great Pond	FW	NY	Southold

High Ranked Sites - CT

Sitecode	Town	Site_name	Habitat
014A	Branford	Sybil Creek	TW
014E	Branford	Farm River	TW
015D	Bridgeport	Pequonnock River	RMC
015F	Bridgeport	Pleasure Beach	BD
027B	Clinton	Clinton Harbor	SAV
027F	Clinton	Hammock River	TW
027H	Clinton	Chapman Pond Dam	RMC
035A	Darien	Noroton River at I-95	RMC
035D	Darien	Holly Pond	RMC
037A	Derby	Derby Dam on Housatonic	RMC
044D	East Haven	New Haven Airport	TW
045A	East Lyme	Niantic River	SAV
045B	East Lyme	Brides Brook Culvert	RMC
045C	East Lyme	Old Black Point Spit	BD
045D	East Lyme	Upper Pattagansett River	TW
045E	East Lyme	Old Black Point Spit Cstl forest	F
050B	Essex	Great Meadows	TW
051A	Fairfield	Pine Creek East	TW
051C	Fairfield	Tide Mill Dam	RMC
051D	Fairfield	Sasco Hill Beach eelgrass	SAV
051O	Fairfield	Sasco Brook Dam	RMC
059A	Groton	Birch Plain Creek	TW
059B	Groton	Bluff/Bushy Point Beach	BD
059C	Groton	Mumford Cove dunes	BD
059E	Groton	Bluff Point	F
059I	Groton	Mystic River SAV	SAV
060A	Guilford	Sluice Creek	TW
060G	Guilford	Lost Lake	TW

061B	Haddam	Higganum Creek	TW
062A	Hamden	upper Mill River	TW
062B	Hamden	Quinnipiac River marsh	TW
075A	Lyme	Lord Cove	TW
075B	Lyme	Nott Island	TW
075C	Lyme	Hamburg Cove	SAV
080A	Meriden	Hanover Pond Dam	RMC
083A	Middletown	Star Mill Pond on Coginchaug River	RMC
084A	Milford	Gravel Pit marsh	TW
084D	Milford	Charles Island	F
084E	Milford	Great Creek	Silver Sands State Park
084H	Milford	Indian River marsh	TW
084I	Milford	Milford Point	BD
084T	Milford	Wheeler Wildlife Management Area	TW
093A	New Haven	West River Salt Marsh	TW
093D	New Haven	upper Mill River	TW
093E	New Haven	West River tide gate	RMC
093G	New Haven	Quinnipiac River Marsh	TW
093L	New Haven	New Haven Airport	TW
093M	New Haven	Lily Pond Dam	RMC
095A	New London	Mitchell College dunes	BD
101A	North Haven	Quinnipiac River Marsh	TW
102A	North Stonington	Side Pond	RMC
103A	Norwalk	Perry Ave. Flood Control Site	RMC
103F	Norwalk	Shea Island	F
103I	Norwalk	Chimon Island	F
103J	Norwalk	Flock Process Dam	RMC
103L	Norwalk	Sheffield Island	F

103M	Norwalk	The Plains	F
105C	Old Lyme	Griswold Point	BD
105D	Old Lyme	Great Island	TW
105F	Old Lyme	Lord Cove	TW
105G	Old Lyme	Goose Island	TW
105H	Old Lyme	Calves Island	TW
105J	Old Lyme	Lieutenant River	TW
106A	Old Saybrook	Ragged Rock Creek	TW
106B	Old Saybrook	South Cove eelgrass	SAV
106E	Old Saybrook	Beamon Creek	TW
106I	Old Saybrook	Lynde Point	BD
106L	Old Saybrook	Ayres Road marsh	TW
126A	Shelton	Farmill River	TW
126C	Shelton	Derby Dam on Housatonic	RMC
135B	Stamford	Noroton River at I-95	RMC
135C	Stamford	Holly Pond	RMC
137E	Stonington	Mystic River SAV	SAV
138A	Stratford	Long Beach	BD
138D	Stratford	Great Meadows	TW
138G	Stratford	Lordship beach	BD
138H	Stratford	Bridgeport Airport	TW
138K	Stratford	Peck's Mill Pond	FW
138L	Stratford	Sikorsky and Route 15 bridge marsh	TW
138M	Stratford	Farmill River	TW
148A	Wallingford	Wallace Dam	RMC
148C	Wallingford	Upper Quinnipiac River Dam	RMC
152A	East Lyme	Niantic River	SAV
152K	Waterford	Millers Pond	RMC
154C	Westbrook	Chapman Pond Dam	RMC

154F	Westbrook	Patchogue River	TW
156A	West Haven	West River Salt Marsh	TW
156G	West Haven	West River tide gate	RMC
158A	Westport	Saugatuck River	TW
158H	Westport	Cockenoe Island	F
158I	Westport	Sasco Brook Dam	RMC

Site Name or Location	Habitat Type	State	Town	Rank
Bronx River Trailway	TW/FW/F/RMC	NY	Bronx	H
Bronx River mouth	TW/F/RMC	NY	Bronx	H
Ferry Point Park	G/BD	NY	Bronx	H
Ferry Point Park Shoreline	TW	NY	Bronx	H
Hutchinson River - DOT property	TW	NY	Bronx	H
Pelham Bay Park Lagoon	TW/F	NY	Bronx	H
Rice Stadium Wetlands	TW/G/F	NY	Bronx	H
Seton Falls Park	FW/F/CB	NY	Bronx	H
Soundview Park	TW	NY	Bronx	H
Turtle Cove	TW	NY	Bronx	H
Westchester Creek	TW	NY	Bronx	H
Mount Sinai Harbor	TW/EE/IF	NY	Brooklyn	H
West Meadow Beach	BD	NY	Brooklyn	H
West Meadow Creek	TW/IF/EE	NY	Brooklyn	H
Betty Allen Nature Park	FW/TW	NY	Huntington	H
Cold Spring Harbor	TW/BD/F/CB/IF	NY	Huntington	H
Twin Ponds Park	TW/FW	NY	Huntington	H
Cold Spring Ponds (wetland #H-1)	FW	NY	Huntington	H
Nature Study Woods	F/FW	NY	New Rochelle	H
Hempstead Harbor Shoreline	TW/F/IF	NY	North Hempstead	H
Mitchell Creek	TW/FW	NY	North Hempstead	H
Beaver Brook/Shu Swamp	RMC	NY	Oyster Bay	H
Beaver Lake	FW/RMC	NY	Oyster Bay	H
Cold Spring Harbor	TW/F/BD/IF/SAV	NY	Oyster Bay	H
Cold Spring Harbor - Huntington Wetland #1	TW/IF/FW	NY	Oyster Bay	H
Huntington Wetland #H-7	FW	NY	Oyster Bay	H
Alley Pond Park	FW/TW	NY	Queens	H
Flushing Airport	FW/G/F	NY	Queens	H
Flushing Bay/Flushing Creek	TW	NY	Queens	H
Flushing Meadow-Corona Park-Willow Lake	TW/FW/CB	NY	Queens	H
Forest Park Shrub Swamp	FW	NY	Queens	H
Kissena Park	G	NY	Queens	H
The Alley@Alley Pond Park	FW/F/TW/CB/IF	NY	Queens	H
Edith G. Read Wildlife Sanctuary	TW/F/EE/FW	NY	Rye	H
Beaver Swamp Brook	FW	NY	Rye	H
Harrison Pond Town Park	FW/RMC/TW/F	NY	Smithtown	H
Sweetbriar Nature Center	G/TW/FW	NY	Smithtown	H
Nissequogue River - Village of Nissequogue	TW/FW/RMC	NY	Smithtown	H
Bailie's Beach Park	BD/TW	NY	Southold	H
Great Pond	FW	NY	Southold	H

Attachment 3. LISS Habitat Restoration Initiative Site Ranking Criteria

Ecological Benefits

1. Area (defined to equal the acreage of habitat being actively improved)

Coastal Barriers & Dunes	Tidal Wetlands	SAV	Riverine Migratory Corridors	Sand Plains	Coastal Forest	Estuarine Embayments
H = > 3	> 50	> 3	special	any	> 30	> 300
M = 1-3	25-50	1-3	special	XX	10-30	100-300
L = < 1	< 25	< 1	special	XX	< 10	< 100

*Acreage guidelines for Intertidal Flats, Cliffs and Bluffs, Shellfish Reefs, Freshwater Wetlands, and Rocky Intertidal Zones are under development.

2. Trust species benefits (defined to include endangered, threatened, special concern or species with legislative mandates for management and protection by the state or federal government)

H - Site historically contained at least one species with federal/state protection

M - Site historically contained at least one species for which a unique management plan has been written

L - Site historically contained no trust species

3. Potential to obtain historical ecological function

H - full restoration

M - partial restoration

L - low or no restoration potential

4. Potential to restore the site to full species use

H - Restoration will attract and support the full suite of species indigenous to that habitat

M - Restoration will attract and support some of the species indigenous to that habitat

L - Restoration will attract and support one indigenous species

5. Value of the site in the surrounding landscape

H - Restoration of the site could expand the existing range of trust species, or is an isolated remnant receiving intensive use, or is a critical complementary habitat.

M - Restoration of the site would enhance the existing range of a trust species.

L - Restoration of the site would provide additional acreage of a locally abundant habitat

Logistical Considerations

1. Technical probability of success

H - restoration technique is proven for particular type of degradation and there will be no negative consequences(i.e. property flooding)

M - restoration technique has not been proven with specific site conditions and/or impacts to adjacent property is questionable

L - technique success is questionable because site conditions include many variables or there will be negative impacts to the adjacent property.

2. Community support

H - known advocates/public support/multiple survey nominations

M - public is indifferent/unaware
L - public opposition

3. Cost per acre of project

H = less than the average accepted cost per acre of restoration
M = within the average accepted range of cost per acre
L = greater than the average accepted cost per acre of restoration

4. Implementation readiness

H - cause of degradation is known and plans are available
M - cause of degradation is known but there will be a cost associated with site plan development
L - cause of degradation is unknown and extensive research and planning may be required

5. Degree of maintenance

H - no annual maintenance other than progress checks
M - annual inspection (i.e. culverts, tide gates)
L - frequent high cost maintenance

Public/Economic Benefits

1. Access/Open space

H - site is highly accessible and/or is in a highly developed urban area
M - site is moderately accessible
L - difficult or no access

2. Environmental equity

H - provides environmental benefits to historically under served community
L - provides no benefits to historically under served community

3. Economic benefits

H - direct
M - indirect
L - little or no benefits

4. Recreational use

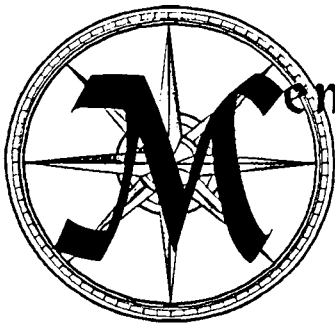
H - will enhance or create several recreational opportunities in a highly developed urban area or in an area where there are currently no recreational programs
M - will contribute to or enhance an already established recreational program
L - creates no recreation opportunities

5. Education

H - will enhance or create several educational opportunities in a highly developed urban area or in an area where there are currently no educational programs
M - will contribute to or enhance an already established educational program
L - creates no educational opportunities

6. Associated surface and groundwater improvements

H - contributes to nitrogen reduction
M - contributes to other water quality pollutant reductions
L - no associated surface or groundwater improvements



Memorandum of Understanding

September 27, 2000

RESTORATION OF COASTAL HABITATS OF LONG ISLAND SOUND

Recognizing that the coastal habitats of Long Island Sound have historically been an exceptionally productive and biologically diverse ecosystem important to the economics and ecological integrity of the Northeast and the nation,

Finding that the acreage of these key habitats for fish, shellfish, birds and other wildlife has greatly declined or degraded over the last century, in part due in large part to hydromodification (dredging, ditching, diking, filling), pollution, and other impacts associated with development,

Recognizing the economic and environmental benefits of coastal habitats, including flood moderation, pollutant filtration, fish and wildlife habitat, recreation, tourism, and other important functions and values.

We the undersigned, to the extent permitted by our respective authorities and subject to the availability of financial and human resources; resolve to use the expertise of our agencies focused through the Long Island Sound Study's Habitat Restoration Initiative, to:

- ❖ *Work together to restore at least 2000 acres of coastal habitat and 100 miles of riverine migratory corridor over the ten year period from 1998 to 2008.*
- ❖ *Periodically review and update the Habitat Restoration Strategy and list of potential restoration sites, and report on progress,*
- ❖ *Involve interested and affected parties in the process,*

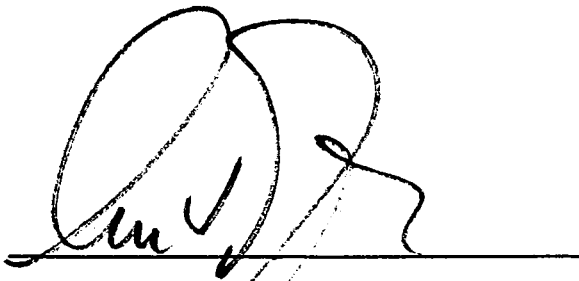
In addition, the specific roles and responsibilities of the partners are attached and made part of this document.

**Connecticut Department of Environmental Protection
and New York Department of Environmental Conservation**

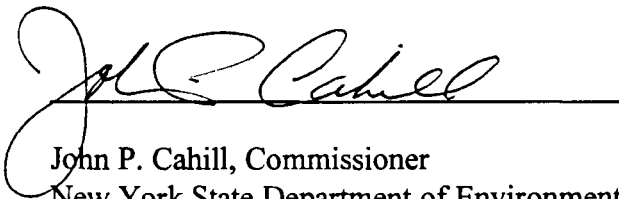
The Connecticut Department of Environmental Protection and the New York Department of Environmental Conservation agree to provide general coordination functions including the maintenance and updating of the habitat restoration Geographic Information System (GIS) for the purpose of tracking habitat restoration progress, convening meetings with the partners, and assisting all of the partners in identifying and securing funding for projects.

The Connecticut Department of Environmental Protection will take lead or co-lead responsibility for the restoration of specific coastal habitats in Connecticut, including Tidal Wetlands, Beaches and Dunes, Coastal Embayments, Submerged Aquatic Vegetation, and Riverine Migratory Corridors. Responsibilities will include providing technical assistance, assistance in developing restoration plans, securing necessary permissions to conduct restoration activities, and identifying or applying for necessary funding to implement habitat restoration projects.

The New York State Department of Environmental Conservation will continue to provide support and guidance to New York municipalities in identifying and planning habitat restoration projects on Long Island Sound. In addition, NYSDEC will agree to provide general coordination functions including supplying updated material to CTDEP for the habitat restoration Geographic Information System (GIS) for the purpose of tracking habitat restoration progress, convening meetings with the partners, and assisting all of the partners in identifying and securing funding for projects, and guide partners through the state permit application process.

A handwritten signature in black ink, appearing to read 'Arthur J. Rocque', is written over a horizontal line.

Arthur J. Rocque, Commissioner
Connecticut Department of Environmental Protection

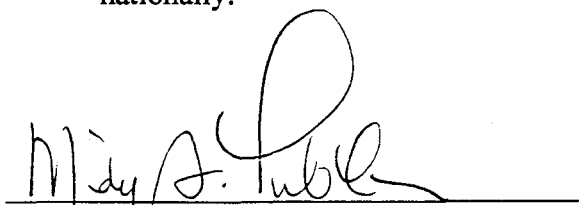
A handwritten signature in black ink, appearing to read 'John P. Cahill', is written over a horizontal line.

John P. Cahill, Commissioner
New York State Department of Environmental Conservation

U.S. Environmental Protection Agency

The EPA, through its Regional Offices in New York and Boston and its Long Island Sound Office, has provided funding to the Connecticut Department of Environmental Protection and New York Department of Environmental Conservation in support of the Long Island Sound Study's Habitat Restoration Initiative. The EPA agrees to support implementation of the Habitat Restoration Strategy in the following ways:

- The EPA LIS Office will continue to coordinate the effort, including tracking and reporting on progress toward commitments
- The EPA LIS Office will support continued public involvement and educational activities on habitat restoration, including the development of fact sheets, pamphlets, and information on its World Wide Web homepage.
- EPA will encourage the application of eligible habitat restoration projects for funding under various programs, such as the CWA Section 319 nonpoint source control program.
- EPA will advocate habitat restoration in watershed protection activities around the Sound.
- EPA will encourage the application of eligible habitat restoration projects for funding through Supplemental Environmental Projects.
- EPA will provide technical support and promote technology transfer of the program nationally.



Mindy S. Lubber, Regional Administrator
US Environmental Protection Agency
New England Region

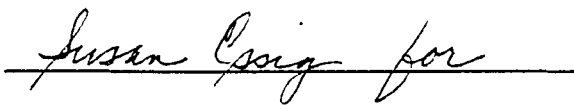


for Jeanne M.. Fox, Regional Administrator
US Environmental Protection Agency
Region II

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (Service) through its Southern New England - New York Bight Coastal Ecosystems Program, Long Island Ecological Services Field Office, Stewart B. McKinney National Wildlife Refuge, Long Island National Wildlife Refuge Complex, and Connecticut River-Long Island Sound Ecosystem Team will support the restoration of coastal habitats associated with Long Island Sound. Specifically, the Service will work with partners to identify appropriate projects from those identified by the Long Island Sound Study Habitat Restoration Initiative and support the funding and implementation of these projects. Appropriate projects will be considered for funding through the Service's Partners for Fish and Wildlife program. The Service will also attempt to match projects or sets of projects with appropriate Service and other related competitive grants programs and work with partners to apply for these grants including North American Wetland Conservation Act grants, National Coastal Wetland grants, and National Fish and Wildlife Foundation grants.

Priority habitats and areas for the Service include: nesting and foraging habitats for colonial waterbirds (especially long-legged waders and roseate tern), habitats on and adjacent to National Wildlife Refuges, habitats that support federally endangered and threatened species, tidal wetland habitats in the Lower Connecticut River (Ramsar area), fish passage in riverine migratory corridors feeding into Long Island Sound, beach strand habitats (especially existing and potential piping plover habitats), and sandplain grasslands. On Long Island, the habitat restoration efforts of the Long Island Wetland Restoration Initiative (a partnership among the Service, State of New York, Ducks Unlimited, Suffolk County, and other partners) will be coordinated with the Long Island Sound Study Habitat Restoration Initiative.

A handwritten signature in cursive script, reading "Susan Essig for", is written over a horizontal line.

Mamie Parker, Acting Director
US Fish and Wildlife Service
Region-5

New York State Department of State

The Department of State will continue to participate in the Long Island Sound Study's Habitat Restoration Initiative through fostering local support and commitment for habitat restoration planning and construction. The Department will encourage Long Island Sound communities to apply for Environmental Protection Funds to identify, prioritize, plan, design and implement habitat restoration projects consistent with the goals of the Long Island Sound Study and the Long Island Sound Coastal Management Program. The Department will continue to provide staff coordination for meetings, field inspections and technical assistance to communities for funding, planning and implementing habitat restoration projects.

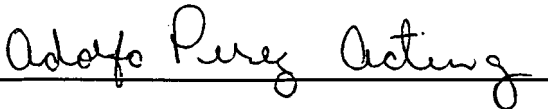
A handwritten signature in black ink, reading "Alexander F. Treadwell". The signature is fluid and cursive, with a horizontal line drawn underneath the name.

Alexander F. Treadwell
Secretary of State
State of New York

USDA-Natural Resources Conservation Service

The USDA-Natural Resources Conservation Service (NRCS) is a state-based federal conservation agency that works primarily on private and non-federal public lands to conserve and sustain natural resources. NRCS staff works with individuals, organizations and governmental agencies to deliver a wide range of technical services that reduce impacts to natural systems from agricultural, urban, and suburban landscapes.

NRCS recognizes Long Island Sound as a priority for protection. While NRCS traditionally works on lands in watersheds that outlet into the coastal area, it can assist with restoration projects in coves and embayments. The agency will continue working with landowners to enhance the quality of the natural resources within the Long Island Sound Ecosystem.



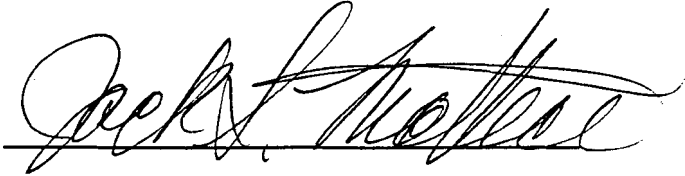
Melvin Womack, Acting New York State Conservationist
USDA Natural Resources Conservation Service



Margo L. Wallace, Connecticut State Conservationist
USDA Natural Resources Conservation Service

New York Sea Grant Extension

The New York Sea Grant Extension program will work to provide the latest scientific information on habitat restoration from the National Sea Grant College Program to groups and organizations conducting restoration projects, provide technical assistance to groups performing habitat restoration projects, especially in the areas of coastal processes and dune habitats, fisheries restoration, and use of native plants. Sea Grant will sponsor habitat restoration workshops, and promote restoration through its newsletters.

A handwritten signature in black ink, appearing to read "Jack Mattice", written over a horizontal line.

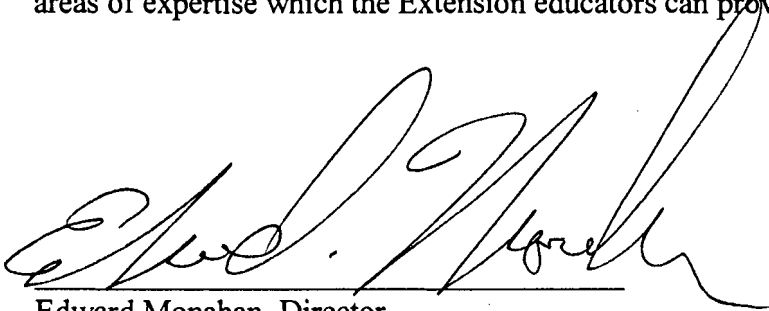
Jack Mattice, Director
New York Sea Grant

Connecticut Sea Grant College Program

The CTSG program, a partnership between the federal government (NOAA) and the University of Connecticut, will continue to support habitat restoration efforts as it has done in the past: by

- (1) soliciting proposals for relevant research, and
- (2) by conducting workshops and other outreach activities, and
- (3) providing educational materials through its Communications and Education offices.

CTSG will continue to distribute "Research in New England Marsh-Estuary Ecosystems: Directions and Priorities into the Next Millennium", a publication resulting from a recent workshop. CTSG Extension staff will continue to work with municipal officials, the State DEP, nonprofit organizations such as Save the Sound, and the Sea Grant network to assist with restoration projects, hold workshops, and assist in technology transfer to user groups. Long Island Sound ecosystem health, water quality, aquatic nuisance species, and fisheries are specific areas of expertise which the Extension educators can provide.

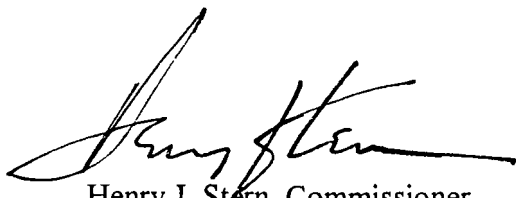
A handwritten signature in black ink, appearing to read 'Edward Monahan', is written over a horizontal line.

Edward Monahan, Director
Connecticut Sea Grant College Program

City of New York/Parks & Recreation

The City of New York/Parks & Recreation's Natural Resources Group (NRG) was established in 1984 and is comprised of scientists, restoration ecologists, and GIS mapping specialists. NRG develops and implements management programs for protection and restoration of the City's natural resources, including a 28, 000 acre park system. More than \$70 million is earmarked for restoration of salt marshes, freshwater wetlands, riparian forests, and grasslands within the City's critical watersheds.

Parks, through its Natural Resources Group, will continue to support the Long Island Sound Study Habitat Restoration Initiative in implementing habitat restoration priorities, non-point source pollution reduction through habitat enhancements, and protection and management of the Sound's most important natural resources. In addition, Parks will continue to seek support through community education, and government and private grants to augment parkland acquisition, research, monitoring, and restoration goals established by LISS.

A handwritten signature in black ink, appearing to read "Henry J. Stern", with a stylized, flowing script.

Henry J. Stern, Commissioner
City of New York
Parks & Recreation

Save the Sound, Inc.

Save the Sound, Inc. is a nonprofit organization dedicated to the restoration, protection, and appreciation of Long Island Sound and its watershed through education, research, and advocacy. Founded in 1972, Save the Sound has offices in Stamford, Connecticut and Glen Cove, New York. As a member of the Long Island Sound Habitat Restoration Initiative, Save the Sound commits to the following:

1. Advocacy

- as a member of Restore America's Estuaries, press for appropriate legislation such as the Chafee Estuary Restoration Bill;
- meet with elected officials (DC, Hartford, Albany, local);
- track and monitor legislation;
- encourage adequate funds for restoration and pursue new funding sources;
- streamline the permit process for restoration projects.

2. Education and outreach

(audiences: elementary, middle, and high school faculty and students; municipal/elected officials; adult general public; landowners)

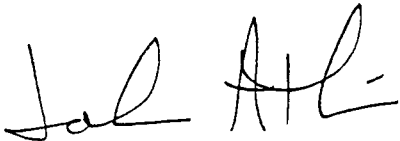
- public speaking engagements;
- conduct technical assistance workshops for municipalities and community groups;
- classroom visits/field trips;
- media outreach (radio, television, print) - site visits, editorial board meetings, press releases.

3. Habitat Restoration

- at the grassroots level, coordinate and assist habitat restoration projects in Connecticut and New York;
- assist LIS organizations by building partnerships, locating funds, and providing or locating technical assistance for restoration projects;
- publish and distribute The LIS Conservation Blueprint - Building the Case for Habitat Restoration In and Around the Sound (a citizen's guide for habitat restoration).

4. Research

- continue to assist non-governmental agencies of both states in developing water quality monitoring programs, similar to ours, that operate under US EPA Quality Assurance Project Plans;
- continue to participate in the network of LIS agencies and organizations that monitor water quality;
- continue to provide our water quality data to federal and state agencies.



John Atkin, President
Save the Sound, Inc.

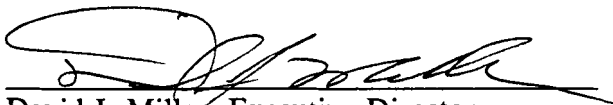
National Audubon Society of New York State

The National Audubon Society of New York State strongly supports this Memorandum of Understanding for the Restoration of the Coastal Habitats of Long Island Sound. Long Island Sound Study Habitat Restoration Strategy is a critical component to the future protection and stewardship of Long Island Sound.

The National Audubon Society of New York State agrees to assist the Long Island Sound Study Habitat Restoration Initiative through our advocacy, science and education programs. Audubon will provide the Initiative with information from the Listen to the Sound 2000 project, which will further advance habitat restoration efforts. Audubon will assist in outreach to local communities to identify future projects and assist in promoting funding for restoration projects.

The National Audubon Society of New York State will also provide input from our science and bird conservation staff on habitat restoration efforts that relate to Important Bird Areas.

Finally, National Audubon Society of New York State will continue to advocate for the habitat restoration strategy in relation to its role on governmental advisory bodies, in the public realm, and in conjunction with discussions of the creation of a Long Island Sound Reserve Program.



David J. Miller, Executive Director
National Audubon Society of New York State and
LISS CAC Co-Chair-NY

LISTEN TO THE *SOUND* 2000

A Citizens' Agenda for the Long Island Sound

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Contents Photo Credit: Kimberley L. Ray
Publication Design and Layout by Kimberley L. Ray

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For more information about Listen to the Sound 2000 contact:

CONTENTS

Acknowledgments	2
Forward by David J. Miller	3
Introduction	4-7
Listen to the Sound 2000: Its History and 2000 Campaign	
Case Studies of the Sound	8-11
A Tale of Two Sounds by Bob Yaro	
A Tale of Opportunity: Urban Habitat Restoration by John Atkin	
Statements from Government Leaders	12-17
Listen to the Sound 2000 Citizens' Agenda	18-26
Creating a Long Island Sound Reserve Program	
Categories of a Reserve Program	27-32
Summaries of Ten Citizen Hearings	33-109
Appendices	110-144
Appendix A (A-110-132)	
List of proposed sites for Long Island Reserve Program	
Appendix B (B-133-144)	
List of Co-Sponsors and Testifiers	
at the ten Listen to the Sound Citizen Hearings	
Organizational Information from Project Sponsors	145-147

Acknowledgments

Listen to the Sound 2000



Listen to the Sound 2000 is a unique partnership between three not-for-profit organizations: the National Audubon Society of New York State and Connecticut, formally known as Audubon New York and Audubon Connecticut, Regional Plan Association and Save the Sound. Each group has brought unique and complementary strengths to this effort.

David Miller, executive director of Audubon New York, created the model for a citizens plan for the Sound, when he inaugurated the original Listen to the Sound effort in 1990 – a successful citizens' initiative to clean up the Sound's waters. David also led the current effort. The lion's share of the credit for the success of this whole effort is due to the extraordinary commitment made by Jane-Kerin Moffat, who coordinated all 10 of the Listen to the Sound hearings.

Bob Yaro, Regional Plan Association's (RPA's) executive director, first proposed that a Long Island Sound Reserve be created (as originally recommended in the Long Island Sound Comprehensive Conservation and Management Plan) at the Long Island Sound Watershed Association's 1999 Annual Meeting. And John Atkin, Save the Sound's president led efforts to engage Save the Sound's extensive citizen network and the concerned public in the hearings.

Key staff members from all three groups helped organize and staff the Listen the Sound hearings and prepare this summary report. These included Carolyn Hughes and Tom Baptist from National Audubon, Helen Speck and Dick DeTurk from RPA, Robin Kreisberg and Amanda Waters from Save the Sound. Christian Michel, RPA's geographic information system (GIS) coordinator prepared the maps used in the hearings. Audubon New York's Linda Coleman proofed and edited. Kimberley L. Ray, Audubon New York's director of communications, was responsible for writing, layout and design of this publication.

Special thanks are due to Paul Tudor Jones, Marian Heiskell, and the Alexander Host Foundation and their supporters, for their financial support for this effort. Without their generous contributions, this effort could not have been launched.

Foreword by David J. Miller

January, 2001

I love the Sound. I grew up learning the magic of nature along its shores. Whether chasing fiddler or horseshoe crabs, fishing in its waters, marveling at a Great Egret or simply looking out on the water, Long Island Sound transformed me as a child. My experiences on the Sound created a love for water, wildlife and habitats. The simple fact that the estuary system is one of the most biologically productive ecosystems on earth was shown to me every time I traveled to the Sound.



Susan Woog Wagner

When I joined National Audubon in 1988, the issue of cleaning-up Long Island Sound was a concern of local chapter leaders throughout Connecticut and New York. Many Audubon chapters and other conservation groups had concerns and programs regarding the state of Long Island Sound. The Long Island Sound Task Force was a lead organization in making Long Island Sound one of the first sites selected under the National Estuary Program. However, there was still no universal movement (Sound-wide) to take action and to lead a coalition for the Sound. In 1990, the National Audubon Society launched the Listen to the Sound campaign to create a citizens' agenda for the restoration and stewardship of Long Island Sound. The Sound was dying and it was crying out through closed beaches, fish kills, loss of habitat and diminished living marine resources. It was time that the citizens of the Sound raised their voices for its future.

The theme was simple – Listen to the Sound through the voices of its citizens. It was a transforming process for me, seeing first hand the power of citizen action from the hearings to the report to the implementation of policy.

Now, ten years later, we are at it again. We celebrate the incredible progress of the Sound's restoration while providing new direction for the future. We have introduced the concept of a Long Island Sound Reserve Program for while we clean its waters, we must also save the fragile land where the Sound meets the shore. Along with Audubon, Save the Sound and Regional Plan Association have joined forces to make Listen to the Sound 2000 a resounding success and to create a compelling citizens agenda for all levels of government to follow.

Long Island Sound is a natural treasure and its open spaces and habitats are the crown jewels of the necklace we know as its coastline. Let's work together to implement the ideas from Listen to the Sound 2000 and the reserve concept...not only for today, but for the children of all future generations. I believe the vision of Listen to the Sound remains clear and, once again, we have a grassroots agenda before us to make it a reality.

A handwritten signature in dark ink, appearing to read 'D. J. Miller'.

David J. Miller
Executive Director
Audubon New York

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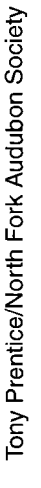
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lanning process. From these circumstances, the National Audubon
id Miller, and through the dedicated organizational work of Jane-
implemented the Listen to the Sound program. It was in the spring
n Society launched Listen to the Sound, asking the people of the
n become the voice for Long Island Sound. Fifteen citizen hearings
rk City to Southold from Memorial Day to the 4th of July, 1990.
to 500 citizens and hearings attended by over 1,500 individuals.
l national organizations co-sponsored the citizen hearings and
eds of Long Island Sound.

on and mission was simple – to create a comprehensive citizens’ and Sound. In the book that followed the hearings, *Listen to the*

**and Sound is of waters that are clean, clear, safe to swim in
is a vision of waters nourished and protected by extensive
licly accessible, litter-free beaches and preserves, and of
undant and diverse wildlife, of flourishing commercial fish-
ble to the boating public, and of a regional consciousness
ects and sustains the ecosystem.”**

ons on hypoxia and nitrogen pollution, polluted run-off, pathogen
d wildlife concerns, as well as recommendations regarding local,
unds to implement the needed actions. In fact, the Listen to the
ed to influence the public policy efforts for Long Island Sound and
and Management Plan being developed by the Environmental
e Sound citizens report stated that the campaign:

ound a voice. The voice of hundreds of people who live in and who care deeply about its future, and echo a common vision Audubon-sponsored citizen hearings, people from all walks of concerns and proposed recommendations for a sustainable future for the future has a collective mission of restoring the sound sustainable development. The ethic must set limits on growth and the species in the ecological system."



Shortly after the citizen summit in 1991, which unveiled the Listen to the Sound agenda, the Long Island Sound Watershed Alliance was formed to link the 200 plus organizations involved to work together to implement the plan. This alliance and agenda puts forth its energies to influence the federally funded Long Island Sound Study. Over the next two years, the Study's Comprehensive Conservation and Management Plan (CCMP), the governmental blueprint for the Sound clean-up, incorporated most of the Listen to the Sound recommendations and was thus supported by citizens and elected officials throughout the Long Island Sound region.

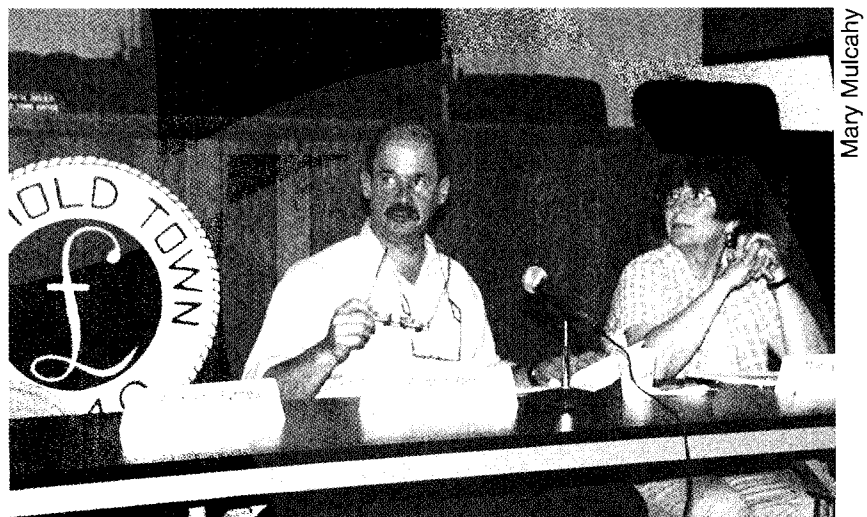
Great achievements were made from the creation of the EPA Long Island Sound office, spearheaded by Connecticut - U.S. Senator Joseph Lieberman (who called for its creation during Listen to the Sound), to New York Governor George Pataki's Clean Water/Clean Air Bond Act in 1996, which had \$200 million earmarked for Long Island Sound. The Clean Water/Jobs Coalition of industry, labor and environmental groups was formed, two governors' agreements for Long Island Sound programs were signed and the waters of Long Island Sound became cleaner with a basin-wide 25% reduction in nitrogen pollution.

Long Island Sound was becoming a national success story and its focus on water quality over the past decade was understandable. However, critical elements of Long Island Sound's restoration plan still needed more and adequate attention. Open space and living marine resources are issues that still needed further programmatic and funding support. It was determined that it was time (on the tenth anniversary of Listen to the Sound) to re-energize its citizens, host new citizen hearings and focus on where the land meets the water - coastal habitat.

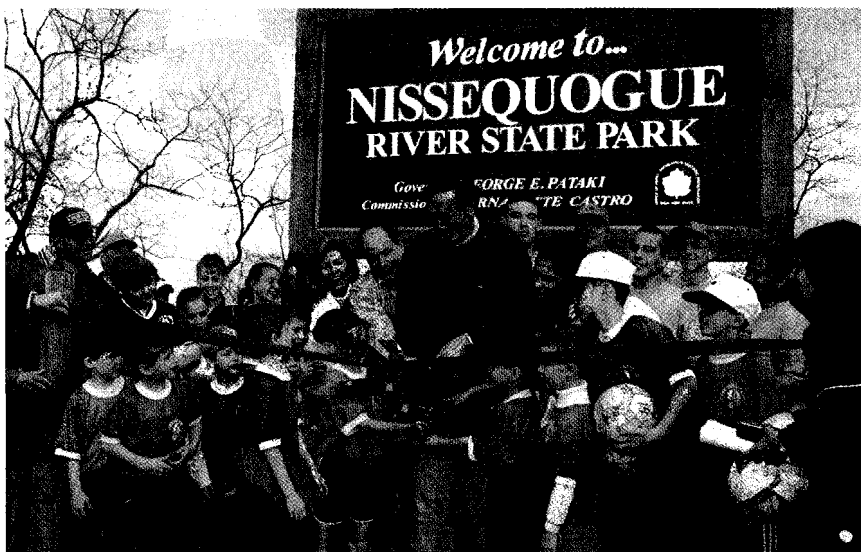
Audubon again launched a Listen to the Sound campaign, which focused on establishing a comprehensive network of open space and natural areas along the Sound's rim, as well as providing for more opportunities for public access and habitat restoration. The concept of a Long Island Sound Reserve was identified as a means to accomplish these goals.

Save the Sound became a project co-sponsor as did the well-known tri-state organization, Regional Plan Association. Save the Sound is a regional organization dedicated to the Sound's protection and coordinates the Long Island Sound Watershed Alliance, a grassroots network of some 200 organizations brought together by the first Listen to the Sound campaign. Save the Sound is also a leader in habitat restoration efforts taken under the CCMP. Regional Plan Association (RPA) has made incredible strides in land use policies for much of the 20th century. They use their influential position as a planning organization to improve the quality of life in the tri-state area, and bring extensive planning and mapping expertise to the project.

Ten citizens hearings were scheduled around Long Island Sound in May and June of 2000. The National Audubon Societies of New York and Connecticut, with local Audubon chapters, Save the Sound, Regional Plan Association and many other organizations concerned about the Sound's future joined under the campaign banner "Listen to the Sound 2000."



Panelists Bob Yaro of Regional Plan Association and Marilyn England of Audubon New York's Theodore Roosevelt Sanctuary.



NYS Governor George E. Pataki cuts the ribbon at a park opening.

The aim was to gather public input and mobilize public concern to create a comprehensive system of protected open space – a Long Island Sound reserve system – around the estuary. The program called for the people who live, work or play near the Sound to attend and share their views about the natural treasures that they cherish along its rim, their concerns and their vision for the future. These hearings were their opportunity to once again be the voice for Long Island Sound.

In that spirit, we came together to focus strongly on restoring and protecting the Sound's coastal habitats, which sustain its fisheries and other wildlife. It was determined that society needs to do more to safeguard the land's natural capacity to filter and break down pollution before it reaches the Sound. Few unprotected open sites remain along the shore, and most of these are likely to be developed within the next decade unless we mobilize quickly to save them.

The Sound is an extraordinary scenic and recreational attraction in the heart of the country's most densely populated region. The costs of restoring and protecting it are public costs and the public deserves the opportunity to have a connection to this resource. Yet the Sound's shore is among the least publicly accessible in the country and, as water quality improves, its parks, beaches and shoreline preserves – the jewels of the shoreline – are increasingly overwhelmed by the public. Society needs more public access sites to protect what we already have from overuse. Overall, governments need a strategy that connects people to the Sound, while protecting the remaining outstanding sites threatened by development.

Outstanding New York sites currently at risk include: Riverhead's Grandifolia Dunes, home to a unique dwarf forest; and east, several miles of largely undeveloped bluffs – the largest remaining stretch of open land on the Sound. This site was lost to development during the Listen to the Sound hearings. Further east, Gardiner's Island, home of the last old growth forest stand on the east coast is a critical part of our natural heritage. Outstanding Connecticut sites include the 29-acre, virtually undeveloped Calves Island off Greenwich, the barrier beach to Great Meadows salt marsh at Stratford, and 42 acres of uplands and tidal wetlands next to Hammonasset Beach State Park in Madison.

Long Island Sound urgently needs a comprehensive system of open space protection to safeguard habitat and water quality, and to make the Sound more accessible to the public. Already, the Sound and its citizens are paying the price.

Loss of essential habitat – breeding areas, food sources and shelter – have diminished the abundance and diversity of the Sound's wildlife and the productivity of its fisheries. Paving the land's surface and hardening the Sound's edges have increased polluted runoff and decreased the land's capacity to absorb and break down the pollutants before they wash into the Sound. In the past century, before regulatory programs halted the trend, the Sound had lost at least a third of its estuarine wetlands and most of the (now rare) upland coastal meadows and forests, and have despoiled much that is left.

Although the Sound lies in the midst of the most densely populated region in the country, its

shores are among the least accessible in the nation, and its public beaches, park lands and refuges – the jewels of its shoreline – are increasingly overburdened. The public bears the cost of restoring the Sound and deserves more opportunities to enjoy it.

Few unprotected open areas remain along the shores and the pressure to develop them is intense. Unless society acts now to protect them, they will soon be lost forever. There have been several successes over the past year, such as the creation of the new Nissequogue River State Park on the Sound by Governor Pataki and Connecticut increased funding and implementation of open space protection projects. While the governors of New York and Connecticut support the reserve concept, it is Listen to the Sound's task to create the public movement, direction for its implementation.

The Listen to the Sound project provided some possible criteria for land conservation and coastal projects. In preparing for the hearings, sponsoring organizations urged citizens to consider priority sites for protection, including:

- critical land and underwater habitat, with limited access;
- research sites, with limited access;
- potential habitat restoration sites;
- coastal watershed buffer lands;
- beaches and coastal park land for public access;
- publicly accessible docks and boat launch areas;
- reclaimable urban waterfronts for public access;
- lookout sites for public access; and
- lands integral to public vistas of the Sound.

In addition, citizens were asked to consider conservation tools that might be appropriate to help achieve their vision for the Sound, including:

- federal, state, municipal and private funding sources and partnerships;
- public and private stewardship and partnerships;
- purchase of fee title or easements from willing sellers;
- state and local planning and regulatory programs; and
- smart growth initiatives.

On April 1, 2000, the annual conference of the Long Island Sound Watershed Alliance, organized by Save the Sound, initiated public discussion of the reserve concept by examining different kinds of reserves and their potential relevance for the Sound. Regional Plan Association prepared geographic information system (GIS) maps of Long Island Sound's coasts for precise identification of undeveloped sites that are protected, unprotected or have the potential for habitat restoration or waterfront reclamation. At the Listen to the Sound 2000 hearings, citizens created the reserve concept by making recommendations on which sites should be protected and possible ways of getting the job done. Following the hearings the project sponsors agreed to prepare this citizens agenda report, which summarizes each hearing and then presents a blueprint, based on testimony received, for establishing the reserve. A citizens' conference on strategies to implement the blueprint will follow in the spring of 2001.

This report presents the results of Listen to the Sound 2000. The following chapters provide a blueprint for the Long Island Sound reserve concept from over 200 testimonies at the ten citizen hearings. Equally important were the over 600 individuals attended the hearings and others sent letters, e-mails and written comments. All of this material is the basis for the citizens' agenda for the reserve concept and the list of open space projects in need of attention. After reviewing this compelling call to action, there is a summary of each of the ten hearings.

It is the hope of Audubon, Save the Sound and Regional Plan Association that this report will provide the vision, direction and blueprint to make the next chapter of Long Island Sound's restoration and protection a reality for all of its citizens and critters alike.

Case Studies of the Sound

A Tale of Two Sounds by Bob Yaro

One way to envision the lasting benefits that creation of the Long Island Sound Reserve could provide is to imagine what the Sound's future would be under two scenarios. In the first scenario, the reserve is established, and in the second, development of the Sound's shoreline continues unabated. Both scenarios are outlined below, looking backward from the year 2040.

Scenario I: A Long Island Sound Reserve Protects and Reclaims the Sound's Resources

It is the year 2040, and a number of Long Island Sound communities, from Southold to Stamford, are celebrating their 400th anniversaries. The President of the United States participated in several of these celebrations, calling special attention to the role that the Long Island Sound Reserve played in inspiring the creation of a national coastal reserve.

Most of these celebrations focused on the Sound's protected and reclaimed shoreline. As a result of visionary action taken to create the reserve back around the turn of the century, dozens of natural areas have been protected and made accessible to the public. Other areas damaged by hurricanes or threatened by sea level rise have become public preserves and beaches. And literally hundreds of once damaged industrial and commercial waterfront areas have been reclaimed as created wetlands, wildlife habitats and waterfront parks, and have become focal points for restored downtown urban economies. Formerly distressed urban waterfront communities have become vibrant new mixed use and mixed income centers with quality access to the Sound.



In recent decades, the Sound has become renowned as one of America's premier natural and recreational resources. A fleet of windjammers carries visitors from all over the world to visit pristine beaches and coves and vibrant urban waterfronts, from Glen Cove to Bridgeport to Greenport. Excursion boats provide "up close and personal" voyages to the Sound's dolphin, whale and harbor seal habitats. A focal point for the Sound's vibrant tourist trade is the network of hundreds of waterfront inns located in what at the turn of the century had been known as "McMansions." When the superheated economy of that era subsided, many of these ostentatious mansions became too expensive to maintain as single-family homes, and were converted to retirement quarters for aging but still active baby boomers and bed-and-breakfasts for tourists.

The Sound also continues to be one of the nation's leading commercial and sport fishing centers, and its most productive oystering grounds. After lobster harvests plummeted back at the turn of the century, cleaner water and better stewardship of the Sound's natural areas resulted in the restoration of lobstering to late 20th century levels by 2010.

The dunes and bluffs of Long Island's North Fork have become a showcase of protected and restored habitat, and a focal point for natural studies in the estuary. The Grandifolia Dunes

Reserve in Riverhead, on the reclaimed site of the former Grandifolia Dunes Golf Course, has again become the east coast's foremost habitat for hummingbirds. This represents an exceptional turn around, after the site was wantonly bulldozed to create a golf course community just before the turn of the century. But its destruction became a wake up call to those concerned about the loss of the Sound's dwindling open spaces. And today it is a global center for the study of ecological restoration, part of a network of reserves that protects more than 30 miles of Long Island Sound shoreline. And it has become a living source of pride to everyone who loves the Sound and its protected and accessible shoreline.

Scenario II: Subdivided from Orient and Stonington to City Island

It is the year 2040 and a number of Long Island Sound communities, from Southold to Stamford, are celebrating their 400th anniversaries. But their celebrations are being held in parking lots and strip malls near the water, separated from the water's edge by a continuous line of "McMansions" and commercial developments. Unfortunately, the proposal back at the turn of the century to create a new Long Island Sound Reserve failed to catch on with public officials preoccupied with cleaning up damaged coastal properties following the destruction of the hurricane of 2003.

Many of the abandoned and underutilized waterfront industrial and commercial sites already derelict at the turn of the century remain unreclaimed four decades

The Story of Grandifolia Sandhills

(From comments made by Dr. Paul Adams, Professor of Biology, SUNY at Stony Brook, June 29, 2000, Listen to the Sound hearing, Southold, New York)



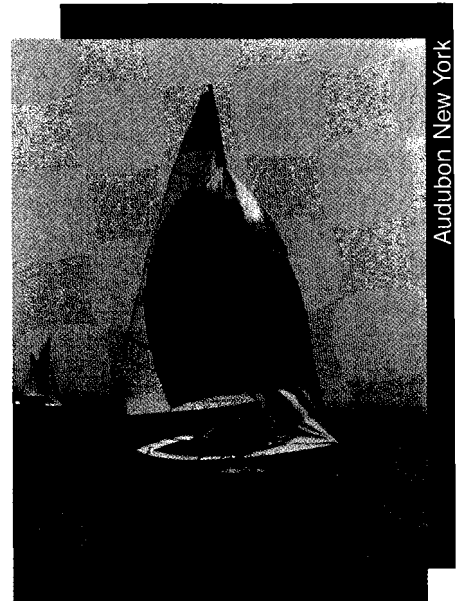
Paul Adams

- "Grandifolia Sandhills in Riverhead...[is a] wooded area of several hundred acres with a mile of frontage on Long Island Sound...probably the single most pristine area located on Long Island Sound anywhere in the State of New York."
- "The site is named for the dramatic, beautiful and extremely rare dwarf beech trees that clothe the bluffs above the Sound."
- "According to the New York State Natural Heritage Program...the Grandifolia Sandhills may [be] the finest example of maritime pygmy beech forest anywhere in the world. The forest provides habitat for hummingbirds"...and is "one of the few places on Long Island where hummingbirds still breed."
- "In 1994...I urged...that the Riverhead bluffs area be accorded outstanding natural coastal area status because of imminent threats to the Sandhills...nothing was ever done and the beech forest was bulldozed in February of this year."
- "Grandifolia Sandhills are now also known as the Traditional Links Golf Course."

"There is something profoundly wrong with a system that allows the destruction of the finest example anywhere in the world of a magical, ecological community for the transient pleasure of a few hundred bored golfers."

later, and off-limits to the public. In some cases contaminated brownfield sites continue to leach chemicals into the Sound; and in others, these have been reclaimed for waterfront office buildings. The remaining natural areas once proposed for the Long Island Sound Reserve have instead become new golf course subdivisions, waterfront industrial parks and power generating plants.

Recreational boating and commercial and sport fisheries began to decline after the turn of the century, as first lobsters, and then other fisheries declined. And aging baby boomers from Long Island and Connecticut retired in droves to the coastal villages along the protected shorelines of New Jersey, the Carolinas and the Chesapeake, rather than face rising taxes and diminished quality of life in the waterfront communities of Long Island, Westchester and Connecticut.



At the celebration of Southold's 400th anniversary, a few old timers remembered a time when the North Fork's dunes, bluffs and farms adjoining Long Island Sound remained largely open and undeveloped. And a few of them also remembered when the bulldozers destroyed the hummingbird habitat on the Grandifolia Dunes property and the coastal farms and forests of nearby Jamesport. But these resources were just a memory, as were the golf courses of the early 21st century, abandoned when this golfing craze ended a decade later. Long Island Sound itself was not something that anyone gave much thought to, walled off as it was by a nearly continuous band of subdivisions and waterfront industrial areas. Where once it had defined the region's quality of life, only four decades later it had become just an afterthought, known only as the nation's least accessible and least attractive coastline.



A Tale of Opportunity: Urban Habitat Restoration

by John Atkin

Imagine yourself several hundred feet from a major water body, or within yards of a river flowing into Long Island Sound, and not even knowing it's there. Now imagine having lived in a region of the Sound for your entire life, and not even knowing a river is there. Now imagine how difficult it would be to finally "discover" this river, and realize that it is there, but lined with junkyards, highways, industry, and barbed wire fences. Welcome to the Bronx, New York. Nearly 1.2 million people live in this borough of New York City, where the Bronx River flows into the Sound, and some of those residents have actually experienced that scenario.

It is obvious from this scenario that much has to be done to preserve, restore and "discover" open space and habitat in our urban centers. Through the foresight of the Long Island Sound Habitat Restoration Initiative (LISHRI), over 450 potential sites have been identified for restoration around Long Island Sound. Of those over 50 are in urban areas of our coast, and of those 18 are in the Bronx. That's right, the Bronx.



Shoreline scene along the Bronx River.

Tidal wetland restorations, riverine migratory corridors, freshwater wetland restoration and even shellfish reefs are suggested and feasible. Additionally, the City of New York Parks and Recreation Department's Natural Resources Group among other government agencies and not-for-profits are active players in LISHRI. Small restoration projects such as Hunt's Point Riverside Park along the Bronx River, and Soundview Park along the Sound, have already occurred but, obviously, much more has to be done.

Long Island Sound has its remaining pristine reaches in eastern Long Island and eastern Connecticut, but still remains the nation's most urbanized estuary. Over 20 million people, nearly 10% of this nation's population, live within 50 miles of the Sound, placing great stress on the water body. Collectively we dump one billion gallons of sewage, usually treated, into the Sound every day. Our towns and cities continue to develop along its shores, adding more impervious surface that speeds up run-off, and adding stress to an aging infrastructure of waste water treatment plants and storm water systems.

Residents are enjoying these areas for recreating, fishing and as put-ins for canoes and kayaks. Funding for more small and large restorations and access points is necessary, but the residents have now identified the need for this access, and the elected officials now have the will to seek the funding. Maybe the next generation won't have to discover a river in their backyard, but will innately know it's there because their parents knew it was there.

It is clear that the urban areas around our estuary have to be part of a reserve, more green jewels in the necklace that connects all of us around the Sound, so that all can understand and appreciate its beauty, and understand how the ecosystem connects humans to the natural world.

