



Consultant Team:

Nelson, Pope & Voorhis/Nelson & Pope

B. Laing Associates

Dr. Chris Gobler, SoMAS

Dr. Richard Orson



Orson
Environmental
Consulting

B. LAING SSOCIATES

**Feasibility Study to Eradicate Aquatic Invasive/Nuisance Species in
Canaan Lake, North Patchogue and
Upper and Lower Lakes, Yaphank**



*Lower
(Lily)
Lake*

**Steering Committee Interim Meeting
March 30, 2010**

Mike Bontje's House



**March 30, 2010
10:30 AM**



**March 30, 2010
4:30 PM**

Project Overview

September 2, 2009 – April 30, 2011