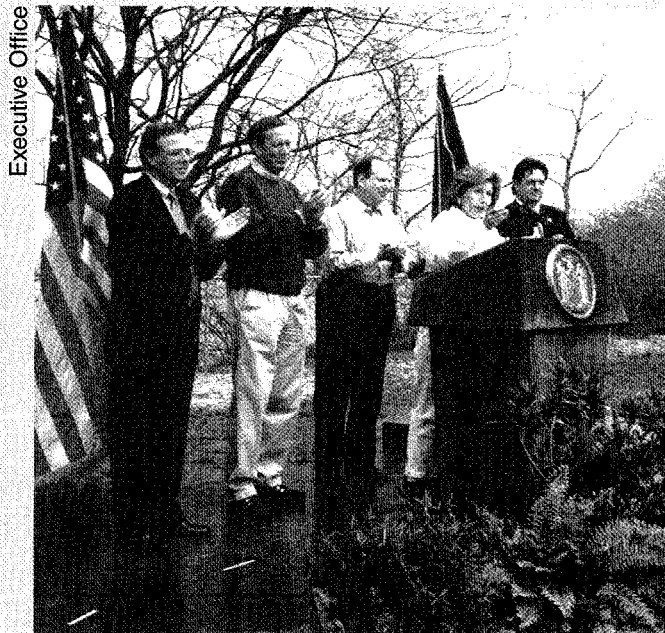
Statements

Government



Senator Joe Lieberman of Connecticut kicks off Listen to the Sound 2000 at a press conference.

From



Executive Office

Parks Commissioner Bernadette Castro at the Nissequogue River State Park Bird Conservation Area designation.

Leaders

G Government Leaders

In the first Listen to the Sound program in 1990, countless government leaders testified on the needs of Long Island Sound. Their testimonies exhibited the strong bi-partisan support for the restoration of Long Island Sound.



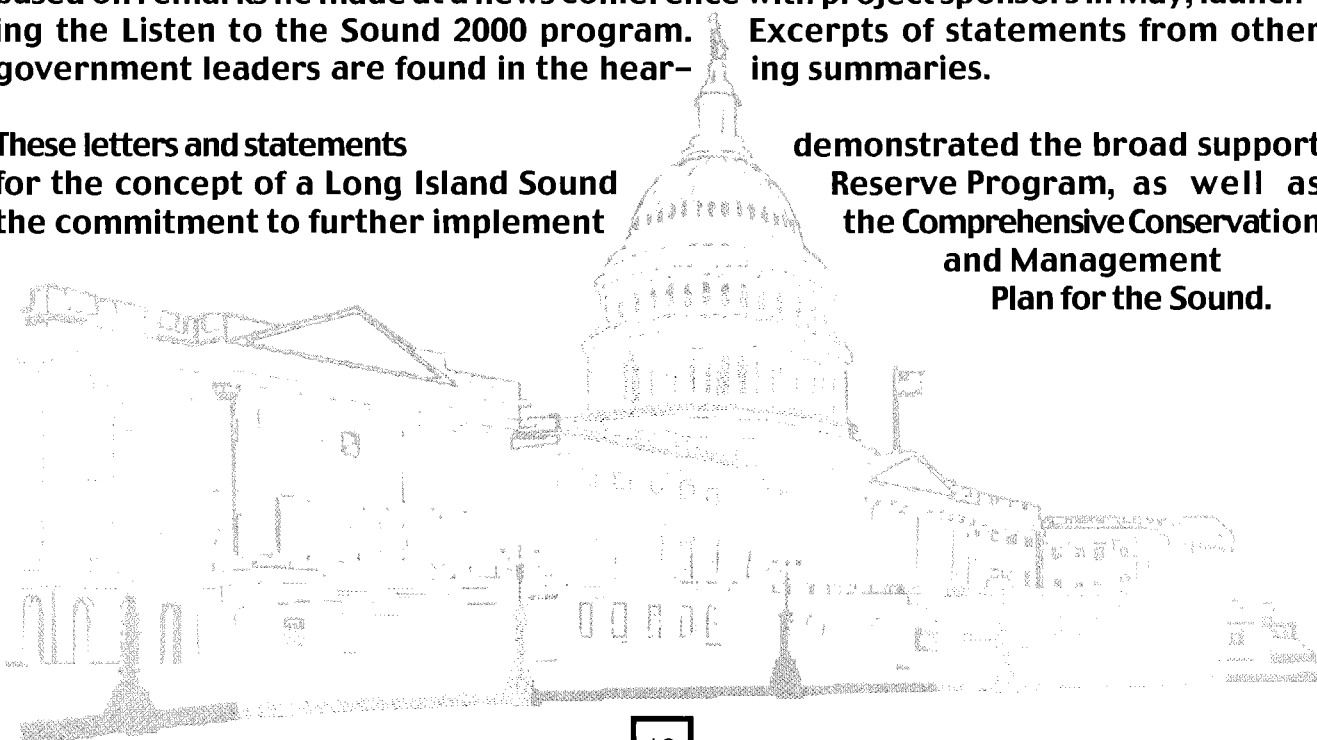
Executive Office

New York Governor George E. Pataki with Audubon's David Miller

During the Listen to the Sound 2000 citizen hearing process, government leaders once again stated their support and commitment to Long Island Sound. Over the next several pages there are three statements of support from the governors of New York and Connecticut, as well as a statement from United States Senator Joseph Lieberman from Connecticut. Both Governor George Pataki (NY) and Governor John Rowland (CT) sent letters of support for the hearing record. Senator Lieberman's statement is based on remarks he made at a news conference with project sponsors in May, launching the Listen to the Sound 2000 program. Excerpts of statements from other government leaders are found in the hearing summaries.

These letters and statements for the concept of a Long Island Sound the commitment to further implement

demonstrated the broad support Reserve Program, as well as the Comprehensive Conservation and Management Plan for the Sound.





STATE OF NEW YORK

August 11, 2000

GEORGE E. PATAKI
GOVERNOR

Dear Friends:

Together we have put together an ambitious agenda for Long Island Sound, improving not only the water quality of the Sound but providing a vision for greater public use and environmental protection. Already, I have made it a priority to fully fund the Environmental Protection Fund (EPF) and dedicate \$200 million of the Clean Water/Clean Air Bond Act to improving the Sound.

For many years the Sound's limited public access has been discussed. With improvements in water quality, that talk must be turned to action. In my 2000 State of the State Message, I announced we will add ten Long Island Sound Access sites over the next ten years, an effort to which we will commit \$25 million.

Although the Sound is a tremendous asset of the State, limited recreational access has compromised the public's appreciation of this great resource. Only a few truly public facilities provide unrestricted access for recreation. Our goal is to add new opportunities for enjoying a restored Sound including: swimming, bird-watching, access for boats, canoes and kayaks, access to trails and scenic vistas, and more. Our projects include the potential for new State parks, several new and improved boat launches, and public shoreside respites. We welcome the fact that many of these projects will be done in partnership with local government. I am pleased that we have already made progress in this regard with the dedication of Nissequogue River State Park, resulting from the adaptive reuse of a portion of a former state psychiatric center into a welcomed public recreational amenity.

I congratulate the National Audubon Society for its sponsorship of the "Listen to the Sound" series of citizen hearings and your endorsement and promotion of a Long Island Sound Reserve System. We welcome the public's ideas on what types of access they would like to see us provide as well as opportunities for partnerships with local government and even the private sector. There is no doubt that the record of these "Listen to the Sound" forums will expand ideas of how to provide greater public access.

New York State strongly supports the creation of a Long Island Sound Reserve system. The State Department of Environmental Conservation (DEC) advocated and developed the language for the reserve system in the Long Island Sound Comprehensive Conservation and Management Plan (CCMP). A Long Island Sound Reserve can help us achieve our goal of improved and protected habitat combined with greater public access.

Friends

August 11, 2000

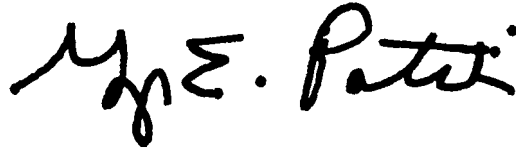
Page 2

As we move forward with the implementation of the State's 1998 Open Space Conservation Plan and its update, the 21st Century Open Space Plan, we will have an opportunity to move forward with the reserve. With the creation of a reserve we can provide protection to critical land and habitats, we can identify those habitats that require restoration, we can protect our existing public access and provide for new opportunities, and we can protect and improve water quality in the Sound's embayments and harbors.

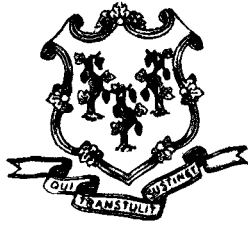
All of these efforts will take resources and creative approaches. Not only must we look towards public funding to accomplish our goals, but we must also seek partnerships with other interested parties. We must also examine those programs landward of the shore such as watershed planning, local municipal planning and even maritime preservation to ensure that all these programs contribute to our common goals.

I know that with a clear vision of a restored Sound we can achieve these goals. I thank the National Audubon Society for bringing so many voices together so that we can achieve that clear vision.

Very truly yours,

A handwritten signature in black ink, appearing to read "M. E. Pateri". The signature is fluid and cursive, with a large initial "M" and a distinct "Pateri" at the end.

National Audubon Society of
New York State
200 Trillium Lane
Albany, New York 12203



STATE OF CONNECTICUT
EXECUTIVE CHAMBERS
HARTFORD, CONNECTICUT
06106

JOHN G. ROWLAND
GOVERNOR

December 20, 2000

Dear Friends:

In 1990, the State of Connecticut and the State of New York committed to improving the quality of Long Island Sound and placed the reduction of nitrogen loads as the top priority. In addition, both states have committed to restore at least 2,000 acres of coastal habitat and 100 miles of riverine migratory corridor by 2008.

The first phase of the commitment was to freeze the level of nitrogen entering Long Island Sound. The second phase involves retrofitting selected sewage treatment plants. Since 1996, I have committed approximately \$500 million on treatment plant renovation projects statewide to achieve a higher level of nitrogen removal. The State of Connecticut has managed to reduce the statewide point source of nitrogen by an estimated 15% through cooperative state-municipal efforts.

The State of Connecticut, together with New York has aggressively moved forward with development of a Total Maximum Daily Load (TMDL) strategy to improve water quality. Over the next 15 years, we have pledged to reduce the levels of nitrogen by 58.5%. Already, Connecticut has noticed a gradual improvement to the overall health of Long Island Sound. It is evident from the high numbers of flourishing marine species that the Sound is becoming increasingly healthier and supporting abundant marine resources.

I applaud the efforts of the National Audubon Society, Save the Sound, and the Regional Plan Association for its sponsorship of the "Listen to the Sound" series of citizen hearings. As Connecticut builds on the successes of the 1990's, Connecticut's Department of Environmental Protection is looking toward new, innovative approaches to meet the water quality needs of Long Island Sound. The Connecticut Department of Environmental Protection is always looking for the cooperation of the public as well as the private sector to contribute ideas, suggestions and resources to accomplish our goals.

Sincerely,

A handwritten signature in cursive script that reads "John G. Rowland".
Governor

NEWS RELEASE



FOR RELEASE

U.S. SENATOR JOE LIEBERMAN CONNECTICUT

Dan Gerstein; Director of Communications 202.224.0414, 202.966.0131 (H)

Kelly Moore; Press Secretary 202.224.9965, 202.224.6095 (Actualities)

Leslie Phillips; Communications, Governmental Affairs Comm. 202.224.0384, 202.338.3372 (H)

Home Page: <http://www.senate.gov/~lieberman/>

Senator Lieberman kicked off the Listen to the Sound 2000 hearings on May 22, 2000. The following is a summary of his remarks.

I am pleased to be here today to encourage people to come out and testify at the Listen to the Sound 2000 hearings. As those of you with long memories may recall, I was able to participate in the first set of Listen to the Sound citizen hearings ten years ago. Those first hearings played an important role in generating public consensus about our goals for cleaning up the Sound. The 2000 series of hearings will address a more specific, but equally important question: Is there a need for a Long Island Sound Reserve System, and if so, what form should it take? I believe that this is a timely and important question, and one whose answer also will require broad public input.

The Long Island Sound is home to roughly 10 percent of the American population and is an important national environmental asset, yet it has traditionally received notably less national attention and federal funding than other estuaries such as the Chesapeake Bay. We here in Connecticut certainly realize that the waters and watershed of the Long Island Sound are extraordinary natural resources, cherished by both residents and visitors for varied wildlife habitat, sandy beaches, recreational and commercial fisheries, successful industry, and historical sites. I believe that one way to raise the profile of the Sound while advancing our cooperative conservation efforts would be to create a Long Island Sound Reserve System.

Over the past few months, I have been looking into drafting legislation to authorize the creation of such a Reserve System. I have studied several models, from broadly defined examples such as the Northern Forest and the Chesapeake Bay to the more narrowly defined example in our own Long Island Sound Comprehensive Conservation Management Plan. Because of the variety of possible designs, I believe that incorporating the public's opinions will be crucial to creating a widely accepted and workable Reserve System. Consequently, I hope that many people come forward during the Listen to the Sound 200 hearings to offer their individual visions of a Reserve System. Regardless of its specific design, a Long Island Sound Reserve System could focus attention on the unique attributes of the Sound and the need for a greater federal partnership on open space and restoration projects.

In closing, I would like to emphasize how critical I believe it is that we engage in this dialogue at this time. The Long Island Sound region is a beautiful place, and we have made a great deal of progress in restoring its land and water over the past two decades. However, the die-off of many of the Sound's lobsters last fall reminds us that much remains to be done. Creating a Reserve System could enhance our ability to restore the natural environment with direct benefits for the long-term economy from clean water, wildlife habitat, and recreational opportunities for generations to come. Living as we do along one of the most densely populated stretches of coastline in the United States, we need to act now to further our efforts to restore and protect valuable habitat and open space. By doing so, we will secure the health of the Sound and ensure that this wonderful resource will be enjoyed by our children's children.

Citizens' Agenda

Creating a Long Island Sound Reserve Program

Introduction

Great strides in the restoration of Long Island Sound have been made over the past decade. Its waters are becoming cleaner and major infrastructure dollars have been allocated to up-grade sewage treatment plants. Additional funds will be needed to continue the clean-up of Long Island Sound for the job is far from over.

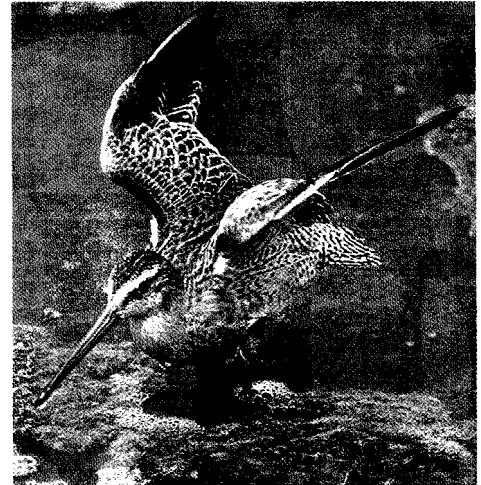
However, as society implements these positive changes, there remains the issue of the character of the Sound's coastline. As each decade passes, more and more of the Long Island Sound coastline is developed, leaving only small remnants for birds, wildlife and citizens to enjoy. At current rates of growth, less than a decade remains to protect what is left of the Sound's shoreline. And if these trends continue, ironically, most of the citizens who have bankrolled the clean up of the Sound will be prevented from visiting its waters and enjoying the rewards of these investments.

The coastal zone of Long Island Sound must be protected, properly managed and, where possible, restored for future generations. These actions will provide great ecological and economic benefits for all. This Listen to the Sound 2000 Citizens' Agenda proposes to address these issues through the creation of a Long Island Sound Reserve.

The Reserve Concept

The Long Island Sound Reserve will provide for the preservation, restoration and improved stewardship of the Sound's shoreline and adjacent resources. It will also provide for public access to these places, consistent with the larger goal of conserving the Sound's ecological values. Specific outcomes will include:

- Creating a network of protected natural areas to ensure that remaining undeveloped and undisturbed sites are permanently preserved. Our goal will be to protect the vast majority of remaining undeveloped shoreline parcels through concerted municipal, state, federal and private conservation initiatives.
- Restoring resources that have already been destroyed or debased to recreate a critical mass of wildlife habitat, wetlands, accessible urban waterfronts and other resources.
- Improving stewardship of public and private lands to ensure preservation of the Sound's water quality, habitat and recreational resources. Stewardship activities will include improved maintenance of existing public parks, adoption of model local codes and regulations requiring development setbacks, vegetative screening and buffer areas, and public education designed to discourage damaging activities, such as chemical lawn fertilizer applications on properties adjoining the Sound and its tributaries.



Michael Bochnik

- Providing reasonable public access to the Sound to be consistent with the goal of protecting the ecological values of reserve lands and safeguarding the privacy of waterfront communities and property owners.

● ————— Precedents

Other northeastern states from Maine to Maryland have adopted ambitious programs to protect and provide public access to their coastlines. Highlights of these programs include:

- Massachusetts' coastal acquisition program, begun in the late 1970s, has committed hundreds of millions of dollars to acquiring dozens of barrier beaches and islands, rocky headlands, public access sites, more than 30 islands in the Boston Harbor Islands State Park and the Waquoit Bay National Estuarine Reserve on Cape Cod.
- Rhode Island has protected dozens of open properties in its Narragansett Bay Island Park System, including the Prudence Island National Estuarine Reserve, and others on Block Island, and other coastal areas.
- New Jersey has had an aggressive statewide Green Acres program for more than two decades that has protected a number of coastal properties. In addition, the state's Supreme Court has required that town beaches be made available to the general public.
- Maryland has created a network of coastal reserves in the Chesapeake Bay, and has adopted strict regulations over new development in the bay that reduce overall densities and require setbacks and vegetative buffers from the bay.

Even New York state has had an ambitious coastal acquisition and public access program on its Atlantic coastline; most of Long Island's Atlantic shoreline is permanently protected as federal, state and municipal parkland. In comparison with these efforts, Long Island Sound is virtually the only section of the entire northeastern coastline that has not benefited from a major public commitment to land conservation and public access, making it one of the most vulnerable and inaccessible sections of coastline in the country.

What's at Stake? ————— ●

What's at stake is the very soul of the Sound and its waterfront communities, and the integrity of the Sound's ecological systems. It has been estimated that approximately 80% of the Sound's wetlands have already been destroyed. Only a handful of state parks are truly accessible to the general public. Most town beaches in both New York and Connecticut limit access to local residents only, and in any event, these beaches protect only a small section of the entire shoreline of the Sound. Approximately 10% of its shoreline remains undeveloped, and these lands are under tremendous growth pressure. Unfortunately, with today's hot economy and pressures for over-development, these remaining open lands will be subject to "industrial strength" development, including "McMansions," golf course communities, marinas and office parks. These "improvements" will obliterate what's left of the Sound's natural shoreline. And inappropriate development of these places will impair the Sound's visual quality for visitors, boaters and waterfront residents.

These few remaining natural areas are also a critical element of the Sound's ecological health and vitality. The Sound's dwindling network of unspoiled uplands, dunes, bluffs, tidal rivers, wetlands, flats and other natural features are an integral part of the Sound's natural systems. They filter pollution and provide habitat for birds, mammals and insects, and provide shelter for shorebirds, shell and fin fish. Destruction of these values could ripple through the ecological chain of the entire estuary, making the Sound less resilient to natural and man-



Gorhams Pond

made stress. After spending billions of dollars to restore the Sound's water quality, if these natural resources are lost, we could end up with a relatively clean but permanently impaired estuary, instead of a healthy, self-sustaining one.



Categories for the Reserve

In the creation of a Long Island Sound Reserve program, it is critical that there are a diversity of categories to meet the unique needs and opportunities of Long Island Sound. Throughout the ten citizen hearings, we heard specific suggestions including Marty Garrell's (of Long Island) call for inclusion of underwater lands. Richard Amper of the Long Island Pine Barrens Society called for protection of the coastal bluffs, dunes and beaches of the Island's North Fork, and in particular the 600-acre KeySpan property in Jamesport. Nancy Seligson, of Westchester, urged that a category be created for vista parks at the end of the streets, where people could sit and enjoy the Sound. The New York League of Conservation Voters emphasized the need for urban paths, where public access as well as habitat restoration could take place. The Connecticut chapter of the Nature Conservancy spoke on the importance of protecting sites with unique habitat types where a variety of threatened and endangered species can be found. National Audubon called for protection of Important Bird Areas both in Connecticut and New York.

With these comments and many more, a Long Island Sound Reserve program must cast a wide umbrella and be all-inclusive. The recommended categories for a Long Island Sound Reserve program are listed below with examples to follow in the next chapter.

Coastal Bays and Points, where some of the greatest diversity of birds, wildlife and marine life exist.

Dunes and Bluffs, which are unique and disappearing habitat types on Long Island Sound.

Barrier Beaches, which are evolving through nature's changes and need buffer land protection to survive.

Islands, which make up a necklace of crown jewel lands around the Sound – some protected and others threatened by development.

Underwater Lands, where the marine life needs to thrive and where protection is critical.

Public Access Sites for urban, suburban and rural communities, so that citizens can get to Long Island Sound, connect with the resource and become stewards of the Sound.

Habitat Restoration Areas are critical to begin to restore what has been destroyed on the shores of Long Island Sound.

Private and Public Conservation Lands including federal lands, state parks, local parks and private land trusts/conservation lands. These protected sites provide a foundation for a Long Island Sound Reserve program and can be examples of proper stewardship and management approaches.

These categories help provide a working definition of a Long Island Sound Reserve program and enable society to look at a multitude of mechanisms to achieve the conservation goals of a reserve system.

Mechanisms for the Reserve and Stewardship: An Action Plan

At Listen to the Sound 2000 hearings, citizens testified for more dollars for land acquisition, more dollars for conservation easements, more dollars for planning and more dollars for stewardship and restoration projects at specific sites. Citizens also called for improved zoning on a local level to protect the Sound's coastline, as well as increasing public education for people of all ages. This citizens' agenda recommends that the following mechanisms be created/enhanced to support a Long Island Sound Reserve program.

I. Creation of a Long Island Sound Open Space Plan. The states of Connecticut and New York would join forces with civic and environmental groups to create an open space plan for Long Island Sound. Using the model developed when the Habitat Restoration Plan was adopted and following techniques used by New York state in the creation and updating of their state Open Space Plan, both states would jointly produce an open space plan by 2003. The plan would have a section on all of the major categories of the Long Island Sound Reserve program. The Listen to the Sound 2000 partners (National Audubon, Regional Plan Association and Save the Sound) would play an active role in this process.

This plan would be updated every two years, be subject to public hearings and have regional advisory committees in different regions of the Sound to help identify sites. The Listen to the Sound 2000 hearing record can be used as an informational base to support this effort.

With a Long Island Sound Open Space Plan in place, the states and federal government would have a blueprint to authorize the use of public dollars for a Long Island Sound Reserve program. All sites authorized for funds would be from willing sellers.

II. Creation of a Long Island Sound Open Space Account. It is recommended that the states of New York and Connecticut create a Long Island Sound Open Space Account. Each state already has land protection funds in their annual state budget. Therefore, it is recommended that each state at a minimum:



Quinnipiac River Watershed Association

- set up a Long Island Sound Open Space sub-account;
- appropriate and initial fund of \$100 million (\$50 million from each state) for this account an aggressively use this fund to protect priority sites identified in the open space plan, as well as storm-damaged and flood-prone properties through state, municipal and private acquisition;
- seek matching federal funds for this purpose through the Land and Water Conservation Fund, and special federal funds appropriated for the Long Island Sound Reserve program or for expansion of the Stewart McKinney National Wildlife Refuge;
- provide additional funds annually to replenish this fund and meet unexpected needs of larger sites that come on the market;
- roll-over unused funds from one year to the next to ensure that they are used for purchases of open space on Long Island Sound.

III. Local Community Assistance and Planning Programs. Not all lands in the Long Island Sound Reserve program will be purchased by local, state or federal governments. Therefore, it is critical that local governments are given planning tools and mechanisms to ensure that their coastlines remain vibrant and properly managed.

It is recommended that the states and federal government provide community assistance funds to all coastal communities to establish local open space plans, as well as waterfront revitalization plans for their communities. These planning processes will not only identify critical parcels in need of protection, but will also provide direction to local towns on where their zoning laws may need to be changed to protect the character of their communities and Long Island Sound coastlines. Zoning could be used, for example, to reduce development densities, increase setbacks, and require vegetative buffers in designated conservation areas.

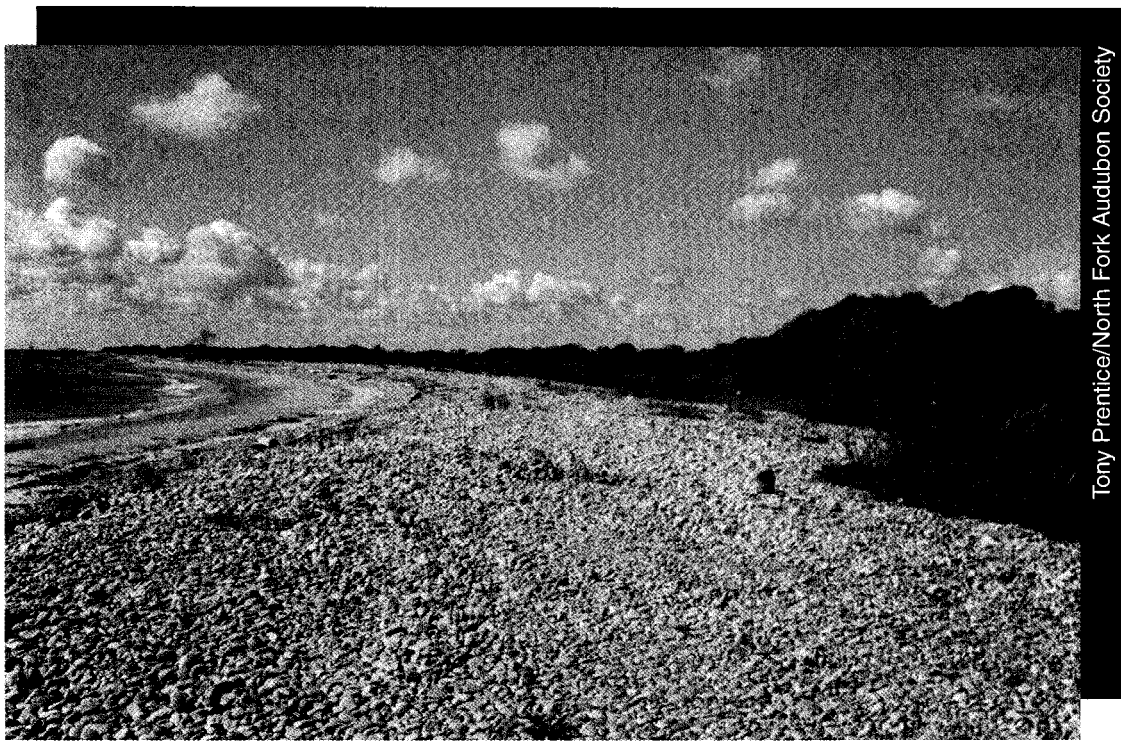


Tim Holstrom c/o The Trust for Public Land

Chandler Estate, Mount Sinai Harbor, NY

Both states have coastal zone programs that contain some of these elements. They need to be expanded and fully funded to address the needs outlined. In addition, each state should allocate adequate funds so, at a minimum, five new communities can participate in open space and/or water revitalization planning processes.

IV. Conservation of Private Lands Program. There are many lands along the shores of the Sound, which will always remain in private ownership. These lands can become part of a Long Island Sound Reserve program if the private land-owner agrees to enter into a voluntary conservation program with the state. In return, the state could purchase some conservation, scenic or trail easements on these lands or provide tax incentives for their conservation actions.



Therefore, it is recommended that a Long Island Sound Reserve Program Certificate be awarded to private land-owners that wish to enroll and agree to certain conservation actions. Actions could include, but are not limited to:

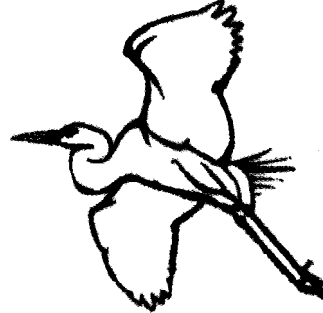
- developing habitat management plans for the property;
- creating additional buffer lands to the coastline and rivers;
- changing management practices on lands to reduce run-off, use of lawn pesticides or restore natural plant species;
- allowing habitat restoration projects to take place on their lands;
- allowing public access to Long Island Sound on a portion of the property; and
- selling or donating development rights of the property to the state.

These are some examples of activities that could take place as part of a private lands program. Private lands eligible for this program could include a wide variety of property types, from farms to corporate headquarter lands to rural/suburban private estates to wetlands or islands or other types of private land holdings.

V. Stewardship of Existing Parks and Private Conservation Lands. Today's parks and private conservation lands should all be part of a Long Island Sound Reserve program, but with that commitment must come additional funds and a commitment to improved stewardship of these properties. The states of Connecticut and New York, as well as federal agencies must increase their funding for improved stewardship of public and private conservation lands, including restoration and improved maintenance of these recreational and natural resources. A precedent of this initiative can be found in the Massachusetts coastal reserve program, through which existing state reservations were restored and their management was improved.

In these places, for example, dune systems were reclaimed, parking lots and camping areas were thinned out and revegetated with native plant species, new and less obtrusive bathhouses and comfort stations were built in and new interpretive trails and programs were instituted. Whether it is the McKinney Refuge, the Nature Conservancy's Griswold Point Preserve, Hammonasset State Park or New York's new Nissequogue River State Park, funds must be provided for similar stewardship activities. Stewardship activities include:

- improved maintenance of existing facilities;
- restoration or replacement of park facilities;
- habitat restoration on site;
- research programs on site;
- educational programs on site; and
- acquisition and protection programs for adjacent lands to these private, state and federal parks and preserves.



New York has a stewardship account in its Environmental Protection Fund and Connecticut has recently allocated some funding to park enhancements, but much more needs to be done. A stewardship program at all federal and state parks on the Sound would go a long way to making them part of a Long Island Sound Reserve program.

It is important not only to protect those lands threatened by development, but also to protect those lands that may be threatened by neglect.

Government Actions: Federal, State and Local

The Long Island Sound Reserve is envisioned as a partnership between federal, state and local governments and private land conservation organizations. Specific steps can and should be taken to formally establish the reserve concept and to clarify how all the partners can most effectively work together to ensure success for this effort. Key steps that can be taken to firmly establish the structure for the reserve follow:

Federal Legislation [2001-2002]:

Congress should enact federal legislation establishing the framework for the Long Island Sound Reserve system. Key elements of the proposed federal legislation include:

- I. Purpose.
- II. Framework for the reserve, including the clear intention that the reserve is a partnership between federal, state and local governments, and private land conservation organizations.
- III. Resources eligible for inclusion in the reserve.
- IV. Authorizes appropriations including, but not limited to, the Land and Water Conservation Fund for land acquisitions and conservation.

- V. Enabling authority for allocation of federal funding for research, monitoring, education, restoration, land acquisition, maintenance and management activities related to the reserve.**
- VI. Contingency fund for purchase of storm-damaged coastal properties for inclusion in the reserve.**
- VII. Clarification that lands to be added to the reserve should be the result of successful negotiations between willing buyers and sellers. To protect private property rights, condemnation should not be a tool that is used to establish the Long Island Sound Reserve.**
- VIII. Designation of specific federal land holdings as part of the reserve (e.g. Lands held under the Stewart B. McKinney National Wildlife Refuge; certain lands held under the Silvio B. Conte National Fish and Wildlife Refuge; other federally owned land that meets the criteria set forth in Section III, above).**

Governors' Agreement [2001]:

New York Governor George Pataki and Connecticut Governor John Rowland should jointly develop and sign an agreement committing the states of New York and Connecticut to development and implementation of a Long Island Sound Reserve system. This type of agreement will continue a tradition established by the signing of the first Long Island Sound Agreement in 1994, and a second in 1996. Earlier agreements have been the catalyst for significant efforts and expenditures by both states to restore and protect the Sound. In carrying out this new agreement, the governors should work in close cooperation with federal and local government and private land conservation organizations. The new agreement should also commit the governors to developing a consistent look for signs identifying sites to be included in the reserve.

State Legislation [2002]:

State legislative bodies in both Connecticut and New York should enact legislation formally establishing the Long Island Sound Reserve and designating specific state-owned properties for inclusion in the reserve system. Key elements of the state legislation include:

- I. Purpose.**
- II. Framework for the reserve, including the clear intention that the reserve is a partnership between federal, state and local governments, and private land conservation organizations.**
- III. Resources eligible for inclusion in the reserve.**
- IV. Authorization of appropriations from the states for land acquisitions and easements.**
- V. Enabling authority for allocation of state funding for research, monitoring, education, restoration, maintenance and management activities related to the reserve.**
- VI. Contingency fund for purchase of storm-damaged coastal properties for inclusion in the reserve.**

- VII. Clarification that lands to be added to the reserve should be the result of successful negotiations between willing buyers and sellers. To protect private property rights, condemnation should not be a tool that is used to establish the Long Island Sound Reserve.**
- VIII. Designation of specific state land holdings as part of the reserve (e.g. state park and forest lands located along the coast or tidal rivers; coastal access points, including boat ramps; other state-owned lands that meet the criteria set forth in Section III, above).**
- IX. A mechanism for local governments and private land conservation organizations to designate their land holdings as part of the Long Island Sound Reserve.**

Local Government Actions [ongoing]:

Local governments, by vote of the local legislative body, may take action to formally designate open space lands that meet the criteria set forth in state and federal legislation as part of the Long Island Sound Reserve. Lands so designated should be posted with consistent signage to identify them as part of the reserve system. The owners of lands so designated would be eligible for federal or state funding that may be available for carrying out the purposes of the reserve, including education, research, monitoring, restoration, maintenance, management and land acquisition.

Private Land Conservation Organizations [ongoing]:

Private land conservation organizations, by vote of their board of directors, trustees or board of governors, may take action to formally designate open space lands that meet the criteria set forth in state and federal legislation as part of the Long Island Sound Reserve. Lands so designated should be posted with consistent signage to identify them as part of the reserve system. The owners of lands so designated would be eligible for federal or state funding that may be available for carrying out the purposes of the reserve, including education, research, monitoring, restoration, maintenance, management and land acquisition.

Kimberley L. Ray



Conclusion

Through the Listen to the Sound citizen hearing process, we heard a chorus of voices in support of the Long Island Sound Reserve concept. This agenda reflects the citizens' energy, commitment and thoughtful suggestions to make a Long Island Sound Reserve system successful. It is imperative that government leaders at all levels heed these voices and work to make the Long Island Sound Reserve program a reality.

Categories of a Long Island Sound Reserve Program

Creating a Long Island Sound Reserve Program

From Old Saybrook to the Bronx, from Greenwich to Oyster Bay, and from New Haven to Southold, there are outstanding opportunities to create a Long Island Sound Reserve. Citizens from the ten Listen to the Sound hearings came forward with suggested sites from small public access areas to islands in the middle of Long Island Sound. In

Appendix A of this report, a complete listing of all the sites suggested is organized in a matrix format. Highlights from these recommended sites are listed below and organized by the major categories recommended in the citizens' agenda chapter.

In reviewing these categories and highlighted sites, it is important to recognize that the Long Island Sound coastline is a disappearing resource. Without a reserve program, many of the examples described may no longer exist several years from now.



Tony Prentice/North Fork Audubon Society



David Kunsler

With these threats in mind, here is a complete description of Long Island Sound Reserve recommended categories and representative examples provided to us during the Listen to the Sound 2000 hearings.

Twin Islands

Coastal Bays and Points

This category represents some of the most ecologically significant sites on the Sound. Coastal bays are nurseries for marine life, as well as critical habitat for shorebirds. Coastal points provide vital staging areas for migratory shorebirds and in many instances shelter breeding needs.



Tony Prentice/North Fork Audubon Society

In New York state, an example of a critical point and bay is the new Nissequogue River State Park. These coastal lands at the mouth of the Nissequogue River stretch out into Long Island Sound, while providing a mixture of inlets and coves.

In Connecticut, there are numerous coves and bays at the mouth of the Connecticut River. These areas provide vital habitats. Development pressures are mounting on the remaining open spaces and wetlands adjacent to the Sound and are no where more pressing than where the Connecticut River empties into the Sound.

Dunes and Bluffs

These habitats are vanishing before our eyes. Once abundant along the north shore of Long Island, as well as in pocketed areas in eastern Connecticut, dunes and bluff habitats are few and far between. Dunes protect interior lands from storm damage and provide vital wildlife habitat. Bluffs provide scenic vistas, as well as bird habitats.

The best example of these unique dune and bluff habitats is the Grandifolia Dunes outside of Riverhead, New York. As described earlier in the case statement chapter, the loss of the Grandifolia Dunes is a tragedy. It can only be hoped that the other dune and bluff habitats at the neighboring KeySpan property are purchased by New York state and made into a state park. The Sound cannot afford losing anymore of this vanishing habitat.

Barrier Beaches

These beaches provide for wildlife and bird habitats, as well as incredible recreational opportunities. One of the most pronounced barrier beaches on Long Island Sound is Long Beach, adjacent to the Great Meadows Marsh in Stratford, Connecticut. These beaches provide a natural barrier between wetland complexes on the Sound and its open waters, and host a vast diversity of wildlife. Rare and endangered shorebirds such as the Piping Plover breed along its shore. Increased development pressures and unmanaged recreational activities threaten the future of this habitat.

It is critical that private lands along this barrier beach be acquired from willing sellers and that recreational rules for protected shorelines be enforced. On the New York side of the Sound, a similar barrier beach stretches eastward from Southold towards Orient Point. Numerous sites along this corridor are in need of permanent protection.

Islands

Throughout Long Island Sound, there are unique islands. Many of these islands off the Connecticut shoreline from Branford to Norwalk have become part of the Stewart McKinney Wildlife Refuge. They provide a haven for a diversity of bird species, marine mammals, as well as nurseries for marine life. Many islands have been designated by National Audubon Society as Important Bird Areas due to their unique habitats.

Several islands remain unprotected and should be purchased and transformed into state parks or added to the existing McKinney Refuge. Calves Island, off the coast of Greenwich, Connecticut, needs to be purchased using Land and Water Conservation Funds and incorporated into the McKinney Refuge System. In New York, both David's and Huckleberry Islands should become state parks and have passive recreational opportunities. Both of these islands are threatened by development proposals.

Underwater Lands

As one travels several hundred yards off shore along the coastline of Long Island Sound, some of the most biologically rich and productive areas are found. In these waters, the underwater lands provide critical habitat to marine life, from oysters and clams to flounders and bunker to sea grass and other marine vegetation. As part of the Long Island Sound Reserve, it is important to set aside the most productive of these sites from unnecessary disturbance. In many instances, habitat restoration is critical for native marine vegetation. There are numerous examples of critical underwater lands throughout the Sound, whether in the Stony Brook harbor or the shellfish beds off Oyster Bay or the critical habitats along the near shores where the Housatonic and Connecticut Rivers enter the Sound. While these areas are known for their biological benefits, the reserve program should embark on a more comprehensive review of underwater lands, rank their condition and set forth appropriate conservation measures.



Marian Heiskell



Public Access Sites: Urban, Suburban and Rural

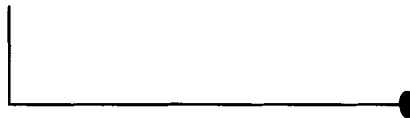
Long Island Sound has some of the most limited public access of an estuary its size in the nation. At each citizen hearing, people called for more public access whether along some of the rural shorelines on the North Fork, or the suburban coasts of Fairfield County, Connecticut, or on the urban shores of New York City. Everyone emphasized that we should increase public access to Long Island Sound.

Governor Pataki of New York state has announced a program, where he has dedicated 25 million dollars over the next 5 to 10 years to create state-owned, public access sites. This initiative will connect more people to the Sound and build a stronger constituency for its protection.

In some areas, public access must be delicately balanced with the town's home rule. Many town parks on Connecticut shores only allow entrance to local residents. While respecting these historic ordinances, the reserve program must be creative in providing more public access sites and opportunities so the greater society can be served.

Examples of new public access sites include a small boat launch and beach area near Southold, New York. Near Huntington, New York, the new Nissequogue River State Park will provide public access for boaters and beach strollers alike. In Connecticut, there are opportunities in urban settings for boat launch sites in New Haven and Bridgeport. And in New York City, there are brownfield sites that could be cleaned-up and restored to become part of a network of passive parks and boat access points. In Westchester, the concept of street-end access points was raised as an example. These sites were described as primarily for those who would like access to a view of Long Island Sound and enjoy their lunch on a park bench. While small in size and scale, street end access points with 6 to 10 parking spaces can provide yet another important connection to Long Island Sound.

The states of Connecticut and New York and communities across the Sound need to aggressively pursue public access sites and ensure that they are a major element of their open space plans under a Long Island Sound Reserve program.



Habitat Restoration Areas

Under the Long Island Sound Habitat Restoration Plan (EPA – 1997) and the September 2000 Habitat Restoration Memorandum of Understanding, between EPA, the Fish and Wildlife Service, the states and conservation groups, hundreds of habitat restoration sites have been identified. They range from planting native sea grasses in Long Island coves, to restoring shoreline habitats in the Bronx, to enhancing tidal wetland systems along the Connecticut shoreline, to restoring fish passages in its rivers. The habitat restoration plan and program outlines the major habitat categories along Long Island Sound and prioritizes its actions based on this work.

At every Listen to the Sound hearing, there was testimony in support of habitat restoration. In addition, there was equal support to embrace the current habitat restoration plan and make it a major component of the reserve program. Funding for these habitat restoration projects is critical and by being linked to the reserve program it is hoped that more federal, state and local dollars could be utilized. A complete listing of all the habitat restoration sites and a reference to the Habitat Restoration Plan is in Appendix A.

Private and Public Conservation Lands

Already, there is a strong foundation of protected lands on the shores of Long Island Sound. These lands are in federal, state or local government or in private conservation ownership. For example, the Stewart McKinney Wildlife Refuge with its host of coastal islands, as well as the Great Meadows Marsh, is a biological treasure. In Connecticut, Hammonasset State Park is one of several shoreline and beach sites which offers swimming, beach bathing, hiking and a host of other recreational activities. In New York, Sunken Meadow State Park and the new Nissequogue River State Park provides access to the Sound and activities such as fishing and picnicing.

Local parks exist on Long Island, Westchester and Connecticut and vary in size and purpose. The Edith Read Sanctuary and Marshlands Conservancy in Westchester provide hiking trails and educational opportunities to learn the wonders of a tidal marsh. Town parks in other locations vary from beach going areas to picnic areas with scenic vistas. The private conservation lands are wildlife sanctuaries or have nature centers for educational programs. Connecticut Audubon's Milford Point Education Center provides a unique learning experience for those who visit the Sound.

The common trend to all of these already protected sites is that they have adjacent lands that are threatened by development. Whether they are river corridor lands upstream from Hammonasset State Park or development proposals on barrier beaches near Milford Point or the sub-division of a large estate neighboring one of New York's



state parks on Long Island's north shore, priority must be given to purchase and protect lands next to these sites. The Stewart McKinney Wildlife Refuge has been expanding over the past decade as new critical coastal islands or marshlands are available on the real estate market. Calves Island off Greenwich is a perfect example and needs to be purchased by the federal government as quickly as possible.

As part of the reserve program, a clear strategy needs to emerge to purchase lands to expand our parks system, whether federal, state, local or private. These parks and protected lands are the foundation, the roots and base of a Long Island Sound Reserve system. All protection and stewardship action will build upon these conservation successes. Therefore, buying lands or easements from willing sellers adjacent to our currently protected areas can only protect the integrity of the Long Island Sound Reserve system.



Below is an example from each state of a critical land protection project under review as this report was printed. These are but two examples of the scores of lands currently threatened by development around the Sound.

- KeySpan at Riverhead/Wading River and Jamesport, New York – two parcels totalling over 1,500 acres of open space on the north shore of Long Island.
- Griswold Airport in Madison, Connecticut – 42 acres of critical habitat adjacent to the Hammonasset State Park.

Conclusion

These categories provide the framework for the Long Island Sound Reserve system. It is a system that is flexible and balances recreational and ecological needs. By enhancing our existing protected areas, creating new parks, restoring more habitats and providing increased access, a Long Island Sound Reserve system can be created that will benefit all for generations to come.

Citizen Hearings



Summaries of the Ten Listen to the Sound Citizen Hearings

May 30 - June 29, 2000

Over the next 75 pages, you will read the summaries of the ten Listen to the Sound 2000 citizen hearings. These hearings, held in ten locations, had 200 people testify and nearly 600 people attend. The summaries were based on over 1,200 pages of transcripts and several hundred pages of written testimony.

These citizen hearing summaries not only make a compelling case for Long Island Sound, but also provide the basis for the Citizens' Agenda and Reserve Category chapters in this report. Once again, the people of Long Island Sound became the voice of the Sound. Our job is simple - to Listen to the Sound.



**ESSEX,
CONNECTICUT**

35

Essex, Connecticut

Essex Town Hall
Tuesday, May 30, 2000

On May 30, 2000, nearly 100 people gathered at the Town Hall in Essex, Connecticut for the first of 10 Listen to the Sound 2000 hearings. Individuals, as well as representatives from a variety of organizations,

The watershed is a victim of sprawl and environmental degradation as it becomes "congested and overgrown".

~ Ted Crosby

offered written and spoken testimony. The hearing was chaired by Carolyn Hughes of National Audubon Society - Connecticut.

The Sound, which was described as an important "complex web of natural systems" by James F. Spallone, attorney in Old Lyme and candidate for state representative from Connecticut's 36th house district, is a deeply respected and adored waterway.

Many professed the importance of preserving local waterways. According to Ted Crosby of the Old Lyme Conservation Trust, the watershed is a victim of sprawl and environmental degradation as it becomes "congested and overgrown".

Recognizing that the cost of saving many of today's waterways will be high, David Sutherland, director of government relations of The Nature Conservancy's Connecticut chapter, encouraged all present to think really big in terms of dollars, "It's going to take an awful lot of dollars to preserve coastal habitat in southern New

England...but as expensive as they seem to us right now, in 30 years the prices that we would pay now are going to seem like pittance."

Sutherland suggested that we also assess abutting upland areas, river corridors and coastal bluffs for inclusion in the reserve, in addition to tidal wetlands.

Comments on the Reserve

Many participants who commented on the reserve concept acknowledged the importance of the Sound to the entire ecosystem. During the hearing various speakers spoke in favor of the reserve concept, which could safeguard Long Island Sound coastal areas through land protection efforts.

Wayne Orsie of Old Saybrook and Lawrence Cyrulik, conservation chairman of Mattabeseck Audubon Society voiced their concerns about the need for scientific data. In an effort to continue to convince the public of the magnitude of the environmental decay, Cyrulik said it

is critical that “we also must continue retrieving scientifically valid and legally supported data from the field to support the concept of the reserve system.”

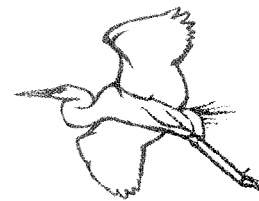
Chester Arnold, president of the Essex Land Conservation Trust (ELCT), stated that while the organization supports the general reserve idea, they maintain that careful presentation of the concept is of the utmost importance: “The system sounds a little bit like a federal land grab or a top-down approach.” Arnold suggested that the reserve concept include a strong system of support for local conservation, including information, funding and emphasis on regional collaboration.

Grant Westerson of the Connecticut Boating Advisory Council voiced concern, stating, “The thought of a reserve scares the devil out of me.” Westerson’s objections were based on zoning and wetlands regulations that he felt were “already almost insurmountable,” negating

the need for a reserve. He called for moderation in crafting a reserve.

Past resident of Ivoryton on Falls River and National Audubon Society of New York State director of operations, Rick Werwaiss said, “this reserve system is something to embrace, not fear,” noting that it will increase public access to beaches and coastal parks,

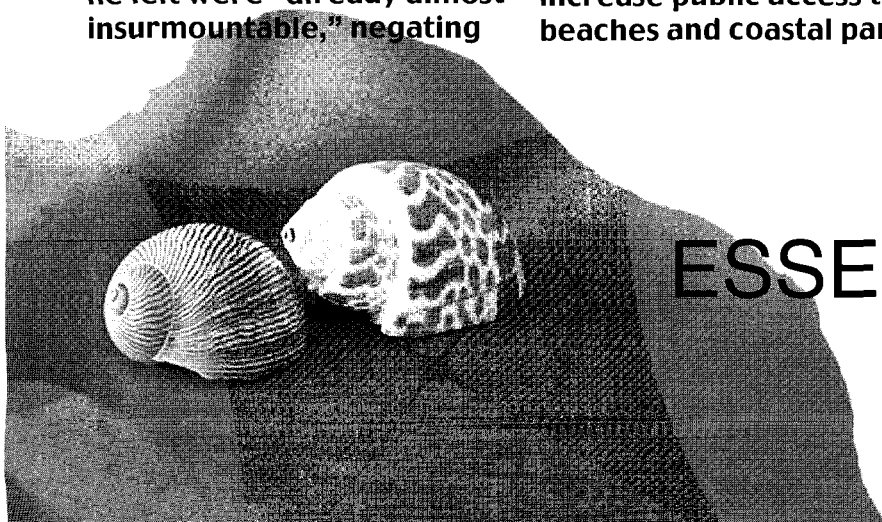
docks and launch areas. Werwaiss emphasized the importance of the effort to ensure that future generations can grow to love Long Island Sound, “like we all have.”



David Sutherland

James Morgan

37



ESSEX

Sites in the Area for the Reserve System

Several participants reminded the attendees of the rising value of the Sound to their community as a viable waterway and coastal zone. "Our culture, our heritage, our economy is so tied to this river (the Connecticut River), which is tied to the vibrant health of the Sound, that it's in all our

"There is precious little open space left along Long Island Sound."

~ Evan Griswold

interests obviously to maintain a clean Sound," asserted Peter Webster, Essex First Selectman. Participants recommended an array of potential sites that could be included in a reserve system.

Geb Cook, board member of the Fishers Island Conservancy, proposed the inclusion of environmentally critical islands and reef areas in eastern Long Island Sound. These areas and their surrounding waters comprise the following islands: Plum Island, now government owned; Great Gull Island; Little Gull Island; and Fishers Island, with its surrounding inlets, reefs and ledges. Great Gull Island is a known bird rookery, and of great value to a huge colony of rare nesting terns. Cook also mentioned the race with its tidal passages of enormous volume, speed and power; areas where Long Island Sound pours into the Atlantic Ocean and where the value of marine life to the balance of nature is truly incalculable. "Help us please to both preserve and reserve this vital area," Cook stated.

There are many wildlife habitats including tidal marshes, inland wetlands, ponds and meadows, old orchards, shrub lands and upland forests in the park, which borders Palmers Cove. Joan Smith, board member of Groton Open Space Association, suggested the

Palmers Cove and the Eckleston Brook watershed areas, which she revealed "are under unprecedented developmental pressure." Furthermore, Smith expressed an interest in the acquisition and preservation of the last open 50-acre parcel adjacent to and uphill from Haley Farm State Park. The land, which is historically part of the farm, is a known cerulean warbler and yellow-breasted chat habitat.

Dr. Mickey Weiss, director of Project Oceanology, contended that many areas can be protected inexpensively, including urban waterfronts, upland areas, sub-tidal areas and "all the islands in Long Island Sound: Falkner's Island, Sheffield's Island, Chimmon's Island, Great Captain's Island. I think it's very important to mention," continued Weiss, "the sub-tidal regions of Long Island Sound that need to be protected - the reefs, the fishing grounds,



James Morgan

Dr. Mickey Weiss, director of Project Oceanology

the shellfish beds, the mud flats, the eel grass beds and spawning grounds of Long Island Sound – again, could become part of a preserve.”

In agreement with many speakers including Weiss, Peter S. Lutz of Old Saybrook also commented that the sewage seepage into Long Island Sound that occurs during heavy rainfall is filtered by these habitats. “The inland wetlands, the salt marsh...it’s all part of this fragile system,” insisted Lutz.

Priscilla W. Pratt, president of Groton Open Space Association, referenced a pioneer coastal reserve at the Bluff Point Coastal Reserve erected by a special act of the legislature in 1975 that determined the best use of the area. It was “a coastal reserve for the purpose of preserving its native, ecological associations, unique faunal and floral characteristics, geological features and scenic qualities in a condition of undisturbed integrity,” stated Pratt. She credits the legislature for preserving this highly visited and coveted community treasure.



First Selectman Peter Webster welcomes all.

James Morgan

39

Mechanisms to protect open space

In an effort to urge those assembled to rally in support of the Sound endeavor, Evan Griswold, trustee of The Nature Conservancy, asked them to contact legislators to earmark more money locally, federally and statewide for land protection. Griswold asked that there should also be consideration of the “option of raising money locally through either bonding or taxation for local communities to raise the money for open space.” Griswold reminds us, “There is precious little open space left along Long Island Sound.”

Many hoped that this report that would emphasize the need for land protection efforts. Alicia Betty, field representative for the Trust for Public Land, echoed the desire for a successful larger scale land protection endeavor requiring the leveraging of funds at the federal, state and local levels of government. Betty suggested that a partnership should be formed on all levels to

ESSEX



create this reserve: "We have to focus regional and local efforts on smaller areas to add to the Long Island Sound reserve. It's all a matter of fitting small pieces into a big puzzle, and we can't let even the small two-acre pieces go by when they're available."

Thomas Maloney,
river steward for the Connecticut River Watershed,

"We have to focus regional and local efforts on smaller areas to add to the Long Island Sound Reserve. It's all a matter of fitting small pieces into a big puzzle..."

~ Alicia Betty

reiterated the need for a coalition. "We'd be remiss in talking about land conservation in the lower Connecticut River without recognizing the incredible effort of the wide variety of land trusts we have here in the lower Connecticut River. And, we've got a really dynamic group of land trust volunteers that are here and ready to help, and are good partners."

Other participants encouraged setting a goal for the eventual reclassification of the Connecticut River. They wanted the status of the river to be changed as it improves. Ed Gullenhammer of Old Saybrook said, "For 45 or 40 of my 65 years, it has cleaned up considerably and it has become a Class B river. But I think the goal should be Class A."

Beverly Crowther, representative of Lyme Conservation Trust, with endorsements from the Lyme Conservation Commission, Lyme Inland Wetlands Commission and Lyme Board of Selectmen, indicated that sprawl could be arrested by the enactment of local ordinances.

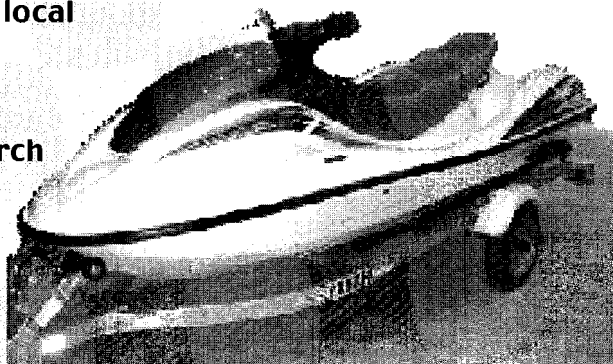
Jenifer
Thalhauser, research

coordinator for Save the Sound, said the waterway is "a wonderful resource, which is in dire need of increased habitat for the nourishment of marine resources." In fact, many speakers reiterated her sentiments and noted the need for pollution control and management actions.

Old Saybrook resident Charles Landrey stated that one of the most effective acts that can be taken to protect the water quality and habitat of the Sound is the restriction or outright ban of personal watercraft. "Jet skis' shallow drafts allow operators to perform high speed terrorism upon fragile coastal environments, home to many sensitive species."

Others reflected on the environment's remarkable past and admonished society for its decline. Philip Miller, director of the Bushy Hill Nature Center and selectman for the Town of Essex, related an anecdote

NYS Parks



told by an octogenarian friend of a time before the first World War when he swam "at Poverty Point, the tip of Great Island, with porpoises splashing right next to (him)." Miller called water pollution a land use issue and pointed out that non-point pollution is something that all of us can work on an individual basis.

"If our government is serious, get these pesticides, chemicals, and detergents and things out of our stores and not let them be used," commented Old Saybrook resident Bob Day. Day's testimony centered on the effects of toxins and the need of having them banned especially from common use.

Bill Pease, selectman in Old Saybrook, suggested sanctioning polluting organizations, such as wastewater treatment plants. "We should try to do what we've already promised the people in this state we would do, and that would be take care of these sewer plants we already have existing," offered Pease.



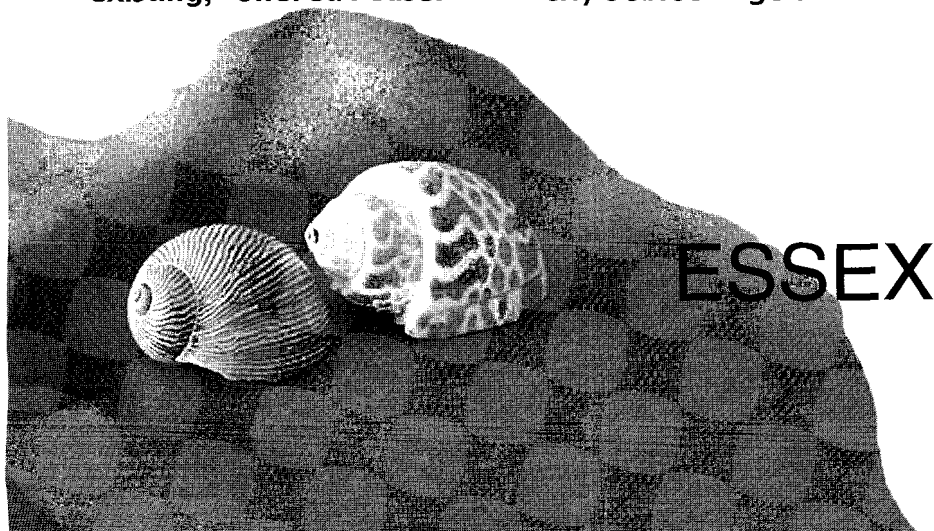
James Morgan

(l. to r.) Jennifer Thalhauser of Save the Sound, Carolyn Hughes of National Audubon Society of Connecticut, Helen Speck of Regional Plan Association and Dorothy Nord of Potapaug Audubon Society serve as panelists.

Concluding Remarks...

Many, such as Melissa Hyland, conservation chair of the New London Garden Club, expressed concern about the impact of lawn care practices on water quality. Chuck Wehrly, chairman of the Old Saybrook Water Pollution Control Authority, and Old Saybrook resident Jean Castanga called for implementation of innovative on-site sewage disposal methods that can minimize the need for new sewage treatment plants discharging into the Connecticut River and Long Island Sound, and help to towns to achieve their local land use goals. "We are looking forward to maintaining our small town character, and are grooming ourselves as a tourist destination point rather than another highly congested shopping highway."

William C. Spicer, III, called for continued emphasis on reducing pollution from New York City's six sewage treatment plants and noted the



CONCLUDING REMARKS (cont.)

need for dredging to maintain ports and harbors as viable waterways for commercial and recreational boating.

Dr. Milton Clark, conservation chair of Potapaug Audubon Society and board member of the Salem Land Trust, said, "As citizens interested in public welfare, present and future, we feel everything possible to clean up the water quality of Long Island Sound should be accomplished. As a vital recreational area, we need clean water for safe swimming, boating and fishing ...The Sound is an important source of food as well as recreational source with an important economic value... The wetlands, shores and islands of the Sound must be protected to conserve the bird life and animal habitat that is disappearing with the encroachment of these areas. Also, these wetlands act as a natural sponge in the prevention of flooding. When these wetlands are gone, they can never be replaced."

42



James Morgan

Alicia Betty

Audubon



Tom Gootz, president of Deep River Land Trust, succinctly stated "I guess I would just say, as someone who's spent some time trying to preserve open space, I think we should get on with it."

NEW HAVEN, CONNECTICUT



43

New Haven, Connecticut

Jones Auditorium
Thursday, June 1, 2000

The second hearing took place at the Jones Auditorium, Agricultural Experiment Station in New Haven, Connecticut. Twenty-seven of the forty attendees testified about their dreams for and problems facing the Sound and potential

“U.S. Senator Joseph Lieberman’s proposal to create a Long Island Sound Reserve would likely translate into increased financial help for the restoration of these sites. Federal action would open up more of the marsh for recreation and educational uses...”

~ Rosemary Bonito

solutions. The hearing was chaired by Carolyn Hughes of National Audubon Society – Connecticut.

Michael Horn, member of the New Haven Bird Club, shared his enthusiasm about ospreys, the big, beautiful fish eagles with large wingspans that he suggests serve as an indicator of how well we are doing preserving Long Island Sound and its habitat. “They’re absolutely gorgeous birds, and they’re coming back strong in the state of Connecticut,” began Horn, referring to their stunning recovery since the banning of the pesticide DDT in the 1960’s. “Last year, the official number of fledges was 315.” He noted that successfully fledging these large birds requires some key infrastructure. “Part of that infrastructure is preservation of habitat where they can find their food, mainly the shoreline of Long Island Sound.” He urged the group to take action to protect their natural habitat.

Barbara K. Johnson, member of the Sierra Club and the Gilford Land Preservation Trust, called for a

renewal in interest of the Quinnipiac and Mill Rivers. Concerned by the public perception that the Sound was not an inviting area, she suggested field trips so that children could get acquainted with the Sound, learn about salt marshes and begin to understand how chemical fertilizers can affect water quality.

Comments on the Reserve Concept

Roland C. Clement of New Haven, who was part of the first Long Island Sound study committee 30 years ago, reiterated the idea that we must introduce the public to the shore by increasing public access. This would serve to increase the Sound’s value in the minds of the community. Clement anticipated that Connecticut salt marshes will decline because of the rising sea level and suggested that we “buy time” by improving tidal circulation to pockets of high marshes now cut off by culverts. “Any semi-landlocked marsh of five acres or more has the potential for supporting populations

of salt marsh sparrows, seaside sparrows, and clapper and Virginia rails," said Clement.



Rosemary Bonito, a resident of the Quinnipiac River District in New Haven, board member of the Quinnipiac River Watershed Association and board member of the New Haven Land Trust, submitted written testimony. The testimony was reflective of other speakers with respect to the need for public access and the need to clean up industrial contamination, especially for sites that could then be restored and protected as part of a reserve system. "U.S. Senator Joseph Lieberman's proposal to create a Long Island Sound Reserve would likely translate

into increased financial help for the restoration of these sites. Federal action would open up more of the marsh for recreation and educational uses," affirmed Bonito.

Sites in the area for the Reserve System

Mr. Henry Ferris, president of Menunkatuck Audubon Society, touted the grasslands of the Griswold Airport as an area treasure. "If the airport site is developed, it will not only mean the loss of an extremely great potential for an upland grassland area near Long Island Sound and also 400 feet of frontage on the Hammonasset River right before it comes into Long Island Sound, but also it will remove an extremely important protective barrier to the natural area preserves of Hammonasset State Park. This is a place that has over 300 sightings of different species and which is frequently a magnet for rare and endangered birds."

Charles A. Schegal, president of the East Haven Land Trust, sited other areas for preservation including the Farm River salt marshes, north of Route 142, the wetlands south of the runway at the Tweed New Haven Airport, Morris Creek, Caroline Creek, the wetlands north of Cozy Beach Avenue, land adjacent to Farm River State Park, and potential public access sites along East Haven Beaches.

"Habitat restoration involves all measures necessary to restore, enhance or create healthy ecosystems, including the re-establishment of native vegetation and fish and wildlife habitat on disturbed sites," asserted Tracy Egoscue, Esq., policy analyst of Save the Sound. "The main goal of restoration is to help rebuild a healthy, functioning system that emulates habitats that existed before it

45

New Haven

was destroyed or degraded." Egoscue revealed other possible restoration sites including the section of the Mill River north of Interstate 91, which is a "riverine migratory corridor"; the New Haven Airport site, which is a tidal wetland; the aforementioned Quinnipiac River Marsh; and portions of the West River. In East

"All of the polluted run off that's coming into the Sound from farms and driveways and roads is a difficult problem and harder to control. It's something that every individual can have an impact on."

~ Lisa Santacroce

Haven, Morris Creek and Caroline Creek were identified. In Milford, 19 sites were suggested including Charles Island, Great Creek Marsh and Wheeler Marsh. In Branford, another 16 possible sites were identified including Farm River and Sybil Creek.

Lisa Santacroce, director of environmental affairs of the Connecticut Audubon Society, reiterated the need to connect the community to the Sound and promoted establishing educational facilities, such as more coastal centers, nature centers, along the Sound. In turn, she asked the public to utilize the education programs to decrease non-point source pollution. "All of the polluted run off that's coming into the Sound from farms and driveways and roads is a difficult problem and harder to control. It's something that every individual can have an impact on," commented Santacroce. She also named coastal islands and barrier beaches, such as Milford Point and Griswold Point, as critical habitats that should be protected for bird populations and nurseries of fish on which birds, like the osprey, depend.

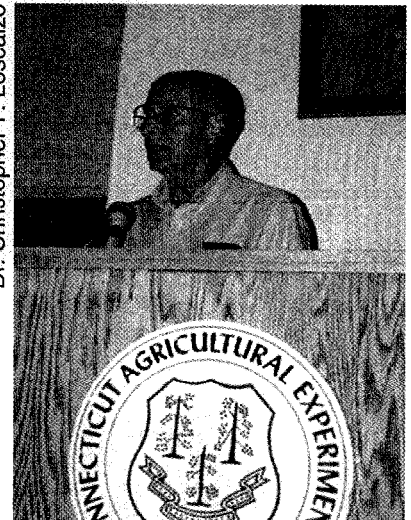
Mark Francis supports habitat preservation and expressed particular concern about the impact of expanding the Tweed New Haven

Airport on Morris Creek.

The chair of the tidal marsh working group of the Quinnipiac River Watershed Partnership, Nancy Rosenbaum, suggested that the Quinnipiac River, and specifically the Quinnipiac tidal marsh, should be preserved and restored with more public access. She added that contaminated areas must be cleaned up and public access provided. The marsh sustains a great diversity of animal life, although it is a victim of surrounding chemical dumps and negligent industry. "We've documented that in the last 10 years, there are over 140 species of birds that are in that marsh," Rosenbaum pointed out. "When I go along the river, it has the largest fiddler crabs I've ever seen."

New Haven resident Crystal Manning also supports the Quinnipiac River

Dr. Christopher P. Loscalzo



Henry Ferris

tidal marsh restoration, protection of the Long Wharf mud flats and the West Haven sand spit. "I feel that too often environmentalists ignore urban areas and focus on preserving pure wilderness, and I think it's really important that we pay attention to nature in our cities," stated Manning.

Dissatisfied with pollutant by-products and poorly planned development, Manning advocated for a stringent regulatory system. She continued, "I'm against development that's not properly regulated. The development here in the New Haven area is too often done ad hoc with no long-term vision."

Martin Mador, vice president of the Quinnipiac River Watershed Association, asserted that the public must be informed of the historic amounts of heavy metal contamination in the river from point source pollution. According to Mador, the problem has abated and the marsh, now recovering from the effects of the pollution, offers downstream advantages.



Harborview Marsh

"It's also one of the finest oyster seeding beds in the country, if not the world, which is an extraordinary fact not many people are aware of, and why the oyster beds have done so well in spite of what man has done to the marsh upstream of it," Mador assessed. "We need to protect it."

Referring to the Quinnipiac River, New Haven resident Stuart Hutchings noted that it is not often that an urban setting has such a natural treasure right on its doorstep. Hutchings fishes regularly on the river and calls it an incredible fishery

with a terrific diversity of species. Hutchings voiced trepidation on behalf of the oyster industry, "My concerns are for the oyster industry...the Quinnipiac itself supplies 50 percent of the seed oysters for the Connecticut oyster industry, which is number two in the country, slightly behind Louisiana, and is growing. I would like to see the state ensure that areas of the river and harbor

New Haven



be protected and improved upon, and old industrial sites cleaned up and either re-stored or used for public access for New Haven residents, and this includes the mud flats along the side of Interstate 95."

Rosemary Bonito, citing the need for preservation of marshes of the Quinnipiac River south of the railroad tracks, stated, "The

"The Quinnipiac River, the Mill River and the

West River all deserve to have completed greenways along each of them so that people can really enjoy the water."

~ Alicia Betty

area we are concerned about is about 60 acres of tidal wetlands and uplands, of which the New Haven Land Trust already owns 25 acres. The area is rich in wildlife. It is one of the prime birding spots in New Haven, harboring a good diversity of species and some state-listed birds." The land trust is also interested in protecting land along Hemingway and Morris Creeks.

Like many that testified, Heather McRae from the Center for Watershed Studies at Yale University recommended that the reserve system include critical habitats, particularly remaining tidal marshes in the Quinnipiac, Mill and West Rivers.

Arne Rosengren, member of the New Haven Bird Club, placed a personal spin on Sandy Point in West Haven, which he dubs a "little gem." Sandy Point, which splits and extends nearly a mile into Long Island Sound, is an important area because it is a breeding ground for state listed species of concern, as well as other species that breed in this habitat. "They are all very, very vulnerable to predation, to disturbances by human beings." As a

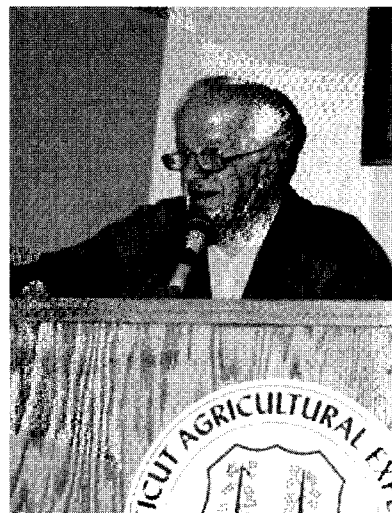
highly recognized area for birders, Rosengren maintained it should be certified as an official bird sanctuary.

West Haven residents spoke of the need to preserve and enhance the Cove River, the Oyster River and the West River, and also passionately voiced support of Oldfield Creek preservation. West Haven homeowner Joanne Martin, like many of her neighbors, would like the creek to be restored through increased tidal flushings and to be preserved. Mary E. Head, president of the West Haven Watershed Association, claimed that the creek should become a nature preserve, and a nature study center could be instituted for both children and adults.

Mechanisms to protect open space

Alicia Betty, field representative for the Trust for Public Land, acknowledged the need to prioritize which sites are potentially available and ensure that adequate funding is available. Betty contended that "the only way" to protect land as development pressures rise is to build local, regional and statewide partnerships.

“The Long Island Sound Reserve will really attract attention and will help focus a lot of those federal dollars to this area that aren’t being focused here now,” continued Betty. She noted that urban areas should be a particular focus of the reserve, reconnecting urban communities with their waterfronts. “New Haven, particularly, the Quinnipiac River, the Mill River and the West River all deserve to have completed greenways along each of them so that people can really enjoy the water.”



Christopher P. Loscazo

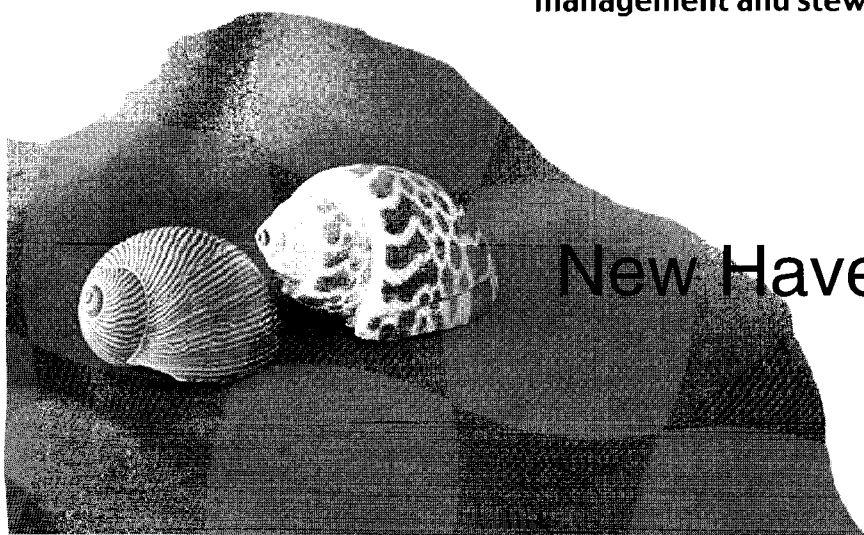
Roland C. Clement

The director of the Connecticut Audubon Coastal Center at Milford Point, Barbara Milton, said her organization had partnered with Manument, Inc., to produce a shorebird survey along the shore of Connecticut. “In the last two weeks, the range of shorebirds spotted at Milford Point was from 2,000 to 2,500,” said Milton, “...and at the same time I found out that there’s a big impetus now to improve Sikorski Airport which would mean rerouting the planes over Milford Point.” Milton pointed out that this issue could threaten Milford Point and pose serious consequences to shore birds.

49

When he first encountered the undeveloped East Haven Industrial Park, he found nothing there but wildlife, stated Michael Criscolo, chairman of the East Haven Union Committee for Protection of Property Rights. He addressed the need to respond to the illegal affront committed at this site. “Every tree, every shrub, every bush was cut to the ground over a two-acre area,” said Criscolo.

“This was done by the Airport Authority. They don’t even own the land that they did it on.” Criscolo’s statement highlights the need for proper management and stewardship of open space sites.



New Haven

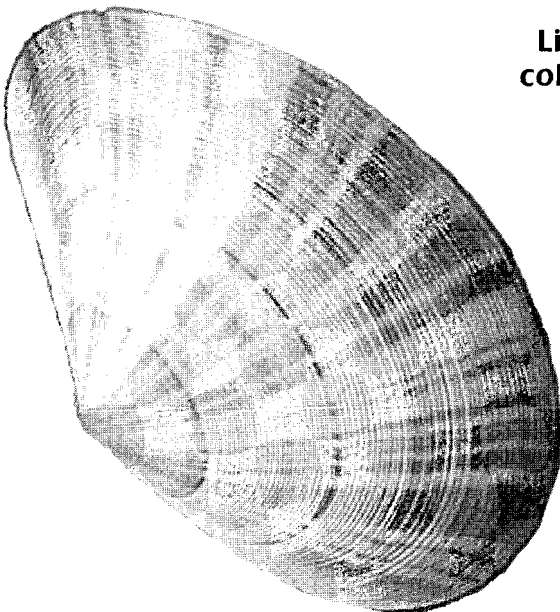
Pat Leahy, member of the New Haven Bird Club and board member of the Milford Point Sanctuary, emphasized the need for stewardship and education funds.



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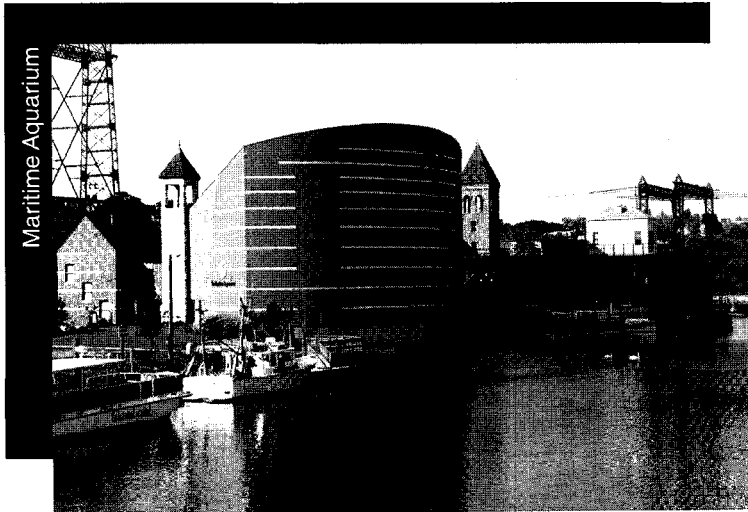
● Concluding Remarks

In support of the reserve program, vice president of the Connecticut River Salmon Association, Dick Bell summarized the objective of the hearing. "It is self-evident, I think, to all of you that a fish restoration program depends a good deal on the welfare and the health of its ecosystem. So any effort that proceeds to support, enhance and ensure the health of Long Island Sound is, from our perspective, consistent with the effort to restore both the Atlantic Salmon and other anadromous fishes to the Connecticut River Basin."



Like others who based success of the reserve on a collaborative undertaking of community and state, Michael Criscolo, chairman of the East Haven Union Committee for Protection of Property Rights, said, "For the organizations and groups interested in the environment and what's happening in our community, it is very important that everyone should stay together...to try to preserve as much wetlands and as much area as we possibly can."

NORWALK, CONNECTICUT



Maritime Aquarium

Norwalk, Connecticut

Maritime Aquarium Hearing Tuesday, June 6, 2000

The third hearing occurred at the Maritime Aquarium in Norwalk, Connecticut. More than 50 attendees paused to listen to the testimony of nearly 30 spokespersons. The hearing was chaired by John Atkin, president of Save the Sound, Inc.

"Just imagine what Long Island Sound waters will look like in 75 to 100 years if we don't really encourage the preservation of critical watershed corridors."

~ Michael Aurelia

Jake Wise, education assistant at Save the Sound, emphasized the importance of habitat restoration and community involvement in restoration projects. Save the Sound published a Long Island Sound Conservation Blueprint, a manual designed for community groups, local governments and individuals that are interested in beginning a restoration project, which Wise referenced.

"There are various examples of reserves throughout our country, which provide guidance and inspiration. These include, but are not limited to, reserves focusing on habitat, no-take zones, underwater areas and scenic vistas," suggested Wise. "In our testimony, we have chosen to highlight local potential habitat restoration sites, which were chosen as part of a habitat initiative restoration collaborate."

Charmaine Rawsthorne of Stamford brought pictures from 38 years ago when the area

contained a natural wetland. She spoke of a highly pleasant, duck and gull inhabited area full of wonder and unspoiled by developmental contamination. Then she sadly reminisced of how the once natural marsh of Cove Island was transformed into a dump. Rawsthorne concluded with the stinging reality that she'll never be able to share with her children the beauty and exhilaration of the property.

Louise Golub, environmental co-chair of the League of Women Voters of Norwalk, also offered a personal statement of support for the reserve, in addition to voicing the League's longstanding position of open space with respect to acquisition and restoration.

Wetland director for the Town of Greenwich and representative of the Connecticut Conservation Association, Michael Aurelia presented ideas for funding and tax incentives to restore lawns to fields and forest areas. Aurelia prophesized the Sound's irreparable

devastation because of the encroachment of industry on nature. "I think we've seen a short-term blip in the improvement in Long Island Sound because we've spent hundreds of millions of dollars on sewage treatment, but as we continue to develop all the upland that runs into the Sound, I think the long-term prognosis is not good," stated Aurelia. "Just imagine what Long Island Sound waters will look like in 75 to 100 years if we don't really encourage the preservation of critical watershed corridors."

Comments on the Reserve Concept

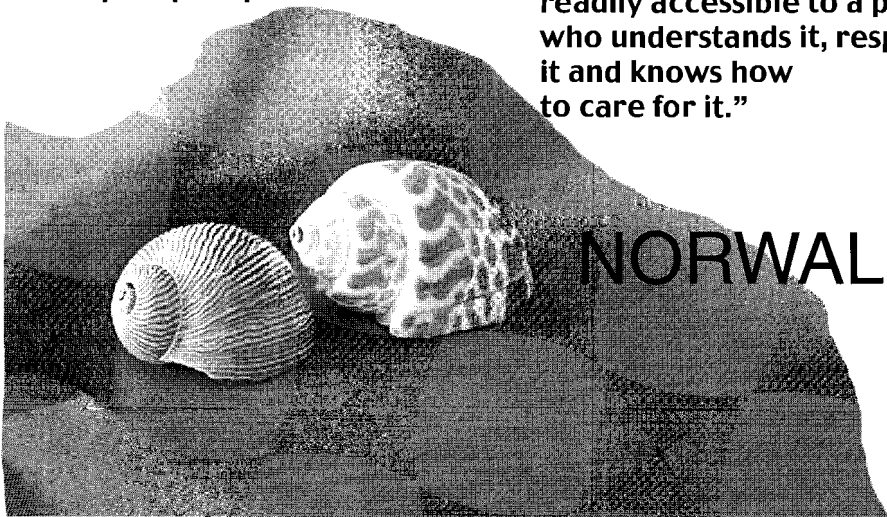
Hope Hageman, president of the Friends of Sherwood Island State Park, said the reserve concept should be an effort to build a "comprehensive system of open space protection to

safeguard habitat and water quality and to make the Sound more accessible to the public."

Hageman continued, stating that, "The Friends of Sherwood Island believe that knowledge can break the gap between the goals of preservation and recreation, and that education can help to make public access compatible with conservation. We cannot overemphasize the need to educate the public about the fragility and complexity of our shoreline ecology. We envision a Long Island Sound readily accessible to a public who understands it, respects it and knows how to care for it."

Jessica A. Kaplan, watershed coordinator of the Norwalk River Watershed Initiative, voiced her support for the Long Island Sound Reserve concept. This effort must be "intended to safeguard and enhance habitat, protect and enhance water quality, and make the Sound more accessible to the public."

Various federal and state partners adopted the Norwalk River Watershed



Action Plan and signed a pledge for the watershed. The pledge recognizes "that rivers and watersheds need to be viewed as a central feature in our landscape that require organized, public and private efforts along watershed, as well as political boundaries," said Kaplan. "We believe that the establishment of the Long Island Sound Reserve supports the goal of our Norwalk River initiative and will lead to the healthy and

dynamic watershed envisioned in our action plan."

Norwalk resident Gary Sorge supported the reserve "110%" if it meant the public would be educated concerning non-point pollution control, proper lawn care and wetlands. "If the reserve means education, if the reserve means that more people will understand what a healthy tidal environment is all about...I'm all for it."

Sites in the area for the Reserve System

"If the reserve means education, if the reserve means that more people will understand what a healthy tidal environment is all about...I'm all for it."

~ Gary Sorge

Many participants mentioned possible sites for restoration. Jake Wise listed 11 potential habitat restoration sites in the Norwalk area. They included Chimmon Island, Flock Process Dam, Sheffield Island, Darien Gorams Pond, Holly Pond, the Rowayton River, North Scott Cove and the Arrow Headway site. In Westport he advocates for nine sites including Calkino Island, Sasco Brook Dam and the Saugatuck River north of Route 1. In Fairfield, he suggested 14 sites including Mill River, Tide Mill Dam and Pine Creek East. In Bridgeport, he recommended six sites including Pleasure Beach. All in all, he identified 40 habitat restoration sites that could be part of the reserve system in this region of Long Island Sound.

Attendees listed various reasons in support of the selection of their preferred sites, such as Long and Pleasure Beaches. Charles Barnard, Jr., board member of Saugatuck Valley Audubon, said, "I think this area is very important because it is one of the very few remaining dune habitat areas that is left undeveloped certainly in western Connecticut, and, as such, it's host to such important species as federally protected plovers."

Barnard also asked for consideration of the restoration of Black Rock Harbor and Pine Creek East. He also suggested the 40-acre field adjacent to the McKinney Great Meadows, Connecticut's only confirmed nesting habitat of the northern harrier. "I know one of the criteria here is that you're supposed to have support in the community, and I believe that a lot of the community supports the marsh restoration," concluded Barnard.

Other bird enthusiasts proposed their preferences. "From the bird point of view, I am particularly interested in a number of sites," said Jack Faulkner, board member and past president of the Darien Audubon Society. "We have, for example at Weed Beach, a small, sort of a pearl, a few acres of woods behind the beach. And, in the spring a couple of years

ago when we happened to hit the warbler migration right, in a couple of hours, we saw 16 varieties of warblers there and more than 60 varieties of birds."

"I would like to see ways that we continue to protect all that land along the way and protect the water that is coming in to purify it through the marshes and through forests along the edge rather than just being poured out between houses," Faulkner concluded.

Also in support of breeding habitats, Elizabeth Johnson of the New Canaan Audubon Society added, "We need a good back log of data in order to be able to determine the success or the failure of the species, and so please try and save and preserve any and every island where such breeding is occurring or stop over is occurring."

Some participants maintained that the reserve concept should be inclusive of developed areas. "I'd like to see the Long Island Sound Reserve system adopt city spaces, like town parks and school yards and golf courses

and highway corridors, as part of the reserve system and then begin to help them learn how to manage for bio-diversity," said Jeff Cordulack, representative of SoundWaters, Environmental Council of Stamford and Stamford Land Trust. "We've been managing those areas for the other purposes for a very long time and the reserve concept stretches beyond the shores up into the watersheds."

Grace W. Lichtenstein, president of Preserve the Wetlands, went on record supporting the Long Island

Sound Reserve and open space initiative. She also described an opportunity to continue restoration of the tidal habitat in Norwalk at Wilson Cove. "This habitat restoration for the Wilton Brook Watershed area ending at Wilson Cove is an area of about 650 acres, the probability of another amount of funding being needed to complete the job is very real," said Lichtenstein.



Jeff Cordulack/Soundwaters.org

NORWALK



Diane Selditch of SoundWaters supported the reserve concept with respect to urban parks and urban spaces. "I think that Cove Island in Stamford represents what the uses of the Sound have been through history...from Native Americans through the Industrial Revolution, and then the possibility that land can be returned to the public to use as a park," stated Selditch.

"Planning and Zoning Commission as well as Conservation Commission staffing is so important. We want a balanced approach to development."

~ Diane Lauricella

She maintained that all of SoundWaters supported the reserve system, "especially so that the people in urban areas could come in and enjoy the area."

Mechanisms to protect open space

Speakers such as Don Nelson, president of Norwalk Clean and Green and Greenways council member, mentioned other successful area restoration projects that incited community interest, "There's an organization called Rails to Trails which helps convert old railroad tracks into greenways," said Nelson. "Folks who are dedicated to try to find ways to make certain that the Norwalk River survives for all of us."

Alan McKissock, Norwalk Land Trust, urged preservation of significant buffers along rivers. "They have a sort of an understanding among the Wetlands Commission to keep a buffer from the inland wetlands to the first building that might be developed, and I think in Norwalk we should have a buffer along the remaining open space."

Alicia Betty of the Trust for Public Land named three essential elements that aid successful implementation of a program: prioritization of land, lever-

aging accounts and forming partnerships. "According to the EPA, from 1982-92, Connecticut has developed in an average, 8,400 acres a year. To counter the pressure of development, we need to look at protecting land for open space conservation, and certainly a comprehensive system of land preservation on the Sound serves that purpose."

Betty continued, stating, "Large land conservation projects most often require an assemblage of funds from various sources — state, local and federal. Through this Long Island Sound Reserve concept, we hope to focus some of the federal dollars directly to our state and directly to Long Island Sound for open space acquisition. We're in the midst of a five-year program in which Governor Rowland of Connecticut has pledged to spend \$166 million on open space funding alone."

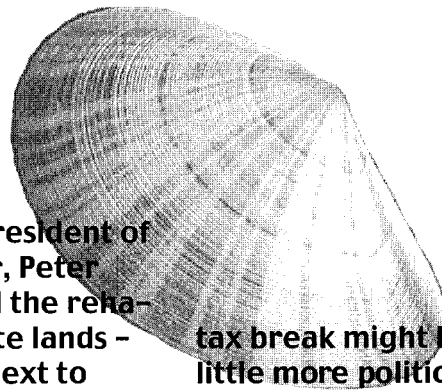
Others mentioned the importance of zoning. Marny Smith testified about strictly-enforced zoning for protection of coastal wetlands. Smith suggested that what is needed is "some kind of stipulation in the zoning regulations for waterfront property that says housing developments of certain kinds must be eliminated, or must not be permitted."

Diane Lauricella, vice president of Norwalk River Watershed Association, called for a greenway along the Route 7 right-of-way and said open space protects watersheds. "Access by the public must be balanced, but you have to include the tourism value of having a reserve system because that brings in the dollars that will also be the causation of people caring about the reserve," said Lauricella. "Planning and Zoning Commission as well as Conservation Commission staffing is so important. We want a balanced approach to development."

Thomas Aikenhead, vice president of Preserve the Wetlands, submitted written testimony in support of wetland preservation. He recommended that, as various governmental bodies "continue monitoring clean-up efforts in the Sound, that special attention be given to the needs of those men in businesses whose work and crops have as their first requirement, clean water."



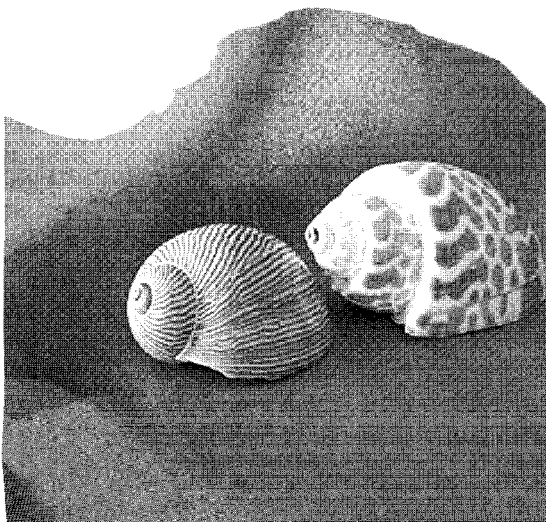
North Fork Audubon Society



57

Sailor and resident of the Norwalk River, Peter Libre encouraged the rehabilitation of private lands - especially areas next to streams. "There are lots of forests that have been reduced to lawns and I think that we can consider giving tax breaks to homeowners that decide to allow a lawn to become a forest again," said Libre. "Maybe it will come that zoning would be another way to do it, but a

tax break might be a little more politically appetizing way of doing that." He suggested that forested buffers rather than lawn that must be fertilized and kept pest free, could greatly contribute to water quality in the Sound.



NORWALK

Concluding Remarks

Paul Saviano of Norwalk, chairman of the Water Quality Committee for the Harbor Management Commission, stated, "The challenge now lies inland with non-point source pollution. We need to change the way we view our waterways and how we have to care for habitat."

Jalne Jaeger, vice president of Saugatuck Valley Audubon Society expressed concern over the impact of lawn care practices on the Sound and highlighted the need for sensitive management of our state parks to protect habitat.

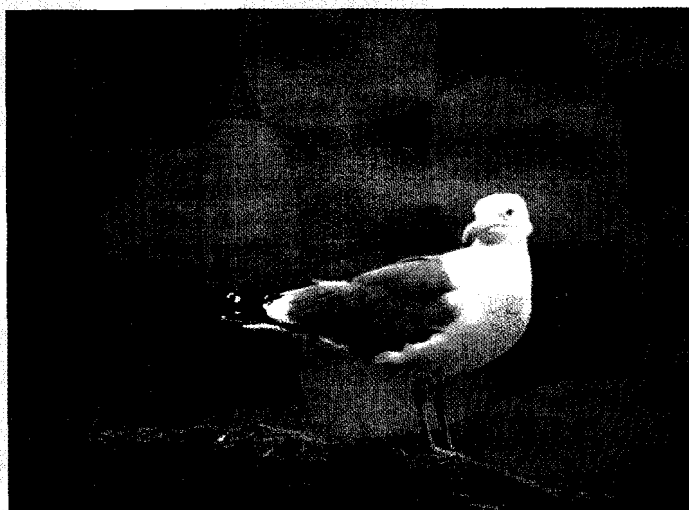
Morgan Silk of Westport highlighted the need to support our state parks and pointed out that air quality also affects us.

Reasons for reserve support varied from loss of habitat to loss of natural resources. "I would just like to reiterate...the importance of doing things in urban areas. Over time, natural habitat has a chance re-establish itself. If you go in to places where that has happened, you feel like you're in a refuge of birds flying all around, birds you never see in other parts of Stamford that are more developed," said Richard Nichols of the Shippan Point Association in Stamford.

"The challenge now lies inland with non-point source pollution. We need to change the way we view our waterways and how we have to care for habitat."

~ Paul Saviano

Save the Sound president John Atkin concluded the hearing by stating that based on testimonies so far, the reserve concept is definitely one worth pursuing.



Greenwich, CONNECTICUT



John Bova

The beach at Greenwich Point

Greenwich, Connecticut

**Cole Auditorium, Greenwich Library
Thursday, June 8, 2000**

The Cole Auditorium at Greenwich Library hosted nearly 100 attendees for the fourth Listen to the Sound hearing, at which nearly 40 persons testified. The hearing was chaired by Tom Baptist of the National Audubon Society – Connecticut.

“This hearing is a long overdue attempt to reach out to the communities that line the shore in search of the remaining remnants of open space.”

~ Christopher Walbrecht

David Miller, executive director of the National Audubon Society of New York State and a Greenwich native, proclaimed his love for Long Island Sound instilled by his parents. “When I was growing up and we’d go to Tod’s Point, I would learn about horseshoe crabs, I’d learn about fiddler crabs, I’d see my first egrets and herons. I’d go out and fish for flounder and bluefish along the Sound,” said Miller. “I had the ability to enjoy Long Island Sound and that experience has helped shape me and what I do today. That experience needs to be there for all future generations so more can have that type of appreciation for Long Island Sound.”

Like Miller, Janice Gardner, chairman of the conservation committee of the Green Fingers Garden Club, also attributed her relationship with her parents to her adoration of the water. “I think that that’s probably what drives most of us, that we have very deep affinity for bodies of living water and where land comes in contact with the water, it’s just something special for us.”

Christopher Walbrecht, member of the Citizens Campaign for the Environment and supporter of the reserve project, began by stating there are “over eight million people living in the Long Island Sound watershed. The Sound has lost most of the lands along its coast and tributaries that once acted as a filter and provided habitat and healthy waters for marine life. This hearing is a long overdue attempt to reach out to the communities that line the shore in search of the remaining remnants of open space. These remaining parcels can provide habitat, public access and buffers that will remain protected and help reduce polluted runoff.”

Tessa Ried, founder of Rippowam Neighbors in Stamford, “supports absolutely the concept of a Long Island Sound Reserve system” and emphasized that “the rivers that flow into the Sound are as much a piece of the system as the beaches and the wetlands and the tidal marshes.”



Comments on the Reserve Concept

Congressman Chris Shays' (R) statement emphasized that while we have come a long way to restore the Sound, much more needs to be done. On the reserve concept he stated, "I believe the time is right to develop the concept of a Long Island Sound Reserve system. I anxiously await the results of these forums to guide us toward a more concrete vision of this pioneering concept."

Cheryl Dunson, land use specialist for the Greenwich League of Women Voters, borrowed the words of author Tony Hiss, who said, "Preservation isn't about the past, it's about the future. It's about making sure that those things that are beloved are there for future generations, so that they can love them and cherish them the same way that we do now." She then

State Senator
William Nickerson



Jeanne Host

added, "The reserve concept could provide the unifying framework for the newest communities, which work to protect our valuable liquid asset."

Many participants felt the reserve concept was achievable and cited other successful models. Denise Savageau, conservation director of the Town of Greenwich, invited the group to "look out of the box when we're talking about Long Island Sound" and the reserve concept. Savageau suggested that "we look at it as a greater concept, much like they're looking at the Silvio Conte National Wildlife Refuge on the Connecticut River Watershed. There they

understand that in a very urbanized and developed watershed like that, in order to develop a natural wildlife refuge we have to look out of the box when we're talking about a reserve."

"If Massachusetts and New Jersey can do this, I don't understand why Connecticut and New York can't ..." were the words of Bob Yaro, executive director of Regional Plan Association (RPA).

"We still have enormous problems in

water quality, but my God, what a lot of progress we've made over the last decade, and I think what we're talking about now is building on that legacy, taking the same kind of confidence and applying it to the Sound's shoreline and the natural systems in and around the Sound," stated Yaro.

"If we can treat our own backyards, neighborhoods and towns as carefully as the lands in a reserve system... then we have a chance for a meaningful preservation of the exceptional sites in the reserve system..."

~ Paul Stacey

"I think we need to go into default mode. This means not assuming that everything that's undeveloped is zoned for development, but rather that it is going to be preserved through a new and creative partnership between the town governments, the towns that front on the Sound, waterfront property owners, local land trusts and supported by state and federal governments. Not led by state and federal governments," Yaro added, but rather led by "the citizens who have gotten us to this stage."

Alicia Betty of the Trust for Public Land identified Calves Island as an example of "why land protection is essential to a successful reserve." According to Betty, "It is one of the largest, privately owned undeveloped islands in the Sound and offers diverse coastal habitat for shorebirds, including tidal wetlands, wooded uplands, intertidal flats and sandy beaches." She also suggested that the Mill River Greenway in Stamford and Mianus River Greenway in Greenwich deserve attention and support as part of the reserve concept.

Others testified about the reserve concept with respect to public access. Stamford resident Frances

Gerety emphasized the need for increased public access. "The fact that having access to the waterfront for as many different interested parties is very key to the health of the community, that we really need to encourage people to get out and partake with nature." She maintained that open space around a waterfront benefits a community and creates "a vision of believing in their lives and themselves."

Paul Stacey of the Connecticut Department of Environmental Protection stated that the vision of the Listen to the Sound 2000 campaign was of a clean and vibrant Long Island Sound surrounded by "healthy habitat, accessible to the public, and full of the fish and wildlife vital to our economy and life-style, and of a regional consciousness and way of life that protects and sustains the ecosystems."

He expressed his vision of a seamless relationship between our own backyards and the reserve area. "If we can treat our own backyards, neighborhoods and towns as carefully as the lands in a reserve system, and if we can live our lives with due consideration for the environmental effects, then we have a chance for a meaningful preservation of the exceptional sites in the reserve system, while protecting the overall health of Long Island Sound," Stacey concluded.



Mark Tedesco

Mark Tedesco, director of the U.S. Environmental Protection Agency's Long Island Sound office, supports development of a common vision of the reserve concept. While addressing restoration, he added that we must "also stop and think about reserving or preserving what isn't degraded as a corollary to that. So certainly, the concept of the reserve system makes an awful lot of sense as part of an overall restoration effort for Long Island Sound. EPA endorses the creation of a reserve system and supports efforts of all of our partners to try to implement this important action."

Sites in the area for the Reserve System

Save the Sound identified various potential restoration sites in the Greenwich area including tidal wetland areas. Jennifer Hanson, Save the Sound education coordinator, referred to Long Island Sound as a wonderful resource in dire need of increased habitat for the nourishment of marine resources. "Tidal wetlands are highly productive areas in the transition zones between land and aquatic systems, whose rooted plants are influenced by the rising and falling tides," said Hanson.

She suggested consideration of specific sites including Greenwich's Byram Harbor, Greenwich Point Park, Holly Pond in Stamford and Calves Island, which is off the coast of Greenwich, as part of the reserve system.

Bob Jensen, board of directors of SoundWaters and president of the Byram River Watershed Alliance, reminisced, "When I was a child, the river was a different color each day, depending on the color dye that was used at a felt mill located along the waterfall in Glenville. Over the past 20 years, the river has cleaned up considerably, mostly due to changes in federal and state laws. It's been a real joy to see the simple creatures, such as barnacles, returning to the wooden pilings and docks."

Jensen recommended that Calves Island become part of the McKinney National Wildlife Refuge and that the reserve include a parcel of land owned by the

GREENWICH



Town of Greenwich, located along the river at 140 South Water Street between the Greenwich Bay Marina and Interstate Lumber. The land would be considered either a reclaimable urban waterfront for public access or as a waterfront public park with proper watershed buffer strips.

Louise Griswold, co-chair of the North Mianus Preservation Association, said, "Admittedly, we came into being to protect one

"...The words of Leopold in the Sand County Almanac came into my mind, in which he reminded us that land is not a commodity of man, but man is part of the community of land."

~ Louise Griswold

very important parcel of land, 110 acres draining into the Mianus River in the Mianus watershed, and I hope you've heard of it. It's called Treetops. We learned that saving one parcel of land is not enough. The words of Leopold in the Sand County Almanac came into my mind, in which he reminded us that land is not a commodity of man, but man is part of the community of land."

Frank Quinn, treasurer of Riverside Association, spoke of 32 acres of open space that borders Stamford. Eighteen acres of this property is known as Laddens Rock Sanctuary, the other 14 acres is Rosa Hartman Park, a public park proposed for golf course development. He advocated the need to create a recreational site there and protect the natural assets, so it meets all the criteria of the Long Island Sound Reserve system.

Member of the Environment Council of Stamford, Elaine Grunberger has been a Stamford resident since 1952 and said, "I'd like you to know that we in Stamford really are with you in this thing to keep Hartman Park and keep the area as it is." The park is threatened by a proposed golf course development and by the

polluted runoff from Interstate 95 that it absorbs.

Sue Baker, board member and past president of Friends of Greenwich Point said, "We are committed to responsible stewardship and public education to preserve and enhance Greenwich Point's diverse and natural environments, as well as to safe and appropriate recreation and to the maintenance of its facilities. So our concern for the big picture explores all the waterways, all the watershed; and it would also include Calves Island as part of the McKinney Reserve."

Lisette Henrey, member of the Greenwich Conservation Commission, supports a plan like the reserve system which would help to "preserve open space and also regulate how it is used, would be something that would be absolutely essential to the preservation of Long Island Sound." Henrey said, "I would like to support the inclusion of Calves Island in the McKinney Wildlife System."

Michael Bogner identified Sherwood Island in Westport and the Marshlands Conservancy in Rye, New York, and expressed concern that "we are rapidly running out of wild shoreline and, further that,

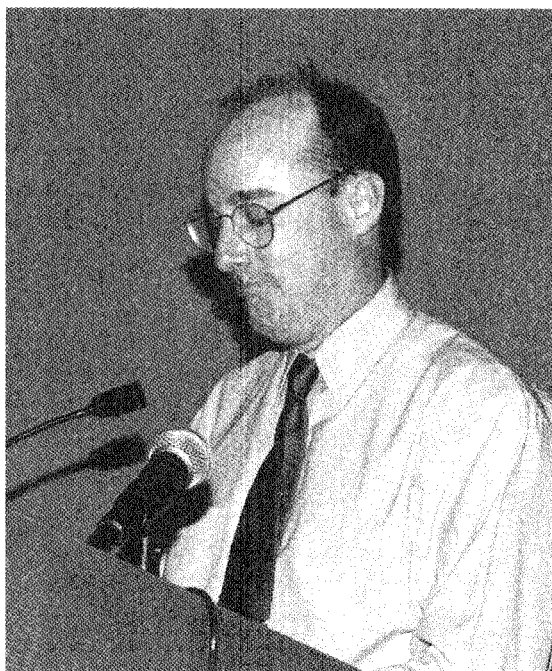
shoreline with multiple habitats is very rare. Please identify and save these disappearing areas so future generations can enjoy the benefits of saving these lands."

Mechanisms to protect open space

William Ruskin, vice chairman of the New York Conservation Education Fund and a member of the executive committee of the New York League of Conservation Voters, pointed out the need to make politicians aware, both in Connecticut and New York, that water quality in Long Island Sound is, "a political issue; that open space and underwater land issues around the Sound is a political issue; and we have to make our officials understand that how they address these concerns or fail to address these concerns will have an enormous impact on how we vote."

Elizabeth Ferretti, member of the Green Fingers Garden Club, addressed two major concerns: the continual need for education for all adult members of the communities on the dangers of nitrogen runoff

Tom Baptist



Jeanne Host

caused by excessive use of fertilization; and an overload on our beaches and our public access points. Ferretti stated, "We just like to be sure that when you consider opening the Sound to increase public access, that the sovereignty of the town and the different state regulations would be respected and worked with in a coalition forum rather than as any sort of a dictate."

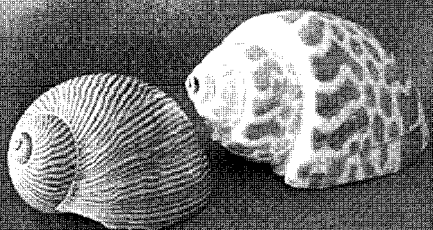
Patricia Thrane, vice president of the Environmental Council of Stamford, supports vegetative buffer zones and sees the "pressure for development." Thrane added, "We need to come up with more rules to

stop these exemptions and protect and enforce adherence to water protection and wetland protection."

Raymond Heimbuch, of the Planning and Zoning Commission in the Town of Greenwich, pointed out that continuous efforts to upgrade sewage treatment plants is critical, and cited non-point pollution

65

GREENWICH



and stream bank erosion as additional water quality problems that need attention. He also applauded "the aggressive approach the town has taken for the acquisition and protection of open space and for the regulations that encourage the retention of private open space."

The point of the reserve seemed to echo loudly as it came full circle wrapped in the insightful remarks of these fifth grade

"We envision a Long Island Sound not only with clean air, water and beaches, but also a suitable habitat for humans and wildlife alike."

~ Michael J. Moccio

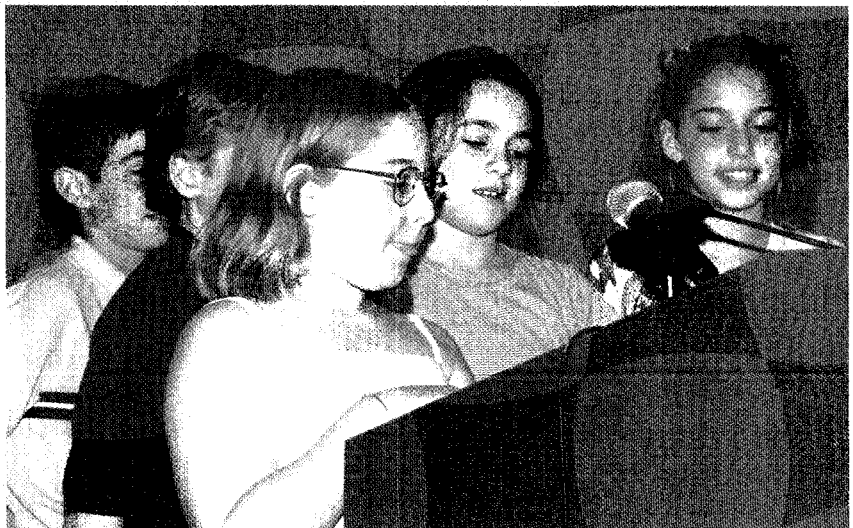
students named Natalie Koch, Juliette Brindoak, Cassandra Adelman, Caitlin Miles, David Lazarowicz and Mason Amado. Their statements penetrated the hearts of those gathered. "We have been studying horseshoe crabs and we have found out that they are endangered. If there is any way we could make a horseshoe crab sanctuary...that would be great. We are just children who would like to make the Sound beautiful. One day when we have kids, we want them to be able to enjoy life by the Sound as we do today."

Related Conservation Issues

"Is the job over? No, it is not over. There is more to do," declared State Senator Bill Nickerson of Greenwich and Stamford. "There are more [sewage treat-

ment] plants to be renewed, and I would ask you to join with me to be sure that the states do not lose sight of the commitment they have made and will continue to make to be the primary source of funding for municipal treatment plants." He also reiterated the need for New York City to be aggressive in cleaning up their sewage treatment plants.

Lile Gibbons, resident of Greenwich for the past 31 years and chairman of the Board of Education, summed up the need for cultural conservation and non-point source education when he said, "Unfortunately, as our children grow up, they become adults, and the first thing they want to do is buy a home in the suburbs, and the next thing they do is they put all the fertilizers on their grass. I think the education has to continue forever."



Jeanne Host

Fifth graders make their case for a cleaner Long Island Sound.

Dan Janson of Norwalk pointed out the need for vegetative buffer zones to help protect water quality in Long Island Sound, and expressed concern about chemicals and herbicides used for lawn care and their impact on water quality in the Sound.



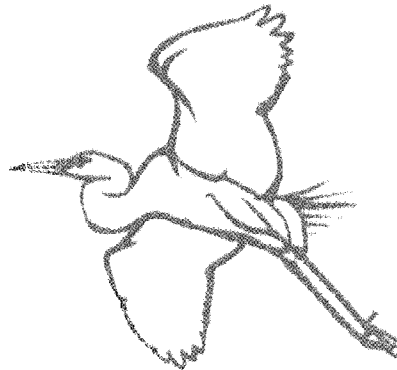
North Fork Audubon Society

Helen Lovett, secretary of the Riverside Garden Club, cited a need for public education including, "information and education for the public on the harmful effects and potential dangers of the overuse of fertilizers and pesticides in gardens, particularly in pursuit of the 'perfect lawn.' The runoff into the Sound, the fertilizers, weed killers and pesticides exacerbated by frequent and usually excessive watering by automatic sprinkler systems is, we feel, unhealthy for the water of the Sound."

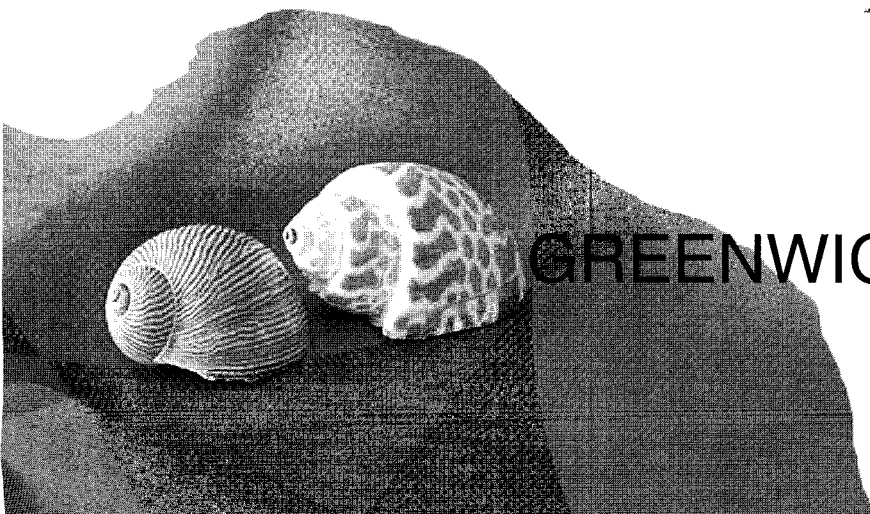
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Other participants echoed Lovelett's concerns including Ian MacMillan, resident of Greenwich for about 25 to 30 years. "So I'm telling you that things are getting better because they are getting better," began Ian MacMillan, "but things have not changed, and in some ways, they have gotten worse, and specifically non-point pollution and specifically pesticides and fertilizers, lawn care, the runoff."

Others cited climate change as the culprit in disease dispersal and infestation. "The change in climate seems to be affecting the Sound," added Lucy Jinishian, chairman of Greenwich Shellfish Commission, "and there have been studies done and they've talked about the increase in temperature and so on, and how it has affected the oysters, maybe the lobsters, maybe the mussels. It certainly has made them all prey to disease."



GREENWICH



Concluding Remarks

Perhaps 52-year Greenwich resident Lydia Stevens said it best, when she recalled past feelings on the Sound. "The water that I just had such a great swim in was connected every single ocean and every single sound on this planet. I believe that this feeling of connectedness needs to under-gird all of our efforts to protect and preserve Long Island Sound."

"In view of the intense pressures to develop all waterfront properties, I believe establishing a Long Island Sound Reserve is a critical component for improving the health of the Sound," said Stig Host, chairman of the Alexander Host Foundation. "We have been privileged to be with you from the beginning and I want to pledge our continuing full support of what you are doing."

Rick Kral, owner of Beacon Point Marina on Mianus River in Stratford, encouraged communication and coalition building between all with maritime interests, especially those who work on these waters every day. What I hope to do is to start to break down maybe some of those barriers that we see. I think we see that a lot of the commercial fisherman, a lot of commercial interest on the water, tag a lot of the conservation groups, if you will, as being left-wing or one-sided, and this is a problem that, I think, we all need to try to address and start to break down those barriers. We, as marina operators, are not the enemies," stated Kral. "We are more of the recipients of the end product."

"In view of the intense pressures to develop all waterfront properties, I believe establishing a Long Island Sound Reserve is a critical component for improving the health of the Sound."

~Stig Host

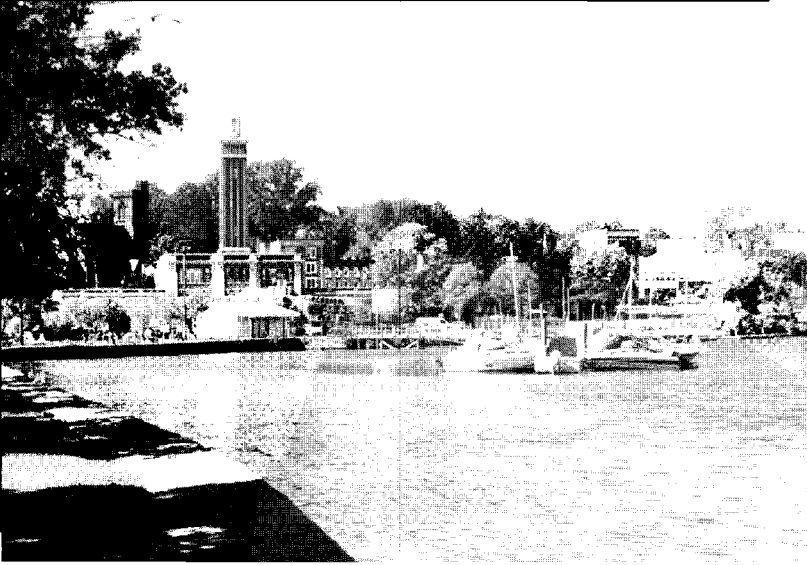


Stig Host

Jeanne Host

MAMARONECK NEW YORK

Federated Conservationists of Westchester County



Mamaroneck
Harbor

Mamaroneck, New York

Mamaroneck Town Center

Tuesday, June 13, 2000

Valerie O'Keeffe, superintendent of the Town of Mamaroneck, welcomed spectators to the fifth of ten hearings for the Listen to the Sound 2000 campaign. She proposed Mamaroneck as "proactive with respect to environmental concerns." Welcomes were also received by John Moyle, president of

the Scarsdale Audubon Society. There were over 50 citizens in attendance and the hearing was chaired by David Miller, executive director of the National Audubon Society of New York State.

Marc Moran, regional director of the New York State Department of Environmental Conservation, spoke of the reserve as "another cornerstone in the restoration of Long Island Sound and other environmental efforts." He credited Governor Pataki's dedication to the renewal of the Sound and to enhancing open space efforts through this new initiative, which pledges to increase public access.

Eda Burne, executive director of the Jay Heritage Center, commented that many residents did not use the Sound, but enjoyed viewing it, in what she termed "the passive use of the Sound" and invited all to experience the remarkable view at the Jay Heritage Center.

John Fine of Environmental Law asked the group to

imagine what the Sound could be: "the shoreline with a buffer, the shoreline with wetlands that filter, the Sound would be clean and the Sound would be healthy." Fine demanded high quality water for recreation and water sales. "If we want to sell high quality water and the cost that goes with it in Long Island Sound, we're going to have to be able to show it's going to be able to be used for recreation," contended Fine. "We have to do a better job of protecting the Sound."

Also present at the hearing were urbanites with their own appreciation for the Sound. Bronx native Holly

"I don't want skyscrapers and I don't want bridges, so I have suggested to the county executive from the first day I became a county legislator that it should be a county park."

~ Jim Maisano



Valerie O'Keeffe

Ira N. Toff

Bukofser, member of the Environmental Advisory Committee in Harrison, shared her childhood experiences of swimming and boating in the Sound. "As I grew up, the Sound got more and more polluted and it was more and more depressing to me and to other people in my neighborhood," said Bukofser.



Robert Funicello, representative of Westchester county executive Andrew Spano, addresses the crowd.

Comments on the Reserve Concept

Several individuals championed the reserve concept for various reasons. Kim O'Brien Lise discussed the proliferation of herons, egrets, swans, geese and ducklings: "We have all kinds of babies...and it's wonderful to see." She added that the reserve concept would help safeguard their homes.

Joining them were several others including County Legislator Jim Maisano, who claimed the system of permanently protected open space and underwater lands concerned him prior to

being an elected official. Maisano asserted, "it's certainly badly needed."

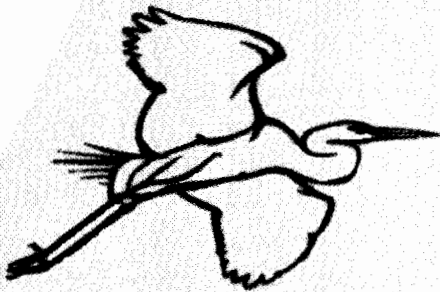
Speaking on behalf of Andy Spano, the county executive, Robert Funicello commended the sponsoring organizations for "initiating the reserve effort and convening the ten Listen to the Sound 2000 public hearings," which allowed the public to be heard.

Funicello claimed that while the reserve – which safeguards natural habitats, water quality and increases public access – was an excellent comprehensive concept, it was not a new idea. Nevertheless, although

many organizations pushed for this type of system in the past, Funicello insisted, "the Long Island (Sound) Reserve is something we must have."

Nancy Seligson, councilwoman in the Town of Mamaroneck, stated that the comprehensive system of permanent open space was essential because it protected an environment for

Sound creatures, birds and plants. She called for a more flexible plan that provided for public access and open space to Long Island Sound.



"As our urban growth continues, we need to dismantle and undevelop the areas adjacent to these streams. To restore Long Island Sound we need to reconnect to inland habitat as well."

~ Steven Mitsc

Sites in the area for the Reserve System

Western Connecticut State University biology professor Ruth Gyure echoed the testimony of several hearing speakers when she asked, "If we don't act now, when...?" Gyure insisted ecosystem preservation is a gift that is necessary for self-preservation and for future generations. She asked that the Larchmont Reservoir and the Sheldrake property be considered.

Wallace Irwin, Jr., who represented Friends of the Reservoir, Inc. (a non-profit organization dedicated entirely to the preservation of the Larchmont Reservoir), spoke of the polluted runoff from all the six watersheds that flowed from Westchester into the Sound. Controlling run-off pollution would help protect sites in the reserve.

Development on David's Island was a point of contention, as it was at the Listen to the Sound hearings ten years ago. Jim Maisano revisited concerns about David's Island falling into the hands of developers. Maisano testified, "I don't want skyscrapers and I don't want bridges, so I have suggested to the county executive from the first day I became a

county legislator that it should be a county park."

Another supporter of David's Island was Robin Kriesberg, coordinator of the Long Island Sound Watershed Alliance. "I could envision a creation of a water trail linking David's Island and a series of smaller islands, such as Huckleberry and Pea Islands in the Sound, to parks and boat launches along the shore," added Kriesberg.

"Citizens Campaign for the Environment has been advocating for many years for the acquisition and protection of David's Island," said Christopher Walbrecht, who also recommended an area to the east of David's Island called Huckleberry Island (a designated Important Bird Area by National Audubon for egrets, gulls, cormorants and herons).

George Latimer, chairman of the Westchester Board of Legislators, identified the "single biggest location for saving" as David's Island. Latimer also echoed the need for partnership with County Executive Andy Spano, Governor George Pataki, the state and county legislators, municipal officials and voters of all parties.

Glenwood Lake Association is fighting to preserve a three-acre parcel that is contiguous to Glenwood Lake because the wetlands on the parcel are part of the Hutchinson River watershed. Glenwood Lake Association representative Jeff Apotheke asked that the reserve include the New Rochelle Nature Study and Wilson Woods, which he deemed "critical environmental areas."

Karen Shultz spoke on behalf of the Sierra Club about their concerns for Milton Harbor and the Marshlands Conservancy on Long Island Sound. Shultz claimed they, "must be considered priority sites for protection because they merit status as critical land and water habitats. We are concerned because the Blind Brook, which flows into Milton Harbor, receives pollution from Westchester County Airport."

Resident Steven Mitsc suggested, "As our urban growth continues, we need to dismantle and undevelop the areas adjacent to these streams. To restore Long Island Sound we need to reconnect to inland habitat as well."



Sound 2000 panelists listen intently to testimony from George Latimer, chairman of the Westchester County Board of Legislators.

Ira N. Toff

Jacqueline Bruskin of the Bedford Audubon Society reminded us that the watershed "includes much more than the land directly abutting the Sound" and urged the group to "think broadly when considering land acquisition and to recognize that more land acquisition is needed."

The Hudson River Audubon Society testified that the National Audubon Society has identified over 125 Important Bird Areas (IBA's) in New York that are unique to the birding community. Michael Bochnik said that "four of them include: Edith G. Read Sanctuary, well known for

thousands and thousands of wintering waterfowl, several great blue herons in the winter, and many other species of birds; Marshland Conservancy, the largest saltwater marsh left on the mainland of New York state; Huckleberry Island, which hosts a colonial water bird colony, including breeding great blue herons, great egrets, snow egrets, black crowned and yellow crowned night herons, double-

crested cormorants, American oystercatchers and many others; and Pelham Bay Park."

Gudrun LeLash, executive director of the Federated Conservationists of Westchester, asked that the reserve include the corridors of the Mamaroneck River, Blind Brook, Byram River and Mianus River. These sites cross municipal boundaries

"Municipalities must move beyond home rule and consider the importance to the region of protecting the tributaries and the Sound."

~ Gudrun LeLash

on their way to the Sound. "Municipalities must move beyond home rule and consider the importance to the region of protecting the tributaries and the Sound," said LeLash.

Others spoke to the group regarding development concerns. Long-time resident Roslyn Wood voiced concern that the owner of the Mamaroneck Beach and Yacht Club "appealed to the Village Board of Mamaroneck to allow him to put up multiple housing, although it's in a marine recreation zone."

John Feingold, vice chair of the Westchester Chapter of the New York League of Conservation Voters, remarked that lawmakers will be "graded on" making the Sound more accessible. Ernie Odierna, councilman for the Town of Mamaroneck, reiterated the demand for public access to the Sound.

Feingold also said leaders must (1) acquire land; (2) provide more car-top boat access sites at bridge crossing, street ends and municipally owned shore front sites; and (3) assemble smaller shoreline properties over the long-term to create new access sites in the future.

Phyllis Wittner, councilwoman for the Town of Mamaroneck, recommended inclusion of the coastal fish and wildlife habitats in the Long Island Sound Reserve. In 1990, New York state designated significant coastal fish and wildlife habitats in Westchester County for inclusion in its Coastal Management Program. These include: the Premium River Pine Brook Wetlands found in the Town of Mamaroneck; City of New Rochelle and Village of Larchmont on Long Island Sound; Huckleberry Island in western Long Island Sound (approximately three-fourths of one mile east of David's Island in New Rochelle); the Marshlands Conservancy on Milton Harbor in the City of Rye; and Playland Lake and Manursing Islands Flats on Long Island Sound in the City of Rye. Wittner stated that we need to use the information we already have.

Mechanisms to protect open space

Clark Wallace, member of the Trust for Public Lands, discussed the intensifying need for land to be developed and stated that creating the Long Island Sound Reserve will help focus federal dollars to the coast for land acquisition.

Wallace suggested that the Conservation and Reinvestment Act (CARA) should use dedicated funds to save land along the shoreline. "At the state level, we've enjoyed a steady stream of income for land conservation through the Environmental Protection Funds and the Clean Water/Clean Air Bond Act. Westchester County has been the leader on conservation, allocating \$5,000,000 a year for land conservation every year," said Wallace.

Irene Saltzburg, president of the Friends of Marshlands, appealed to the group regarding the marshlands conservancy, which she claimed has fallen prey to increased detrimental recreational use at the harbor by "motorized boats, kayaks, canoes that come into the marshes and disturb habitat...although it is a designated (Important Bird Area) IBA." Saltzburg called for the monitoring and relocation of active recreation.



Seining at Marshlands Conservancy

Friends of Marshlands

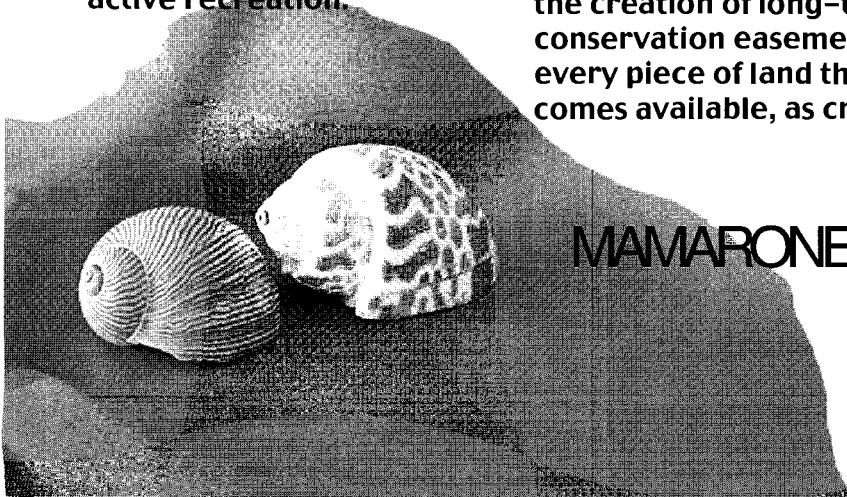
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"We need for Long Island Sound to be considered a reserve so that it will have the funding and protection on a larger level," said Debra Lazarus, program manager at the LIFE Center. "We see this as an opportunity to support inter-municipal cooperation towards a mutually beneficial goal."

Robin Kriesberg stated the necessity of the creation of a funding base for the acquisition of land, or the creation of long-term conservation easements on every piece of land that comes available, as critical

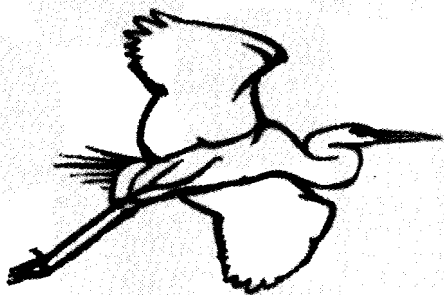
to the long-term health of the region.

Kim O'Brien Lise also presented a case for inclusion of watersheds that should be retained as open spaces sustained by conservation easement. Lise asked, "Perhaps conservation easements on all of the waterways that run into the Sound would be important and helpful to the program?"



MAMARONECK

"The Long Island Sound wants a healthy source of life and the nursery of the ocean has been under an onslaught of human mismanagement," stated Leslie Hughes, conservation chair of the Scarsdale Audubon Society.



"We're still not reaching out to our children, who we say we are protecting this planet for, wanting them to be stewards...maintaining a healthier watershed."

~ John Zappala

Hughes suggested initiating a new economic model that promises to maintain the "potential of reimbursing each community for the amount of natural resources that it protects and, thus, remove much of the conflict that exists between environmental responsibility and short-term economic success." She supported CARA to "ensure greater funding for the Land and Water (Conservation) Fund it provides money to, which provides for the purchase of park land."

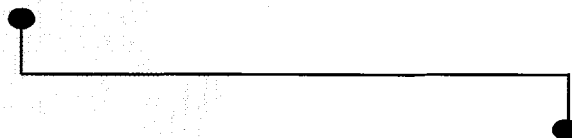
The reserve has the opportunity to "use purchase and development rights, temporary lease and development rights in exchange for abatements in property taxes, bargain sales, transfer development rights," said Paul Gallay, executive director of the Westchester Land Trust. "Natural Resources Inventory helps us focus our attention on the most important of our parcel, so we know really where we need to go and where some smart development could conceivably go," added Gallay.

Related conservation issues

John Zappala maintained the need for education of the children: "We're still not reaching out to our children, who we say we are protecting this planet for, wanting them to be stewards...maintaining a healthier watershed."

"I fully support the improved water quality, recreational and commercial fishing, swimming and boating," said Howard McMichael of Larchmont. He cautioned against allowing the reserve to be used as a "tool for extremists to prevent relocation of dredged material within Long Island Sound, as well as to prevent the expansion of the marine and water dependent and water enhanced businesses, and to further restrict the rights of waterfront homeowners."

Karen Marie Campbell, resident of New Rochelle, voiced concern about pollution, especially in the swimming area: "I think it should be a great recreation area as it is now, but it could be even more improved."



Dorothy Carlsten, private citizen of Rye, apprehensive about marsh restoration, warned the group to “look at the environment and make sure that you don’t have an increase in water level where the plants won’t grow” and ensure the existence of “proper water salinity exchange.”

“Looking at the map, I see a lot of white dots, areas people wish to preserve for their enjoyment, their recreation,” began Frank Mancuso. “I’d like to see a dot on that map...for an area that shouldn’t be preserved and shouldn’t be used because they need to be cleaned up.”



Friends of Marshlands

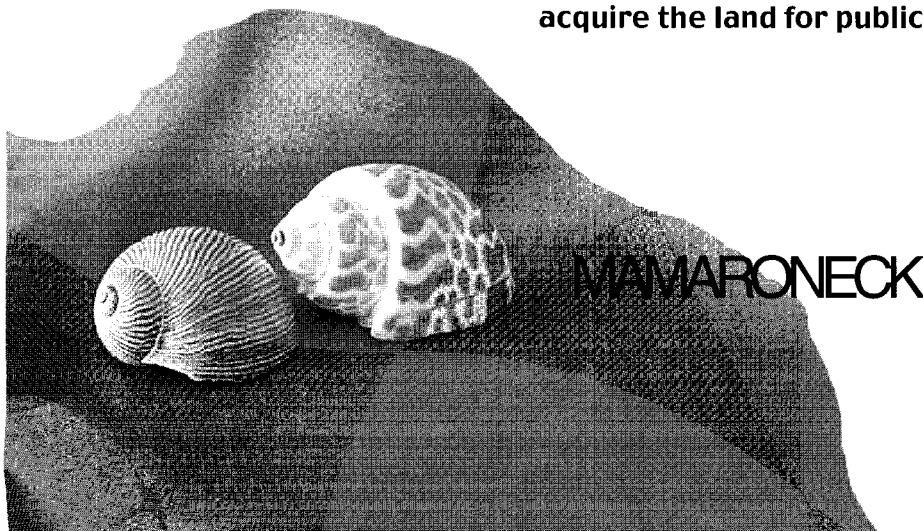
David's Island

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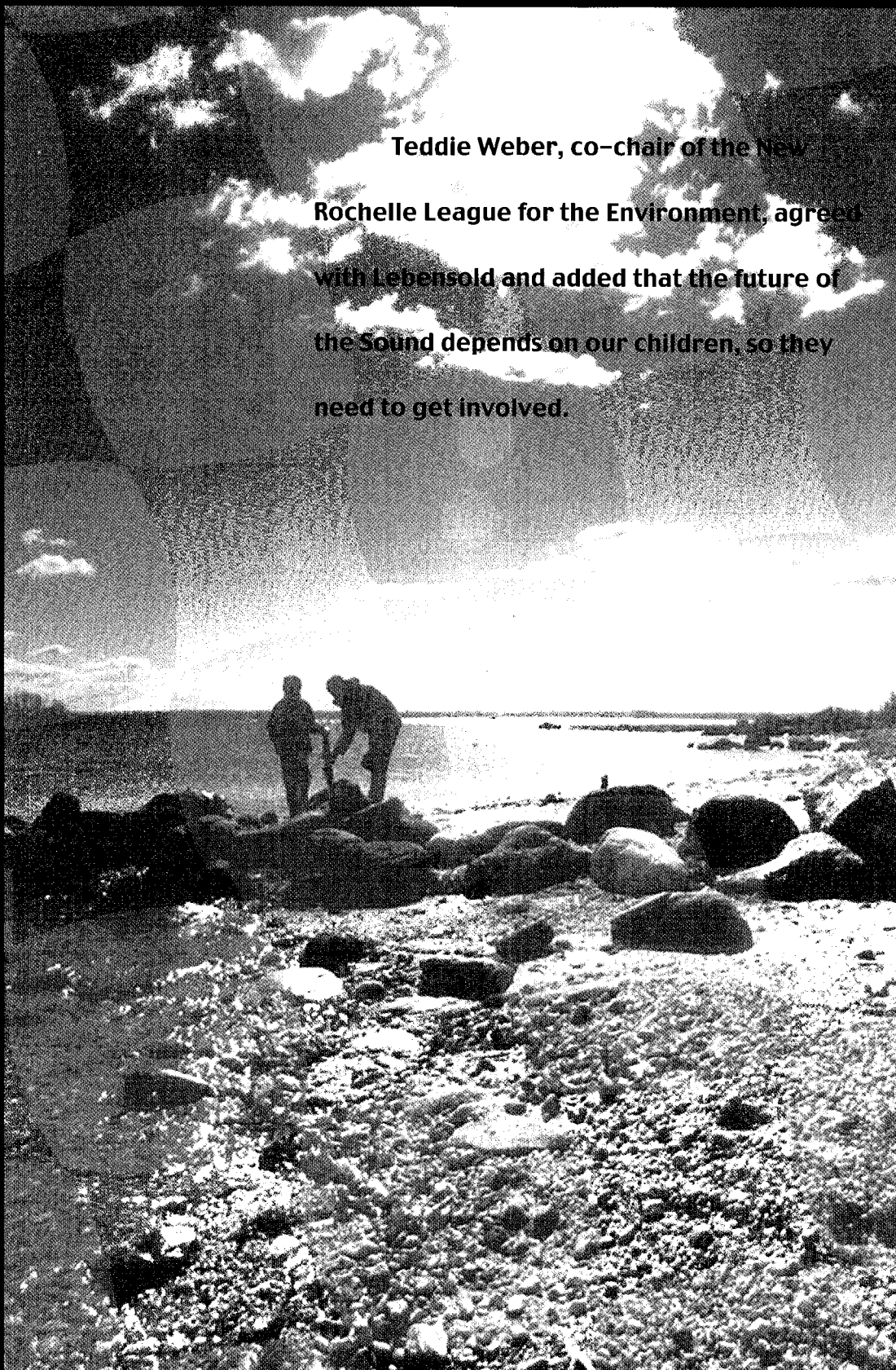
Concluding Remarks...

Upon closing, several themes, from public education to increased public access, were highlighted. Catherine Wachs emphasized the need for public education and then pointed out the irony in the public’s thirst – and lack thereof – for knowledge. “It’s sad to note that most folks know more about McDonald’s hamburgers than their own watershed,” remarked Wachs.

Bob Lebensold of the New Rochelle Environmental League claimed that, “We should acquire the land for public use.”



Teddie Weber, co-chair of the New Rochelle League for the Environment, agreed with Lebensold and added that the future of the Sound depends on our children, so they need to get involved.



CITY ISLAND, NEW YORK

Doris Strauss



City Island Marsh

City Island, New York

Morris Yacht and Beach Club
Thursday, June 15, 2000

Nearly 44 people attended the sixth Listen to the Sound hearing, which occurred at the Morris Yacht and Beach Club on the far tip of City Island. The beach club, which eventually became a topic of discussion, provided a back-

ground for discussions about an area plagued with pollution and development issues. The hearing was chaired by William Cooke, director of government relations for the National Audubon Society of New York State.

It was noted by Andy Darrell, executive director of the Waterfront Park Coalition, "A combined comprehensive program to save Long Island Sound and other New York City waterways, with serious investment by the community and with dollars, could go a long way to improve them."

Darrell insisted the main waterways around the eastern section of New York City, the Harlem River, the Bronx River, the East River, the canals that feed into the East River and the Flushing River "have untapped potential."

Barbara Dolensek reminded the assembly that prior to boat building, City Island's most important industry was oyster farming. The number of crabs and

oysters has declined steadily over the years. Dolensek called for more tax breaks for traditional waterfront uses and fewer waterfront development incentives. She also suggested Tier and Ditmars Marshes, which hydraulically link freshwater and saltwater, for purchase and restoration.

Comments on the Reserve Concept

Mark Tedesco, director of the Long Island Sound office of the Environmental Protection Agency, commented on the system: "The reserve concept makes imminent sense, and there is an action in the Long Island Sound Management Plan to create a reserve system."

Alison Beall called for a reserve system that had separate wildlife areas, which had limited access for research, education and recreation. Beall's vision for the Sound emphasized development pressures. She warned, "Once it's gone, it's gone forever..."

"The reserve concept makes imminent sense, and there is an action in the Long Island Sound Management Plan to create a reserve system."

~ Mark Tedesco



Sites in the area for the Reserve System

“We support the proposal of the Westchester County Board of Legislatures to purchase David’s Island so it can be preserved as open space and to provide public transportation through a ferry service,” began Paula De Caro, League of Women Voters of Westchester.

De Caro also urged support of an environmentally sensitive area in Davenport Neck – namely the former Riviera Shore Club – as a prime candidate for purchase by the state and county as an extension of Davenport Park. “We urge the preservation of low density zoning on Davenport Neck.”

In addition to the last remaining wetlands on City Island (which include a freshwater creek between Tier and Ditmar Streets),



City Island Marsh

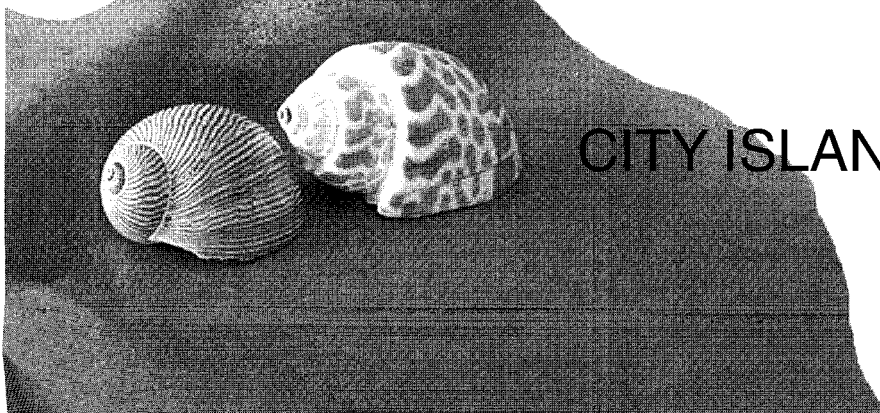
ten-year City Island resident Doris Strauss asked to protect Huckleberry Island, an area that is heralded by National Audubon Society and currently under development pressures by the New York Athletic Club. City Island resident John Sinclair added that the smaller wetlands between Tier and Ditmar Streets were as important to preserve as the large wetlands.

Wilma Turnbull, president of the New York Coastal Fishermen’s Association, asked that Palmer Inlet and Wier Creek be considered for preservation and be made part of the reserve system.

SoundWatch representative Susan Bellison’s recommendations included: Huckleberry Island; Rodman’s Neck, where she suggested that a pier be built; the wetland between Tier and Ditmar Streets on City Island; and Pea Island. And lastly, various large parcels of land throughout City Island vacated by boat yards and marinas could become part of the reserve system. Bellison continued, “The ones that are no

Doris Strauss

81



CITY ISLAND

longer in use should be developed very carefully limiting density, keeping within the nautical character of the community and maintaining vistas from as many points as possible, and providing public promenades and seating areas in any new development of shoreline property."

The Sound supports important bird populations, such as rookeries of herons

"My husband and I have personally witnessed water birds being attacked by jet skis, and neighbors have also reported a swan killed by a jet ski as it tried to defend its young..."

~ Doris Strauss

and egrets, and provides coastal habitat for a range of plant and animal species. "New York City parks, such as Orchard Beach and Pelham Bay, connect hundreds of thousands of New York City residents with the sea," said Sean Andrews, executive director of New York City Audubon Society. Andrews also suggested Huckleberry Island, a key habitat site for colonial nesting birds such as herons and egrets, be protected as part of the reserve system.

David Kunstler, wildlife manager of Van Cortlandt and Pelham Bay Parks administrator's office, joined with the group to recommend two colonial water bird rookeries, Huckleberry Island and Goose Island.

"The estuary of the Bronx River lies between the communities of Hunt's Point and Soundview, and empties directly into the Long Island Sound, and the Bronx River itself is a southern gateway to the Long Island Sound," said Majora Carter, director of Hunt's Point Re-envisioning Project at the Point Community Development Corporation. Carter also hoped, with time and preservation, that the Bronx River will eventually return to its former glory as an amazing natural resource.

Mechanisms to protect open space

Much of New York City's waterfront is not protected in terms of wildlife habitat or for public access. "This reserve concept will help funnel federal money into the Long Island Sound watershed for open space acquisition," stated Clark Wallace of the Trust for Public Lands. "The Clean Water/Clean Air Bond Act will expire, so we're hoping that another source of funding will be able to fill the gap."

Fearing burgeoning housing development, Howard Smith, president of the City Island Civic Association, claimed that five acres of land on the Morris Yacht Club that were being "taxed out of existence" were consequently the cause for the probable loss to development. Smith warned, "You can put an awful lot of dwelling units on five acres." Jack Reith, representing the Long Island Sound Commodores Association, echoed the demand for control on taxation.

Dr. Paul Mankeiwicz, executive director of the Gaia Institute, said unless "the coastal structure, as brought up locally by Howie Smith, the tax structure and

also regulatory structure” are addressed, “we’re going to end up with very little on the coast.”

Related conservation issues

Doris Strauss, ten-year resident of City Island, criticized owners of personal watercraft for causing increased pollution from boat traffic. She blamed them for the premature demise of ocean and wildlife. “My husband and I have personally witnessed water birds being attacked by jet skis, and neighbors have also reported a swan killed by a jet ski as it tried to defend its young,” exclaimed Strauss. “These kind of watercraft, more often than not, seem to encourage a brutal lack of respect for our environment.” She added that control of these watercraft must be part of management strategies in the reserve system.

Bob Lebinsold, New Rochelle Environmental League, insisted that although the reserve concept incorporated a list of recommended properties,



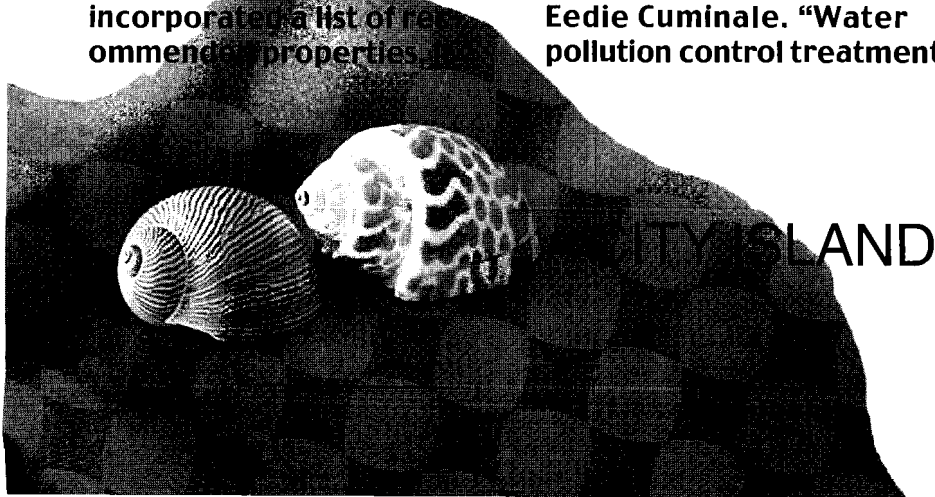
Bruce Ando

should also “include costs for cleanup of toxins.” Lebinsold cautioned that those who swim at the beach would undoubtedly be in contact with polychlorinated biphenyl (PCBs), and contaminated sites should be part of the plan.

The Hunter’s Point Community Coalition has concerned itself with habitat restoration along the East River, the Bronx River and the waterways in New York (the metropolitan area of the boroughs). “We need to do some habitat restoration on those water bodies,” began Long Island City resident Eedie Cuminale. “Water pollution control treatment

plants won’t do the job, cleaning up brownfields and all of that won’t do the job completely.”

Ten years ago lobstermen stood to express their disgust over the demise of the profitable lobster industry in the area due to anoxia. Local lobsterman Eugene Garbowski spoke at this hearing about the all-consuming pollution created by antiquated sewage treatment plants.



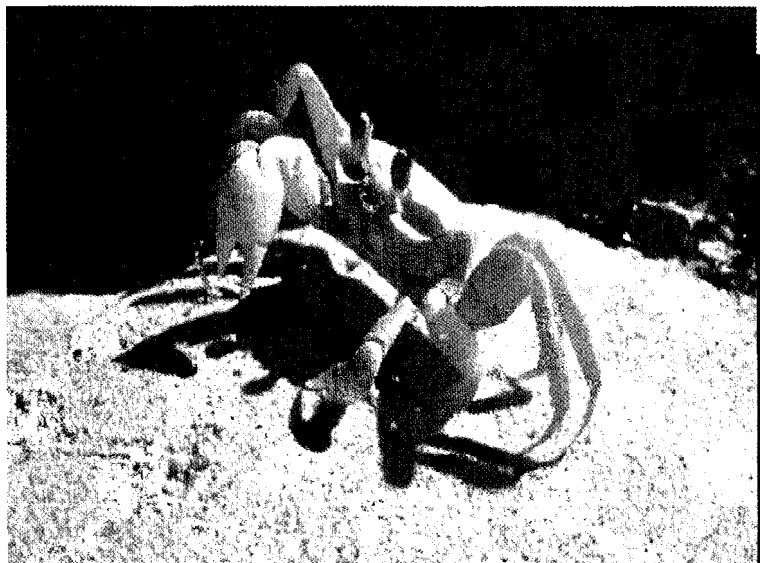
“There used to be lobsters right out here,” recalled Garbowski, pointing at the map. “They’re all dead...they die farther and farther up. It’s just a very sad thing.” He called for action.

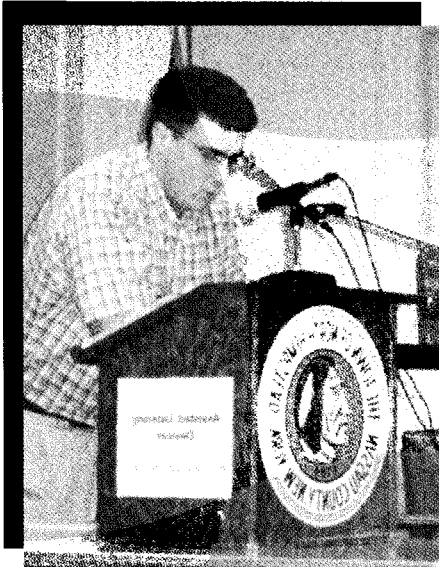
Conversely, Catherine Poggi, representing Westchester Creek, mentioned that the Rochester Creek’s waters have progressed greatly in current years. However developers have turned the other cheek in favor of the dollar. Poggi commented, “They’ve had blue claws in that creek since the 1600’s, but no one wants to notice it, because...if you notice that the blue claws are coming back, it means the water is not poisoned, and if the water is not poisoned, they can’t develop it as industry on both sides of the creek.”

Concluding Remarks...

Virginia Gallagher of City Island reminded the group that only persistence will insure the success of the preservation program and of the historically nautical community. “We all want to be able to use the waterfronts. We have got to do it judiciously, and what that means is we’ve got to draw up a plan and it’s got to be an overall plan.”

“It’s our hope that our messages that come from these hearings are heard loud and clear and that they translate into changes which will protect habitat and open space and increase public access and enjoyment of the Sound,” declared Susan Bellinson.





Guy Jacobs

MANHASSET, NEW YORK

Frank Morris testifies at the 7th
Sound 2000 hearing.

Manhasset, New York

North Hempstead Town Hall

Tuesday, June 20, 2000

Jennifer Wilson Pines, vice president and conservation chair for the North Shore Audubon Society, welcomed nearly forty people to the seventh Listen to the Sound 2000 hearing.

"Clearly the place we call Long Island Sound and lands adjacent to it are phenomenal natural treasures for the people of New York, Connecticut and all over the United States..."

~ Michael Burger, Ph.D.

Shirley Hartman, director of development for the National Audubon Society of New York State, chaired the meeting.

Many speakers stated that long ago Long Island Sound contained wetland and buffer areas along its coastline and tributaries that once acted as a filter and provided habitat and healthy waters for marine life. Today, development has diminished these areas leaving only ten percent of the coastal land remaining in the original state.

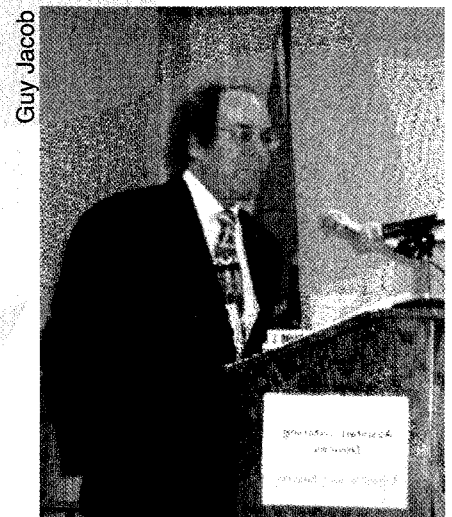
Testifiers agreed that although more than half of the undeveloped sites are owned by the public or by organizations with an environmental focus, almost all of the remaining sites should be included in the state's Open Space Plan.

Eric Dumont, Long Island program coordinator of the Citizens Campaign for the Environment (CCE), referred to the Long Island Sound estuary as, "our region's greatest natural and economic treasure." Dumont blamed the steady decline of marine life and habitat on the rapid pace of human recklessness, developmental sprawl and

inadequate wastewater treatment facilities.

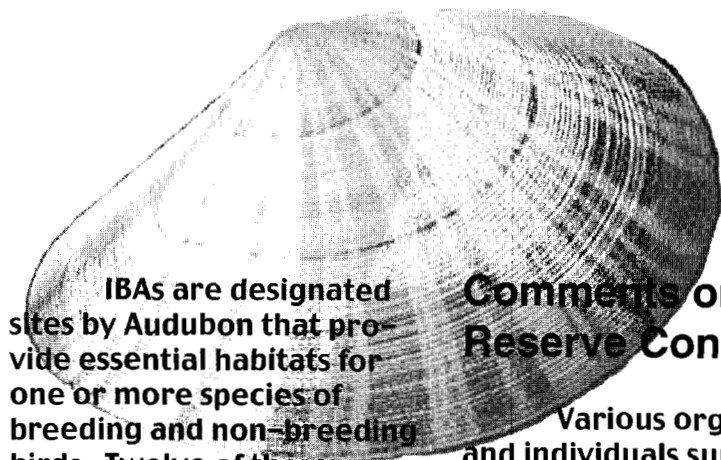
Dumont, having witnessed a "serious decline" in water quality over the past 20 years, insisted that protection of the areas would "help to preserve sensitive habitats, protect estuarine life, reduce polluted runoff and increase public access to the water."

The director of bird conservation at the National Audubon Society of New York State, Michael Burger, Ph.D., echoed Dumont's sentiment stating, "Half of the endangered, threatened and special concern bird species in New York state are found at Important Bird Areas (IBAs) on Long Island Sound."



Guy Jacob

Robert Gans



IBAs are designated sites by Audubon that provide essential habitats for one or more species of breeding and non-breeding birds. Twelve of these special sites are located on Long Island Sound and are home to no fewer than 18 of the 38 state-listed endangered species, including the piping plover, bald eagle, least tern, American bittern, osprey, black skimmer and others. "Clearly, the place we call Long Island Sound and lands adjacent to it are phenomenal natural treasures for the people of New York, Connecticut and all over the United States," said Burger.

Ten of the 12 Long Island Sound IBAs are threatened by pollution or development or both. "From the breeding herons and migrating songbirds of Pelham Bay Park to the largest roseate tern colony in North America on Great Gull Island," said Burger. "We have to act now to make sure that all birds continue to be part of the Sound's natural heritage."

Comments on the Reserve Concept

Various organizations and individuals supported the concept. The League of Women Voters of Nassau County firmly supported the reserve system that they referred to as, "a comprehensive system of permanently protected open space and underwater lands along Long Island Sound."

Giving a statement on behalf of Ruth Kogel, natural resources director of the League of Women Voters of Nassau County, Robin Gordon said, "Loss of essential habitat and breeding areas, food sources and shelter for fish, birds and animals have diminished the abundance of the Sound's wildlife and production of all kinds of marine and wetlands life."

Carol de Paolo, community programs director of the Coalition to Save Hempstead Harbor, supported the reserve and encouraged open space preservation and habitat



Guy Jacob

Carol de Paolo of the Hempstead Coalition

restoration along the entire coastline of Long Island Sound. Under the auspices of this reserve concept, the system could assure preservation of open spaces and property, therefore, increasing public access to the harbor "through extended trail ways or expanded park land and provide a coastal buffer that is critical to continue the improvements that have been made on water quality."



Sites in the area for the Reserve System

Dr. Burger listed the following IBAs as reserve possibilities: Pelham Bay Park, the Oyster Bay area, Theodore Roosevelt Sanctuary, Little Neck Bay to Hempstead Harbor, Crane Neck to Misery Point, Great Gull Island, Huntington and Northport Bays, Nissequogue River watershed/Smithtown

"The Gouldstone land...From the highest point of this acreage, there is this spectacular view of Long Island Sound. With the pond, a forest and about four acres of wetlands, this is an important property to earmark for preservation.

~ Guy Jacob

Bay, Orient Point and Plum Island, Edith Read Wildlife Sanctuary, Huckleberry Island and Marshlands Conservancy. While this hearing was specific to the Glen Cove area, Burger's recommendation included the entire northern coast of Long Island.

Jim Jones, a biology teacher at Tribes High School in Port Washington, suggested southwest Hempstead Harbor, from Bar Beach to the Rosen Viaduct. "It's about 1.75 miles. At one time, it was a natural wetland, today it's primarily unused and it's prime wetland habitat. Since 50 years ago, it's been nothing but stressed, but we have the opportunity to take it back," said Jones. "We've been doing a study of osprey restoration of the past nine years around the peninsula of Cow Neck and we have nine active nests this year."

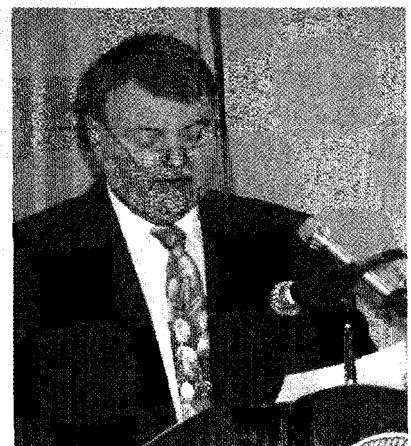
Mitchell Creek Salt Marsh was illegally filled back in the late '60s. Julian Kane of Hofstra University listed it as a marsh in need of protection. The Mitchell Creek Salt Marsh, which is located in the village of King's Point, leads into Manhasset Bay and eventually into the Sound. The old George M. Cohan Estate, also in the King's Point region, was also suggested.

Robert Gans, director of conservation of the Bronx River Restoration, asked for community access to Queen's Dock, a property

south of the Westchester Bridge. Gans also suggested Starlight Park, a beautiful park that hosts herons and egrets and other wildlife, and lastly Soundview Park, a wetland.

Carol de Paolo suggested that the following properties be incorporated into the reserve plan: Morwood property and two acres of land that lie on the eastern shore of the harbor could be sold by the local water company and twenty-five acres that are on or near the waterfront on the eastern shore of the lower harbor are being assessed for possible sale by the public utility, KeySpan. Eight other acres in this industrially zoned portion of the waterfront are up for sale by two separate owners.

Guy Jacob, chairman of the Sierra Club Coastal Resources, championed the "pristine coastal watershed buffer land" that lies between the Sunken Meadow



Region 1 NYSDEC director Ray Cowan

Guy Jacob

State Park and the new Nissequogue River State Park. "Its preservation would link two state parks, and therefore multiply and strengthen the individual prominence of each park. Consequently, the whole would be monumentally greater than the sum of its parts," said Jacob.

"The Gouldstone land should be included in this Sound reserve system," stated Jacobs. "From the highest point of this acreage, there is this spectacular view of Long Island Sound. With the pond, a forest and about four acres of wetlands, this is an important property to earmark for preservation."

Glenwood Landing resident, Patrice Benneward urged all public and elected officials to support the reserve effort. Benneward suggested Glenwood Landing Waterfront, as well as Hempstead Harbor, at large, be included in the planning efforts.



James Morgan

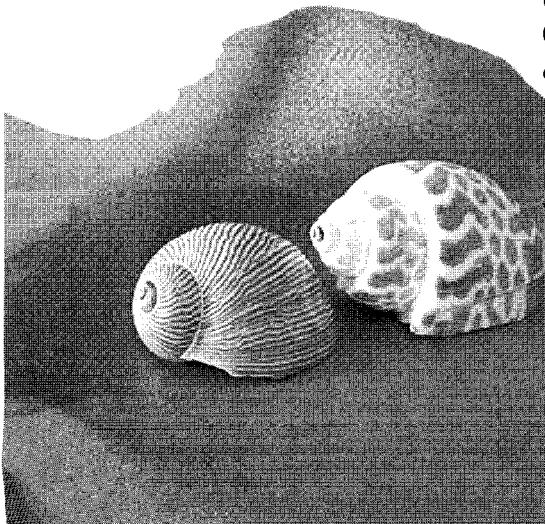
Mechanisms to protect open space

89

The town of North Hempstead proposed "a fund of \$15 million for three major public purposes; \$8 million for open space acquisition," said Town Supervisor May Neuberger. The supervisor hopes this effort will be part of a reserve system.

Ray Cowan, regional director for the New York State Department of Environmental Conservation, read a prepared statement to the audience. It included, "As charged in the Governor's State of the State message, we have begun working in partnership to provide ten Long Island Sound access sites over the next ten years, an effort for which we have committed \$25 million. And although the Sound is a tremendous public resource, recreational use is compromised by limited public access to its waters. Only a few state park facilities provide unrestricted access to the public for recreation. Our goal is to add new opportunities for enjoying a restored Sound, including swimming, access for operators of powerboats, canoes and kayaks, access to scenic vistas, and even camping near the shore."

MANHASSET



Cowan added that the reserve system is another cornerstone in the restoration of Long Island Sound, in addition to the work that the Department of Environmental Conservation and the Department of State have been doing to reduce nitrogen, control non-point source pollution and restore aquatic habitats through Governor Pataki's Clean Water/Clean Air Bond Act. The reserve system dovetails perfectly with the state's Open Space Conservation Plan and its update of the 21st Century Open Space Plan.

Cowan concluded that federal legislation and funding to match New York's efforts are critical and stated New York's support of the Conservation and Reinvestment Act (CARA).

Patrice Benneward noted that several miles of waterfront property were currently available for redevelopment on Shore Road in Glenwood Landing. Benneward advocated for the restoration of critical land and marine habitat on the North Shore of Nassau County to "create a much needed coastal watershed buffer, expand public access to the waterfront and provide breathtaking views of the Sound."

Concluding Remarks...

Photographer and writer, Helen Gaillet de Neergaard observed, "The harbor is relatively calm, very beautiful and needs to be preserved, with all of the coalitions who are actively doing so."

"The Sound is cherished by millions and yet the Sound, like all of New York state's waters, has been taken for granted...Our common interests can best be served by the common purpose of Sound restoration."

~ Frank Morris

"The Sound is cherished by millions and yet the Sound, like all of New York state's waters, has been taken for granted and damaged by human exploitation," exclaimed Frank Morris, chairman of Long Island's Sierra Club. "Our common interests can best be served by the common purpose of Sound restoration."

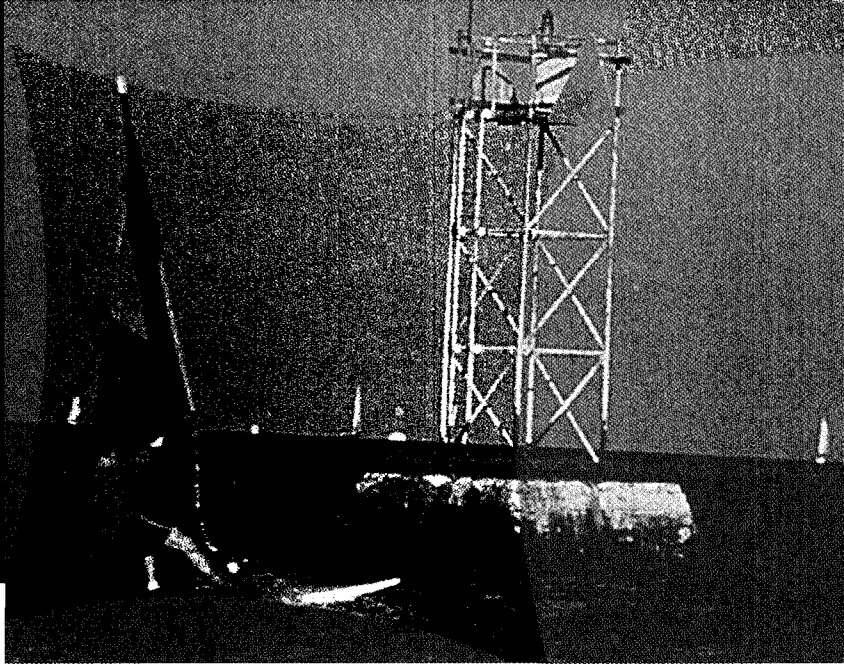
"We really have to look back now at what happened and see if we can recreate our environment," began Joel Ziev, a consultant for the waterfront in the Town of North Hempstead. "I know the Village of Port Washington is looking at making a deal with Lewis Oil and taking over the waterfront there."

"Thank you for this opportunity to provide these comments on behalf of the governor on his vision for Long Island Sound and to publicly endorse Listen to the Sound 2000 and to launch the creation of the Long Island Sound Reserve system," said Ray Cowan.

Jennifer Wilson Pines, vice president and conservation chair of the North Shore Audubon Society, resolved that the reserve had reached a "critical juncture where the open space that's left is diminishing tremendously" and resolved that we preserve the space.

COLD SPRING HARBOR, NEW YORK

Audubon New York



91

Cold Spring Harbor, New York

**Cold Spring Harbor High School
Thursday, June 22, 2000**

Over fifty people attended the eighth hearing of **Listen to the Sound 2000**. David Miller, executive director of National Audubon Society of New York State chaired the event.

"Ten years ago, Audubon helped lead a campaign to address declining water quality in the Sound.

Today the water is 25 percent cleaner, and there is increasing momentum and support to get the rest of the job done."

~ Marilyn England

Marilyn England, executive director of Theodore Roosevelt Audubon Sanctuary, maintained that the timing of the hearing could not be better, as development on Long Island has intensified under today's economic boom.

According to England, the Sound has troubles, "from annual dead zone events to the recent lobster die off, to over-development of its shorelines. Ten years ago, Audubon helped lead a campaign to address declining water quality in the Sound. Today the water is 25 percent cleaner, and there is increasing momentum and support to get the rest of the job done."

Basil Tangredi, member of the Huntington Conservation Board, claimed that the group supports marine conservation laws to protect the shoreline of the Town of Huntington, which contains bay complexes, deep harbors and the projections of Eden's Neck and Lloyd's Neck that provide interesting habitats and quality shellfish.

Tangredi stated that public education and legislation would increase appreciation of the Sound and a sense of responsibility for the environment. "We have to really change the individual, what the individual thinks of the land," began Tangredi. He added that we should turn away from materialistic values and turn towards a future with "clear water, and maybe the return of dolphins and lobsters for Long Island Sound."

Comments on the Reserve Concept

Action for Preservation and Conservation of the North Shore of Long Island member Caroline DuBois enthusiastically supported the united efforts of citizens and government officials in producing a reserve that permanently protects open space. "We share the vision of an emerald necklace, a network of wild shorelines ringing the Sound forever." DuBois challenged citizens to empower leaders to adopt smart growth, a practice that emphasizes the

control of sprawl, and other sustainable development stewardship policies to create "a living environmental legacy for the greater good for all mankind."

Resident Mary Malloy supported the British concept of access and open availability of the waterfront for the community and recommended that Americans mimic the policy. Malloy took issue with the low quality of the water in the Cold Spring Harbor estuary. Malloy and resident Lisa Marks also insisted that the oil tank area at Cold Spring Harbor Mobil Oil Terminal be cleaned.

The Sierra Club of Long Island supported the idea of a Long Island Sound Reserve system. The group pushed for expansion of environmental protection once "all the properties that are already in public ownership and more of the undeveloped properties are

properly mapped so that the public shoreline access exists," said the group's treasurer, Barbara Josepher.

Sites in the area for the Reserve System

Dyan Freiberg of Save the Sound said, according to the United States Environmental Protection Agency, Connecticut has lost some 74 percent of its wetlands dating from the 1780s, while New York has lost some 60 percent during this same time period. Freiberg included sites identified by the Habitat Restoration Initiative: 18 sites in Oyster Bay, including Beaver Brook,

Shoe Swamp, Beaver Lake and Cold Spring Ponds. In Huntington, 11 sites, including Betty Allen Nature Park, Center Port Ponds and Twin Ponds Park.

Marilyn England, executive director of Audubon New York's Theodore Roosevelt Sanctuary suggested the Chandler Estate, KeySpan Jamesport, North Fork Preserve, Dam Ponds parcels and the KeySpan property, formerly owned by LILCO.



Tappan Marina adjacent to KeySpan owned property.

Coalition to Save Hempstead Harbor

According to Maria Kelly of Huntington Audubon, "KeySpan has not yet decided what to do with the land where the tanks were buried." Other speakers had ideas about how to transform the land.

"The Mobil Oil terminal site in Cold Spring Harbor...could reclaim its historic maritime heritage if

"There is no doubt that the record of these Listen to the Sound forums will expand ideas of how to provide greater public access..."

~ Alexander Treadwell

it were transformed into a passive beach and marine environmental education and research site," said Caroline DuBois.

Basil Tangredi recommended the former Morgan Estate, which includes tidal wetlands, freshwater wetlands, old fields and climax woods, the Fuke's property and Crab Meadow.

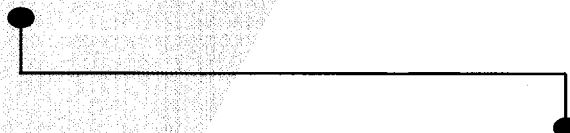
Joanna Radin, citizen of Kings Park, recommended that the state retain the Kings Point property for use as an educational tool. "I grew up there. I played there. I went to camp in the area surrounding there, and I really think that the state's retention of that land would help unify it."

Amy Hamlin, Long Island chapter director of the New York League of Conservation Voters and the New York Conservation Education Fund, suggested Nissequogue River State Park. "On its northern border, Long Island Sound, and on the eastern border, Nissequogue River designated by the Audubon Society as one of the most important bird areas in this state."

Ed Mohlenhoff, resident of Oyster Bay Cove, recommended Beaver Lake, Shoe Swamp, Francis Pond and the Commander Oil terminal area in Oyster Bay.

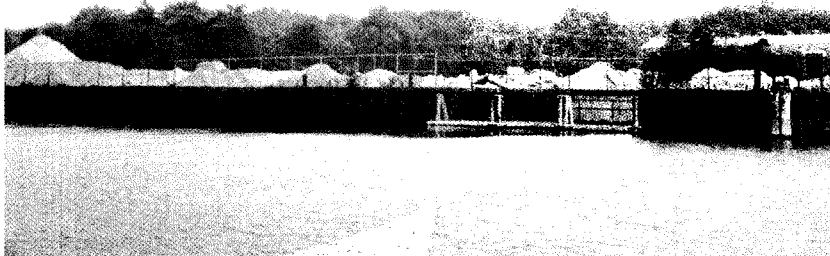
Denise Woodin, executive director of Friends of the Bay in Oyster Bay, also encouraged the bay's inclusion, "We know from first-hand experience the pressure that can transform open space and waterfront property into high density development," said Woodin. "However, protecting our natural resources means constant vigilance from environmentalists, community residents and our public officials."

Woodin encouraged "sustainable economic development, environmental protection, historic preservation and the creation of additional open space that would link Bayville," the western waterfront and the eastern waterfront of Oyster Bay. Woodin contended that if the Commander Oil terminal was phased out, as recommended by the state's Long Island Sound Comprehensive Conservation and Management Program, public use of the site should be encouraged.



Mechanisms to protect open space

“Governor George E. Pataki has put forward an ambitious agenda for Long Island Sound...a fully-funded Environmental Protection Fund, and through his leadership the resources of the Clean Water/Clean Air Bond Act are being devoted to improving the Sound’s environment,” declared Secretary of State Alexander Treadwell.



KeySpan property recently cleared of propane tanks.

Through the governor’s vision the Nissequogue River State Park has become a reality. The governor has provided for the transfer of 153 acres of this former psychiatric center in order for it to become one of our newest state parks.

95

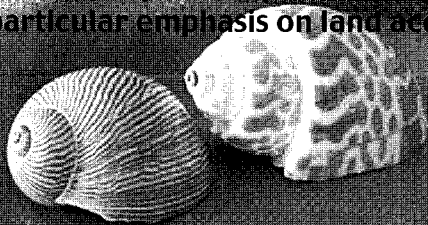
“There is no doubt that the record of these Listen to the Sound forums will expand ideas of how to provide greater public access,” said Treadwell. “We share a joint optimism that together we will not only achieve the governor’s goal for access, but also exceed the public’s expectation.”

“This Listen to the Sound campaign is very timely for providing identification of priority Long Island Sound watershed acquisition sites for inclusion in the 21st Century Open Space Plan, as well as for the reserve system.” Treadwell concluded with a call for federal funds to enhance the state’s efforts.

Nancy Douziman stated that a great number of people care about the reserve and encouraged more groups to work together. “I think what we need to do is in line with what was said before as far as smart growth, we really need to take a bigger perspective,” said Douziman.

Suffolk County Legislator (District 18) and vice chair for the environment committee, Jon Cooper grew up near the Sound and was very concerned about its present state of dying commercial fisheries and therefore strongly supported the Long Island Sound Reserve System. Cooper intended to introduce a bill in the legislature shortly that would increase funding in 2001 for open space preservation with particular emphasis on land acquisition in Western Suffolk.

COLD SPRING
HARBOR



Ed Mohlenhoff, resident of Oyster Bay Cove, also driven by the noticeable decrease in the quality of life and environment over his lifetime, emphasized the need to begin "cluster zoning, or up-zoning, of some of these villages to stop the cookie-cutter two-acre or quarter-acre developments that are just shoved into areas and destroying whatever is in its path."

Legislator Brian Muellers said Nassau County called for a partnership between local like-minded organizations, government officials and the public. "I've read through the Nassau County draft open space plan and there's no mention of it anywhere, of the Long Island Sound Reserve," stated Mueller and he encouraged it to be part of the plan.

Related conservation issues

Horseshoe crab eggs play a crucial role in shorebird migration and their copper-based blood is used for human medical research. They are continuously threatened by over-harvesting from the conch and eel bait industry. "The entire Sound should become a habitat refuge for these fascinating creatures," said Caroline DuBois.

"We need more money for research, as to what exactly is going on. The lobsters in the last two years that have been dying off, something is going on."

~ Ceil Stepanian

Ceil Stepanian requested money for research, stating that he is "seeing better wildlife in the salt marshes, more herons, more egrets, more young fish being hatched, but something is happening when they get out there on Long Island Sound. We need more money for research, as to what exactly is going on. The lobsters in the last two years that have been dying off, something is going on."

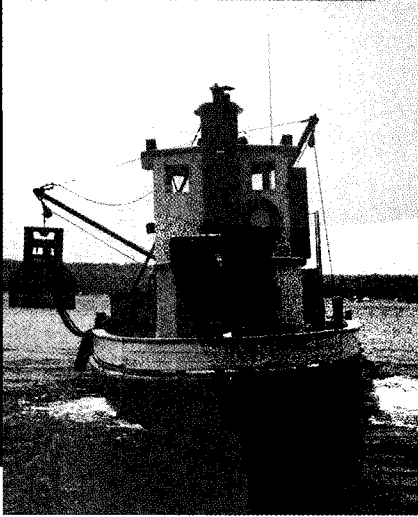
Concluding Remarks...

Echoes for public education were heard when Fritz Coudert, president of the Center for Marine Education and Recreation, voiced his perception: "People who don't care, or don't know enough to care, about what to do for their environment must be a target of our educational efforts." Coudert encouraged laws, purchasing properties and community education. "We need the regional concept, but we need to educate people, and that's where I think we will be supporting this as much as anybody and our way."

Maria Kelly of Huntington Audubon called for maintenance and expansion of public access. According to Kelly, "nature's way of filtration is wetlands" and she encouraged other organizations' participation in the reserve incentive in order to retain the natural defense.

PORT JEFFERSON, NEW YORK

Friends of the Bay



97

Port Jefferson, New York

**Village Court Hall
Tuesday, June 27, 2000**

Close to sixty people attended the ninth hearing of Listen to the Sound 2000. Lucy Betty Nash, vice president of Four Harbors Audubon Society, introduced hearing chair Marilyn England of Audubon New York's Theodore Roosevelt Sanctuary.

"Although too late to save Grandifolia Sand Hills, which was bulldozed beginning the same day that the zoning change was approved, public access at such a site should be limited to passive observation of flora and fauna."

~ Amie Hamlin

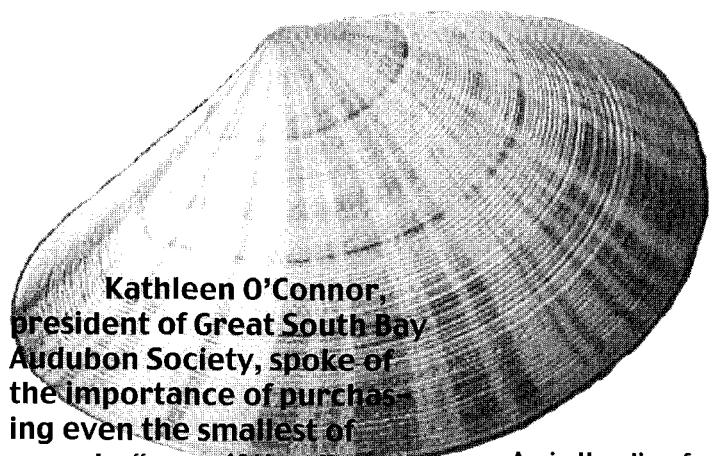
Having witnessed a slow and steady degeneration of wildlife habitat, water quality, and fish and shellfish populations over the last half century due to the excessive use of chemicals, insecticides and fertilizers, Camille Johnson, president of Stony Brook Civic Association, encouraged the creation of a Long Island Sound Reserve. The blue claw crab, which was abundant in Stony Brook, has been absent from its waters since the 1960's. Clam and oyster beds have been closed to the public from May to October for the last several years as a result of high bacteria counts.

"If Stony Brook, Forsythe Meadow and the Plock property are developed, they could have a negative impact on water quality with respect to runoff into the Stony Brook Harbor and, subsequently, into the Sound," Johnson stated. She cites unified cooperation as the only way to successfully safeguard the environment for ourselves and future generations.

Comments on the Reserve Concept

Many voiced their full support for the reserve. "We will lend our support and our energy and whatever ability and talent we have to making the reserve come into being," said Richard DeTurk of the Regional Plan Association.

Luci Betti Nash maintained that continued research and youth education would ignite the conservationist flame. Drawing from childhood memories Nash said, "We must recreate that wonder in children today by insuring the health of the Sound." She also suggested that money spent on creating these new access points and parks could be matched with money for education and research. She insisted land for open space should be purchased, giving landowners an incentive to sell for preservation instead of development. "The time to do these things is now, while we have a booming economy," said Nash.



Kathleen O'Connor, president of Great South Bay Audubon Society, spoke of the importance of purchasing even the smallest of parcels, "even if they're one or two acres...keep acquiring them and keep fighting."

Amie Hamlin of New York League of Conservation Voters



Mary Mulcahy

Sites in the area for the Reserve System

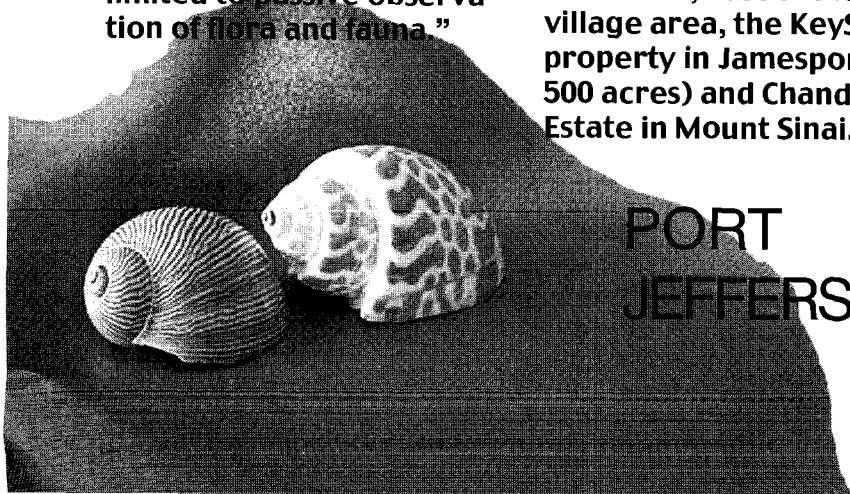
Amie Hamlin, the Long Island chapter director of the New York League of Conservation Voters and the New York Conservation Education Fund, expressed great sadness about the transformation of the hummingbird haven, Grandifolia Sand Hills, into a golf course. Hamlin encouraged locating new adjacent parcels of land and added, "Although it's too late to save Grandifolia Sand Hills, which was bulldozed beginning the same day that the zoning change was approved, public access at such a site should be limited to passive observation of flora and fauna."

Rebecca Grella, executive director of Aiza Biby, suggested Cedar Beach Nature Sanctuary and land on the south side of the Old Post Road be a part of the reserve system. She emphasized the importance of educating the youth to become stewards of the environment.

Luci Betti Nash suggested that the following properties be added to the reserve system: Forsythe Meadow in Stony Brook, the Plock property in Stony Brook, the Detmer Farm in Sautucket, east of the three village area, the KeySpan property in Jamesport (over 500 acres) and Chandler Estate in Mount Sinai.

Gary Halada recommended the Chandler Estate because it "is a site that's been listed for acquisition...one of the last remaining pieces of open land on Mount Sinai Harbor, and a valuable marine and estuary ecosystem."

Sarah Karpany, a Ph.D. candidate in the Department of Ecology and Evolution at SUNY Stony Brook, also recommended the Chandler Estate and strongly encouraged the creation of a



canoe access in the
Nissequogue River State Park.

Louise Harrison,
consultant for Conservation
and Natural Areas Planning,
cited Four Sides Meadow, a
40-acre forest in Stony
Brook Village. Harrison also
encouraged a close exami-
nation and incorporation of
the recommendations of the

"We may need to
consider creative
solutions to create
wetlands as many
will be lost as the
sea level rises."

~ Alex Kolke

Long Island Sound Coastal
Management Program,
which included three out-
standing natural coastal
areas: Mitchell Creek wet-
lands in Nassau County, the
500-acre property in
Jamesport owned by
KeySpan and the Sharm
property owned by KeySpan.

Harrison maintained
that a collaborative effort
was necessary to retain the
regionally important natural
areas where there's high
concentrations of natural
resources that are signifi-
cant and cultural resources
that are dependant on those
natural resources.

Edward Luke, presi-
dent of Nissequogue Canoe
and Kayak Club, urged the
assembly to create a water
trail along the shore of Long
Island Sound. A water trail is
a series of sites spaced apart
by a day's paddling distance
where boaters can spend the
night on multi - day journeys.

Guy Jacob, coastal
resources chair of the Sierra
Club, recommended 26 acres
of nearly pristine coastal
watershed buffer land be-
tween the Sunken Meadow
State Park and the new
Nissequogue River State Park.

Mechanisms to protect open space

Many resolved to find
ways in which to protect the
environment. George
Prioios, chairman of Suffolk
County Soil and Water Con-
servation District, stated,
"The vast majority of all the
problems that many of us
have spent countless years
trying to address have been
the result of poor planning,
improper planning or no
planning at all. I believe that
the Long Island Sound Man-
agement Committee working
with the CAC, the Citizens
Advisory Committee, should
establish a timetable for all
local governments along the
Sound to change their zoning
and local laws to become
compliant with all the recom-
mendations to the Sound's
Comprehensive Conservation
and Management Plan."

"How do you get
funding to run the public
education programs that are
necessary to educate the
public?" questioned Donald
Coyle, chairman of Port
Jefferson Harbor Advisory
Commission. Coyle encour-
aged the assembly to en-
dorse the reserve and seek
funding for implementation
and education of the public.



Erik Dumont, Long Island program coordinator of Citizens Campaign for the Environment (CCE), referred to the Long Island Sound estuary as "the region's greatest natural and economic treasure." CCE believes that lands that act as buffers, key habitats and estuarine wetlands should be given priority. Many of the issues should be addressed by strengthening the Federal Coastal Zone Management Act, increasing funding for non-point source pollution control and appropriating substantial federal dollars to the Long Island Sound Restoration Act, recently approved by the House of Representatives.

New York State Assemblyman Steven Englebright recommended Detmer Farm and Ploch property. Englebright encouraged the group to urge Pataki to sign the legislation he sponsored (New York State Assembly Bill #10402 and New York State Senate Bill #7251) which will amend parks and preservation laws to include most of Long Island Sound in the North Heritage area. Most of Long



Audubon

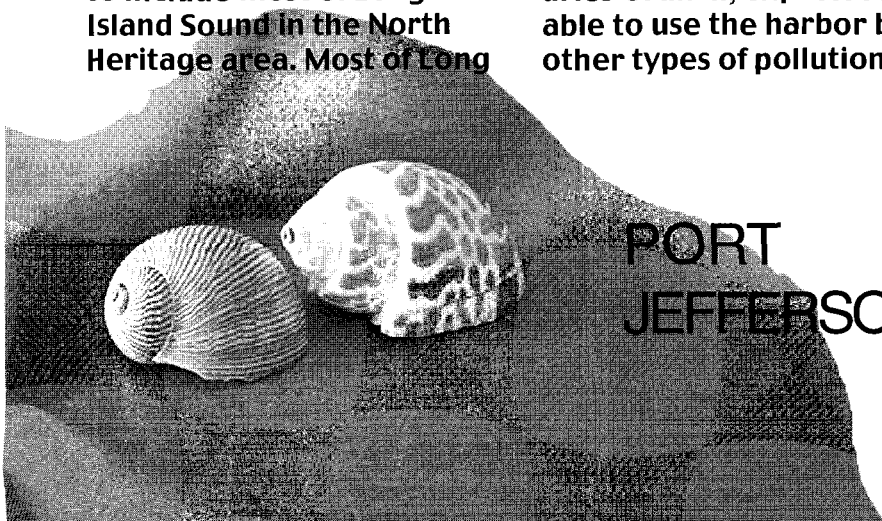
Island Sound has been recognized by both houses of the state legislature as an important resource that should be given the status of a "heritage area".

101

Sarah Karpany suggested that boater fees at each of the harbors on Long Island Sound be used for educational purposes. Jack Finkinberg, board member of the Open Space Council, called for an aggressive plan to preserve the rest of eastern Suffolk.

Related conservation issues

Janet Lauber, president of Stony Brook Estuaries Council, expressed the frustration of not being able to use the harbor because of road runoff and other types of pollution. Lauber promoted the use



PORT
JEFFERSON

of catch basins and infiltration, a project undertaken by the council for the last five years. "But if you save your part of the Sound, that's the start, isn't it? That's what you want, we all want to do," exclaimed Lauber.

Sarah Karpany discussed the use of pesticides to control mosquitoes, where she encouraged Suffolk County to abstain from pesticides spraying until all other methods had been exhausted.

Louise Harrison asked the towns and villages to take advantage of the new state legislation that allows for the regulation of personal watercraft in the waters within 1,500 feet of their boundaries.

Alex Kolke, a graduate student at SUNY Stony Brook, said the sea level rise must be taken into account. Kolke maintained resultant flooding in marshes would require plans to be creative and reflective. She suggested the purchase of additional land to allow marshes to move inland. "We may need to consider creative solutions to create wetlands as many will be lost as the sea level rises."

"I have and am listening to the Sound, and will continue to do so. What I hear is, 'please stop abusing me, and leave my open space open and quiet, and used for quiet recreation only.' My personal dream is that we get to save it all. And we fight to save it all"

~ Meg Engelman

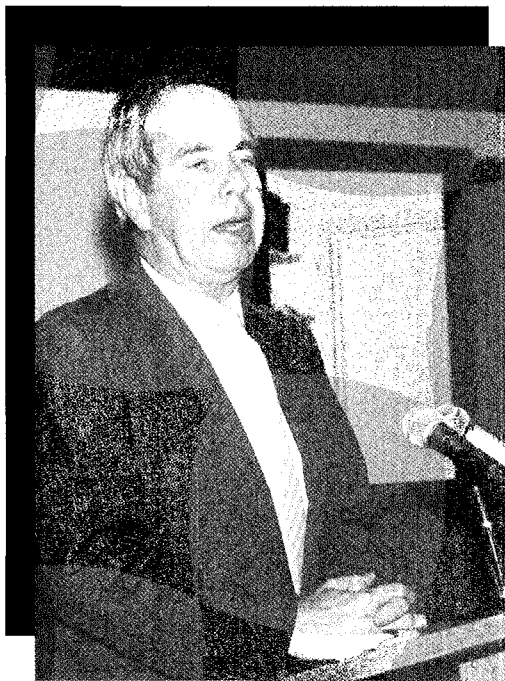


Howard Pincus

Concluding Remarks...

Karen Chytalo, New York State Department of Environmental Conservation, pressed for public access stating, "You should have the ability to use it, see it, touch it and get to it." Chytalo encouraged working in partnership also with the Department of Transportation to erect directional signs for increased public access to sites.

Meg Engelman summarized the movement beautifully from another perspective, "I have and am listening to the Sound, and will continue to do so. What I hear is, 'please stop abusing me, and leave my open space open and quiet, and used for quiet recreation only.' My personal dream is that we get to save it all. And we fight to save it all."



Mary Mulcahy

Dick Amper speaks at the final
Sound 2000 hearing

SOUTHOLD, NEW YORK

103

Southold, New York

**Southold Town Hall
Thursday, June 29, 2000**

Over forty people attended the final hearing of the Listen to the Sound project. Proceedings were opened by Beverley Prentice, president of North Folk Audubon Society. Bob

Yaro, executive director of Regional Plan Association, chaired the meeting and began testimony urging the group to continue the effort that began ten years prior with the first Listen to the Sound hearings.

Marguerite Purnell, director of the Fisher's Island Conservancy, set forth a vision of the reserve that incorporates terrestrial and underwater areas within Long Island Sound...adjacent to Long Island Sound. Purnell said the reserve provides for a network of open space areas encompassing ecological value, public access to Long Island Sound and educational opportunities.

Development pressures have intensified as population trends increased in the community surrounding Long Island Sound. Purnell encouraged the use of conservation easements, transfer of development rights and other tools to encourage property owners to protect the environment.

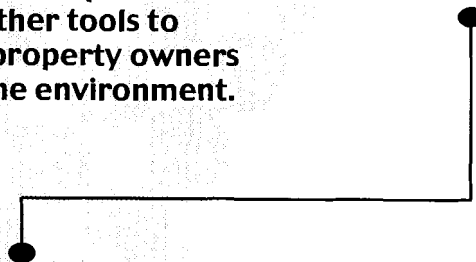
Comments on the Reserve Concept

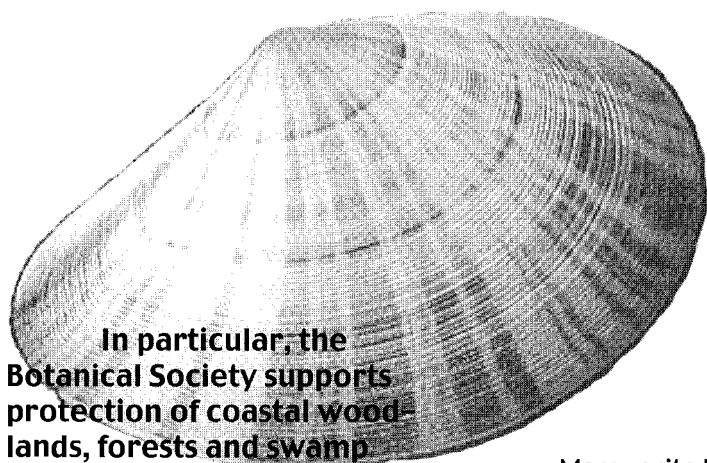
Bob Yaro encouraged preservation of the shoreline of the Sound now under attack from sprawl. The reserve concept is critical to preserve the ecological systems of the Sound, including the natural systems that surround the Sound. He asked for government support in what he termed the "appropriate development" of our natural resources.

Mary Laura Lamont, educational chairperson of the Long Island Botanical Society, said, "I was born and raised on Long Island Sound, and I love Long Island Sound, too." Long Island Botanical Society supported all efforts to protect and preserve forever land bordering and adjacent to Long Island Sound.

"I was born and
raised on Long Island
Sound, and I love
Long Island
Sound, too."

~ Mary Laura Lamont





In particular, the Botanical Society supports protection of coastal woodlands, forests and swamp forests that are currently not protected and are in eminent danger of being developed. Significant coastal wetlands and swamps draining into Long Island Sound are currently not regulated by the New York State Department of Environmental Conservation and are being proposed for development. Specific reference was made to the Northville Swamp Forest.

Lamont added, "I personally can attest to the tremendous number of birds in these woodland communities during migration seasons. Some of these woodlands still house breeding populations of declining neo-tropical species, such as wood thrush, ruby-throated hummingbirds, oven birds, scarlet tanagers, et cetera."

Marguerite Purnell



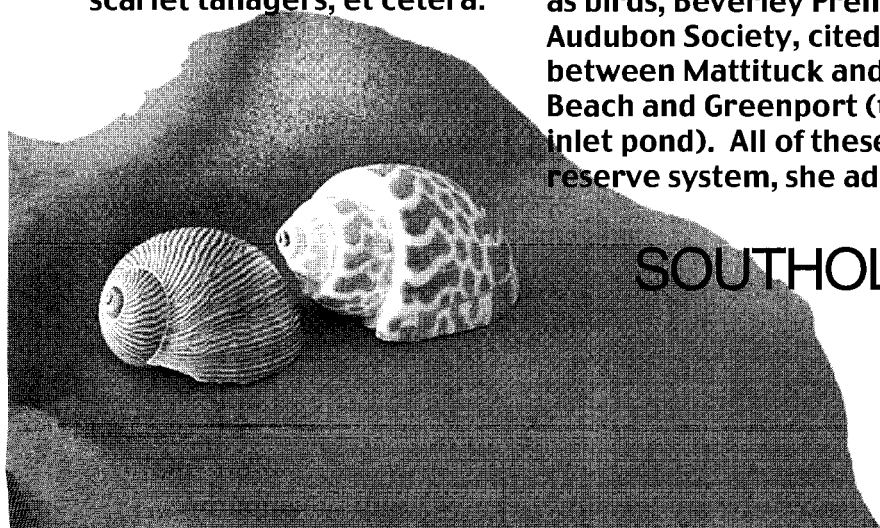
Mary Mulcahy

Sites in the area for the Reserve System

Lisa Holst, habitat restoration coordinator at the New York State Department of Environmental Conservation, said it would be extremely helpful if the Long Island Sound Coastal Advisory Commission, which is organized by the Department of State, and the Long Island Sound Study Management Conference would recommend to the Regional Advisory Committee a prioritized list of Long Island Sound acquisition sites. This list would assist in the development of the reserve system.

As a supporter of water trail recreation as well as birds, Beverley Prentice, president of North Fork Audubon Society, cited Mattituck Creek (the beach between Mattituck and Iron Pier Beach), Clark's Beach and Greenport (the area adjacent to a 50-acre inlet pond). All of these sites should be part of the reserve system, she added.

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Dan Morris, member of the Open Space Council, expressed his love for the Sound extending from his childhood. He supported saving Mattituck Inlet. "While the issues of the Sound's problems are many and complex, there's one thing I think is very clear, that there is a relation between population density, and many of the problems that exist. I encourage you to advocate for the acquisi-

"While the issues of the Sound's problems are many and complex... I encourage you to advocate for the acquisition of as much land as you can.

There can be no such thing as too much."

~ Dan Morris

tion of as much land as you can. There can be no such thing as too much," said Morris.

Gwynn Schroeder, Friends of Long Island Sound maintained that the reserve system should contain environmentally critical islands and reef areas in the eastern portion of the Sound. These areas with their surrounding waters comprise Plum Island, Great Gull Island, Little Gull Island and Fisher's Island. Schroeder described these areas as, "a treasure trove of environmental rarities, open spaces and scenic water resources, unparalleled in the over-built, over-fished and over-polluted areas that comprise the northeast coast of the United States."

According to Schroeder, Plum Island, which is U.S. Government owned, should be saved from development. Big Gull Island is a known bird rookery and of great value to a huge colony of rare nesting terns. Little Gull Island is similar, but on a smaller scale. Fisher's Island is home to over 45 species of flora and fauna classified as rare or endangered in New York state and there are open spaces on it that should be permanently protected.

Paul Stoutenburgh described an area on the North Shore near Riverhead with eighty-foot tall banks, many of which are

untouched by man. Stoutenburgh also suggested Mattituck and Peconic Inlets and Duck Pond Road. Mattituck Inlet is noted for its oysters and its clams.

Stoutenburgh included Richard Reeve and Carol Granton Farms, which are currently being saved through an easement of the Peconic Land Trust, and the Riverhead high bluffs (two parcels of land that were saved through the Peconic Land Trust).

Beverley Prentice, president of North Fork Audubon Society, also suggested Mattituck Creek for its important wetlands, wildlife and public access. Prentice encouraged a continued search of land at the areas along the creek for possible public acquisition and restoration, and stated that, "even parcels of several acres, could have an impact on the health of the small estuary."

The beach east of Iron Pier Beach is part of a parcel now owned by the power company KeySpan that was originally to be the site of a nuclear power plant. Prentice also suggested the Hallukful Farm Museum on Sound Avenue, which contains about 300 acres of leased farmland, a fresh water pond and a stretch of hard wood forest that provide a habitat for a wide variety of wildlife.

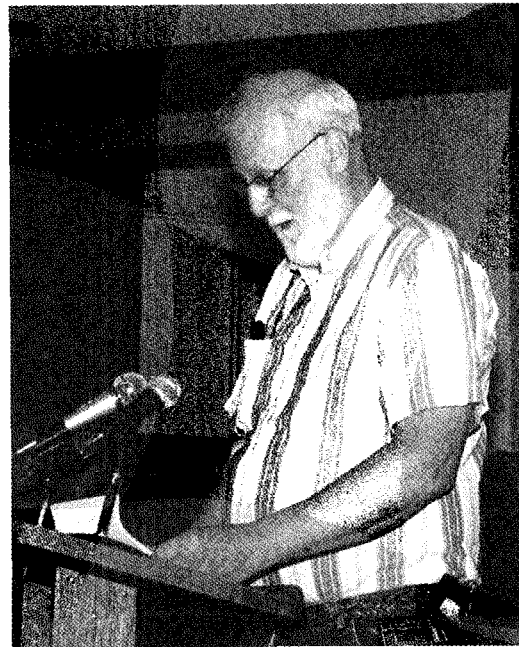
Prentice also cited Clarks Beach, which the mayor of Greenport recently stated is for sale. The 50-acre Inlet Pond Park is now under the stewardship of the Town of Southold.

"A water trail is a series of sites spaced apart by a day's paddling distance where boaters can spend the night on multi-day journeys. A new and interesting idea for one of our least polluting boating activities," Prentice concluded.

Dan Morris cited many opportunities to provide public access and reduce development of pressure on the coast. Morris asked the group to consider the purchase of parcels in East Marian, Dam Pond area, the KeySpan parcel in Jamesport (500 acres) and the KeySpan parcel in Shoreham (over 800 acres). In addition, the North Fork preserve in Northville (300 plus acres) was recommended to be part of the reserve system.

Howard Meinke, president of North Fork Environmental Council, added Goldsmith's Inlet, the last estuary before Orient Point. Behind the Inlet is a marsh area that opens into a fresh water pond.

Dan Morris



Mary Mulcahy

Henry Halama of the North Fork Audubon Society reflected on the destruction of the Grandifolia Dunes, which he branded as "one of the biggest tragedies in recent years." The Grandifolia Dunes would have been a crown jewel of the reserve system, but fell to development.

Charles Cetas, vice president of North Fork Environmental Council, proposed several areas including the KeySpan and McQuade properties, Wading River Marsh area, Wading River Creek Marsh, and the Bating Hollow Marsh, currently owned by the DEC. If the property is not purchased Cetas suggested that develop-

ment rights be given to Bating Hollow Boy Scout Camp.

Amie Hamlin, director of the Long Island chapter of the New York League of Conservation Voters, stated, "The North Fork has the opportunity, I think more than any other place on Long Island, to preserve its land on the Sound." Hamlin added the Chandler Estate.



Mechanisms to protect open space ---

Dick Amper of the Long Island Pine Barrens Society discussed how eastern Long Island was being developed before our eyes. A county study he mentioned projected a build-out of all major developable lands on the island by 2012. Amper called for preservation of the lands and increased public access to counter this trend.

Amper noted that the protection of land would benefit the ecological value of the Sound. These open areas need to be prioritized and development rights must be transferred to appropriate groups so they can be preserved for future generations.

--- Related conservation issues

Gwynn Schroeder of Friends of Long Island Sound addressed the polluting of the Sound and warned of its consequences. Jim King, a lobster fisherman from Mattituck concerned with the state of his industry and the environment, remarked, "I think we've got a lot of work to do. We haven't cleaned up the Sound. We still have a ways to go."

Captain James House asked the group to maintain a "balanced approach" by working with the New York State Department of Environmental Conservation to regulate fishing, ensure the public access and preserve the environment.

"I think we've got a lot of
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~ Jim King



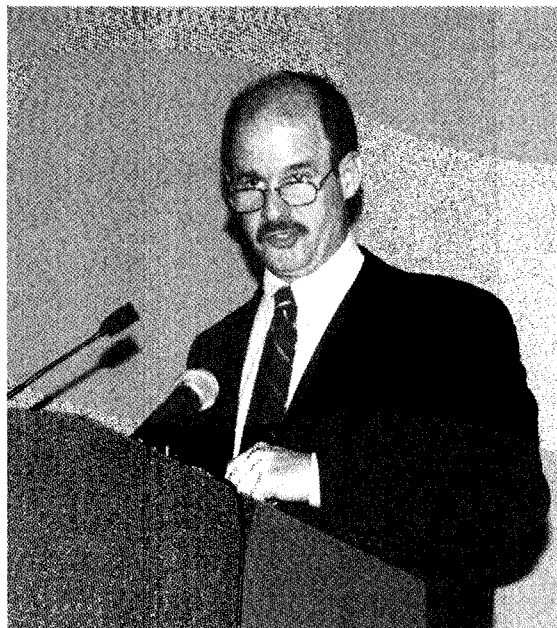
Tim Holstrom c/o The Trust For Public Land

Chandler Estate

Concluding Remarks

Bob Yaro opened with the remark that the hearings raised inspiring ideas for thousands of citizens of the Sound. He warned that instead of allowing the remaining areas of the Sound to be developed the community must fight to protect the land.

Yaro maintained that the collaborative effort was necessary for the assurance of a legacy for future generations, and so predicted, "This is the beginning...and it will be a great ending if we all work together to make it happen."



Jeanne Host

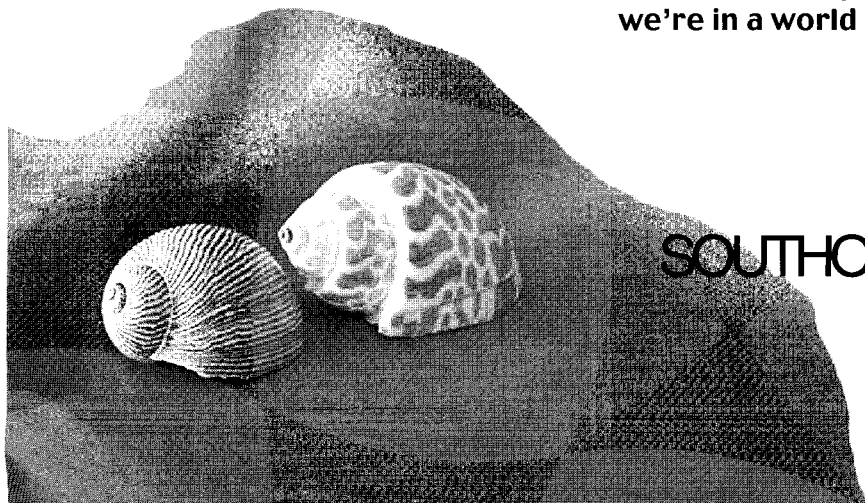
Bob Yaro

"I hope we will be able to permanently preserve as much as possible, and that the North Fork can avoid the overdevelopment that has gobbled up most of the rest of Long Island," said Amie Hamlin. Dismayed about the injustice of the Grandifolia Sandhills, she claimed, "It hurts. And so I hope that we can just preserve as much as we possibly can preserve."

109

Paul Adams, a biology professor at SUNY Stony Brook, voiced disgust about the destruction of the hummingbird habitat at the Grandifolia Sandhills. He likened the slaughter to "an unarmed nation facing a few Soviet tanks, the developers." Adams added, "I'm appalled that in the Year 2000, in one of the wealthiest, most educated counties in the U.S., their breeding grounds should be casually bulldozed to make yet another golf course."

Jane Kerin-Moffat linked conservation to the survival of the entire community. "A lot of people at different times have mentioned, almost in passing or by implication, we have a spiritual need to be able to get to nature. I think this is very, very fundamental. I think we're in a world crisis."



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APPENDICES

Appendix A: List of Proposed Sites for
the Long Island Reserve Program

Appendix B: List of Co-Sponsors and
those who gave testimony at the ten
Listen to the Sound Hearings

A Appendix A _____●

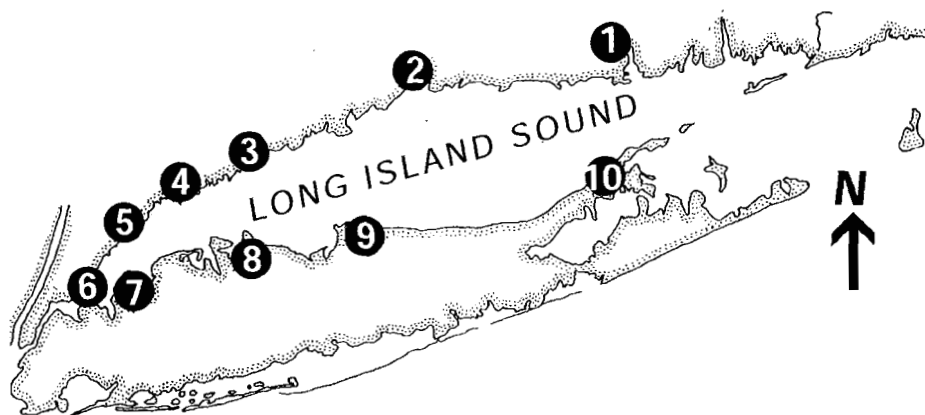
Appendix A

Listen the Sound Testimony Site Recommendation

For consideration in establishing the Long Sound Reserve System

These sites were recommended at Listen to the Sound 2000 citizen hearings as a part of a proposed Long Island Sound Reserve program. All of the sites were provided through citizens' testimonies and would need further evaluation should a Long Island Sound Reserve program be implemented. They are listed geographically, counterclockwise around the Sound, beginning in eastern Connecticut.

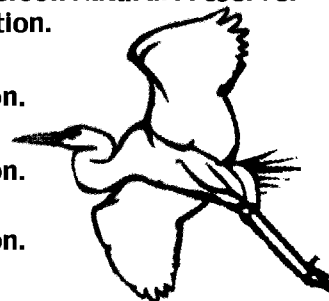
Site names printed in italics have also been identified as habitat restoration priorities under Long Island Sound Habitat Restoration Initiative (see footnote at end of listing. *)



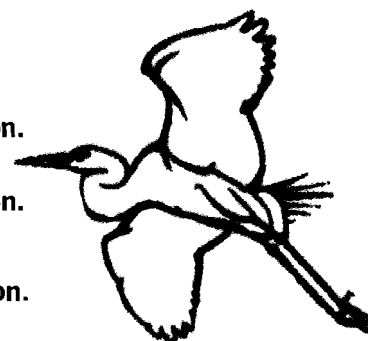
- (1) Essex, CT
- (2) New Haven, CT
- (3) Norwalk, CT
- (4) Greenwich, CT
- (5) Mamaroneck, NY
- (6) City Island, NY
- (7) Manhasset, NY
- (8) Cold Spring Harbor, NY
- (9) Port Jefferson, NY
- (10) Southold, NY

Sites Recommended for Eastern Connecticut

Municipality	Site	Comment and Recommendation
STONINGTON	<i>Ram Island</i>	This 16-acre privately owned island off Mason Point provides colonial water bird habitat and potential term habitat. The coastal forest needs restoration.
STONINGTON	Barn Island	This state-owned Wildlife Management Area has extensive salt marshes, boat launch access.
GROTON	Haley Farm State Park and 50 adjacent acres	The 300-acre park is a popular passive recreation area, about 200 acres, on Palmers Cove. Fifty adjoining acres of the original Haley Farm constitute the only large open space left next to the park and should be added to it. The addition is needed to preserve sufficient habitat for the rare cerulean warbler and yellow-breasted chat.
GROTON	<i>Bluff Point State Park and Coastal Preserve</i>	This popular 800-acre natural preserve includes rocky bluff, tombolo beach, tidal salt marsh and coastal forest, the last of which needs restoration.
WATERFORD	Mamacoke Island and adjacent river coves	The Connecticut College Arboretum maintains this undeveloped, forested island in the Thames River, its adjacent coves and salt marsh as a natural area. All told there are at least 40 acres significant of bird habitat.
EAST LYME	Rocky Neck State Park	This is a popular 700-acre natural park.
OLD LYME	Properties along Four Mile River	These properties lie adjacent to Rock Neck State Park and should be protected.
OLD LYME	Roger and Sylvia Marsh properties	As of June, 2000, these 60 acres in the Mile Creek area were up for development but still purchasable.
OLD LYME	<i>Griswold Point</i>	This barrier beach at the mouth of the Connecticut River is a Nature Conservancy preserve. Beach and dunes need restoration.
OLD LYME	<i>Great Island</i>	Connecticut has designated this island at the mouth of the CT River as the Roger Tory Peterson Natural Preserve. Beach and dunes need restoration.
OLD LYME	<i>Lieutenant River</i>	Tidal wetlands need restoration.
OLD LYME	<i>Calves Island</i>	Tidal wetlands need restoration.
OLD LYME	<i>Goose Island</i>	Tidal wetlands need restoration.

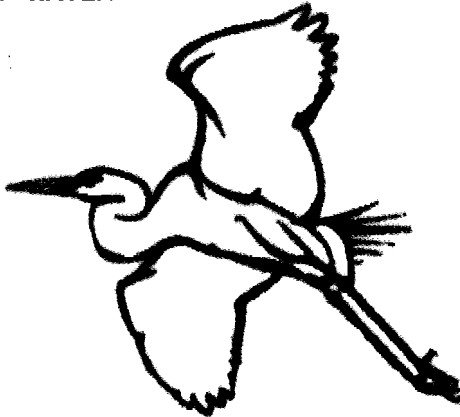


Municipality	Site	Comment and Recommendation
OLD LYME	<i>Lord Cove</i>	This is a state nature preserve. Tidal wetlands need restoration.
LYME and OLD LYME	Selden Creek, Cove and Island	Selden Neck State Park is an uninhabited, heavily forested, 528-acre island accessible only by water. The Nature Conservancy's adjoining Selden Creek Preserve is about 200 acres. The two properties constitute a significant bird conservation area.
LYME	Whalebone Cove and Creek	This 200-acre freshwater tidal marsh is prime rail habitat and provides important winter habitat for bald eagles and black ducks. It is approximately 16 miles from the mouth of the Sound.
EAST HADDAM and SALEM	Burnham Brook Preserve	Approximately 1,000 acres in total, this Nature Conservancy preserve includes one mile of the Eight Mile River, which empties into the Connecticut River at Hamburg Cove. The preserve is outstanding for its diversity of birds, other wildlife and flora.
EAST HADDAM	<i>Chapman's Pond</i>	This 60-acre Nature Conservancy preserve is an Important Bird Area (IBA).
DEEP RIVER	Pratt and Post Coves and adjoining marsh uplands	These two coves comprise 1/6 of Connecticut's threatened freshwater tidal marshes and provide significant bird habitat. The areas adjacent to the marsh uplands should also be preserved.
ESSEX	Falls River	A fishway was recommended.
ESSEX	<i>Great Meadows</i>	Tidal wetlands need restoration.
ESSEX	<i>Thatchbed Island</i>	Tidal wetlands need restoration.
OLD SAYBROOK	<i>Beamon Creek</i>	Tidal wetlands need restoration.
OLD SAYBROOK	<i>Lynde Point</i>	Beach and dunes need restoration.
OLD SAYBROOK	<i>Ragged Rock Creek</i>	Tidal wetlands need restoration.
OLD SAYBROOK	<i>South Cove</i>	Restore this estuarine embayment.
WESTBROOK	<i>Menuketeseck and Salt Islands, surrounding tidal flats.</i>	The islands and adjacent mudflats provide important habitat for plovers, terns and colonial shore birds. The beach and dunes at Menunketeseck need restoration.



Municipality	Site	Comment and Recommendation
WESTBROOK	Salt Meadow	The headquarters and visitors center of the Stewart B. McKinney NWR, Salt Meadow, is an Important Bird Area (IBA) with a range of habitats from salt marsh to rare deciduous coastal forest and upland fields meadow.
WESTBROOK	<i>Quotonset Beach</i>	Restore tidal wetlands.
WESTBROOK	<i>Patchogue River</i>	Restore tidal wetlands.
CLINTON	<i>Hammock River</i>	Restore tidal wetlands.
CLINTON	<i>Clinton Harbor</i>	Restore tidal wetlands, submerged aquatic vegetation and shellfish reefs.
MADISON	Griswold Airport	The 42-acre tract borders the Natural Area Preserve in Hammonasset Beach State Park and contains potential nesting habitat for grassland birds. It is under immediate threat of development.
MADISON	<i>Hammonasset Beach State Park</i>	Connecticut's most popular state park Hammonasset is an Important Bird Area (IBA). Tidal wetlands need restoration.
GUILFORD	<i>Faulkner's Island</i>	As a 4.5 acre unit of the McKinney NWR, the Island hosts one of Connecticut's largest tern colonies. Steep coastal slopes need restoration.
BRANFORD	Thimble Islands	These 20 or so small islands and rock outcroppings provide important habitat for colonial birds. Only Outer Island (a unit of the McKinney NWR) and Yale's Horse Island are protected for wildlife. During nesting season, the birds on the smaller, privately owned islands are frequently disturbed by trespassing kayakers. Providing designated kayak landing sites on the larger islands might alleviate this problem.
BRANFORD	<i>Sybil Creek</i>	Restore tidal wetlands.
BRANFORD and EAST HAVEN	<i>Farm River and Salt Marsh</i>	Ninety acres of salt marsh north of Rte. 142 should be included in the reserve. Of these the East Haven Land Trust holds 20 and 30 are designated as a state sanctuary. Farm River tidal wetlands in Branford need restoration.
EAST HAVEN	Farm River State Park	This is a new state park of 62 acres, off Mansfield Grove Road, south of Route 142.
EAST HAVEN	Wetlands north of Cosey Beach Ave.	About 20 privately owned acres west and north of the Beach Head Restaurant need protection. Developers have tried to build there.

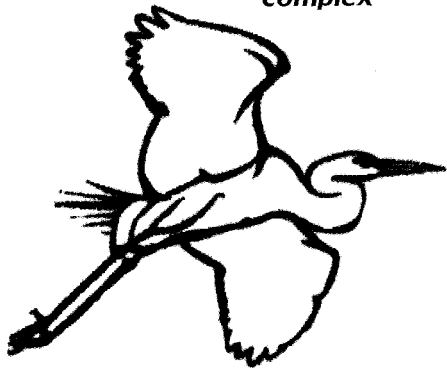
Municipality	Site	Comment and Recommendation
EAST HAVEN	<i>Caroline Creek</i>	About 30 private, valuable acres east of Brazos Road are in need protection and restoration.
EAST HAVEN	Deeded beach access	The deeds of Mansfield Landing, Four Beaches and Victoria Beach Condominiums include public right-of-ways for beach access, but the public is unaware of this.
EAST HAVEN	<i>Morris Creek</i>	The flow of the creek is improving. Its tidal wetlands are listed as needing restoration.
EAST HAVEN and NEW HAVEN	<i>Tweed New Haven Airport</i>	The tidal wetlands at the airport need restoration and some 60 acres of wetlands south of runway 220 are immediately threatened by its planned expansion.
NEW HAVEN	Lighthouse Point Park	This 84-city park has a swimming beach and boat launch. It is also one of the most popular east coast birding spots, noted for fall hawk migration counts.
NORTH HAVEN, HAMDEN, and NEW HAVEN	<i>Quinnipiac River estuary system</i>	This urban tidal salt marsh extends south along the Quinnipiac River from the Sackett Point Road area in North Haven to about Rte 80; it includes the state-owned Quinnipiac River Wildlife Area (c. 900 acres) and 14 acres belonging to Town of Hamden. Below Rte 80, in Fair Haven, between the railroad and the river, the New Haven Land Trust's Fargeorge Preserve protects 25 acres of tidal wetland and upland and thirty-four adjacent acres are immediately threatened with impending development. Although the marsh needs extensive clean up from accumulated historical pollution and land abuse, the upper marsh, supports significant and diverse wildlife and the lower Fair Haven area of river provides half of the seed oysters of the Connecticut oyster industry. Currently the marsh is cut off from public access. An effort is underway to create a Quinnipiac River Greenway.
NEW HAVEN	<i>Mill River</i>	An effort is underway to create a Mill River Greenway. Tidal and fresh water wetlands and the river corridor need restoration.
NEW HAVEN	<i>Long Wharf</i>	The Long Wharf tidal flats need restoration.
NEW HAVEN and WEST HAVEN	<i>West shore of the West River</i>	This privately owned area parallel to Water Street and First Ave. is part of projected West River Greenway, but it is immediately threatened by development. Tidal water wetlands and the river corridor habitat need restoration.
WEST HAVEN	Sandy Point	This 8-10 acre municipally owned sand spit and salt marsh is a breeding area for several listed bird species. Some breed nowhere else in Connecticut.



Municipality	Site	Comment and Recommendation
WEST HAVEN	<i>Old Field Creek</i>	The 390 acre Old Field Creek tidal estuary area extends from the Sound to Peck Ave., includes Sandy Point (above), Morris Point, a quaking bog, 3,600 feet of river channel above the Beach Street tide gate and 500 feet of channel below it. One third is privately owned and 2/3 are municipally owned. A local watershed group is seeking to restore the tidal wetlands and to create a nature preserve with an education center.
WEST HAVEN	<i>Cove River estuary</i>	Bounded by Platt Ave. and Capt. Thomas Boulevard, the estuary comprises over 400 acres of municipally owned, unprotected tidal wetlands identified for restoration.
WEST HAVEN-MILFORD	<i>Oyster River</i>	Oyster River marks the West Haven-Milford boundary. Its tidal wetlands need restoration.
MILFORD	<i>Milford Point and Wheeler Marsh complex</i>	The 850-acre Wheeler Marsh is a state Wildlife Management Area at the mouth of the Housatonic River. Its salt marsh needs restoring. Milford Point, a unit of the McKinney NWR, is a 10-acre barrier beach with two large sandbars. The complex is an important area for nationally and regionally significant nesting and migratory birds.

Sites Recommended for Western Connecticut

Municipality	Site	Comment and Recommendation
BRIDGEPORT	<i>Black Rock Harbor</i>	Populations of Old Squaw are plummeting and autopsies reveal high levels of mercury in the birds' tissues. This historically polluted harbor, which reportedly has spots of mercury contamination, may be part of the problem as large flocks of Old Squaw over-winter there.
FAIRFIELD	<i>Pine Creek East</i>	This town-owned salt marsh needs restored tidal flushing.
STRATFORD and BRIDGEPORT	<i>Great Meadows estuarine complex</i>	The Great Meadows unit of the McKinney National Wildlife Refuge encompasses about 750 acres of salt marsh and associated uplands and provides critical habitat for several listed species of birds and other wildlife. We should also protect the marsh's associated barrier beaches: Long Beach (Stratford) and Pleasure Beach (Bridgeport); and an adjacent, municipally owned, 40-acre field, which is a known habitat for the state-endangered Northern Harrier. Beaches, dunes and tidal wetlands in the complex need to be restored.



Municipality	Site	Comment and Recommendation
WESTPORT	<i>Sasco Brook Dam</i>	Restore the riverine migratory habitat.
WESTPORT	<i>Sherwood Island State Park</i>	Intensive recreational use stresses the park's natural habitats, several of which have been identified for restoration. More staffing and conservation enforcement are essential.
WESTPORT	<i>Cockenoe Island</i>	Restore coastal forest.
WESTPORT	<i>Saugatuck River</i>	Restore the tidal wetlands north of Route 1.
NORWALK	Manresa Island	When the Manresa power plant (one of CT's "filthy five") is decommissioned, the harbor-side site should be restored and maintained as open space.
NORWALK	<i>The Norwalk Islands</i>	The islands provide important colonial bird habitat. Chimon and Sheffield Islands are part of the McKinney NWR. Together with Shea Island they need coastal forest restoration.
NORWALK	<i>Flock Process Dam</i>	Restore the riverine migratory corridor.
NORWALK	<i>Wilson's Cove</i>	Restoration of this private cove on the Darien-Norwalk border is incomplete. More funding and monitoring are needed.
NEW CANAAN	<i>New Canaan Nature Center</i>	Restore fresh water wetlands.
DARIEN	<i>North Scott Cove and Arrowhead Way</i>	Restore tidal wetlands.
DARIEN	<i>Gorhams Pond</i>	Restore the estuarine embayment.
DARIEN	Ziegler's Cove	A family estate surrounds and protects this beautiful cove, a haven for migratory warblers and for boaters to come and drop anchor. It should be preserved from development.
DARIEN	<i>Gorhams Pond</i>	This estuarine embayment needs restoration.
DARIEN	Weed Beach	The woods behind the beach of this small town owned park need protection from creeping encroachments.
DARIEN	<i>Noroton River and Holly Pond</i>	Restore riverine migratory habitat.



Municipality	Site	Comment and Recommendation
NEW CANAAN	New Canaan Nature Center	Restore fresh water wetlands.
STAMFORD	Cove Island Park	This popular, 83-acre city park is a microcosm of historical uses and abuses of shore lands, and is unique in the diversity and local rarity of its habitats. 263 bird species and 29 butterfly species have been documented there in the past 15 years.
STAMFORD	<i>Kosciusko Park</i>	The City of Stamford plans to refurbish these 9-acres on Stamford Harbor to provide more public access to the harbor's edge. Tidal wetlands and mudflats need restoration.
STAMFORD	Mill River Greenway	A 7-mile greenway along the river is being developed through downtown Stamford.
STAMFORD	Rosa Hartman Park	This upland wooded park, which joins Greenwich's Ladies Rock Sanctuary border, is threatened with imminent development as a golf course driving range, to the potential detriment of Greenwich wetlands. Both parks lie in the Greenwich Cove watershed. Local groups urge their joint management as a single natural park.
STAMFORD and GREENWICH	Mains River Greenway	Treetops is an immediately threatened, ecologically sensitive 110-acre property straddling the Greenwich-Stamford border, and a major component of the 12-mile Mianus River Greenway, which extends from the Main Gorge to Cos Cob Harbor.
GREENWICH	<i>Greenwich Point Park</i>	This popular 147-acre town park includes a public swimming beach and boating facilities, a recently restored tidal pond and nearby islands. It is a significant spot for migrating birds and nesting terns.
GREENWICH	<i>Greenwich Cove Drive</i>	Restore tidal wetlands.
GREENWICH	<i>Mead Point Drive</i>	Restore tidal wetlands.
GREENWICH	Great Captain's Island	This 18-acre island has a picnic area and swimming beach with ferry service for town residents, and a conservation area, which hosts the state's largest colony of nesting egrets and herons.
GREENWICH	<i>Byram Harbor</i>	Restore the shellfish reef.

Municipality	Site	Comment and Recommendation
GREENWICH	Calves Island	Soon after the Listen to the Sound hearings, Congress approved federal funds to include this undeveloped 28-acre island in the McKinney National Wildlife Refuge.
GREENWICH	140 S. Water Street	The town no longer needs this 4-acre municipal storage yard on the Byram River, so it should convert it to provide a public boat launch access or a waterfront park with proper watershed buffer strips.

Sites Recommended for Westchester County

Municipality	Site	Comment and Recommendation
WESTCHESTER	NYS designated significant fish and wildlife habitat	<p>Those in Westchester are:</p> <ul style="list-style-type: none"> • Playland and Manursing Flats (Rye) • Marshlands Conservancy, on Milton Harbor (Rye) • The Premium River Pine Brook Wetlands (Mamaroneck, Larchmont, and New Rochelle) • Huckleberry Island and western Long Island Sound starting approximately 3/4 mile east of David's Island in New Rochelle
RYE	<i>Edith Read Nature Center and Wildlife Sanctuary</i>	This 170-acre county preserve within the county's Playland Park encompasses Playland Lake and its surrounding area. The preserve is a state and county designated Bird Conservation Area (BCA) noteworthy for thousands of wintering waterfowl, foraging wading birds and migrating songbirds. A range of habitats have been identified for restoration. Some properties adjacent to the Read sanctuary are up for development and should be preserved.
RYE	<i>Blind Brook</i>	Restore freshwater wetlands and extend the reserve upstream.
RYE	<i>Marshlands Conservancy</i>	This 169-acre Westchester County preserve overlooks Milton Harbor and is a National Historic Landmark. It includes mainland New York's largest salt marsh, a coastal forest, all in need of restoration, historic vistas, over a century-old meadow and a cluster of historical buildings maintained by the Jay Heritage Center.

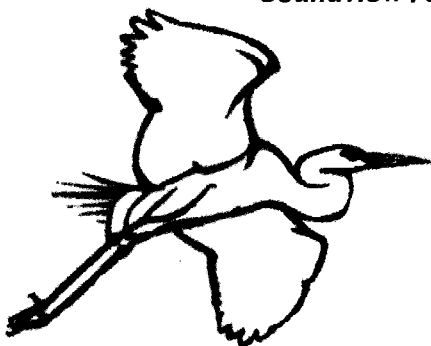
Municipality	Site	Comment and Recommendation
RYE	Hen Island	This 3–5 acre island adjacent to Marshlands Conservancy is cooperatively owned by several families. It should never be developed or subjected to more intensive use.
RYE	Beaver Swamp Brook	Restore freshwater wetlands and extend the reserve upstream.
MAMARONECK	Magid Pond	Off Taylor Lane, above, The Nature Conservancy's Otter Creek Preserve, privately owned Magid Pond is a municipally–designated area of critical environmental significance.
MAMARONECK	Mamaroneck Beach and Yacht Club	This 12–acre harbor site on Otter Creek, fronts the water on 3 sides. A recent attempt to sell it for development collapsed under public outcry.
MAMARONECK	Harbor Island Park	This is a popular town park and recreational boating facility at the head of Mamaroneck Harbor.
MAMARONECK	<i>Graecen Point</i>	Restore tidal wetlands and inter–tidal flats.
MAMARONECK	<i>Hummock Marsh</i>	Restore tidal wetlands.
LARCHMONT	Flint Park	This 15–acre municipal park should be visually reconnected to the Sound.
LARCHMONT	<i>Pryer Manor Marsh</i>	This area just before the creek enters Premium Mill Pond has been largely destroyed by development, but the marsh remnant is still potentially important bird habitat and should be restored.
LARCHMONT	Larchmont Reservoir Conservancy and lower Sheldrake River	This municipally–owned 60–acre preserve at 687 Weaver Street protects the former Larchmont reservoir, which is fed by the Sheldrake River. The Sheldrake watershed below the conservancy should be included in the reserve and as much as possible of the river's developed edges should be reclaimed and restored.
NEW ROCHELLE	<i>Dickermans Pond</i>	This former pond in the upper Sheldrake River, belongs to the City of New Rochelle. Part of the old Larchmont reservoir system, it has silted up and should be restored.
NEW ROCHELLE	Carpenters Pond	Upstream from Dickerman's Pond and now a New Rochelle City Park, this pond was also part of the old Larchmont Reservoir system, and should be restored.
NEW ROCHELLE	<i>Echo Bay</i>	The west branch of Echo bay is severely polluted by PCBs and dioxins. Health warnings should be posted and clean–up and restoration of expedited. The Bay needs extensive habitat restoration throughout.

Municipality	Site	Comment and Recommendation
NEW ROCHELLE	Old Riviera Club	This privately owned waterfront property should be publicly acquired and added Davenport Davenport Park. It is threatened with immediate development.
NEW ROCHELLE	Neptune Pond	Neptune Pond is a scenic tidal wetland and mud flat at Harbor Lane and Fort Slocum Road. Neighbors fear that a new wastewater treatment to be constructed next it will destroy the pond.
NEW ROCHELLE	Harbor Islands: Davids, Huckleberry, Goose, Columbia, Pea, Middle Ground	Davids Island is about 80 acres, is owned by New Rochelle and for decades had been under continuous threat of development. The island should be protected parkland, with no bridge to the mainland, possibly with limited development to offset the high cost of cleanup the island. Huckleberry Island, owned by the New York Athletic Club, should be permanently protected. It is a state and county-designated Bird Conservation Area (BCA) with a unique interior tidal habitat, an extraordinary oak-hickory forest in need of restoration, and it is an important colonial bird nest habitat. Of the smaller islands, Pea Island (2-3 acres) is privately owned and should be protected. The status of the other islands was not specified. It was suggested to create an interpretive canoe and kayak watertrail to link the islands and mainland parks.
NEW ROCHELLE	Glenwood Lake and wetlands	Development immediately threatens this 2-4-acre pocket of upland lake, marsh and associated woodland in an otherwise built up residential area.
PELHAM and MOUNT VERNON	<i>Glover Field and Nature Study Woods</i>	Restore these two fresh water wetlands in two widely separated areas of the Hutchinson River.

Sites Recommended for New York City

Municipality	Site	Comment and Recommendation
BRONX	<i>Pelham Bay Park Lagoon, Landfill, Orchard Beach, Rodman's Neck</i>	This 2,700-acre New York City Park is a state designated Bird Conservation Area (BCA). Pelham Bay Lagoon's tidal forest and coastal forest need to be restored. The Pelham Bay Landfill sits on 83 acres carved out of the park in 1963. Now capped, planted and remediated, it should be returned expeditiously to park use. Orchard Beach, which links hundreds thousands of city residents to the Sound, should have its own nature center and canoe and kayak rental concessions. The NYC Police firing range occupies Rodman's Neck, a 54-acre spit of prime shorefront parkland. It should be moved out for the park. A fishing area could be constructed on the site.

Municipality	Site	Comment and Recommendation
BRONX	<i>City Island Marsh</i>	This fresh water creek and degraded salt marsh occupying 3 acres or less between Tier and Ditmar Streets comprise the island's last natural wetland and are now further threatened by the burgeoning of surrounding development. The wetlands should be restored, buffer land acquired around them and the whole used as a wildlife study area for City Island children.
BRONX	Morris Yacht Club (City Island)	The Morris Yacht Club's 5 acres of magnificent open shorefront should be protected in perpetuity. The state and city should give tax relief to beach and yacht clubs and small marinas, which are being taxed out of existence while waterfront development pressures increase. Large vacated waterfront parcels should be carefully developed to maintain low density, vistas, public access and the nautical character of the community.
BRONX	Goose Island	This city owned Bird Conservation Area in the Hutchinson River is an important colonial bird habitat.
BRONX	Palmer Inlet	Imminent development of 33 three-family homes at Outlook Avenue threatens a rare stretch of open shoreline vistas. The inlet needs dredging and restoration.
BRONX	<i>Weir Creek</i>	The creek should be dredged and its tidal wetlands restored.
BRONX	<i>Ferry Point Park and Westchester Creek</i>	This neglected 220-acre park on the east side of the mouth of Westchester Creek contains valuable grassland habitat supporting a range of bird species, as well beach, dune and shoreline marsh habitat all in need of restoration. An 18-hole golf course proposed for the site will bring in a million cubic yards of potentially hazardous construction and demolition material. Pesticide and chemical laden runoff from golf course maintenance is another potential hazard. One long-time resident said she had lost hope for the river and the neighborhood above the park, but another said that the benthic community is coming back.
BRONX	<i>Bronx River Trailway and Soundview Park</i>	Work has begun to reclaim and restore parkland and brownfields for a trailway along the blighted lower Bronx River. The trailway would link together the Bronx Zoological Park, Starlight Park and Soundview Park. Key city properties to transfer to the trailway include the Bronx River Art Center just below the Zoo on East Tremont Avenue, the cement plant site and vacant land along Sheridan Road and Lafayette Avenue. Key components for outright acquisition include the Apex Auto site at 172nd Street, a vacant lot, the Bronx Queen Landing at Westchester Avenue and the Loral Munitions Factory at Lafayette Avenue.



Municipality	Site	Comment and Recommendation
BRONX	North and South Brothers Islands	Both islands, which are just west of Rikers Island, are Bird Conservation Areas. The city owns North Brothers Island. An easement or public acquisition should be sought for South Brothers Island, the only New York City Island that has never been publicly owned.

Sites Recommended for Queens

Municipality	Site	Comment and Recommendation
QUEENS	<i>Flushing Complex</i>	Flushing Creek flows through Flushing Meadows–Corona Park to Flushing Bay. Kissena Park adjoins the east side of Flushing Meadow. Each of these contiguous sites and the nearby Flushing Airport need one or more habitat types restored.
QUEENS	<i>Powell's Cove</i>	Restore tidal wetland and beach and dune habitat along the cove shoreline.
QUEENS	<i>Alley Pond Park</i>	Restore tidal and fresh water wetlands in this park at the head of Little Neck Bay.
QUEENS	<i>Udall's Cove and Ravine</i>	Restore freshwater wetlands and coastal forest at Aurora, at the base of Udall's Ravine.

Sites Recommended for Nassau County

Municipality	Site	Comment and Recommendation
QUEENS and NORTH HEMPSTEAD	Little Neck Bay to Hempstead Harbor	The waters of and adjoining wetlands of southwestern-most Long Island Sound should be protected as an Important Bird Area.
NORTH HEMPSTEAD	<i>Lake Success</i>	Restore fresh water wetlands.
NORTH HEMPSTEAD	Cohen Estate (Kings Point)	A developer is seeking a variance of Kings Point's new 230' required setback from the Sound shore.
NORTH HEMPSTEAD	<i>Mitchell Creek Salt Marsh (Kings Point)</i>	Restore and preserve these tidal wetlands. The marsh, which leads to Manhasset Bay, is about 60 acres all told. About one third was filled illegally in the 1960s, but has not yet been developed (although not for want of trying). However, as of June, 2000, a developer had preliminary approval (allegedly granted with insufficient public notice) to build 9 large homes there.

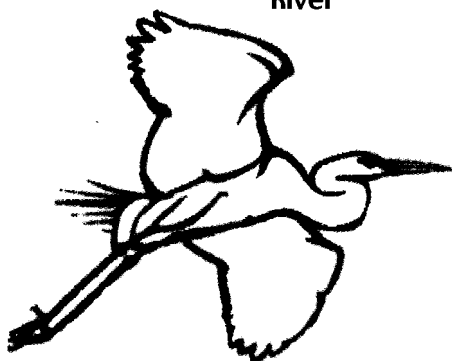
Municipality	Site	Comment and Recommendation
NORTH HEMPSTEAD	<i>Port Washington Town Dock (East shore of Manhasset Bay)</i>	Expand present parking and boat launch to create a park.
NORTH HEMPSTEAD	<i>Sheets Creek (East shore of Manhasset Bay)</i>	Restore tidal wetlands. Removal of accumulations of old debris from the lower creek has begun.
NORTH HEMPSTEAD	Manhasset Bay to Hempstead Harbor	A project is being launched to create a shoreline trail system linking Manhasset Bay to Hempstead Harbor. No details were given.
NORTH HEMPSTEAD and OYSTER BAY	<i>Hempstead Harbor (all)</i>	Restore estuarine wetlands, inter-tidal flats, tidal wetlands. Part of Hempstead Harbor is a superfund site.
NORTH HEMPSTEAD	<i>South West shore of Hempstead Harbor</i>	Acquire and restore a 1.75-mile highly stressed parcel between Bar Beach to the Roslyn Viaduct. A nine-year study of Osprey here and the rest of Cow Neck peninsula (between Manhasset and Hempstead Bays) shows increased nesting in this area, but for reasons not yet understood, reproduction may be decreasing.
NORTH HEMPSTEAD	<i>Motts Cove (East shore of Hempstead Harbor)</i>	Some residents reportedly want a municipal shorefront parcel made available for public access to the water.
OYSTER BAY	<i>Glenwood Landing (East shore of Hempstead Harbor)</i>	This is a former industrial waterfront in transition from past industry. Local residents want re-development to provide public access and vistas of the water, with buffers to protect water quality.
OYSTER BAY	Beaver Lake, Beaver Swamp, Shu Swamp (Mill Neck)	Restore fresh water wetlands.
OYSTER BAY	Francis Pond (Mill Neck or Locust Valley)	Restore fresh water wetlands.
OYSTER BAY	Bayville to Oyster Bay Cove	Create additional open space to link Bayville and Oyster Bay's western and eastern waterfronts. This entire area, including the Oyster Bay National Wildlife Refuge, should be protected as part of an Important Bird Area extending from Bayville to Cold Spring Harbor.

Municipality	Site	Comment and Recommendation
OYSTER BAY	Commander Oil Terminal	This is the last heavy industrial site on Oyster Bay. Phase it out and remediate the area for public use.
OYSTER BAY	Oyster Bay Cove to Laurel Hollow	The Incorporated Villages of Oyster Bay Cove, Cove Neck and Laurel Hollow should write a common Local Waterfront Revitalization Plan (LWRP).
OYSTER BAY and HUNTINGTON (Suffolk)	<i>Cold Spring Ponds (head of Cold Spring Harbor, Nassau and Suffolk Counties.)</i>	Restore fresh water and tidal wetlands and inter-tidal flats.

Sites Recommended for Queens for Suffolk County

Municipality	Site	Comment and Recommendation
HUNTINGTON	Mobile Oil Terminal (Cold Spring Harbor)	Convert this site to a marine environmental education center and research site, and reserve the beach for passive use.
HUNTINGTON	Lloyd Harbor	Include the entire west coast of the Village of Lloyd Harbor in the reserve.
HUNTINGTON	Cuamsett State Park (Lloyd's Neck)	The park is part of an Important Bird Area extending from Cold Spring Harbor to Eatons Neck and Asharoken. The park is overstressed, particularly by boaters who land illegally in the tidal basin. Ban jet skis and enforce rules and educate the public to protect sensitive areas.
HUNTINGTON	Former Hogan Estate (northeastern Lloyd's Neck)	Preserve this 20-acre property now. It is one of the last open spaces on the high bluffs and has wonderful old growth woodland. The property is zoned for one-acre and is under immediate threat of development.
HUNTINGTON	Former Morgan Estate (northeast side of Eaton's Neck)	This passively maintained property encompasses 400 acres of diverse habitat ranging from fresh water and tidal wetlands to old fields and climax woods. There is nothing else like it this west on the North Shore.
HUNTINGTON	<i>Betty Allen Nature Park (Centerport)</i>	Restore fresh water and tidal wetlands.
HUNTINGTON	<i>Centerport Ponds (Centerport)</i>	Restore fresh water and tidal wetlands.

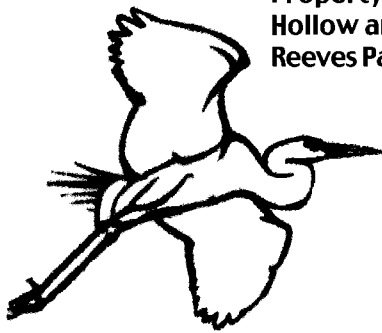
Municipality	Site	Comment and Recommendation
HUNTINGTON	<i>Twin Ponds Park (Centerport)</i>	Restore fresh water and tidal wetlands.
HUNTINGTON	The Fukes Property (west of Crab Meadow Park)	Preserve this privately owned property as part of the Town of Huntington's Jerome Ambro Park Reserve, an assemblage of fresh water, brackish and salt water wetlands associated with the Crab Meadow complex.
SMITHTOWN	Gouldstone Property (Sunken Meadow)	New York State Parks should acquire this 16-acre parcel of forest and wetland with a spectacular view of the Sound. The property lies at the end waters of Sunken Meadow Creek and abuts the west arm of Sunken Meadow State Park by Route 25A.
SMITHTOWN	127 acres of the former Kings Park Psychiatric Center (Kings Park)	New York state should annex to the new Nissequogue River State Park the 127 adjoining acres of mature forest between the marine zone and Route 25A. The land is currently earmarked for sale.
SMITHTOWN	Nissequogue River State Park	Create canoe access to the park and forbid motorized boats. The park, together with almost all the other Smithtown properties cited, is part of an Important Bird Area encompassing the entire Nissequogue River watershed and Smithtown Bay.
SMITHTOWN	St Johnsland (Kings Park)	Acquire this 49.6-acre parcel of watershed buffer land on Old Dock Road between Sunken Meadow State Park and the new Nissequogue River State Park, directly opposite the 127 acres of mature woods described above.
SMITHTOWN	<i>Nissequogue River, Village of Nissequogue</i>	Restore the river's freshwater and tidal wetlands and riverine migratory corridor.
SMITHTOWN	<i>Briar Nature Center</i>	Restore coastal grassland and tidal and freshwater wetlands.
SMITHTOWN	Small lots adjacent to the Caleb Smith State Park and Nissequogue River	Several small lots totaling 13 acres (available as of June, 2000) should be publicly acquired to protect the Nissequogue River from polluted runoff and to buffer existing wildlife habitat. Two contiguous parcels connect the west side of the park to Plymouth Road and include a stream that feeds the Caleb and Nissequogue Rivers. Two other contiguous parcels connect the west side of the park to Jericho Turnpike. Yet another is across the turnpike from the Nissequogue River at the eastern end of the park. An easement on the narrow strip bounded by the Long Island Railroad, the Willow Lake Apartment Complex and Route 25A would protect the water quality of another tributary of the Nissequogue River.



Municipality	Site	Comment and Recommendation
SMITHTOWN	<i>Harrison Pond Town Park</i>	Restore tidal and freshwater wetlands and forest.
BROOKHAVEN	<i>Aunt Amy's Creek (Stonybrook)</i>	Restore tidal and freshwater wetlands and obtain easements on properties surrounding the creek to protect water quality.
BROOKHAVEN	<i>West Meadow Creek (Stonybrook)</i>	Restore tidal wetlands, inter-tidal flats and the estuarine embayment.
BROOKHAVEN	<i>Forsythe Meadow (Stonybrook)</i>	Preserve this immediately threatened 40-acre, historical, scenic and forested property in the Stonybrook Creek watershed.
BROOKHAVEN	<i>The Ploch Property (Stonybrook)</i>	This historical property in the Stonybrook Creek watershed will be preserved through a town-state purchase.
BROOKHAVEN	<i>The shoreline between Crane Neck and Misery Point</i>	The unvegetated sandy beach and bluffs between Crane Neck and Misery Point on the Oldfield Peninsula, west of Port Jefferson Harbor, rate protection as an Important Bird Area.
BROOKHAVEN	<i>Detmer Farm (Setauket)</i>	This historical property off Route 25 is being considered for public acquisition.
BROOKHAVEN	<i>Mount Sinai arbor</i>	Restore the tidal wetlands, estuarine embossments and inter-tidal flats.
BROOKHAVEN	<i>Chandler Estate (Mount Sinai)</i>	This 40-acre property on the east shore of Mount Sinai Harbor was acquired for preservation by Suffolk County shortly after the Listen to the Sound 2000 hearings.
BROOKHAVEN	<i>Old growth woods (Mount Sinai)</i>	This small piece of old growth woodland near Cedar Beach & the junction of Old Post & Shore Roads should be protected as "a fragment associated with the Chandler Estate."
BROOKHAVEN	<i>Cedar Beach</i>	Restore beach and dune habitat.
BROOKHAVEN	<i>Undeveloped land on the Post Road (Mount Sinai)</i>	This is a large tract of unprotected, undeveloped land on the south side of Post Road "on the way to Cedar Beach."
BROOKHAVEN	<i>Satterly Landing (Mount Sinai)</i>	Restore these tidal wetlands on the east side of Mount Sinai Harbor.
BROOKHAVEN	<i>KeySpan Shoreham Prop. (Wading River)</i>	Acquire these 800+ acres of open space outright. Get them into private conservation hands, so that we can control any future ferry and road transportation in that area.

Sites Recommended for Eastern Suffolk County

Municipality	Site	Comment and Recommendation
RIVERHEAD	<i>Wading Creek Marsh</i>	Restore the tidal marsh and the river. The marsh, which may be the largest such on the North Fork was degraded by the Shoreham Power Plant's diversion of the creek.
RIVERHEAD	Wildwood State Park	This popular park is becoming overused as Suffolk County becomes more developed.
RIVERHEAD	Boy Scout Camp (Baiting Hollow)	Purchase the development rights to this 150-acre tract, which includes beach access, hardwood forest, bluffs and hollows.
RIVERHEAD	<i>NYS DEC wetlands (Baiting Hollow)</i>	Restore freshwater and tidal wetlands and river corridor habitat. The tidal wetlands are being invaded by phragmites.
RIVERHEAD	McQuade Property (Baiting Hollow and Reeves Park area)	These privately held 20+ acres contain critically rare pitch pine dune woodlands and almost all that remains of the <i>Grandifolia</i> Sandhills. The latter are dunes perched on coastal bluffs (a geological formation that is rare worldwide) on which grow forests of the rare pigmy beech species, <i>Grandifolia</i> , and other rare plant communities. The sandhills are the last places left on Long Island where humming birds breed. Until recently, the 300-acre former Talmage property next to the McQuade property contained almost all the rest of the <i>Grandifolia</i> Sandhills in a rare and huge dune complex, which is now being bulldozed to create the Traditional Links Golf Course.
RIVERHEAD	Nassau County's 4-H Camp.	The camp, which abuts the east side of the McQuade property, contains a bit of the <i>Grandifolia</i> Sandhills and a lot of forest buffer. Obtain the development rights, in case the financially-strapped Nassau County wants to sell it.
RIVERHEAD	14 or so parcels between Roanoke Landing and Penny Lane	These properties front the Sound with near-vertical forested bluffs and agricultural land south of the forest. A condominium development is under construction.
RIVERHEAD	Tasco Industries buffer	This former summer camp buffers the Northville tank farm.
RIVERHEAD	Villa Immacula	Perhaps this Catholic Church retreat would be willing to sell its development rights for conservation.



Municipality	Site	Comment and Recommendation
RIVERHEAD	North Fork Hunting Preserve	This 300-acre private hunting preserve west of Pier Avenue needs immediate protection. Although it does not front the Sound, its freshwater wetlands drain to the Sound and its owner has filed a subdivision application to develop the northern part of the property within 500 feet of the Sound.
RIVERHEAD	Iron Pier Beach	The town is hardening the shoreline here in order to rebuild and reinforce its damaged beach parking lot and to enlarge its boat launch capacity.
RIVERHEAD and SOUTHOLD	Long Island Power Authority (LIPA) (Jamesport)	This threatened property between Sound Avenue and the high shoreline bluffs at the Riverhead-Southold boundary would be an ideal acquisition as part preserve, part recreational area. Over 500 acres, and largely undisturbed, it includes leased farmland, forest, freshwater wetlands and a long unbroken stretch of beach. The land was originally bought by LILCO to be the site of the Jamesport Nuclear Power Plant, which was never built.
SOUTHOLD	<i>Mattituck Creek</i>	Require 100-foot buffers and establish overlay zoning to protect the creek's water quality, and preserve any remaining undeveloped acreage. Clean up the industrial debris from the old oil depot at the end of the creek near the breakwater.
SOUTHOLD	<i>Bailey's Beach</i>	Restore beach and dune habitat and tidal wetlands in this park at the mouth of the Mattituck Inlet.
SOUTHOLD	Duck Pond Point	Preserve the wonderful forested bluffs and buffering farmland land between Mattituck and Peconic Inlets (centering on Duck Pond Point). The area has so far remained unspoiled because of the cost of putting in roads, but that could change.
SOUTHOLD	<i>Goldsmith Inlet and Pond</i>	Restore beach and dune habitat, freshwater and tidal wetlands and inter-tidal flats. Require 100-foot buffers around the inlet. Remove the Goldsmith Inlet Jetty, which is causing beach erosion.
SOUTHOLD	Bittner Property	Acquiring this property to link the town beach at the end of Goldsmith Inlet with the County's Peconic dunes.
SOUTHOLD	<i>Peconic Dunes and wetlands complex</i>	Restore freshwater wetlands on this county-owned duneland.
SOUTHOLD	Kenny's Beach	Piping Plovers have nested on this town beach in the past.

Municipality	Site	Comment and Recommendation
SOUTHOLD	McCabe's Beach	Plovers nest on this small town beach.
SOUTHOLD	Horton's Point	An historic lighthouse sits atop the bluff and point.
SOUTHOLD	Hashamomuck Beach	This is a town beach with boat launch.
SOUTHOLD	<i>Clark's Beach and Inlet Pond Park (Greenport)</i>	Restore the beach, dunes and bluffs. The 50-acre Inlet Pond Park is reserved for hiking, nature education, and other passive recreation, under the stewardship of the Town of Southold and North Fork Audubon Society. Should the Village of Greenport decide to sell Clark Beach, the town or county should buy it for it active recreation, such as scuba diving and kayaking.
SOUTHOLD	Steps	This is a rocky town beach with bluffs accessed from Sound Road.
SOUTHOLD	Town Beach (East Marion)	This is a rocky beach with bluffs off Rocky Point Road.
SOUTHOLD	Dam Pond area (East Marion)	Approximately 80 acres of unprotected, privately owned land on the west side of Dam Pond should be acquired for habitat and water quality protection, public recreation and scenic value. The Peconic Land Trust owns Dam Pond and some land west of it.
SOUTHOLD	Truman's Beach (East Marion)	This town beach has a boat launch area and is a popular fishing spot.
SOUTHOLD	Hillcrest Estates	Private development of this pristine spot was halted to protect sensitive bluff sites and an historical Indian site.
SOUTHOLD	<i>Orient Point County Park</i>	This park, with walking trails extends out the point and is a popular fishing area. Restore grassland, forest, bluffs and riverine migratory corridor.
SOUTHOLD	Plum Island/Fishers Island Complex: Plum Island, Great Gull Island, Little Gull Island, Fishers Island, surrounding reefs and islets	Roughly 20 by 4 miles, this scenic and ecologically extraordinarily rich complex deserves special protection. The federal government, New York, Connecticut and Rhode Island should declare the area a major conservation management area, and should close it to open water dumping

Sites Recommended on a Sound-wide Basis

Municipality	Site	Comment and Recommendation
ENTIRE LIS	Existing public open space	Existing federal, state, county and municipal parks and preserves, refuges and wildlife management areas around Long Island Sound, should be considered for inclusion in the Long Island Sound Reserve.
ENTIRE LIS	Federally-documented significant fish and wildlife habitat	Recommendations for the reserve system should take into account the <i>recommendations North East Coastal Area Study: Significant Coastal Habitats of Southern New England and Portions of Long Island, New York</i> , U.S Fish and Wildlife Service, 1991.
ENTIRE LIS		Designate the entire Sound as a horseshoe crab sanctuary.
ENTIRE LIS		Through a public nomination process, identify and designate ecologically unique, sensitive underwater areas in the Sound as no-take Marine Protected Areas (MPAs). Include oyster reefs destroyed in the early 19th century.
ENTIRE LIS		Designate the entire Sound as a no-discharge zone.
ENTIRE LIS	Water trail	Establish access points for canoes and kayaks: parking spaces near small ramps/paths to the water. Create a Sound-wide water trail: a series of sites spaced apart by a day's paddling distance where canoer or kayaker could spend the night on multi day journeys.
NEW YORK STATE	NYS designated significant fish and wildlife habitat	The reserve system should encompass all the NYS-designated significant fish and wildlife habitats (SF&WH).
NEW YORK STATE	Entire NYS portion of LIS	Make all of the Sound within New York state's boundaries a State Heritage Area (i.e. an area under State Parks law, but that the state does not necessarily have to own). As of June, 2000, a bill to this effect was awaiting New York Governor George Pataki's signature.
BROAD AREAS	Watersheds	The reserve systems should encompass the riparian lands associated wetlands and greenways in the Mianus, Byram, Blind Brook, Beaver Swamp, Marmaroneck and Sheldrake River watersheds.
BROAD AREAS	Urban streets	Where feasible, open up street-ends and municipal lots to create visual access to the Sound.

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 * The Long Island Sound Habitat Restoration Initiative is a partnership of concerned agencies and organizations working to improve the Sound for its living resources. For more information about the Long Island Sound Habitat Restoration Initiative, including a map and complete listing of designated sites, contact any of the following:

Mr. William Paul Shadel , *Habitat Ecologist • Save the Sound • 185 Magee Ave., Stamford, CT 06902 • (203) 327-9786*
 Mark Tedesco, *Director • EPA LIS Office • Stamford Government Center • 888 Washington Blvd. • Stamford, CT 06904-2152 • (203) 977-1541*
 Ms. Kimberly Zimmer, *LISS Public Outreach Coordinator • NY Sea Grant Extension Program • 146 Suffolk Hall • SUNY at Stony Brook • Stony Brook, NY 11794-6002 • (631) 632-9216*

B Appendix B _____●

Appendix B

List of Co-Sponsors

A

ACTION for the Preservation & Conservation of the North Shore of Long Island, Inc.
Alexander Host Foundation
Audubon Society of Greenwich

B

Bedford Audubon Society
Bronx Council on Environmental Quality
Byram River Watershed Association

C

Center for Marine Education and Recreation at Oyster Bay
Citizens Campaign for the Environment (CCE)
City Island Civic Association
Coalition to Save Hempstead Harbor
Connecticut Audubon Society
Connecticut Conservation Association
Connecticut River Watershed Council
Country Club Civic Association

D

Darien Audubon Society
Deep River Land Trust

E

East Haven Land Trust
Environmental Council of Stamford
Essex Land Conservation Trust

F

Federated Conservationists of Westchester County
Fishers Island Conservancy
Four Harbors Audubon Society
Friends of Greenwich Point
Friends of Marshlands
Friends of Sherwood Island Park
Friends of the Bay, Inc.
Friends of the Reservoir

G

Gaia Institute
Glenwood Lake Association
Great South Bay Audubon Society
Green Fingers Garden Club
Greenwich Conservation Commission
Greenwich Land Trust

H

Hudson R. Audubon Society of Westchester
Hunters Point Community Coalition
Huntington Audubon Society
Huntington Conservation Board

J

Jay Heritage Center

L

L.I.F.E. (Local Involvement for the Environment)
Larchmont-Mamaroneck League of Women Voters
League of Women Voters of Greenwich
Long Island Pine Barrens Society
Long Island Sound Commodores Association
LWV Nassau County

M

Mattabeseck Audubon Society
Menunkatuck Audubon Society
Mianus River Watershed Council

N

New Canaan Audubon Society
New Haven Bird Club
New Haven Land Trust
New York City Audubon Society
New York Coastal Fishermen's Association
New York League of Conservation Voters
Nissequogue Canoe and Kayak Club
North Fork Audubon Society
North Fork Environmental Council
North Mianus Preservation League
North Shore Audubon Society
Norwalk Clean and Green
Norwalk Land Trust
Norwalk River Watershed Association

O

Open Space Council

P

**Potapaug Audubon Society
Preserve the Wetlands
Project Oceanology**

Q

**Queens College Center for Environmental Teaching and Research
Quinnipiac River Watershed Association**

R

Residents for a More Beautiful Port Washington

S

**Sagamore Rowing Association
Sanchez 2000
Saugatuck Valley Audubon Society
Scarsdale Audubon Society
Sierra Club/CT
Sierra Club/Long Island
Sierra Club/Lower Hudson Chapter
Sierra Club/Lower Fairfield County Group
SoundWatch
SoundWaters
Stamford Garden Club
Stony Brook Civic Association
Stony Brook Estuaries Council
Suffolk County Soil and Water Conservation District**

T

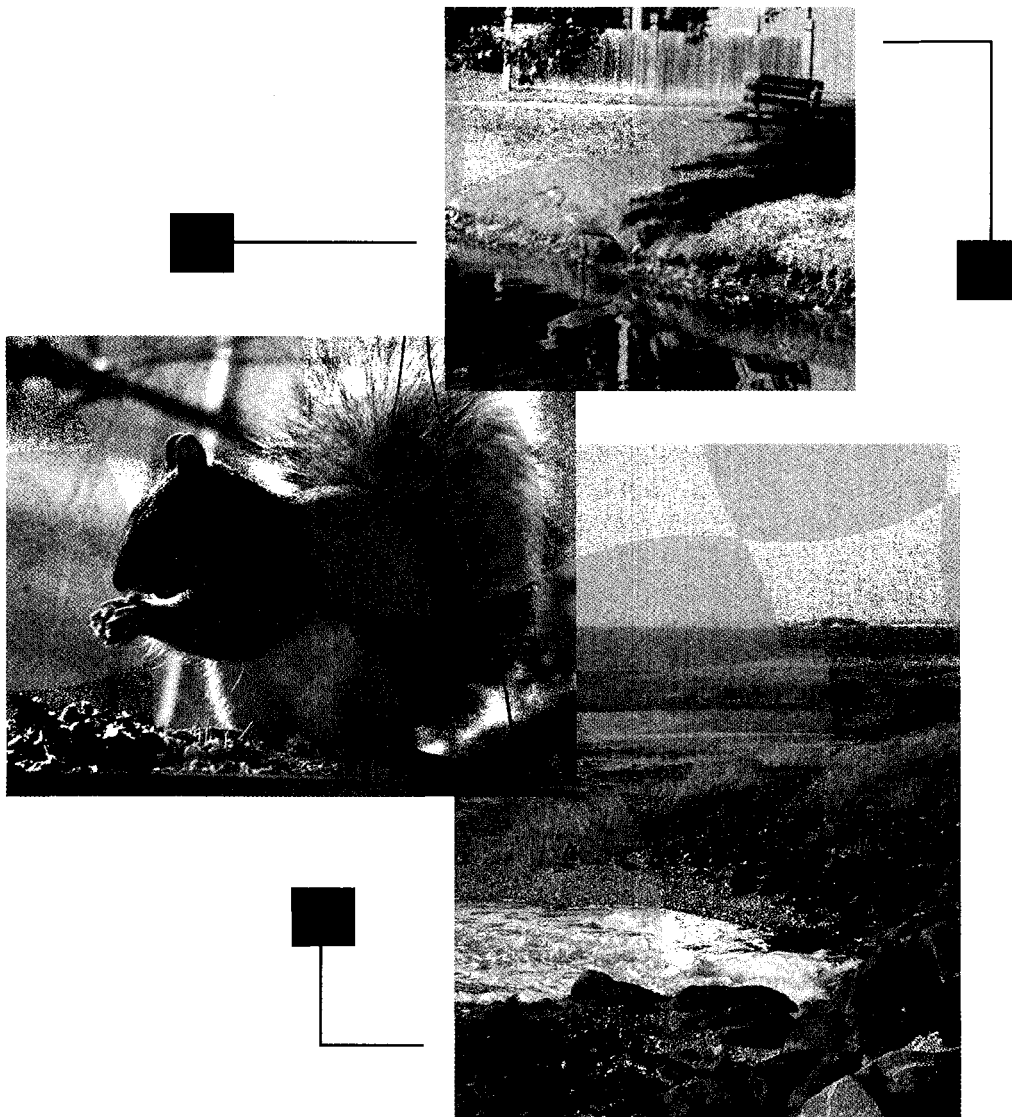
**The Nature Conservancy/CT
The Nature Conservancy/Long Island
Theodore Roosevelt Sanctuary
Tidal Marsh Workgroup of the Quinnipiac River Watershed Partnership
Town of Mamaroneck–Village of Larchmont Coastal Zone Management Commission
Town of North Hempstead
Trust for Public Land
Trust for Public Land/CT Project Office
Trust for Public Land/NY Project Office**

W

**Waterfront Park Coalition
West Haven Watershed Association
Westchester County Department of Planning
Westchester Land Trust
Wildlife Gallery**

Y

Yale Center for Coastal and Watershed Systems



Witnesses

*Listed by order in which testimony was received. *Written testimony only.*

Essex, CT May 30, 2000

Name	Address	Affiliation
Charles Landrey	Old Saybrook, CT	
William C. Spicer	Noank, CT	
Chuck Wehrly	Old Saybrook, CT	Old Saybrook Water Pollution Control
David Sutherland	Middletown, CT	The Nature Conservancy-CT Chapter
Geb Cook	Fishers Island, NY	Fishers Island Conservancy
Chester L. Arnold, Jr.	Haddam, CT	UConn Cooperative Extension
Joan Smith	Groton, CT	Groton Open Space Association
Grant Westerson	Old Saybrook, CT	
Rick Werwaiss	Albany, NY	Audubon New York
Lawrence Cyrulik	Portland, CT	Mattabeseck Audubon Society
Jean T. Castagno	Old Saybrook, CT	Save Our Shoreline
James F. Spallone	Essex, CT	
Evan Griswold	Old Lyme, CT	The Nature Conservancy
Ted Crosby	Old Lyme, CT	Old Lyme Conservation Trust, Inc.
Dr. Howard M. Weiss	Groton, CT	Project Oceanology
Melissa Hyland	Groton, CT	New London Garden Club
Dr. Milton Clark	Salem, CT	Potapaug Audubon Society
Tom Gootz	Deep River, CT	Deep River Land Trust
Wayne Orsie	Old Saybrook, CT	
Alicia Betty	New Haven, CT	Trust for Public Land/CT Project Office
Jennifer Thalhauser	Stamford, CT	Save the Sound
Thomas H. Maloney	Easthampton, MA	CT River Watershed Council
Philip Miller	Ivorytown, CT	Bushy Hill Nature Center
Bob Day	Old Saybrook, CT	
Beverly Crowther	Lyme, CT	
Bill Peace	Old Saybrook, CT	
Peter S. Lutz	Old Saybrook, CT	
Ed Gyllenhammer	Old Saybrook, CT	
Priscilla W. Pratt	Groton, CT	Groton Open Space Assn., Inc.
* Hon. Claire B. Sauer	Lyme, CT	
* Peter J. Auster	Groton, CT	National Undersea Research Center
* Diana & Richard Blair	Old Lyme, CT	Potapaug Audubon Society
* Prof. Stan Gaby	Gales Ferry, CT	Eastern Connecticut State University
* Raymond D. Gastil	Essex, CT	Essex Planning Commission
* Joseph B. Geraci	Niantic, CT	
* Jil Nelson Kaplan	Lyme, CT	Lyme Garden Club
* Joan Meek	Old Lyme, CT	Potapaug Audubon Society
* Grace Krick	Deep River, CT	Wind Over Wings
* Betsy Morgan	Lyme, CT	Potapaug Audubon Society
* Dot Nord	Essex, CT	Potapaug Audubon Society
* Nathan Tasoulas	Waterford, CT	
* Thomas V. Wagner	Waterford, CT	City of Waterford
* James Morgan, Jr.	Lyme, CT	
* C. P. Kenting	Waterford, CT	

New Haven, CT June 1, 2000

Name	Address	Affiliation
Henry Ferris	Madison, CT	Menunkatuck Audubon Society
Tracy Egoscue	Stamford, CT	Save the Sound, Inc.
Dick Bell	New Haven, CT	Connecticut River Salmon Association
Alicia Betty	New Haven, CT	Trust for Public Land/CT Project Office
Charles A. Schlegel	East Haven, CT	East Haven Land Trust
Roland Clement	Hamden, CT	
Patrick Leahy	Bethany, CT	New Haven Bird Club
Michael F. Horn	Hamden, CT	New Haven Bird Club
Lisa Santacroce	Hartford, CT	Connecticut Audubon Society
Nancy Rosenbaum	Hamden, CT	New Haven Bird Club
Arne Rosengren	Hamden, CT	
Martin Mador	Hamden, CT	Quinnipiac River Watershed Association
Mark Francis	East Haven, CT	
Michael Criscuolo	East Haven, CT	
Barbara K. Johnson	Guilford, CT	
Heather McGray	New Haven, CT	Center for Coastal and Watershed Systems
Barbara Milton	Milford, CT	CT Audubon Coastal Center (CAS)
Stewart Hutchings	New Haven, CT	
Christel Manning	New Haven, CT	Sierra Club
Mary Head	West Haven, CT	West Haven Watershed Association
Joanne Martin	West Haven, CT	
Rosemarie Bonito	New Haven, CT	Quinnipiac River Watershed Association
* Hon. Mary Mushinsky	Meriden, CT	Quinnipiac River Watershed Association
* Lauren Brown	Branford, CT	New Haven Land Trust
* Celia Lewis	Guilford, CT	
* Donna Lindgen	Ansonia, CT	Ansonia Nature and Recreation Center
* Marcy Klattenberg	Middletown, CT	Friends of Hammonasset
* Alice Siebecker	Bozeman, MT	

Norwalk, CT June 6, 2000

Name	Address	Affiliation
Jack Wise	Stamford, CT	Save the Sound
Charmaine Rawsthorne	Stamford, CT	
Charles Barnard	Southport, CT	Saugatuck Valley Audubon Society
Donald Nelson	S. Norwalk, CT	Friends of Norwalk Clean and Green
Grace Lichtenstein	Norwalk, CT	Preserve the Wetlands, Inc.
Hope Hageman	Westport, CT	Friends of Sherwood Island
Jessica Kaplan	Wilton, CT	Norwalk River Initiative
Louise Golub	Norwalk, CT	League of Women Voters – Norwalk
Thomas Aikenhead	Norwalk, CT	Preserve the Wetlands, Inc.
Diane Lauricella	Norwalk, CT	Sierra Club – Fairfield County Group
Alicia Betty	New Haven, CT	Trust for Public Land/CT Project Office
Peter Libre	Norwalk, CT	
Michael Aurelia	Greenwich, CT	Connecticut Conservation Association
Alan McKissock	Rowayton, CT	Norwalk Land Trust
Jeff Cordulack	Stamford, CT	SoundWaters
John C. Faulkner	Darien, CT	Darien Audubon Society
Elsbeth Johnson	Ridgefield, CT	New Canaan Audubon Society
Jalna Jaeger	Norwalk, CT	Saugatuck Valley Audubon Society
Gary Sorge	Norwalk, CT	

Richard Nicholls
Marny Smith
Dianne Selditch
Paul Saviano

Stamford, CT
Rowayton, CT
Stamford, CT
Norwalk, CT

Shippan Point Association

SoundWaters
Norwalk Harbor Management
Commission
Friends of Sherwood Island State Park

Margery Silk
* Allison Allen

Westport, CT
Norwalk, CT

Greenwich, CT June 8, 2000

Name	Address	Affiliation
Lydia Stevens	Greenwich, CT	Save the Sound
Jenniffer Hanson	Riverhead, CT	Byram River Watershed Alliance
Robert Jensen	Riverside, CT	Audubon New York
David J. Miller	Albany, NY	Regional Plan Association
Robert Yaro	New York, NY	Connecticut Senate
Hon. William Nickerson	Greenwich, CT	
Hon. Lile Gibbons	Old Greenwich, CT	
Elizabeth Ferretti	Greenwich, CT	Green Fingers Garden Club
Christopher Walbrecht	White Plains, NY	Citizens Campaign for the Environment
Frances Gerety	Stamford, CT	
Denise Savageau	Greenwich, CT	Town of Greenwich
Raymond J. Heimbuch	Greenwich, CT	
Alicia Betty	New Haven, CT	Trust for Public Land/CT Project Office
Louise Griswold	Cos Cob, CT	North Mianus Preservation Association
Frank Quinn	Riverside, CT	Riverside Association
William A. Ruskin	Riverside, CT	New York Conservation Education Fund
Paul Stacey	Hartford, CT	CT Department of Environmental Protection
Mark Tedesco	Stamford, CT	U.S. EPA – Long Island Sound Office
Stig Host	Greenwich, CT	Alexander Host Foundation
Cassandra Adelman	Old Greenwich, CT	Student
Mason Amato	Old Greenwich, CT	Student
Juliette Brinoak	Old Greenwich, CT	Student
Natalie Koch	Old Greenwich, CT	Student
David Lazgrowitz	Old Greenwich, CT	Student
Katelyn Miles	Old Greenwich, CT	Student
Elaine Grunberger	Stamford, CT	Environmental Council of Stamford
Tessa Ried	Stamford, CT	Environmental Council of Stamford
Dan Jensen	Norwalk, CT	
Ralph Loomis	Bridgeport, CT	Congressman Christopher Shays' Office
Dr. Michael Moccio	Stamford, CT	
Helen Lovett	Riverside, CT	Riverside Garden Club
Sue H. Baker	Riverside, CT	Friends of Greenwich Point
Lisette Henrey	Greenwich, CT	
Patricia Thrane	Stamford, CT	Environmental Council of Stamford
Cheryl Dunson	Greenwich, CT	League of Women Voters – Greenwich
Rick Kral	Greenwich, CT	Beacon Point Marina
Ian MacMillan	Greenwich, CT	Strategic Water Resources
Lucy Jinishian	Old Greenwich, CT	Greenwich Shellfish Commission
Janice Gardner	Greenwich, CT	Green Fingers
Stephanie H. Sanchez	Stamford, CT	
* Diane Fox	Greenwich, CT	Town of Greenwich
* N. George Host	Greenwich, CT	Greenwich Land Trust

* David Medd
 * Mary Hope Lewis
 * Debra Redfern
 * Thomas R. Baptist

Greenwich, CT
 Greenwich, CT
 Stamford, CT
 Greenwich, CT

Mianus River Watershed Council
 Greenwich Garden Club
 Audubon Connecticut

Mamaroneck, NY June 13, 2000

Name	Address	Affiliation
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Wallace Irwin, Jr.	Larchmont, NY	StreamWalkers
Irene Saltzburg	Larchmont, NY	Friends of Marshlands
Christopher Walbrecht	White Plains, NY	Citizens Campaign for the Environment
Clark Wallace	New York, NY	Trust for Public Land
John Zappala	N. Harrison, NY	SEA-WASP
Daniel Natchez	Mamaroneck, NY	
Hon. George Latimer	White Plains, NY	Westchester County Board of Legislators
Robert Funicello	New Rochelle, NY	Westchester County Dept. Environmental Facilities NYS Department of Environmental Conservation
Mark Moran	New Paltz, NY	Glenwood Lake Association Westchester County Board of Legislators
Jeff Apotheker	New Rochelle, NY	
Hon. James Maisano	New Rochelle, NY	
Howard McMichael	Larchmont, NY	Sierra Club/Westchester
Karen Shultz	West Harrison, NY	
Nancy Seligson	Larchmont, NY	
Steven Mitsch	Larchmont Acres, NY	
Jacqueline Bruskin	Eastchester, NY	Bedford Audubon Society Hudson River Audubon Society of Westchester
Michael Bochnik	Yonkers, NY	Larchmont-Mamaroneck League of
Katherine Wachs	Larchmont, NY Women Voters	
Debra Lazarus	Larchmont, NY	LIFE Center Federated Conservationists of Westchester
Gudrun LeLash	White Plains, NY	Jay Heritage Center Save the Sound/ CT LISWA
Eda Burne	Rye, NY	
Robin Kriesberg	Stamford, CT	
Roslyn Wood	Mamaroneck, NY	Scarsdale Audubon Society
Karen Marie Campbell	New Rochelle, NY	
Ernie Odierna	Larchmont, NY	
Dorothy Carlsen	Rye, NY	
Leslie Hughes	Mamaroneck, NY	
John Feingold	Larchmont, NY	
Phyllis Wittner	Larchmont, NY	
Theodora Weber	City Island, NY	New Rochelle Environmental League Scarsdale Audubon Society Westchester Land Trust
Dr. John Moyle	Scarsdale, NY	
Paul Gallay	Bedford Hills, NY	
Bob Lebensold	New Rochelle, NY	
Frank Mancuso	Millbrook, NY	
Kim O'Brien Lise	New Rochelle, NY	
Holly Bukfoser	Purchase, NY	Environmental Advisory Comm. of Harrison Friends of Read Sanctuary
* Garrison Corwin, Jr.	Mamaroneck, NY	
* Lube Fineson	Larchmont, NY	
* Marlene Kolbert	Larchmont, NY	
* Ronald Winston	New York, NY	Public Land Preservation Society

City Island, NY June 15, 2000

Name	Address	Affiliation
William Paul Shadel	Stamford, CT	Save the Sound
James J. Gilmore	Long Island City, NY	NYS Department of Environmental
	Conservation	
Paula De Caro	New Rochelle, NY	League of Women Voters -
	Westchester County	
Doris Straus	City Island, NY	
Wilma A. Turnbull	Bronx, NY	NY Coastal Fishermen's Association
Susan Bellinson	City Island, NY	SoundWatch
Andy Darrell	New York, NY	Waterfront Park Coalition
John B. Sinclair	City Island, NY	
Barbara Dolensek	City Island, NY	City Island Historical Society
Clark Wallace	New York, NY	Trust for Public Land
Howard Smith	City Island, NY	City Island Civic Association
Sean Andrews	New York, NY	New York City Audubon Society
David S. Kunstler	Bronx, NY	NYC Department of Parks and Recreation
Alison Beall	Sleepy Hollow, NY	
Jack Reith	Bronx, NY	Long Island Sound Commodore
	Association	
Dr. Paul S. Mankiewicz	City Island, NY	Gaia Institute
Bob Lebensold	New Rochelle, NY	
Mark Tedesco	Stamford, CT	U.S. EPA - Long Island Sound Office
Eddie Cuminale	Long Island City, NY	Hunters Point Community Coalition
Eugene Karbowski	Riverside, CT	
Catherine Poggi	Bronx, NY	Ferry Point Civic Association
Virginia Gallagher	Bronx, NY	Community Board #10 - The Bronx
Majora Carter	Bronx, NY	The Point Community Development
Corp.		
Dorothy Poggi	Bronx, NY	Ferry Point Civic Association
* Christine Ciardiello	Bronx, NY	

Manhasset, NY June 20, 2000

Name	Address	Affiliation
Hon. May Newberger	Manhasset, NY	Town of North Hempstead
Erik Dumont	Farmingdale, NY	Citizens Campaign for the Environment
Robin Gordon	Great Neck, NY	League of Women Voters
James P. Jones	Bayville, NY	
Julian Kane	Great Neck, NY	
Robert Gans	New York, NY	Bronx River Restoration
Ray E. Cowen	Stony Brook, NY	NYS Department of Environmental
	Conservation	
Michael F. Burger, Ph. D	Ithaca, NY	Audubon New York
Meg Tocantins	Stamford, CT	Save the Sound
Frank Morris	New Hyde Park, NY	Sierra Club - Long Island Group
Patrice Benneward	Glenwood Landing, NY	The Glenwood/Glen Head Civic Assn.
Carol DiPaolo	Sea Cliff, NY	Coalition to Save Hempstead Harbor
Amie Hamlin	Bellport, NY	New York League of Conservation
	Voters	
Joel Ziev	Port Washington, NY	Town of North Hempstead
Guy A. Jacob	Elmont, NY	Sierra Club
Helene Gaillet de	Roslyn, NY	Neergaard

* Dan Kriesberg	Bayville, NY	
* Martin Garrell	Garden City, NY	Adelphi University, Physics Department
* Jennifer Rimer	Port Washington, NY	Residents for a more beautiful Port
	Washington	
* Ruth Kogel	Great Neck, NY	League of Women Voters – Great Neck/ Tri-State

● Cold Spring Harbor, NY June 22, 2000 ●

Name	Address	Affiliation
Hon. Alexander Treadwell	Albany, NY	NYS Department of State
Dyan Freiberg	Glen Cove, NY	Save the Sound
Marilyn England	E. Patchogue, NY	Open Space Council
Caroline DuBois	Oyster Bay, NY	ACTION
Basil P. Tangredi	Greenlawn, NY	Huntington Conservation Board
Maria Kelly	Huntington, NY	Huntington Audubon Society
Ceil Stepanian	Huntington, NY	Lloyd Harbor Conservation Advisory Board
Nancy Rauch Douzinas	Lloyd Harbor, NY	Rauch Foundation
Joanna Radin	Kings Park, NY	
Amie Hamlin	Bellport, NY	New York League of Conservation Voters
Hon. John Cooper	Huntington, NY	Suffolk County Board of Legislators
Edward C. Mohlenhoff	Oyster Bay, NY	
Denise Woodin	Oyster Bay, NY	Friends of the Bay
Dorothea L. Cappadona	Lloyd Neck, NY	Caumsett Foundation
Hon. Brian Muellers	Mineola, NY	Nassau County Board of Legislators
Susan Langton	Huntington, NY	
Mary J. Molloy	Cold Spring Harbor, NY	
Lisa Mars	Cold Spring Harbor, NY	Computer Associates International, Inc.
Barbara Josepher	Syosset, NY	Sierra Club-Long Island
Fritz Coudert	Oyster Bay, NY	Center for Marine Education
* Robert Crafa	Oyster Bay, NY	Center for Marine Education and Recreation
* William B. Reeves	E. Northport, NY	
* Spencer Ross	Glenwood Landing, NY	Sagamore Rowing Association

● Port Jefferson, NY June 27, 2000 ●

Name	Address	Affiliation
Amie Hamlin	Bellport, NY	New York League of Conservation Voters
Rebecca Grella	Port Jefferson, NY	Aiza Biby
Meg Engelman	Coram, NY	
George Proios	Hauppauge, NY	Suffolk County Soil and Water Conservation District
Camille Johnson	Stony Brook, NY	Stony Brook Civic Association
Donald L. Coyle	Port Jefferson, NY	Conservation Commission
Luci Betti Nash	Stony Brook, NY	Four Harbors Audubon Society
Gary Halada	Stony Brook, NY	
Karen Chytalo	E. Setauket, NY	NYS DEC-Division of Marine Resources
Janet Lauber	Stony Brook, NY	Stony Brook Estuaries Council
Erik Dumont	Farmingdale, NY	Citizens Campaign for the Environment
Hon. Steven Englebright	Setauket, NY	NYS Assembly

Kathleen O'Connor
Edward Luke
Sarah Karpanty
Louise Harrison
Jack Finkenberg
Alex Kolker
Jane-Kerin Moffat
* Dyan Freiberg
* Thomas Gallup
* Guy A. Jacob
* Nina Marden
* Elizabeth Shepherd

East Islip, NY
West Sayville, NY
Stony Brook, NY
Setauket, NY
Babylon, NY
Stony Brook, NY
Cos Cob, CT
Glen Cove, NY
Rocky Point, NY
Elmont, NY
St. James, NY
St. James, NY

Great South Bay Audubon Society
Nissequogue Canoe and Kayak Club
Four Harbors Audubon Society
Conservation Natural Areas Planning
Great South Bay Audubon Society

Save the Sound

Sierra Club
ACTION
Head of the Harbor Environmental
Conservation Board

* Rev. DuBois Tangier Smith White Sulphur Springs, NY
* Thomas Allen Stock Kings Park, NY
* Harry R. Van Liew St. James, NY
Ken Edwards Port Jefferson, NY

Village of Head of the Harbor

Southold, NY June 29, 2000

Name

Address

Affiliation

Gwynn Schroeder
Richard Amper
Paul Stoutenburgh
Col. James A. House
Cynthia Blyth Halsey
Beverley Prentice
Dan Morris
Lisa Holst
Marguerite W. Purnell
Mary Laura Lamont
James King
Howard Meinke
Dr. Paul Adams
Henry Halama
Charles Cetas
Amie Hamlin
Peg Dickerson
Jane-Kerin Moffat
Brigitte Byrnes
Robert Yaro
* Mary Mulcahy

Cutchogue, NY
Manorville, NY
Cutchogue, NY
Cutchogue, NY
Southold, NY
Jamesport, NY
Brookhaven, NY
E. Setauket, NY
Washington, CT
Riverhead, NY
Mattituck, NY
Mattituck, NY
Setauket, NY
Shelter Island, NY
Riverhead, NY
Bellport, NY
Cutchogue, NY
Cos Cob, CT
Stamford, CT
New York, NY
Greenport, NY

Friends of Long Island Sound
Long Island Pine Barrens Society

North Fork Audubon Society
Open Space Council
NY DEC
Fishers Island Conservancy
Long Island Botanical Society
Town of Southold
North Fork Environmental Council
SUNY at Stony Brook
North Fork Audubon Society
North Fork Environmental Council
New York League of Conservation Voters

Audubon Council of Connecticut
Save the Sound
Regional Plan Association
North Fork Audubon Society

Organizational Information

Listen to the Sound 2000



145

Organizational Information

Listen to the Sound 2000

National Audubon Society

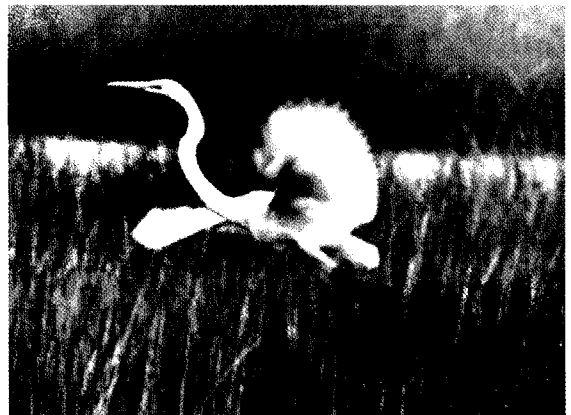
Audubon New York is the state program of the National Audubon Society. Audubon promotes the protection and proper management of birds, wildlife and their habitats through advocacy and education. Through a state board of directors, statewide council, 31 chapters and a network of Audubon centers and sanctuaries, Audubon New York is providing conservation leadership based on sound science with specific campaigns on birds, forests, wetlands, estuaries and wildlife on local, state and national levels. In addition, Audubon New York's executive director David Miller serves as the New York co-chair to EPA's Citizen Advisory Committee for Long Island Sound, chair of Governor Pataki's Long Island Sound Coastal Commission and co-founder of Clear Water Jobs Coalition.



Audubon NEW YORK

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Audubon Connecticut, with over 15,000 members in the state, works to protect birds, other wildlife and their habitats through education, research, conservation and legislative advocacy. Audubon Connecticut oversees the operation and management of Audubon Nature Education Centers in Greenwich, Southbury and Sharon, and Nature Sanctuaries in Sharon, Guilford and Greenwich. Audubon Connecticut also coordinates and implements grassroots, outreach and advocacy initiatives; provides support for the Audubon Council of Connecticut and 14 Audubon Chapters and affiliates; and coordinates the planning, networking, and partnerships necessary to successfully implement the Audubon Strategic Plan in Connecticut.



Egret



Audubon CONNECTICUT

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Regional Plan Association

Regional Plan Association was established in 1921 as a not-for-profit civic group to create a long range plan to shape the growth of the New York-New Jersey-Connecticut metropolitan region. For 80 years RPA has led efforts to build the region's transportation and open space systems and to promote better patterns of development throughout the Tri-state region. RPA's landmark regional plans in 1929, 1968 and 1996 and subsequent advocacy efforts resulted in the preservation of the metropolitan area's one million acre open space system –the world's largest metropolitan greenspace system. RPA's 1996 Plan called for further expansion of this system through creation of a "Metropolitan Greensward" system of 11 large protected regional reserves, including Long Island Sound. Over the years, RPA's open space advocacy efforts have helped to preserve some of the region's most important parks and reservations, including the Long Island State Park system, Gateway National Recreation Area, the Merritt Parkway, Minnewaska State Park, the Upper Delaware National Recreation Area, Fire Island National Seashore, the Long Island Pine Barrens and Sterling Forest.

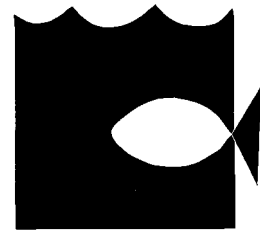


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Save the Sound

Formed in 1972, and with offices in Stamford, CT, Avery Point, CT and Glen Cove, NY, Save the Sound, Inc. is a regional non-profit organization dedicated to the restoration, protection and appreciation of the Sound and its watershed through advocacy, education and research. The organization's advocacy efforts include working with elected and appointed officials in Washington, DC, Albany, NY, and Hartford, CT, as well as in the halls of local government. Save the Sound comments on issues ranging from the dumping of dredge spoils into the Sound to the protection of open space to the construction of docks. Its education programs teach over 20,000 people a year, mostly kids, about the wonders of the Sound. And its research programs include monitoring the water quality at 60 sites in 13 harbors around the Sound, analyzing chlorophyll levels in those harbors at its lab in the Stamford facility, and working with high school students in the watersheds to learn the science of water quality monitoring. Save the Sound also coordinates the Long Island Sound Watershed Alliance and has affiliations or memberships with the LIS Study's Citizen's Advisory Committee, the Coast Alliance, Restore America's Estuaries, the Environmental Federation of New England, the Interstate Sanitation Commission, and the Clean Water Network.



Save the Sound®

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A Partnership to Restore and Protect the Sound

LONG ISLAND SOUND STUDY

FEDERAL FISCAL YEAR 1999 WORK PLAN AND BUDGET

August 1999

I. INTRODUCTION

The Long Island Sound Study (LISS) began in 1985 when Congress appropriated funds for the U.S. Environmental Protection Agency (EPA) and the states of Connecticut and New York to research, monitor, and assess the water quality of Long Island Sound. The 1987 amendments to the Clean Water Act officially established the National Estuary Program (Section 320). At the request of the states of Connecticut and New York, Long Island Sound was officially designated an “estuary of national significance” under this program, and a Management Conference was convened in March of 1988. The Management Conference was charged with developing a Comprehensive Conservation and Management Plan (CCMP) for protecting and improving the health of Long Island Sound while ensuring compatible human uses within the Sound ecosystem.

The Long Island Sound Study CCMP was completed in March 1994 and was officially approved by EPA and the states of New York and Connecticut on September 26, 1994. The CCMP characterizes the priority problems affecting Long Island Sound and identifies specific commitments and recommendations for actions. The LISS focused on environmental problems that are Soundwide and require a bi-state remedial effort. Six problems merit special attention: (1) low dissolved oxygen (hypoxia), (2) toxic contamination, (3) pathogen contamination, (4) floatable debris, (5) the impact of these water quality problems, and habitat degradation and loss, on the health of living resources, and (6) land use and development resulting in habitat loss and degradation of water quality. The priority issue is hypoxia, and reducing anthropogenic nitrogen loadings, which have been identified as the primary cause of low dissolved oxygen (DO).

On February 5, 1998 the LISS Policy Committee formally approved the *Proposal for Phase III Actions for Hypoxia Management*, which sets an ambitious course of action to remove 58.5 percent of the human-caused nitrogen load to Long Island Sound from the Connecticut and New York portions of the watershed. The 58.5 percent nitrogen reduction will be phased in over a 15-year period (1999-2014), with interim targets to achieve 40 percent of the goal (23 percent) in five years, and 75 percent of the goal (44 percent) in ten years. Achieving the target reduction is expected to reduce the maximum area of the Sound unhealthy for fish and shellfish by 75 percent and the duration of the unhealthy conditions by 85 percent. Adoption of the nitrogen reduction target culminates eight years of work to develop a solid technical foundation for forming effective nitrogen control plans with confidence that they will result in the desired water quality improvements.

As a commitment of the CCMP, the Long Island Sound Management Conference has been extended to oversee the transition from planning to full implementation of the CCMP. As in prior years, this work plan identifies the activities supported by funds under the jurisdiction of the Management Conference.

II. IMPORTANT PROGRESS IN FY99

Activities conducted in FY99 (October 1, 1998 - September 30, 1999) were supported in part by the FY98 appropriation. Highlights of high priority activities conducted during the past year are as follows:

General

- The LISS submitted its second *LISS Biennial Review Report* to the EPA Oceans and Coastal Protection Division in April 1999 in compliance with the National Estuary Program Biennial Review Guidance. The report covers progress by the LISS on a wide range of issues during the period from July 1997, when the last report was submitted, through March 1999.
- In May 1999, the LISS issued its *1998 Tracking Report: The Comprehensive Conservation and Management Plan* to report on progress in implementing the CCMP for Long Island Sound. The tracking system includes appropriate measurement indicators to evaluate success in reaching the goals outlined in the CCMP, and will be used to help direct future management activities toward achieving desired results. The LISS Citizens Advisory Committee (CAC) has played an active role in reviewing and recommending modifications to the report as it has evolved over the past several years.

Hypoxia Management

- With support from the EPA Long Island Sound Office (LISO), the states of Connecticut and New York have developed a draft total maximum daily load (TMDL) analysis for anthropogenic nitrogen loads and a plan to achieve the dissolved oxygen water quality standard for the Sound. The states plan to “public notice” the TMDL in September 1999, after which it will be submitted to EPA for final approval. In the interim, both states continue nitrogen reduction efforts through sewage treatment plant upgrades and nonpoint source management.
- The estimated nitrogen load from human activity in the Long Island Sound drainage basin that entered the Sound in 1998 was approximately 31,000 tons -- 8,000 tons below the estimated 1992 peak loadings and below the 1997 estimated load of 35,100 tons. The total point source nitrogen load to the Sound in 1998 was 160,441 lbs/day, a decrease of 26,775 lbs/day from 1990 levels.
- While nitrogen loading was down in 1998, low dissolved levels in the bottom waters of the Sound increased. The maximum areal and temporal extent of dissolved oxygen levels below 3 mg/l (hypoxia) in the Sound was 184 square miles and 73 days respectively, compared with 22 square miles and 48 days in 1997. Nevertheless, these conditions are a marked improvement over 1989, when more than 500 sq. mi. (40 percent) of the Sound's bottom waters had dissolved oxygen levels below 3 mg/l. These conditions are thought to be caused by an unusually wet year due to El Nino, unusually warm water temperatures ($+2^{\circ} \geq \text{avg.}$) in the Sound, and a persistent thermocline condition, which hindered mixing of surface and bottom waters, especially in the western Sound.
- In 1998, Connecticut awarded \$25 million in loans and grants for sewage treatment plant upgrades to benefit Long Island Sound, adding to the \$250 million awarded in 1996-97.

Construction continued on denitrification plants at Waterbury, Norwalk, and New Canaan, and planning for denitrification projects is underway at three others. Facilities planning for full-scale, long-term nitrogen removal has been completed for sewage treatment plants in Branford and Fairfield.

- In 1998, New York awarded approximately \$12 million of the \$200 million targeted for Long Island Sound projects from the 1996 \$1.75 billion Clean Water/Clean Air Bond Act for sewage treatment plant upgrades in New Rochelle, Hunts Point, Oyster Bay, Kings Park, and Northport.
- The CT DEP, New York City Department of Environmental Protection (NYC DEP), and Interstate Sanitation Commission (ISC) continued their ambient water quality monitoring programs following the recommendations of the CCMP's monitoring plan. LISS funding supports most of the CT DEP and some of the NYC DEP monitoring on the Sound, while ISC monitoring is supported by CWA section 106 grant funds.
- EPA and state LISS staff have continued to build support for additional NO_x controls on the basis of atmospheric deposition of nitrogen contributing to hypoxia in Long Island Sound and other eastern estuaries.

Habitat Restoration

- The LISS updated its Habitat Restoration Strategy, approved by the Policy Committee in 1998, by selecting 373 sites – 228 in Connecticut and 145 in New York – from the original list of 450 nominated sites. A total of 111 sites in both states have been designated as “high priority” sites.
- CT DEP, working in cooperation with other federal, state, and local agencies and organizations, completed five tidal flow/wetland restoration projects totaling approximately 45 acres, and five phragmites control projects totaling over 100 acres, and one beach and dune restoration project under its Tidal Wetlands Restoration, and Coves and Embayments programs, and initiated several others. Also completed were three anadromous fish passage restoration projects, all involving the construction of fish ladders.
- NYS DEC is conducting four habitat restoration projects with \$1.2 million of bond act funds in 1998-99 at Baxter Stage Pond, Centre Island Beach, Oyster Bay Western Waterfront, and the Betty Allen Nature Preserve. NYSDEC has two tidal wetland restoration projects in progress and two in the planning stage.

Watershed Management

- The planning phase of the Norwalk River Watershed Initiative, begun in 1996 as part of the LISS Watershed Management Initiative, was completed in October 1998 with release of the *Norwalk River Watershed Action Plan*. The plan is a product of the Norwalk River Watershed Initiative Committee, which comprised more than 50 representatives from the

seven watershed communities and local, state, and federal government agencies. The plan includes a "state of the watershed" report and "action plans" for four priority issues of concern: water quality, habitat restoration, land use/open space/flooding, and education/stewardship. The LISS invested \$120,000 over a three-year period to share the salary of an USDA NRCS staff person to serve as project coordinator.

Implementation is being guided by the newly formed Norwalk River Watershed Advisory Committee, with representatives from EPA, the USDA Natural Resources Conservation Services, CT DEP, the seven watershed communities, several citizen groups, and area residents. Clean Water Act section 319 funds are supporting several high priority implementation activities, including hiring a "watershed coordinator," riparian buffer restoration, road sand/salt reduction, and septic system outreach and education.

- The University of Connecticut/Cooperative Extension System (UConn/CES) continued for a second year its Nonpoint Education for Municipal Officials (NEMO) workshops targeted to the land use commission members in the seven towns in the Norwalk River watershed, in support of the Norwalk River Watershed Initiative. Over 850 participants, including elected and appointed land use officials, from 14 Fairfield County (CT) and Westchester County (NY) municipalities attended 32 workshops on the effects of impervious surfaces, innovative land development practices, conserving open space, and geographic information systems. The LISS provided a total of \$110,000 in FY96 and FY98 to support the Long Island Sound NEMO project.
- Both states continue to utilize CWA section 319 nonpoint source grants to support watershed management efforts, including demonstration projects, technical assistance, and public education and outreach, many of which are targeted at reducing nonpoint sources of nitrogen. Funding for Sound-related nonpoint source control projects in Connecticut totaled \$455,000 in 1998.

Dredged Material Management

- EPA and the Army Corps of Engineers signed a Letter of Agreement in April 1998 to formally designate open water disposal sites under the Marine Protection, Research, and Sanctuaries Act (MPRSA). The LISS is assisting with the public participation component of the Environmental Impact Statement process by sponsoring workshops to facilitate public discussion, input, and feedback to the regulatory agencies.
- Work was completed on the study to provide background information necessary to update the interim *Plan for Disposal of Dredged Materials in Long Island Sound*. The report, *Long Island Sound Dredged Material Management Approach*, was completed in August 1998 and includes information on current regulatory requirements, reviews alternatives to open water disposal, and identifies future research needs. The LISS provided \$102,884 in FY95 and FY97 funds to support this effort.

Public Education and Involvement

- The LISS CAC continues to meet on a quarterly basis, with EPA Long Island Sound Office administrative support, and is playing an active role in many aspects of the program. The CAC has been particularly effective at building the public, political, and financial support the LISS currently enjoys.
- Through the New England Interstate Water Pollution Control Commission, the LISS recently hired, with FY98 funds, a “communications coordinator” to enhance coordination of outreach and education activities between the EPA LISO, CT DEP, NYS DEC, and New York Sea Grant.
- The small grants program, administered by New York Sea Grant with CAC oversight, was continued for a fifth year. Based on its popularity and positive results, the funding level was increased to \$50,000 for FY98, bringing the five-year total to \$150,000. During the past four years a total of 31 small grants have been awarded to support community-based implementation and education activities for cleaning up and restoring the Sound and learning more about its ecosystem.
- The LISS developed a new fact sheet (*Putting the Plan in Motion: 1997-1998*) and revised one (*Supporting the Sound*), and published three issues of *Update*, the LISS newsletter, focusing on water quality monitoring, TMDLs, and nitrogen trading.
- The LISS outreach program responded to 502 information requests, developed and staffed displays at 17 public events that reached 4,115 people, and made four presentations to a combined audience of 145.
- The LISS, with continued contractor support, regularly updates its World Wide Web site to include all fact sheets, newsletters, slide shows, recent reports, Long Island Sound-related links, and key personnel contact information. The LISS site has been one of the most visited on the EPA Region 1 home page and can be accessed through “<http://www.epa.gov/region01/eco/lis/>.”

III. MAJOR AREAS OF EMPHASIS FOR FY99 FUNDED ACTIVITIES

The Long Island Sound Study will utilize FY99 funds to continue to support CCMP implementation. Federal financial assistance again will be awarded under sections 104(b)(3) and 119 of the Clean Water Act, as amended by the Long Island Sound Improvement Act of 1990. Implementation grants made under section 119 require a 50 percent match. Grants awarded under sections 104(b)(3) and 119 to support technical assistance, public education, outreach and participation efforts require a 5 percent match.

The following work plan tasks focus on activities directly funded through the National Estuary Program and directed by the Long Island Sound Study Management Committee. The amount of federal and non-federal matching funds allocated for each task are provided in Tables 1 and 2 at the end of this work plan.

EPA base program funds authorized under other sections of the Clean Water Act, other federal sources of funds, and state and local funds being targeted for CCMP implementation are not comprehensively discussed here. State and local implementation costs for actions not conducted directly under the National Estuary Program or listed as match for the program also are not provided here.

1. COORDINATION AND REPORTING OF CCMP IMPLEMENTATION

The LISS will continue to coordinate CCMP implementation and report on progress. The EPA LISO will continue to support the LISS Management Conference by providing coordination, technical assistance, and administrative support. Funds are set aside to support the administrative costs of the office. In addition, the LISS will continue to provide funding for one staff person each in NYS DEC and CT DEP to assist in the general coordination of implementation activities by their agencies and other Management Conference members. Special emphasis will be placed on:

- facilitating public review and coordinating EPA review and approval of the total maximum daily load (TMDL) analysis and implementation plan for reducing nitrogen loads to Long Island Sound;
- coordinating the development of a “nitrogen effluent trading program” for Connecticut, including EPA approval of a statewide “watershed” NPDES permit, to facilitate more cost-effective nitrogen reductions;
- facilitating and coordinating implementation of the *Long Island Sound Habitat Restoration Strategy*;
- utilizing the CCMP tracking and monitoring system to track and report on progress on implementing CCMP actions;
- updating and implementing an enhanced public outreach and education program, utilizing the services of the new communications coordinator, to build public and political support for the nitrogen reduction program;
- continuing monitoring of pollutant loads and the condition of the Sound; and
- based on the above, identifying the most appropriate indicators of success to better direct ongoing management to achieve desired results, and publishing an environmental indicators report for Long Island Sound.

2. PUBLIC INVOLVEMENT AND EDUCATION

A. EDUCATION PROGRAM

The LISS will continue its coordinated, bi-state public outreach and education program with

oversight by the EPA LISO. Funds will again be provided to New York Sea Grant Program to staff the Long Island Sound Office in Stony Brook and to the CT DEP for an outreach coordinator located in the Bureau of Water Management. The New York Sea Grant Program also will continue to manage the small grants program described below.

B. SMALL GRANTS PROGRAM

The LISS will continue the successful small grants program that was established with the FY94 funding cycle to support community-based implementation and education activities for cleaning up and restoring the Sound. The program will be administered by New York Sea Grant, with assistance from the CT DEP outreach coordinator and LISS communications coordinator. The CAC Communications Subcommittee will continue to review and recommend projects for funding under the program.

C. OUTREACH SUPPORT

LISS funds will be awarded to the New England Interstate Water Pollution Control Commission (NEIWPCC) to: (1) to provide the LISS with technical writing, editing, and layout support for outreach materials and technical reports, including an “environmental indicators” report to be released in conjunction with the 15th anniversary of the LISS; (2) logistical support for two conferences, one targeting educators and the other, municipal government officials; and (3) cover costs for CAC and TAC representatives traveling to program-related outreach and technical transfer activities. The new communications coordinator hired with FY98 funds will assist the two state outreach coordinators in updating and implementing the LISS public outreach plan.

3. WATER QUALITY MONITORING

Monitoring Long Island Sound is necessary to: (1) measure the effectiveness of management actions and programs implemented under the CCMP, and (2) provide essential information that can be used to redirect and refocus the management plan. The LISS will continue to provide funding support for the Long Island Sound Ambient Water Quality Monitoring Program in an effort to collect valuable data on current conditions in the Sound. These monitoring activities will be consistent with those recommended in the Long Island Sound Study monitoring plan, developed as part of the CCMP.

A. FIELD SURVEYS

CTDEP, ISC, and NYCDEP will continue to conduct baseline water quality monitoring in Long Island Sound. The CTDEP and NYCDEP monitoring programs will be supplemented with funding from the LISS. ISC will continue its monitoring program with support from CWA Section 106 funds provided by EPA Region II. CTDEP will complete a report that analyzes and assesses monitoring data collected over the past several years.

B. NITROGEN LOADING TREND ANALYSIS

While the LISS has estimated the amount of nitrogen from nonpoint source runoff for average rainfall conditions using runoff coefficients, the annual variability of nonpoint nitrogen loads over the past ten years has not been summarized. This information is important in validating the contribution of nonpoint sources of nitrogen to Long Island Sound and in assessing correlations between nitrogen loads and dissolved oxygen levels each year. The LISS will provide FY99 funds to CT DEP and NYS DEC to supplement FY98 funds for a trend analysis by the U.S. Geological Survey of nitrogen loads to the Sound over the past ten years. In addition, the USGS will assess whether groundwater inputs to Long Island Sound have been adequately accounted for in previous loading estimates. This task is consistent with EPA guidance to target the funds to further the goals of the Clean Water Action Plan.

4. HABITAT RESTORATION

In its sixth year, the LISS Habitat Restoration Team will continue with identification of degraded habitats, their status and trends, mapping, criteria development for defining and ranking restoration needs, and developing restoration recommendations. Funding support will be provided to the CTDEP and the NYSDEC to maintain staff to work under the guidance of the Habitat Restoration Team with a focus on facilitating the implementation of habitat restoration priorities.

LISS staff will continue to participate in an inter-agency work group to review progress of the USACOE Feasibility Study of a subset of the high priority habitat restoration projects in the Connecticut Long Island Sound Coastal Area. The Feasibility Study targets tidal wetland restoration, stormwater remediation, and riverine migratory corridor restoration on three rivers (Quinnipiac, Naugatuck, and Norwalk).

5. WATERSHED MANAGEMENT

The LISS will continue to support local watershed management initiatives through funding and technical assistance in support of CCMP implementation.

A. NONPOINT EDUCATION FOR MUNICIPAL OFFICIALS

Funding will be provided to the UConn/CES for a third year to conduct NEMO workshops for local land use officials and others in Fairfield (CT) and Westchester (NY) counties, and to assist with the establishment of a NEMO program in New York State through its Cooperative Extension System and NY Sea Grant. In Westchester County, NEMO efforts will target the Watershed Action Committees created by the Westchester County Planning Department as part of the county's watershed management strategy.

B. COMMUNITY-BASED WATERSHED PROTECTION ASSISTANCE

EPA and the USDA Natural Resources Conservation Service (NRCS) will continue their

partnership through a new interagency agreement (IAG) to provide guidance on community-based watershed protection efforts in support of CCMP implementation. NRCS will work with local government officials, community groups, other federal and state agencies, and the Congressional delegation to identify opportunities to improve the quality of water and natural resources locally and in the Sound. Based on lessons learned from the Norwalk River Watershed Initiative and other community-based watershed planning efforts, NRCS will develop workshop materials, develop and conduct workshops, and provide guidance to selected new and existing community-based watershed planning efforts within the LISS project area boundaries. The LISS is providing \$40,000 in FY99 funds to establish this new IAG, which will be matched with \$40,000 from NRCS.

C. NORWALK RIVER WATERSHED INITIATIVE

As described in the "Important Progress in FY99," the Norwalk River Watershed Initiative Committee completed the *Norwalk River Watershed Action Plan* in October 1998. The LISS will work with the new Norwalk River Watershed Advisory Committee to coordinate and oversee implementation of the plan. The NRWI already has leveraged \$140,000 in FY98-99 CWA section 319 funds to implement several high-priority action items, and is tentatively set to receive \$100,000 in FY00 section 319 funds to implement several other priority actions identified in the plan. The NRWI also has been successful in leveraging over \$11,000 from Trout Unlimited's "Embrace-A-Stream" program over the past two years for in-stream and riparian habitat restoration, and \$60,000 in FY99 Wildlife Habitat Incentives Program (WHIP) funds from NRCS for similar activities. The federal funds typically require anywhere from a 25-40 percent non-federal match, so they in turn leverage significant local cash and in-kind contributions.

6. RESEARCH

The *Phase III Actions for Hypoxia Management*, as described above, calls for a 58.5 percent reduction in nitrogen loads from sources in Connecticut and New York. Both states have already spent millions of dollars to upgrade sewage treatment plants for nitrogen removal and are committed to spending millions more over the next 15 years. Many of these STPs will be using biological nitrogen removal (BNR) processes which involve a nitrification step and a denitrification step. Many of the plants that have already installed these BNR processes are experiencing intermittent and extended periods when there is a loss of either nitrification or denitrification.

The LISS will provide a second year of funding for a study to be conducted by the City of Stamford and the University of Connecticut to identify determinants of nitrogen removal failure at Long Island Sound-area STPs due to process control and waste stream characteristics. The ultimate goal will be to develop a manual containing troubleshooting guides and process control flow charts which can be used by any STP operator to assess and assist in solving problems associated with BNR. In addition, there will be periodic seminars between the project managers, regulatory agencies, and STP operators to gather and disseminate information on operating

nitrogen removal processes. This work will have broad implications for BNR systems nationwide and will contribute in a significant fashion to controlling nitrogen discharges to our nation's waters.

IV. FUNDING AMOUNTS AND SOURCES

Table 1 shows the distribution and amount of LISS funds and required non-federal matching funds supporting work plan tasks. Table 2 summarizes the overall funding sources for the LISS, and Table 3 shows the total federal funds awarded to each grant recipient, their required non-federal match, and their actual match. These projects and activities were approved for funding by the Management Committee at its April 15 and July 15, 1999 meetings. Under section 119, there is a 50 percent match requirement for implementation grants and a five percent match requirement for grants supporting public outreach, involvement, and education activities. As shown in Tables 1 and 2, the recipients have committed to meeting the required cumulative nonfederal match, which is documented in the FY99 grant applications and work plans for CTDEP, NYSDEC, NYCDEP, NRCS, NEIWPCC, the University of Connecticut, and NY Sea Grant.

Table 1. Summary of FY99 LISS Federally Funded Tasks

Category	Task	Products/Services	Recipient Organization	Assistance Type	LISS Federal Share	Required Match
Coordination and Reporting of CCMP Implementation	LIS Office Administrative Support	SEEP support; phone; printing; photocopying; mail; supplies; and materials	Various	P.O.s Contracts I.A.G.	\$65,000	\$0
	State Coordination/ Technical Assistance	Assist in all aspects of program development and support	NYSDEC	C.A.	\$88,750	\$88,750
			CTDEP	C.A.	\$46,115	\$46,115
	Travel Support	Travel for CAC/TAC	NEIWPPC	C.A.	\$10,000	\$526
	GIS support	GIS maps; QA review	EPA Region 1 GIS Center	Transfer of funds	\$8,000	\$0
Public Involvement and Education	Education Program	Newsletter, fact sheets, presentations, press releases	NY Sea Grant	C.A.	\$99,657	\$5,245
			CT DEP	C.A.	\$67,507	\$3,553
	Small Grants Program	Local public education and involvement projects	NY Sea Grant	C.A.	\$70,000	\$3,684
	Outreach Support	Municipal and educators workshops; outreach materials	NEIWPPC	C.A.	\$19,597	\$1,031
Water Quality Monitoring	Field Surveys of LIS	Water quality data	CTDEP	C.A.	\$250,000	\$250,000
			NYCDEP	C.A.	\$20,000	\$20,000
	Trend Analysis	Nitrogen Load Trend Analysis	CTDEP	C.A.	\$25,000	\$25,000
			NYSDEC	C.A.	\$25,000	\$25,000
Habitat Restoration	Habitat Restoration Team Staff Support	Prioritized list of habitat restoration sites and implementation.	CTDEP	C.A.	\$77,660	\$77,660
			NYSDEC	C.A.	\$88,750	\$88,750
Watershed Management	Technical Assistance	NEMO workshops	UConn/CES	C.A.	\$50,000	\$2,632
		Watershed workshops	USDA/NRCS	I.A.G.	\$40,000	\$0
Research	STP Nitrification/ Denitrification Failure Study	Recommendation on how to prevent nitrification/ denitrification failures at sewage treatment plants	CTDEP/ UConn/ City of Stamford	C.A.	\$88,964	\$88,964
	LIS Research	Research findings	RFPs	C.A.	\$100,000	\$100,000
TOTAL					\$1,240,000	\$826,910

Table 2. Summary of LISS Federal Funding Sources	
FY99 NEP Base Funds	\$300,000
FY99 NEP Travel Supplement	\$10,000
FY99 NEP CWAP Supplement	\$30,000
FY99 EPA LISS Line Item	\$500,000
FY99 Congressional "Earmark"	\$400,000
Total	\$1,240,000

Table 3. Summary of LISS Federal and Non-federal Funds			
Recipient Organization	Federal Funds	Required Non-federal Match	Actual Non-federal Match
EPA Long Island Sound Office	\$65,000	\$0	\$0
CT DEP	\$555,246	\$491,292	\$653,389
NYS DEC	\$202,500	\$202,500	\$202,500
NY Sea Grant	\$169,657	\$8,929	\$8,929
Research RFP (TBD)	\$100,000	\$100,000	\$0
UConn Cooperative Extension	\$50,000	\$2,632	\$2,701
USDA/NRCS	\$40,000	\$0	\$0
NEIWPPC	\$29,597	\$1,557	\$0
NYC DEP	\$20,000	\$20,000	\$20,000
EPA Region 1 GIS Center	\$8,000	\$0	\$0
Total	\$1,240,000	\$826,910	\$887,519



A Partnership to Restore and Protect the Sound

THE


of the U.S. Environmental Protection Agency

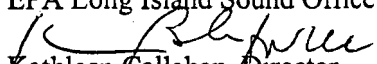
Look For Us On The World Wide Web at:
<http://www.epa.gov/region01/eco/lis/>

August 1, 2000

MEMORANDUM

SUBJECT: Review of Fiscal Year 2000 Work Plan for the Long Island Sound Study.

FROM: 
 Mark Tedesco, Director
 EPA Long Island Sound Office

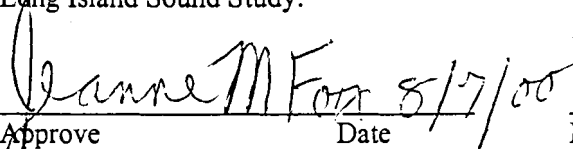
THROUGH: 
 Kathleen Callahan, Director
 Division of Environmental Planning and Protection

TO: Jeanne M. Fox, Regional Administrator

Please find attached a copy of the Long Island Sound Study's fiscal year 2000 (FY00) work plan. The work plan reflects the consensus on the use of FY00 funds that was reached by the Long Island Sound Study's Management Committee at its April 13, 2000 meeting.

As provided for in the National Estuary Program grant regulation [40CFR Part 35 subpart P; 35.9065(c)], the ratification of the annual work plan has been delegated to the Regional Administrator. I have reviewed the work plan and have found it consistent with requirements under the National Estuary Program and the Long Island Sound Improvement Act. The work plan describes the status of major tasks supported by FY 1999 funds and identifies tasks necessary to implement the Comprehensive Conservation and Management Plan (CCMP) using FY 2000 funds.

With your signature in the approval line below, EPA will exercise its authority to award funds under Section 119 of the Clean Water Act, as amended by the Long Island Sound Improvement Act, for the Long Island Sound Study.

 8/7/00

Approve	Date	Disapprove	Date
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Jeanne M. Fox
 Regional Administrator



A Partnership to Restore and Protect the Sound

LONG ISLAND SOUND STUDY

FEDERAL FISCAL YEAR 2000 WORK PLAN AND BUDGET

I. INTRODUCTION

The Long Island Sound Study (LISS) began in 1985 when Congress appropriated funds for the U.S. Environmental Protection Agency (EPA) and the states of Connecticut and New York to research, monitor, and assess the water quality of Long Island Sound. The 1987 amendments to the Clean Water Act officially established the National Estuary Program (Section 320). At the request of the states of Connecticut and New York, Long Island Sound was officially designated an "estuary of national significance" under this program, and a Management Conference was convened in March of 1988. The Management Conference was charged with developing a Comprehensive Conservation and Management Plan (CCMP) for protecting and improving the health of Long Island Sound while ensuring compatible human uses within the Sound ecosystem.

The Long Island Sound Study CCMP was completed in March 1994 and was officially approved by EPA and the states of New York and Connecticut on September 26, 1994. The CCMP characterizes the priority problems affecting Long Island Sound and identifies specific commitments and recommendations for actions. The LISS focused on environmental problems that are Soundwide and require a bi-state remedial effort. Six problems merit special attention: (1) low dissolved oxygen (hypoxia), (2) toxic contamination, (3) pathogen contamination, (4) floatable debris, (5) the impact of these water quality problems, and habitat degradation and loss, on the health of living resources, and (6) land use and development resulting in habitat loss and degradation of water quality. The priority issue is hypoxia, and reducing anthropogenic nitrogen loadings, which have been identified as the primary cause of low dissolved oxygen (DO).

On February 5, 1998 the LISS Policy Committee formally approved the *Proposal for Phase III Actions for Hypoxia Management*, which sets an ambitious course of action to remove 58.5 percent of the human-caused nitrogen load to Long Island Sound from the Connecticut and New York portions of the watershed. The 58.5 percent nitrogen reduction will be phased in over a 15-year period (1999-2014), with interim targets to achieve 40 percent of the goal (23 percent) in five years, and 75 percent of the goal (44 percent) in ten years. Achieving the target reduction is expected to reduce the maximum area of the Sound unhealthy for fish and shellfish by 75 percent and the duration of the unhealthy conditions by 85 percent. Adoption of the nitrogen reduction target culminates eight years of work to develop a solid technical foundation for forming effective nitrogen control plans with confidence that they will result in the desired water quality improvements.

As a commitment of the CCMP, the Long Island Sound Management Conference has been extended to oversee the transition from planning to full implementation of the CCMP. As in prior years, this work plan identifies the activities supported by funds under the jurisdiction of the Management Conference.

II. IMPORTANT PROGRESS IN FY00

Activities conducted in FY00 (October 1, 1999 - September 30, 2000) were supported in part by the FY99 appropriation. Highlights of high priority activities conducted during the past year are as follows:

General

- The second *LISS Biennial Review Report*, submitted in April 1999, was approved by the EPA Oceans and Coastal Protection Division (OCPD) in December 1999. The report covered progress by the LISS on a wide range of issues during the period from July 1997, when the first report was submitted, through March 1999. The OCPD approval letter cited good progress being made by the LISS, particularly in the areas of hypoxia management, habitat restoration, watershed management, monitoring and indicators, outreach, and institutional changes.
- In May 2000, the LISS issued its *1999 Comprehensive Conservation and Management Plan Implementation Tracking Report*, that reports on progress in implementing the CCMP for Long Island Sound. The tracking system includes appropriate measurement indicators to evaluate success in reaching the goals outlined in the CCMP, and will be used to help direct future management activities toward achieving desired results. The LISS Citizens Advisory Committee (CAC) has played an active role in reviewing and recommending modifications to the report as it has evolved over the past several years.
- The LISS Management Committee met quarterly in January, April, July, and October 1999. Management Committee meetings follow the quarterly CAC meetings, which enables committee members to more quickly consider and respond to issues identified by the CAC.
- The New York and Connecticut Sea Grant Program Directors were added as full members of the Management Committee in 1999. This action enhances the capability of the LISS to communicate and address issues of concern to LIS stakeholders.

Hypoxia Management

- The states of New York and Connecticut released a draft Total Maximum Daily Load (TMDL) for nitrogen to public comment in November 1999. The TMDL is consistent with the July 1998 *Phase III Actions for Hypoxia Management*, a bi-state agreement calling for a 58.5 percent reduction in human-caused (anthropogenic) nitrogen loads to the Sound over a 15 year period beginning in 1999.
- The estimated nitrogen load from sewage treatment plants in the Long Island Sound drainage basin that entered the LIS in 1999 was approximately 151,245 lbs/day, a decrease of nearly 36,000 lbs/day from 1990 levels, and nearly 10,000 lbs/day less than 1998. New York's 1999 point source nitrogen loading was 105,759 lbs/day, compared with 110,595 lbs/day in 1998. Connecticut's point source nitrogen loading was 45,486 lbs/day in 1999, compared with 49,846 lbs/day in 1998.
- In 1999, the maximum area and duration of dissolved oxygen (DO) levels less than 3 mg/l in LIS was 314 km² (121 mi²) and 50 days. This was less than the 1998 levels of 436

km² (168 mi²) and 73 days, and below the 10 year average of 470km² (181 mi²) and 57 days.

- The lawsuit initiated in 1998 by NYSDEC against New York City for violations at its sewage treatment facilities has been ruled in NYSDEC's favor in state court. Terms of the settlement will include penalties and supplemental environmental projects.
- Both states continued to prioritize funding for nonpoint source pollution control projects with nitrogen reduction elements that will help reduce hypoxia in the Sound.
- EPA and state LISS staff have continued to build support for additional NO_x controls on the basis of atmospheric deposition of nitrogen contributing to hypoxia in Long Island Sound and other eastern estuaries.

Habitat Restoration

- Connecticut and New York made good overall progress toward the LISS Habitat Restoration Strategy goals of restoring 2000 acres of tidal wetlands and 100 miles of river corridors for anadromous fish access within 10 years. To date, Connecticut has restored 68 acres of tidal wetland habitat, treated or retreated many acres of phragmites-infested habitat, and restored 22.5 miles of river corridor to anadromous fish access. The state of New York Department of Environmental Conservation awarded over \$2.5 million in 1999 Bond Act funds to communities on Long Island and in Bronx and Westchester counties for nine projects to restore more than 85 acres of aquatic and riparian habitat.
- The Long Island Sound Watershed Alliance (LISWA) passed a Resolution at its April 1999 meeting supporting the creation of a Long Island Sound "reserve system," as called for in the CCMP. The CAC sent a letter to the Policy Committee in June 1999 supporting the creation of a LIS reserve that would identify and protect open space and underwater habitats in the Sound. A coalition of interest groups is working to implement this CCMP action.

Watershed Management

- A growing number of communities in the Long Island Sound watershed are adopting watershed management-based approaches to controlling point and nonpoint sources of pollution to the Sound, including sewage treatment plants, CSOs, and various land uses. Many communities have formed watershed management committees or groups that cross local, municipal, or even state jurisdictions, to work together in addressing environmental management problems that have no boundaries.
- The LISS continued to provide staff support to the Norwalk River Watershed Initiative. Implementation of the Norwalk River Watershed Action Plan is being guided by the Norwalk River Watershed Advisory Committee, with representatives from EPA, the USDA Natural Resources Conservation Services, CT DEP, the seven watershed

communities, several citizen groups, and area residents. From FY98-00, EPA awarded \$240,000 in Clean Water Act section 319 funds to support several high priority implementation activities, including a "watershed coordinator" (hired in February 2000), riparian buffer restoration, stormwater management, road sand/salt reduction, and septic system outreach and education.

- The LISS provided a third year of funding in FY99 to the University of Connecticut/Cooperative Extension System (UConn/CES) to continue its Nonpoint Education for Municipal Officials (NEMO) program in Long Island Sound coastal tributary watersheds. The scope of the program was expanded beyond the seven towns in the Norwalk River watershed to include towns and watersheds in other parts of Fairfield County and in Westchester County, NY, and to help New York establish a counterpart NEMO program on Long Island. Now in its third year, the LIS NEMO program has conducted 44 workshops reaching more than 1093 participants in 17 communities (12 in Connecticut and five in New York). The LISS provided a total of \$160,000 in FY96 and FY98-99 to support the Long Island Sound NEMO project.
- NRCS, in partnership with the EPA ORD Atlantic Ecology Division in Narragansett, Rhode Island, has developed a workshop presentation and "mentoring" service to support new and ongoing watershed management efforts. Based on lessons learned from the Norwalk River Watershed Initiative, the Pawcatuck Watershed Partnership, and other community-based watershed planning efforts, NRCS will develop workshop materials, develop and conduct workshops, and provide guidance to selected new and existing community-based watershed planning efforts within the LISS project area boundaries. The LISS allocated \$40,000 in FY99 funds to establish an IAG with NRCS to carry out this project, which will be matched with \$40,000 from NRCS.
- Both states continue to utilize CWA section 319 nonpoint source grants to support watershed management efforts, including demonstration projects, technical assistance, and public education and outreach, many of which are targeted at reducing nonpoint sources of nitrogen. Funding for Sound-related nonpoint source control projects in Connecticut totaled approximately \$430,000 in FY00.

Dredged Material Management

- EPA and the Army Corps of Engineers signed a Letter of Agreement in April 1998 to formally designate open water disposal sites under the Marine Protection, Research, and Sanctuaries Act (MPRSA). The agencies jointly held public meetings in Connecticut and New York in 1999 to solicit public comment and input on the site designation process, proposed work plan, and site selection evaluation criteria and methodology. The designation process is expected to be completed by March 2002. The LISS is assisting with the public participation component of the Environmental Impact Statement process by sponsoring workshops to facilitate public discussion, input, and feedback to the regulatory agencies.

- The LISS sponsored a *Dredging and the Environment* workshop in March 1999 for Connecticut and New York residents, to increase the opportunity for public discussion, input and feedback to the regulatory agencies on dredged material management in LIS. The workshop complemented efforts by EPA and the ACOE to begin the process of designating dredged material disposal sites in Long Island Sound.
- In 1999 CTDEP received a fellowship award from NOAA's Coastal Services Center for development of a Long Island Sound Sediment Quality Information Database (SQUID) using GIS and associated databases, which include such spatial and attribute data as: sewer treatment outfalls; combined sewer outfalls; industrial discharges; oil & chemical spills; landfills; stormwater outfalls; and locations in the Sound and harbors where sediment testing has been conducted. The Coastal Management Fellow began work at DEP in November 1999.

Monitoring and Environmental Indicators

- The CT DEP, New York City Department of Environmental Protection (NYC DEP), and Interstate Sanitation Commission (ISC) continued their ambient water quality monitoring programs following the recommendations of the CCMP's monitoring plan. LISS funding supports most of the CT DEP and some of the NYC DEP monitoring on the Sound, while ISC monitoring is supported by CWA section 106 grant funds.
- The LISS will issue a "State of the Sound" report in fall 2000 for the general public that will use selected indicators to illustrate the Sound's condition and trends. Approximately 5,000 of the 15-page, color report, printed on newspaper will be produced. A more comprehensive presentation of environmental indicators will be presented as a web-based slide show.

Research and Studies

- The LISS established a new research program fund in 1999 by allocating \$100,000 from the LISS FY99 appropriation, and allocated an additional \$190,000 of FY00 funds. The EPA contribution was matched by an additional \$50,000 apiece from the New York and Connecticut Sea Grant programs bringing the total available funding to \$390,000. The LISS issued a Request for Proposals in November 1999 and received 30 proposals totaling over \$3,000,000 in requested funding.
- With the states of Connecticut and New York and the federal government investing millions of dollars to upgrade sewage treatment plants for nitrogen removal, ensuring that the treatment facilities operate properly is extremely important. The LISS allocated \$169,357 in FY98-99 for a study to be conducted by the City of Stamford and the University of Connecticut to identify determinants of nitrogen removal failure at Long Island Sound-area STPs due to process control and waste stream characteristics. The ultimate goal will be to develop a manual containing troubleshooting guides and process control flow charts which can be used by any STP operator to assess and assist in solving

problems associated with BNR. In addition, there will be periodic seminars between the project managers, regulatory agencies, and STP operators to gather and disseminate information on operating nitrogen removal processes. This work will have broad implications for BNR systems nationwide and will contribute in a significant fashion to controlling nitrogen discharges to our nation's waters.

Public Education and Involvement

- The LISS outreach and education programs continued to conduct many meetings, conferences and workshops attended by hundreds of public officials and concerned citizens.
- The Citizens Advisory Committee (CAC) continued to meet quarterly to review progress and provide guidance on CCMP implementation, and plays an active role in many aspects of the program. The CAC made some important recommendations to the LISS Policy Committee, including endorsing the creation of a Long Island Sound "reserve system," providing comments on the draft nitrogen TMDL, and facilitating public participation in the development of the dredged material disposal site designation EIS. The CAC has been particularly effective at building the public, political, and financial support the LISS currently enjoys. The EPA LISO provides administrative support to the CAC.
- At the initiative of the CAC, the LISS produced and distributed 5,000 copies of a series of four nonpoint source management posters that use humor to persuade people to take personal action to pick up after their pets, repair automobile oil leaks, reduce use of home fertilizers, and use conservation techniques when washing the car.
- The LISS produced and distributed many thousands of copies of its quarterly LIS newsletter, *UPDATE*, as well as fact sheets, publications, and brochures covering timely and critical LIS topics. Many of these documents were posted on the LISS web page: <http://www.epa.gov/region01/eco/lis>. The LISS webpage continued to be the most visited page on the EPA New England Region website, with over 35,000 hits in 1999, an average of nearly 3,000 per month.
- LISS program staff continued to: provide Long Island Sound displays at annual public events, such as Earth Day and Long Island Sound Day in Connecticut and New York, the Norwalk Oyster Festival, and the New Haven County Conservation Fair; address scores of teachers, educators, school children, groups and classes; and issue press releases, produce public service announcements, and give radio and press interviews on Long Island Sound issues.
- The LISS continued, for a second year, to support a "communications coordinator" through the New England Interstate Water Pollution Control Commission. The role of this staff person is to enhance coordination of outreach and education activities between the EPA LISO, CT DEP, NYS DEC, and New York and Connecticut Sea Grant offices.

- The LISS continued to explore methods to increase local and municipal participation in Management Conference in 1999. The LISS provided FY99 funds to conduct a second municipal conference in June 2000, which was co-hosted by the City of Stamford and the town of Glen Cove, Long Island and held at the University of Connecticut - Stamford.
- The very successful small grants program, administered by New York Sea Grant with CAC oversight, was continued for a sixth year. Based on its popularity and positive results, the funding level was increased from \$50,000 to \$70,000 for FY99, bringing the six-year total to \$220,000. During the past five years a total of 41 small grants have been awarded to support community-based implementation and education activities for cleaning up and restoring the Sound and learning more about its ecosystem.

III. MAJOR AREAS OF EMPHASIS FOR FY00 FUNDED ACTIVITIES

The Long Island Sound Study will utilize FY00 funds to continue to support CCMP implementation. Federal financial assistance again will be awarded under sections 104(b)(3) and 119 of the Clean Water Act, as amended by the Long Island Sound Improvement Act of 1990. Implementation grants made under section 119 require a 50 percent match. Grants awarded under sections 104(b)(3) and 119 to support technical assistance, public education, outreach and participation efforts require a 5 percent match.

The following work plan tasks focus on activities directly funded through the National Estuary Program and directed by the Long Island Sound Study Management Committee. The amount of federal and non-federal matching funds allocated for each task are provided in Tables 1 and 2 at the end of this work plan. Total FY00 federal funds available are: \$1,305,000.

EPA base program funds authorized under other sections of the Clean Water Act, other federal sources of funds, and state and local funds being targeted for CCMP implementation are not comprehensively discussed here. State and local implementation costs for actions not conducted directly under the National Estuary Program or listed as match for the program also are not provided here.

1. COORDINATION AND REPORTING OF ENVIRONMENTAL ACTIONS AND RESULTS

The LISS will continue to coordinate CCMP implementation and report on progress. The EPA LISO will continue to support the LISS Management Conference by providing coordination, technical assistance, and administrative support. Funds are set aside to support the administrative costs of the office. In addition, as described below, the LISS will continue to provide funding for one staff person each in NYSDEC and CTDEP to assist in the general coordination of implementation activities by their agencies and other Management Conference members. In FY00, special emphasis will be placed on:

- completing and submitting for EPA review and approval the total maximum daily load (TMDL) analysis and implementation plan for reducing nitrogen loads to Long Island Sound, as called for in the 1998 Phase III Hypoxia Agreement;

- continuing to coordinate the development and implementation of a “nitrogen effluent trading program” for Connecticut, including EPA approval of a statewide “watershed” NPDES permit, to facilitate more cost-effective nitrogen reductions;
- facilitating and coordinating implementation of the *Long Island Sound Habitat Restoration Strategy*;
- utilizing the CCMP tracking and monitoring system to track and report on progress on implementing CCMP actions;
- updating and implementing an enhanced public outreach and education program, utilizing the services of the new communications coordinator, to build public support for the nitrogen reduction program;
- continuing monitoring of pollutant loads and the condition of the Sound; and
- based on the above, identifying the most appropriate indicators of success to better direct ongoing management to achieve desired results, and publishing an environmental indicators report for Long Island Sound.

2. PUBLIC INFORMATION AND EDUCATION

A. EDUCATION PROGRAM

The LISS will continue its coordinated, bi-state public outreach and education program with oversight by the EPA LISO. Funds will again be provided to New York Sea Grant Program to staff the Long Island Sound Office in Stony Brook and to the CT DEP for an outreach coordinator located in the Bureau of Water Management. The New York Sea Grant Program also will continue to manage the small grants program described below. The program will continue to produce its quarterly newsletter, *Update* that is circulated to 5,000 organizations, groups and individuals interested in LIS.

B. SMALL GRANTS PROGRAM

The LISS will continue the successful small grants program that was established with the FY94 funding cycle to support community-based implementation and education activities for cleaning up and restoring the Sound. The program will be administered by New York Sea Grant, who will utilize a subcommittee and the CAC and LISS Management Committee to review projects for funding under the program.

C. OUTREACH SUPPORT

LISS funds will be awarded to the New England Interstate Water Pollution Control Commission (NEIWPCC) to: (1) to provide the LISS with technical writing, editing, and layout support for

outreach materials and technical reports, including an “environmental indicators” report to be released in conjunction with the 15th anniversary of the LISS; (2) logistical support for a LIS-wide conference focused on public input for developing a 2001 LIS Agreement; (3) cover costs for CAC and TAC representatives traveling to program-related outreach and technical transfer activities, and (4) to support LISS website maintenance. The LISS communications coordinator will assist the two state outreach coordinators in updating and implementing the LISS public outreach plan.

The LISS has also awarded FY00 funds to the Connecticut Sea Grant Program to produce posters with useful and interesting facts about Long Island Sound that were originally published in a booklet entitled, *Sound facts*, that was funded through the Small Grants Program.

3. MONITORING, MODELING AND RESEARCH

Monitoring Long Island Sound is necessary to: (1) measure the effectiveness of management actions and programs implemented under the CCMP, and (2) provide essential information that can be used to redirect and refocus the management plan. The LISS will continue to provide funding support for the Long Island Sound Ambient Water Quality Monitoring Program in an effort to collect valuable data on current conditions in the Sound. These monitoring activities will be consistent with those recommended in the Long Island Sound Study monitoring plan, developed as part of the CCMP.

A. FIELD SURVEYS

CTDEP, ISC, and NYCDEP will continue to conduct baseline water quality monitoring in Long Island Sound. The CTDEP and NYCDEP monitoring programs will be supplemented with funding from the LISS; ISC will continue its monitoring program with support from CWA Section 106 funds provided by EPA Region II. CTDEP will conduct 12 monthly water quality cruises, 6 summertime hypoxia cruises (June-September); and 2 cruises in late winter/early spring for *chlorophyll a* at 48 stations using the CT vessel *John Dempsey*. Samples for dissolved oxygen, salinity, temperature, *chlorophyll a*, BOD, Total Suspended Solids, and nutrients at the surface and bottom will be taken and analyzed. NYCDEP will conduct monthly sampling at 4 stations in western LIS throughout the year for temperature, salinity, dissolved oxygen, PAR, *chlorophyll a*, BOD, Total Suspended Solids, and nutrients. CTDEP and NYCDEP will complete reports that analyze and assess monitoring data collected.

B. NITRIFICATION/DENITRIFICATION FAILURE STUDY

The LISS will provide funding to the University of Connecticut to expand its efforts to study causes of nitrification/denitrification failures in Publically Owned Treatment Works (POTWs). UConn will conduct a project at the Bowery Bay POTW in New York to supplement its ongoing work, also funded by LISS, at the Stamford, Connecticut plant. The results of these projects will provide POTW operators with specific information on the potential causes of failures in order to institute processes and procedures to avoid such failures.

C. CCMP RESEARCH PRIORITIES

The LISS Management Committee agreed to reserve \$100,000 in funds beginning in FY99 and extending into FY00 to be used for research projects related to the LIS ecosystem. In FY00 the committee reserved \$190,000 for potential qualifying research projects. These funds were supplemented by the New York and Connecticut Sea Grant College Programs for \$50,000 in both fiscal years. A subcommittee identified research priorities for LIS and issued a Request for Proposals to solicit projects to address the priorities: 1) Living Resources; 2) Dynamics of Tropic Webs; 3) Water and Sediment Quality; 4) Hydrodynamics and Sediment Transport; 5) Watershed Management; 5) Habitat Restoration; 6) Public Policy and Management. A total of 30 proposals were received from the RFP process.

A peer review committee convened by the LISO selected three projects for funding in FY00, which will use \$290,628 of the existing funds and leave a balance of \$99,372 for future awards. The projects are: *Assessment of the Causes and Extent of Morbidity and Mortality of American Lobsters in Long Island Sound* (Dr. Richard French; University of Connecticut; \$98,097); *Environmental Change in Long Island Sound Over the Last 400 Years* (Dr. J.C. Varekamp; Wesleyan University; \$75,909); and *Trace Metals, Organic Carbon, and Inorganic Nutrients in Surface Waters of the Long Island Sound: Sources, Cycling, and Effects of Phytoplankton Growth* (Dr. Sergio Sanudo-Wilhelmy; SUNY Stony Brook; \$116,622).

4. CCMP IMPLEMENTATION SUPPORT AND TECHNICAL ASSISTANCE

A. HABITAT RESTORATION

In its seventh year, the LISS Habitat Restoration Team will continue with identification of degraded habitats, their status and trends, mapping, criteria development for defining and ranking restoration needs, and developing restoration recommendations. Funding support will be provided to the CTDEP and the NYSDEC to maintain staff to work under the guidance of the Habitat Restoration Team with a focus on facilitating the implementation of habitat restoration priorities.

LISS staff will continue to participate in an inter-agency work group to review progress of the USACOE Feasibility Study of a subset of the high priority habitat restoration projects in the Connecticut Long Island Sound Coastal Area. The Feasibility Study targets tidal wetland restoration, stormwater remediation, and riverine migratory corridor restoration on three rivers (Quinnipiac, Naugatuck, and Norwalk).

B. WATERSHED TECHNICAL ASSISTANCE

The LISS will continue to support local watershed management initiatives through funding and technical assistance in support of CCMP implementation. Funding will be provided to the UConn/CES for a third year to conduct NEMO workshops for local land use officials and others in Fairfield (CT) and Westchester (NY) counties, and to assist with the establishment of a NEMO program in New York State through its Cooperative Extension System and NY Sea Grant. In

Westchester County, NEMO efforts will target the Watershed Action Committees created by the Westchester County Planning Department as part of the county's watershed management strategy.

EPA and the USDA Natural Resources Conservation Service (NRCS) will continue their partnership through a 1999 interagency agreement (IAG) to provide guidance on community-based watershed protection efforts in support of CCMP implementation. NRCS will work with local government officials, community groups, other federal and state agencies, and the Congressional delegation to conduct workshops for local officials to identify opportunities to improve the quality of water and natural resources locally and in the Sound.

IV. FUNDING AMOUNTS AND SOURCES

Table 1 shows the distribution and amount of LISS funds and required non-federal matching funds supporting work plan tasks by LISS category.

Table 2 shows the total federal funds awarded to each grant recipient, their required non-federal match, and their actual match.

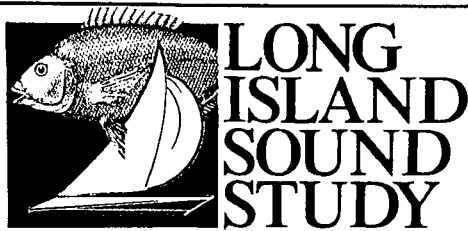
These projects and activities were approved for funding by the Management Committee at its April 13, 2000 meeting. Under CWA Section 119, there is a 50 percent match requirement for implementation grants and a five percent match requirement for grants supporting public outreach, involvement, and education activities. As shown in Tables 1 and 2, the recipients have committed to meeting the required cumulative non-federal match, which is documented in the FY00 grant applications and work plans for CTDEP, NYSDEC, NYCDEP, NEIWPCC, the UConn/CES, NY Sea Grant, and Connecticut Sea Grant.

Table 1. Summary of FY2000 LISS Federally Funded Tasks under CWA §119 by Category

LISS Category	Task	Products/Services	Recipient Organization	LISS Federal Share	Required Match
Coordination and Reporting of Environmental Actions/Results	LIS Office Administrative Support	SEEP support; phone; printing; photocopying; mail; supplies and materials	EPA LISO	\$65,000	\$0
	State Coordination/ Technical Assistance	Assist in all aspects of program development and support	NYSDEC	\$92,417	\$92,417
			CTDEP	\$50,892	\$50,892
	PI&E Coordination	LISS Public Outreach Coordinator	NEIWPCC	\$72,696	\$3,826
	Travel Support	Travel for CAC/TAC	NEIWPCC	\$10,000	\$10,000
COORDINATION SUBTOTAL				\$291,005	\$157,135
Public Information and Education	Education Program	Newsletters, small grant/LISS fact sheets, presentations, press releases	NY Sea Grant	\$101,947	\$5,366
		LISS fact sheets, presentations, press releases/events, conferences,	CTDEP	\$70,954	\$3,734
		Sound Facts Graphics	CT Sea Grant	\$17,272	\$909
	Small Grants Program	Local public education and involvement projects	NY Sea Grant	\$70,000	\$3,684
		LISS Public outreach products/projects	NEIWPCC	\$14,765	\$777
	COMMUNICATIONS SUBTOTAL			\$274,938	\$14,470
Monitoring, Modeling and Research	Field Surveys of LIS	Water quality data	CTDEP	\$250,000	\$250,000
			NYCDEP	\$20,000	\$20,000
	STP Nitrification/ Denitrification Failure Study	Bowery Bay POTW	UConn/CEE	\$69,945	\$69,945
	CCMP Research Priorities	LIS Research Grant Program	LISO	\$190,000	\$190,000
	MONITORING, MODELING & RESEARCH SUBTOTAL			\$529,945	\$529,945
CCMP Implementation Support & Technical Assistance	Habitat Restoration	Prioritized list of habitat restoration sites and implementation.	CTDEP	\$70,944	\$70,944
			NYSDEC	\$84,127	\$84,127
	Watershed Technical Assistance	CT NEMO	UConn/CES	\$34,041	\$1,792
		NY NEMO	NYSDEC	\$20,000	\$1,053
	IMPLEMENTATION SUPPORT SUBTOTAL			\$209,112	\$157,915
TOTAL				\$1,305,000	\$859,466

Table 1. Summary of FY2000 LISS Federally Funded Tasks Under CWA §119 by Recipient	2000 Final Budget	2000 Required Match
EPA LISO	\$65,000	\$0
NYSDEC	\$196,544	\$177,597
CTDEP	\$512,735	\$445,515
NEIWPCC	\$97,461	\$14,603
NYCDEP	\$20,000	\$20,000
UConn/CES	\$34,041	\$1,792
NYSEA	\$171,947	\$9,050
CTSEA	\$17,272	\$909
LIS RESEARCH	\$190,000	\$190,000
	\$1,305,000	\$859,466

Table 2. Summary of FY2000 LISS Federally Funded Tasks Under CWA §119 and Non-federal Funds			
Recipient Organization	Federal Funds	Required Non-federal Match	Actual Non-federal Match
EPA Long Island Sound Office	\$65,000	\$0	\$0
CT DEP	\$512,735	\$445,515	\$578,019
NYS DEC	\$196,544	\$177,597	\$200,000
NY Sea Grant	\$171,947	\$9,050	\$9,050
LISS Research RFP Reserve Fund	\$190,000	\$190,000	\$49,288
UConn Cooperative Extension	\$34,041	\$1,792	\$2,200
CT Sea Grant	\$17,272	\$909	\$909
NEIWPCC	\$97,461	\$14,603	\$0
NYC DEP	\$20,000	\$20,000	\$20,000
Total	\$1,305,000	\$859,466	\$859,466



A Partnership to Restore and Protect the Sound

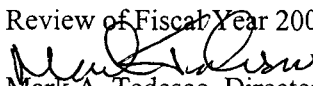
of the U.S. Environmental Protection Agency


Look For Us On The World Wide Web at:
<http://www.epa.gov/region01/eco/lis/>

July 24, 2001

MEMORANDUM

SUBJECT: Review of Fiscal Year 2001 Work Plan for the Long Island Sound Study.

FROM: 
Mark A. Tedesco, Director
EPA Long Island Sound Office

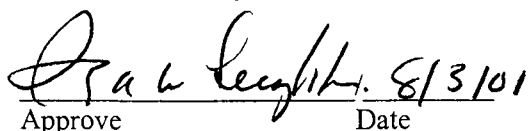
THROUGH: Linda Murphy, Director 
Office of Ecosystem Protection

TO: Ira Leighton, Acting Regional Administrator

Please find attached a copy of the Long Island Sound Study's fiscal year 2001 (FY01) work plan. The work plan reflects the consensus on the use of FY01 funds that was reached by the Long Island Sound Study Management Committee at its April 19, 2001 and July 19, 2001 meetings.

As provided for in the National Estuary Program grant regulation [40CFR Part 35 subpart P; 35.9065(c)], the ratification of the annual work plan has been delegated to the Regional Administrator. I have reviewed the work plan and have found it consistent with requirements under the National Estuary Program and the Long Island Sound Restoration Act of 2000. The work plan describes the status of major tasks supported by FY 2001 funds and identifies tasks necessary to implement the Comprehensive Conservation and Management Plan (CCMP) using FY 2001 funds.

With your signature in the approval line below, EPA will exercise its authority to award funds under Section 119 of the Clean Water Act, as amended by the Long Island Sound Restoration Act, for the Long Island Sound Study.


Approve _____ Date _____

Disapprove _____

/ _____
Date

Ira Leighton
Acting Regional Administrator

Attachment



LONG ISLAND SOUND STUDY

FEDERAL FISCAL YEAR 2001 WORK PLAN AND BUDGET

July 2001

Table of Contents

I.	INTRODUCTION	1
II.	IMPORTANT PROGRESS IN FY01	2
	1. PROGRAM COORDINATION AND MANAGEMENT	2
	2. HYPOXIA MANAGEMENT	2
	3. HABITAT RESTORATION	3
	4. WATERSHED MANAGEMENT	4
	5. DREDGED MATERIAL MANAGEMENT	5
	6. MONITORING AND ENVIRONMENTAL INDICATORS	5
	7. RESEARCH AND STUDIES	6
	8. PUBLIC EDUCATION AND INVOLVEMENT	7
III.	MAJOR AREAS OF EMPHASIS FOR FY01 FUNDED ACTIVITIES	8
	1. COORDINATION AND REPORTING OF ENVIRONMENTAL ACTIONS AND RESULTS	9
	2. PUBLIC INFORMATION AND EDUCATION	10
	A. EDUCATION PROGRAM	10
	B. SMALL GRANTS PROGRAM	10
	C. OUTREACH SUPPORT	10
	D. ECONOMIC STUDY	11
	3. MONITORING, MODELING AND RESEARCH	11
	A. FIELD SURVEYS	11
	B. SYSTEM WIDE EUTROPHICATION MODEL	12
	C. SPARROW MODEL	12
	D. MYSOUND	12
	E. CCMP RESEARCH PRIORITIES	12
	4. CCMP IMPLEMENTATION SUPPORT AND TECHNICAL ASSISTANCE	13
	A. HABITAT RESTORATION	13
	B. LONG ISLAND SOUND RESERVE SYSTEM	13
	C. WATERSHED TECHNICAL ASSISTANCE	14
	D. CCMP IMPLEMENTATION PROJECTS	14
IV.	FUNDING AMOUNTS AND SOURCES	14
V.	CONTACTS	15
	TABLE 1	16
	TABLE 2	17

I. INTRODUCTION

The Long Island Sound Study (LISS) began in 1985 when Congress appropriated funds for the U.S. Environmental Protection Agency (EPA) and the states of Connecticut and New York to research, monitor, and assess the water quality of Long Island Sound. The 1987 amendments to the Clean Water Act officially established the National Estuary Program (Section 320). At the request of the states of Connecticut and New York, Long Island Sound was officially designated an “estuary of national significance” under this program, and a Management Conference was convened in March of 1988. The Management Conference was charged with developing a Comprehensive Conservation and Management Plan (CCMP) for protecting and improving the health of Long Island Sound while ensuring compatible human uses within the Sound ecosystem.

The Long Island Sound Study CCMP was completed in March 1994 and was officially approved by EPA and the states of New York and Connecticut on September 26, 1994. The CCMP characterizes the priority problems affecting Long Island Sound and identifies specific commitments and recommendations for actions. The LISS focused on environmental problems that are Soundwide and require a bi-state remedial effort. Six problems merit special attention: (1) low dissolved oxygen (hypoxia), (2) toxic contamination, (3) pathogen contamination, (4) floatable debris, (5) the impact of these water quality problems, and habitat degradation and loss, on the health of living resources, and (6) land use and development resulting in habitat loss and degradation of water quality. The priority issue is hypoxia, and reducing anthropogenic nitrogen loadings, which have been identified as the primary cause of low dissolved oxygen (DO).

On April 8, 2001, EPA approved *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound*, a plan developed through the LISS by the Connecticut Department of Environmental Protection (CT DEP) and New York State Department of Environmental Conservation (NYS DEC) that will reduce nitrogen loads to the Sound and, ultimately, eliminate hypoxic conditions throughout the Sound. The TMDL builds on the 1998 *Phase III Actions for Hypoxia Management*, which calls for the removal of 58.5 percent of the human-caused nitrogen load to Long Island Sound from the Connecticut and New York portions of the watershed by addressing other nitrogen sources, including atmospheric deposition and tributary rivers from north of Connecticut. Approval of the TMDL culminates ten years of work to develop a solid technical foundation for forming effective nitrogen control plans with confidence that they will result in the desired water quality improvements.

As a commitment of the CCMP, the Long Island Sound Management Conference has been extended to oversee the transition from planning to full implementation of the CCMP. In 2000, Congress gave the LISS a significant boost when it passed the Estuaries and Clean Waters Act, Title IV of which, the Long Island Sound Restoration Act, increases the annual funding authorization to \$40 million from FY01 through FY05. In FY01, Congress appropriated a total of \$5,319,700, of which \$4.5 million was an “earmark,” \$500,000 was from an EPA line-item for the Long Island Sound Office, and \$330,000 was National Estuary Program base funding. After a mandated .022% rescission taken on the Congressionally earmarked funds, the total LISS budget for FY2001 is \$5,319,700. As in prior years, this work plan identifies the activities supported by these funds under the jurisdiction of the Management Conference.

II. IMPORTANT PROGRESS IN FY01

Due to the timing of the transfer of funds from HQ to the Regional offices, Federally-funded LISS implementation activities conducted in FY01 (October 1, 2000 - September 30, 2001) were supported primarily by the FY00 appropriation. Highlights of high priority activities conducted during the past year are as follows:

1. PROGRAM COORDINATION AND MANAGEMENT

- The LISS completed its *2000 Comprehensive Conservation and Management Plan Implementation Tracking and Monitoring Report* in July 2001. The tracking system includes appropriate measurement indicators to evaluate success in reaching the goals outlined in the CCMP, and is used to help direct future management activities toward achieving desired results. The LISS Citizens Advisory Committee (CAC) has played an active role in reviewing and recommending modifications to the report as it has evolved over the past several years.
- At its September 2000 meeting, the LISS Policy Committee directed the Management Conference partners to update the 1996 LIS Agreement to identify measurable environmental goals for implementation of CCMP priorities over the next 5-10 years. The 2001 LIS Agreement is to be signed by the New York and Connecticut Governors and the EPA Administrator in 2001.
- The LISS Management Committee continued to meet quarterly in July and October 2000, and January and April 2001 to review and approve annual work plans and budgets, discuss other LIS-related technical and policy issues, and provide general program oversight. Management Committee meetings follow the quarterly CAC meetings, which enables committee members to more quickly consider and respond to issues identified by the CAC.
- The U.S. Fish and Wildlife Service formally joined the Management Committee in 2000, bringing additional resources and technical expertise to the Management Conference.

2. HYPOXIA MANAGEMENT

- The states of New York and Connecticut completed a total maximum daily load analysis (TMDL) for nitrogen loads to Long Island Sound in December 2000 and submitted it to EPA for its approval in early January 2001. EPA subsequently approved the TMDL on April 8, 2001. The TMDL builds on the nitrogen reduction goals of the 1998 *Phase III Actions for Hypoxia Management*, a bi-state agreement calling for a 58.5 percent reduction in human-caused (anthropogenic) nitrogen loads to the Sound over a 15 year period beginning in 1999, by allocating responsibility for load reductions among point and nonpoint sources throughout the Long Island Sound watershed.
- The estimated nitrogen load from sewage treatment plants in the Long Island Sound

drainage basin that entered Long Island Sound in 2000 was approximately 158,676 lbs/day, a decrease of nearly 28,000 lbs/day from 1990 levels, but about 7,400 lbs/day more than 1999. This slight increase is attributed to several large sewage treatment plants undergoing upgrades to improve nitrogen reduction, during which treatment efficiency is reduced. New York's 2000 point source nitrogen loading was 110,563 lbs/day, compared with 105,759 lbs/day in 1999. Connecticut's point source nitrogen loading was 48,113 lbs/day in 2000, compared with 45,486 lbs/day in 1999.

- Nonpoint sources of nitrogen cannot be easily monitored and are subject to wide variations depending on weather conditions, especially rainfall. Rough approximations of nonpoint source nitrogen loads have been constructed using a mix of stream monitoring data and export estimates based on land cover. They show the 1999 nonpoint nitrogen load to be about 28,000 tons/yr, about 9,000 tons below the highest load over the last decade in 1991 of 37,000 tons/yr. The LISS plans to revise these estimates using a U.S. Geological Survey report to be released in 2001.
- In 2000, the maximum area and duration of dissolved oxygen (DO) levels less than 3 mg/l in Long Island Sound was 173 square miles and 35 days, compared with 121 mi² and 50 days in 1999. Although the areal extent was greater in 2000 than in 1999, the duration was significantly less and both figures compare favorably with the 14-year averages of 203 mi² and 56 days.
- Through the end of 2000, 19 municipal sewage treatment plants (STPs) in Connecticut have completed nitrogen removal projects costing more than \$250 million; five STPs had nitrogen removal upgrades in progress costing \$80 million; and six STPs were under design for nutrient removal with design costs totaling over \$116 million. New York state has spent nearly \$100 million over the last three years on STP upgrades.
- Both states continued to prioritize for funding nonpoint source pollution control projects with nitrogen reduction elements that will help reduce hypoxia in the Sound.
- EPA and state LISS staff have continued to build support for additional NO_x controls on the basis of atmospheric deposition of nitrogen contributing to hypoxia in Long Island Sound and other eastern estuaries. CT DEP staff participated in a NOAA project to evaluate and publish a book on atmospheric nitrogen contributions for more than 40 estuaries and their watersheds throughout the U.S., and served as the lead author on the book's summary and integration chapter. The book was published by the American Geophysical Union in October 2000.

3. HABITAT RESTORATION

- Connecticut and New York made good overall progress toward the 1998 LISS Habitat Restoration Strategy goals of restoring 2000 acres of tidal wetlands and 100 miles of river corridors for anadromous fish access by 2008. To date, Connecticut has restored over 308 acres of tidal wetland habitat, treated or re-treated (by mowing or applying

herbicides) many acres of phragmites-infested habitat, and restored 34.9 miles of river corridor for anadromous fish access. During the same three year period, New York has restored more than 65 acres of tidal wetlands in the Long Island Sound watershed.

- In September 2000 the Policy Committee signed the Long Island Sound Habitat Restoration Memorandum of Understanding (MOU) along with several Federal, state, and local agency partners. The MOU establishes roles and responsibilities of the partners in implementing the Habitat Restoration Strategy goals of restoring 2,000 acres of habitat and reopening 100 river miles to anadromous fish passage by 2008.
- Save the Sound, Inc., the National Audubon Society of New York State, and the Regional Plan Association sponsored a series of ten public hearings from May-June 2000, *Listen to the Sound 2000*, to gather public input for the creation of a Long Island Sound reserve system. More than 500 people attended the hearings and over 200 people testified in support of the proposed reserved system, the purpose of which is to identify and protect key sites for recreation, public access, open space, and underwater habitats in the Sound.

4. WATERSHED MANAGEMENT

- A growing number of communities in the Long Island Sound watershed are adopting watershed management-based approaches to controlling point and nonpoint sources of pollution to the Sound, including sewage treatment plants, CSOs, and various land uses. Many communities have formed watershed management committees or groups that cross local, municipal, or even state jurisdictions, to work together in addressing environmental management problems that have no boundaries.
- The LISS continued to provide staff support to the Norwalk River Watershed Initiative. Implementation of the Norwalk River Watershed Action Plan is being guided by the Norwalk River Watershed Advisory Committee, with representatives from EPA, the USDA Natural Resources Conservation Service (NRCS), CT DEP, the seven watershed communities, several citizen groups, and area residents. From FY98-01, EPA awarded \$340,000 in Clean Water Act section 319 funds to support several high priority implementation activities, including hiring a “watershed coordinator” (in February 2000), riparian buffer restoration, stormwater management, road sand/salt reduction, and septic system outreach and education.
- The LISS provided a fourth year of funding in FY00 to the University of Connecticut/Cooperative Extension System (UConn/CES) to continue its Nonpoint Education for Municipal Officials (NEMO) program in Long Island Sound coastal tributary watersheds. The scope of the program, which originally was targeted at the seven towns in the Norwalk River watershed, then expanded to include towns and watersheds in other parts of Fairfield County and in Westchester County, NY, focused primarily on assisting the NY Sea Grant Program establish a counterpart NEMO program on Long Island. In 2000, the NEMO program was expanded to include a new coordinator and office in SUNY Stony Brook, New York. The New York NEMO program is

working with the Hempstead Harbor and Manhasset Bay Protection Committees in briefing local boards and commissions and in conducting two basic NEMO workshops for municipal officials in those communities. In three and a half years, the LIS NEMO program has conducted 110 workshops reaching more than 2400 participants in approximately 30 communities. The LISS provided a total of \$194,000 in FY96 and FY98-00 to support the Long Island Sound NEMO

- NRCS, in partnership with the EPA ORD Atlantic Ecology Division in Narragansett, Rhode Island, developed a workshop presentation and “mentoring” service to support new and ongoing watershed management efforts. Based on lessons learned from the Norwalk River Watershed Initiative, the Pawcatuck Watershed Partnership, and other community-based watershed planning efforts, NRCS developed workshop materials, conducted six workshops, and provided guidance to new and existing community-based watershed planning efforts within the LISS project area boundaries (including the Quinnipiac and Pomperaug river watersheds in Connecticut and Suffolk County in New York). The LISS allocated \$40,000 in FY99 funds to establish an IAG with NRCS to carry out this project, which was matched with \$40,000 of in-kind services by NRCS.
- Both states continue to utilize CWA section 319 nonpoint source grants to support watershed management efforts, including demonstration projects, technical assistance, and public education and outreach, many of which are targeted at reducing nonpoint sources of nitrogen. Funding for Sound-related nonpoint source control projects in Connecticut totaled approximately \$570,000 in FY00.

5. DREDGED MATERIAL MANAGEMENT

- EPA and the Army Corps of Engineers continued to work together in 2000 on the Environmental Impact Statement (EIS) for designation of dredged material disposal sites in Long Island Sound under the Marine Protection, Research, and Sanctuaries Act (MPRSA). The agencies jointly held workshops in Connecticut and New York to solicit public comment and input on disposal alternatives, the EIS work plan and process, and field work. Although the designation process was originally planned to be completed by March 2002, funding shortages may delay its completion. The LISS is assisting with the public participation component of the EIS process by facilitating public discussion, input, and feedback to the regulatory agencies.
- CT DEP continued development of a Long Island Sound Sediment Quality Information Database (SQUID) using GIS and associated databases, which include the following spatial and attribute data: sewage treatment plant and industrial wastewater discharges; stormwater discharges; combined sewer outfalls; oil and chemical spills; landfills; and locations in Long Island Sound and harbors where sediment testing has been conducted.

6. MONITORING AND ENVIRONMENTAL INDICATORS

- The LISS issued a report entitled, *Sound Health 2001* in April 2001 for the general public

that uses 19 key environmental indicators to illustrate Long Island Sound's condition and trends. The report presents data and trends in such areas as water quality, habitat restoration, toxics and pathogen contamination, as well as the status of important living resources native to the Sound or dependent on its health. The LISS produced approximately 480,000 copies of the 16-page, color report, 430,000 of which were inserted in the weekend editions of Connecticut and New York coastal area newspapers. A more extensive suite of environmental indicators is now available on the LISS web site. The *Sound Health 2001*, when viewed in concert with the *2000 CCMP Implementation Tracking Report*, can provide an overview of the impact of management actions on the health of the Sound, and can help managers to refocus priorities if a desired environmental outcome is not being achieved. Both reports are available on the LISS homepage at: <http://www.epa.gov/region01/eco/lis>.

- The CT DEP, New York City Department of Environmental Protection (NYC DEP), and Interstate Environment Commission (IEC) continued their ambient water quality monitoring programs following the recommendations of the CCMP's monitoring plan. LISS funding supports most of the CT DEP monitoring on the Sound, while IEC monitoring is supported by CWA section 106 grant funds. The CT DEP monitoring program, which covers most of Long Island Sound's open waters, published a report entitled, *Long Island Sound Ambient Water Quality Monitoring Program: Summer Hypoxia Monitoring Survey 1991-1998 Data Review*, in September 2000. CT DEP also participated in the EPA Office of Research and Development's *Coastal 2000* monitoring program, and will continue to do so in 2001.

7. RESEARCH AND STUDIES

- The LISS awarded its first round of research grants under its new Long Island Sound Research Fund in 2000 using a combination of \$240,628 in FY99 and FY00 LISS funds and \$25,000 apiece from the New York and Connecticut Sea Grant programs, for a total of \$290,628. The LISS selected three research projects for funding in 2000, including: (1) *Environmental Change in Long Island Sound Over the Last 400 Years* (Dr. Johan Varekamp, Wesleyan University, \$75,909); (2) *Assessment of the Causes and Extent of Morbidity and Mortality of American Lobster in Long Island Sound* (Dr. Richard French, University of Connecticut, \$98,097); and (3) *Trace Metals, Organic Carbon, and Inorganic Nutrients in Surface Waters of Long Island Sound: Sources, Cycling, and Effects on Phytoplankton Growth* (Dr. Sergio Sanudo-Wilhelmy, SUNY Marine Sciences Research Center, \$116,622). The LISS will issue an RFP for a second round of research proposals in calendar 2001 for grant awards in FY2002.
- With the states of Connecticut and New York and the Federal government investing millions of dollars to upgrade sewage treatment plants for nitrogen removal, ensuring that the treatment facilities operate properly is extremely important. The LISS allocated \$169,357 in FY98-99 for a study to be conducted by the City of Stamford and the University of Connecticut to identify determinants of nitrogen removal failure at Long Island Sound-area STPs due to process control and waste stream characteristics. The

LISS awarded an additional \$69,945 in FY00 to conduct similar work at the Bowery Bay STP in New York City, which is now underway. The ultimate goal will be to develop a manual containing troubleshooting guides and process control flow charts which can be used by any STP operator to assess and assist in solving problems associated with BNR. In addition, there will be periodic seminars between the project managers, regulatory agencies, and STP operators to gather and disseminate information on operating nitrogen removal processes. This work will have broad implications for BNR systems nationwide and will contribute in a significant fashion to controlling nitrogen discharges to our nation's waters.

8. PUBLIC EDUCATION AND INVOLVEMENT

- The Citizens Advisory Committee (CAC) continued to meet quarterly to review progress and provide guidance on CCMP implementation, and plays an active role in many aspects of the program. The CAC made some important recommendations to the LISS Policy Committee, including endorsing the creation of a Long Island Sound "reserve system," providing comments on the draft nitrogen TMDL, and facilitating public participation in the development of the dredged material disposal site designation EIS. The CAC has been particularly effective at building the public, political, and financial support the LISS currently enjoys, as exemplified by the passage of the *Long Island Sound Restoration Act of 2000* which increases the appropriations authorization to \$40 million annually through 2005. The EPA LISO provides administrative support to the CAC.
- The LISS produced and distributed many thousands of copies of its quarterly LIS newsletter, *UPDATE*, as well as fact sheets, publications, and brochures covering timely and critical LIS topics. Many of these documents were posted on the LISS web page: <http://www.epa.gov/region01/eco/lis>. The LISS webpage continued to be one of the most visited page on the EPA New England Region website, with over 60,000 hits in 2000, an average of nearly 5,000 per month.
- The LISS continued, for a third year, to support a "communications coordinator" through the New England Interstate Water Pollution Control Commission. The role of this staff person it to enhance coordination of outreach and education activities between the EPA LISO, CT DEP, NYS DEC, and New York and Connecticut Sea Grant offices.
- The LISS outreach and education programs continued to conduct many meetings, conferences and workshops attended by hundreds of public officials and concerned citizens. LISS program staff continued to: provide Long Island Sound displays at annual public events, such as Earth Day and Long Island Sound Day in Connecticut and New York; address scores of teachers, educators, school children, groups and classes; and issue press releases, produce public service announcements, and give radio and press interviews on Long Island Sound issues.
- The LISS provided funding support for the Long Island Sound Educators Conference, which was held in March 2000 in cooperation with the Maritime Aquarium in Norwalk,

Connecticut. Over 220 educators attended the conference that featured 40 exhibitors and 25 workshops on a variety of critical LIS areas of concern.

- The LISS continued to explore methods to increase local and municipal participation in CCMP implementation in 2000. The LISS provided FY99 funds to conduct a second municipal conference in June 2000, which was co-hosted by the City of Stamford and the City of Glen Cove, Long Island and held at the University of Connecticut/Stamford.
- The very successful small grants program, administered by New York Sea Grant with CAC oversight, was continued for a sixth year. Based on its popularity and positive results, the funding level was increased from \$50,000 to \$70,000 in FY99 and continued at that level for FY00, bringing the seven-year total to \$290,000. Through 2000, the LISS Small Grants Program has provided funds for 58 educational, informational and construction projects totaling over \$211,000 (the balance of funds has not yet been expended). These projects assisted hundreds of teachers and thousands of school children, and produced over 20,000 pieces of LIS literature. In 2000, the LISS awarded funds totaling \$74,000 for 17 local community environmental education projects in New York and Connecticut.
- The CT DEP Long Island Sound License Plate Fund awarded \$80,000 in grants for education projects, including development of a teacher resource guide to environmental education programs, public education for septic system maintenance, groundwater contamination and nonpoint source protection and community-based programs at Cove Island Park in Stamford, creating 100 year-round environmental education activities about the Sound for a wide range of age groups.

III. MAJOR AREAS OF EMPHASIS FOR FY01 FUNDED ACTIVITIES

The Long Island Sound Study will utilize FY01 funds to continue to support CCMP implementation by providing Federal financial assistance under Section 119 of the Clean Water Act as amended in 2000 by Title IV of the *Estuaries and Clean Waters Act of 2000*, P.L. 106-457, the *Long Island Sound Restoration Act*. The *Long Island Sound Restoration Act* increased the annual authorization for the LISS to \$40 million and extended the program through 2005. Implementation grants made under Section 119 require a 50 percent non-Federal match, while grants to support technical assistance, public education, outreach and participation efforts require a 5 percent non-Federal match.

The following work plan tasks focus on activities directly funded through the National Estuary Program and directed by the Long Island Sound Study Management Committee. The amount of Federal funds and non-Federal matching funds allocated for each task are provided in Tables 1 and 2 at the end of this work plan. Total FY01 Federal funds available is: \$5,319,700.

EPA base program funds authorized under other sections of the Clean Water Act, other Federal sources of funds, and state and local funds being targeted for CCMP implementation are not comprehensively discussed here. State and local implementation costs for actions not conducted

directly under the National Estuary Program or listed as match for the program also are not provided here.

1. COORDINATION AND REPORTING OF ENVIRONMENTAL ACTIONS AND RESULTS

The LISS will continue to coordinate CCMP implementation and report on progress. The EPA LISO will continue to support the LISS Management Conference by providing coordination, technical assistance, and administrative support. Funds are set aside to support the administrative costs of the office. In addition, as described below, the LISS will continue to provide funding for one staff person each in NYS DEC and CT DEP to assist in the general coordination of implementation activities by their agencies and other Management Conference members. In FY01 special emphasis will be placed on:

- developing a *2001 Long Island Sound Agreement* that will identify measurable targets and time frames to implement CCMP actions, including affirming existing goals for nitrogen reduction and habitat restoration and potentially additional actions such as developing a Long Island Sound Reserve System, watershed protection, living resources, research, and monitoring. The intent is to have the agreement signed in 2001 by the Governors of Connecticut and New York and the EPA Administrator to reaffirm executive-level support for CCMP implementation.
- coordinating the implementation of the recently approved total maximum daily load (TMDL) analysis and implementation plan for reducing nitrogen loads to Long Island Sound;
- coordinating the implementation of the recently established “nitrogen effluent trading program” for Connecticut, including EPA endorsement of a statewide “watershed” NPDES permit, to facilitate more cost-effective nitrogen reductions;
- facilitating and coordinating implementation of the *Long Island Sound Habitat Restoration Strategy*;
- utilizing the CCMP tracking and monitoring system to track and report on progress on implementing CCMP actions;
- updating and implementing an enhanced public outreach and education program, utilizing the services of the LISS communications coordinator, to build public support for the nitrogen reduction program;
- continuing monitoring of pollutant loads and the condition of the Sound; and
- based on the above, identifying the most appropriate indicators of success to better direct ongoing management to achieve desired results, and updating the recently completed environmental indicators report for Long Island Sound (*Sound Health 2001*).

2. PUBLIC INFORMATION AND EDUCATION

A. EDUCATION PROGRAM

The LISS will continue its coordinated, bi-state public outreach and education program with oversight by the EPA LISO. Funds will again be provided to New York Sea Grant Program to staff the Long Island Sound Office in Stony Brook and to the CT DEP for an outreach coordinator located in the Bureau of Water Management. The New York Sea Grant Program will continue to produce its quarterly publication of the LISS newsletter, *Update*, which is circulated to 5,000 organizations, groups and individuals interested in Long Island Sound, as well produce new and update existing issue-specific fact sheets as necessary. The CT DEP outreach coordinator will continue to co-produce, with the Office of Long Island Sound Programs, their periodic newsletter, *Sound Outlook*, and work within his agency and with the LISS partners to produce fact sheets and other outreach materials, and make public presentations on LISS-related activities and issues. New York Sea Grant also will continue to manage the small grants program described below. The LISS will support the National Estuary Program (NEP) national estuary education and outreach program emerging from the Philadelphia educators conference in June 2001. The NEP will coordinate development of national estuary education outreach products that can be tailored to each individual NEP.

B. SMALL GRANTS PROGRAM

The LISS will continue the successful small grants program that was established with the FY94 funding cycle to support community-based implementation and education activities for cleaning up and restoring the Sound. The program will be administered by New York Sea Grant, which will utilize a subcommittee to review and select projects for funding, and the CAC and LISS Management Committee to endorse funding decisions under the program.

C. OUTREACH SUPPORT

LISS funds will be awarded to the New England Interstate Water Pollution Control Commission (NEIWPCC) to: (1) to cover the salary of the LISS Communications Coordinator, who will assist the two state outreach coordinators in updating and implementing the LISS public outreach plan; (2) provide the LISS with technical writing, editing, and layout support for outreach materials and technical reports, including a *Sound Health 2001* summary fact sheet and updated slide and video presentations; (3) assist in planning and convening a municipal conference in 2002; (4) cover costs for CAC and TAC representatives traveling to program-related outreach and technical transfer activities. Funds are also set aside to support a significant upgrade to the LISS website as well as website maintenance.

The LISS also has awarded FY01 funds to the Connecticut Sea Grant Program to revise and reprint their booklet entitled, *Plants and Animals of Long Island Sound*.

D. ECONOMIC STUDY

The LISS will update a 1992 study of the economic value of Long Island Sound's recreational resources, which included fishing, swimming, boating, seafood, and beach going. The study found the value of these limited resources to the regional economy in 1990 dollars to be over \$5 billion. The LISS believes that the value of these resources alone in current dollars is far in excess of this amount, and will seek to include additional parameters in assessing the value of LIS to the regional economy. The economic value of the Sound is perhaps the most cited element in justifying additional investments in the cleanup and protection of this vital resource to the public.

3. MONITORING, MODELING AND RESEARCH

Monitoring, modeling, and conducting scientific research on Long Island Sound is necessary to: (1) measure the effectiveness of management actions and programs implemented under the CCMP, and (2) provide essential information that can be used to redirect and refocus the management plan. The LISS will continue to provide funding support in FY01 for the Long Island Sound Ambient Water Quality Monitoring Program in an effort to collect valuable data on current conditions in the Sound. These monitoring activities are consistent with the recommendations in the Long Island Sound Study monitoring plan, which was developed as part of the CCMP and the update of which will be the subject of a workshop jointly sponsored by the LISS and EPA Coastal Management Branch in late 2001 or early 2002. The LISS also is providing FY01 funds to support use of the recently approved System Wide Eutrophication Model (SWEM) to refine the nitrogen waste load allocations (WLAs) and load allocations (LAs) established under the recently approved TMDL, which is scheduled for a revision by 2004.

A. FIELD SURVEYS

CT DEP, IEC, and NYC DEP will continue to conduct ambient water quality monitoring in Long Island Sound. The CT DEP monitoring program, which covers more than 90 percent of the Sound, will be supplemented with funding from the LISS; IEC will continue its monitoring program with support from CWA Section 106 funds provided by EPA Region II. CT DEP will conduct 12 monthly water quality cruises, six summertime hypoxia cruises (June-September), and two cruises in late winter/early spring for *chlorophyll a* at 48 stations using the CT vessel *John Dempsey*. Samples for dissolved oxygen, salinity, temperature, *chlorophyll a*, biological oxygen demand (BOD), total suspended solids (TSS), and nutrients at the surface and bottom will be taken and analyzed. Additional funds have been provided to CT DEP this year to contract with the University of Connecticut (UConn) to conduct phytoplankton identification work to correlate with chlorophyll *a* and nutrient concentration data. NYC DEP will conduct monthly sampling at four stations in western LIS throughout the year for temperature, salinity, dissolved oxygen, PAR, *chlorophyll a*, BOD, TSS, and nutrients. CT DEP and NYC DEP will complete reports that analyze and assess monitoring data collected. IEC will continue its summer hypoxia monitoring in LIS by collection and weekly measurements of DO, temperature, salinity, and *chlorophyll a* at 21 stations; at a subset of stations, samples will be collected for phytoplankton and *Pfiesteria*.

B. SYSTEM WIDE EUTROPHICATION MODEL

The LISS allocated FY01 funds to support use of the recently approved System Wide Eutrophication Model (SWEM) to refine the nitrogen waste load allocations (WLAs) and load allocations established under the recently approved TMDL, which is scheduled for a revision by 2004. The SWEM is considered technically superior in comparison with the LIS 3.0 model on which the current TMDL analysis is based, particularly in how it models the transport of nutrients through the East River in New York City. EPA, NYS DEC, CT DEP and NYC DEP are committed to using SWEM to reassess the validity of the WLAs and LAs established by the current TMDL, and possibly revise them through a formal TMDL revision process to be conducted by 2004.

C. SPARROW MODEL

The Long Island Sound TMDL calls for the reduction of nitrogen loads associated with atmospheric deposition and from point and nonpoint sources located north of Connecticut (primarily in the Connecticut River basin). Current tributary load estimates are based on a minimal amount of data and must be revised and improved before more refined wasteload and load allocations can be established for these sources. To improve its knowledge of the relative importance of the different point and nonpoint sources throughout the upper portion of the Long Island Sound watershed, and to help guide future management efforts, the LISS is contributing to a joint effort by EPA New England and USGS to develop a Spatially Referenced Regressions on Watershed Attributes (SPARROW) model specific to the New England region. The SPARROW model is a useful tool for pollutant load and source assessments that will support Regional efforts to conduct TMDL analyses and establish nutrient criteria. The strength of the model is its ability to define an empirical relationship between actual in-stream water quality measurements with watershed conditions and pollution sources to determine predicted pollutant loads in streams and the source of the loads. The model is also a tool for making predictions of pollutant concentrations and loads and pollutant sources when little water quality data exists. The proposed New England SPARROW model will provide assessments of nitrogen and phosphorous throughout the entire region, covering about 50,000 stream segments with an average watershed size of 3-4 square miles.

D. MYSOUND

The LISS will support UCONN's MYSOUND (Monitoring Your Sound) real time water quality monitoring network of stations in LIS. The stations measure water temperature, salinity and dissolved oxygen at the surface and bottom, sampling 4 times each hour. Data are transmitted to UCONN's Avery Point campus for editing, compilation and dissemination in near real time on the project's web site, <http://www.mysound.uconn.edu>.

E. CCMP RESEARCH PRIORITIES

The LISS allocated \$350,000 in FY01 funds to combine with a carryover of \$49,372 from FY00 and \$25,000 each from the New York and Connecticut Sea Grant College Programs for a total of

\$449,372 to conduct a second round of research grant awards in 2001. The 2001 “Request for Preliminary Proposals” targets research on the following priority topics: (1) nutrient and phytoplankton dynamics; (2) factors controlling the timing, intensity, and fate of primary production; (3) mechanisms by which hypoxia develops; (4) benthic processes and elemental cycling; (5) factors affecting the distribution, abundance, and trends of recreationally commercially, or ecologically important living resources; (5) submerged aquatic vegetation; (6) development of ecological indicators of the health of Long Island Sound; (7) management of nutrient sources; (8) sea level rise impacts; and (9) innovative research.

4. CCMP IMPLEMENTATION SUPPORT AND TECHNICAL ASSISTANCE

A. HABITAT RESTORATION

The LISS Habitat Restoration Initiative began with the use of FY94 funds to hire habitat restoration coordinators in each of the two states. CT DEP and NYS DEC each hired a staff person to form a Habitat Restoration Team, including representatives from several LISS Management Conference member agencies and organizations, and develop a Habitat Restoration Strategy for Long Island Sound. Their initial work culminated with the adoption of a Long Island Sound Habitat Restoration Strategy by the LISS Policy Committee in February 1998. Now in its eighth year, the LISS Habitat Restoration Team will continue with identification of degraded habitats, their status and trends, mapping, criteria development for defining and ranking restoration needs, developing restoration recommendations, and publishing restoration technical manuals. Funding support will be provided to the CT DEP and the NYS DEC to maintain staff to work under the guidance of the Habitat Restoration Team with a focus on facilitating the implementation of habitat restoration priorities. The LISS is also funding an eelgrass mapping project that will involve mapping eelgrass beds using low-altitude color aerial photography of the region from the Pawcatuck River to the Connecticut River, and the northern shore of Long Island.

B. LONG ISLAND SOUND RESERVE SYSTEM

The CCMP identifies development of a reserve system for Long Island Sound as an important action in the chapter, “Management and Conservation of Living Resources and Their Habitats.” In 2000, Audubon New York, Save the Sound, and the Regional Plan Association sponsored a series of the public hearings around the Sound to solicit citizen input on the establishment of a reserve system. The proposed reserve system would be a network of protected natural areas that will help preserve the remaining undeveloped and undisturbed sites on Long Island Sound as well as existing parks and refuges. The hundreds of citizens who testified at these hearings were overwhelmingly in support of the reserve system concept, so the LISS is now embarking on a multi-year effort to turn the concept into reality. To initiate the process, the LISS is providing FY01 funding support to the U.S. Fish and Wildlife Service (USFWS), NYS DEC, and CT DEP to develop the ecological component of the reserve system by identifying, assessing, and mapping the most significant and essential habitats. The LISS also is awarding funds to Audubon New York to support their continued efforts to facilitate public participation in the planning process and coordinate the development of the overall framework for the reserve.

C. WATERSHED TECHNICAL ASSISTANCE

The LISS will continue to support local watershed management initiatives through funding and technical assistance in support of CCMP implementation. Funding will be provided to the New York Sea Grant College Program to expand its capacity to deliver a high quality NEMO program in the New York portion of the Long Island Sound watershed while reducing its dependency on the University of Connecticut Cooperative Extension System's NEMO Project for technical support. New York Sea Grant will conduct NEMO workshops for local land use officials and others on Long Island, in New York City, and in Westchester County in an effort to improve their understanding of the link between land use and water quality.

The LISS will fund a new interagency agreement (IAG) between EPA and the USDA Natural Resources Conservation Service (NRCS) to continue their partnership to provide guidance on community-based watershed protection efforts in support of CCMP implementation. Building on lessons learned through the successful Norwalk River Watershed Initiative and other watershed management activities, NRCS will work with local government officials, community groups, other Federal and state agencies, and the Congressional delegation to conduct workshops for local officials to identify opportunities to improve the quality of water and natural resources locally and in the Sound.

D. CCMP IMPLEMENTATION PROJECTS

The increased funding level for FY01 will allow the LISS, for the first time, to provide significant financial support for "on-the-ground" CCMP implementation projects. The LISS is awarding \$1,580,000 each to NYS DEC and CT DEP to support STP nitrogen removal upgrades, habitat restoration, and stormwater and nonpoint source management. Since the Long Island Sound Restoration Act gives priority to providing financial assistance for upgrading STPs to "distressed communities," CT DEP will use its funds to support facility planning for STP upgrades, specifically targeting "distressed communities" as defined by state statute. NYS DEC will use its LISS funds in conjunction with its own Clean Air/Clean Water Bond Act funds to conduct a wide range of implementation projects, including habitat restoration, stormwater and nonpoint source management, and possibly STP facility planning.

IV. FUNDING AMOUNTS AND SOURCES

Table 1 shows the distribution and amount of LISS funds and required non-Federal matching funds supporting work plan tasks by LISS category and by recipient organization.

Table 2 shows the total Federal funds awarded to each grant recipient, their required non-Federal match.

These projects and activities were approved for funding by the Management Committee at its April 19 and July 19, 2001 meetings. Under CWA Section 119, there is a 50 percent match requirement for implementation grants and a five percent match requirement for grants supporting public outreach, involvement, and education activities. As shown in Tables 1 and 2,

the recipients have committed to meeting the required cumulative non-Federal match, which is documented in the FY01 grant applications and work plans for CT DEP, NYS DEC, NEIWPCC, University of Connecticut Sea Grant Program, New York Sea Grant College Program, and Audubon New York. Because funding for IAGs with other Federal agencies, including USFWS and NRCS, cannot be matched with non-Federal funds, CT DEP and NYS DEC are providing additional match to ensure attainment of the overall LISS program match requirement.

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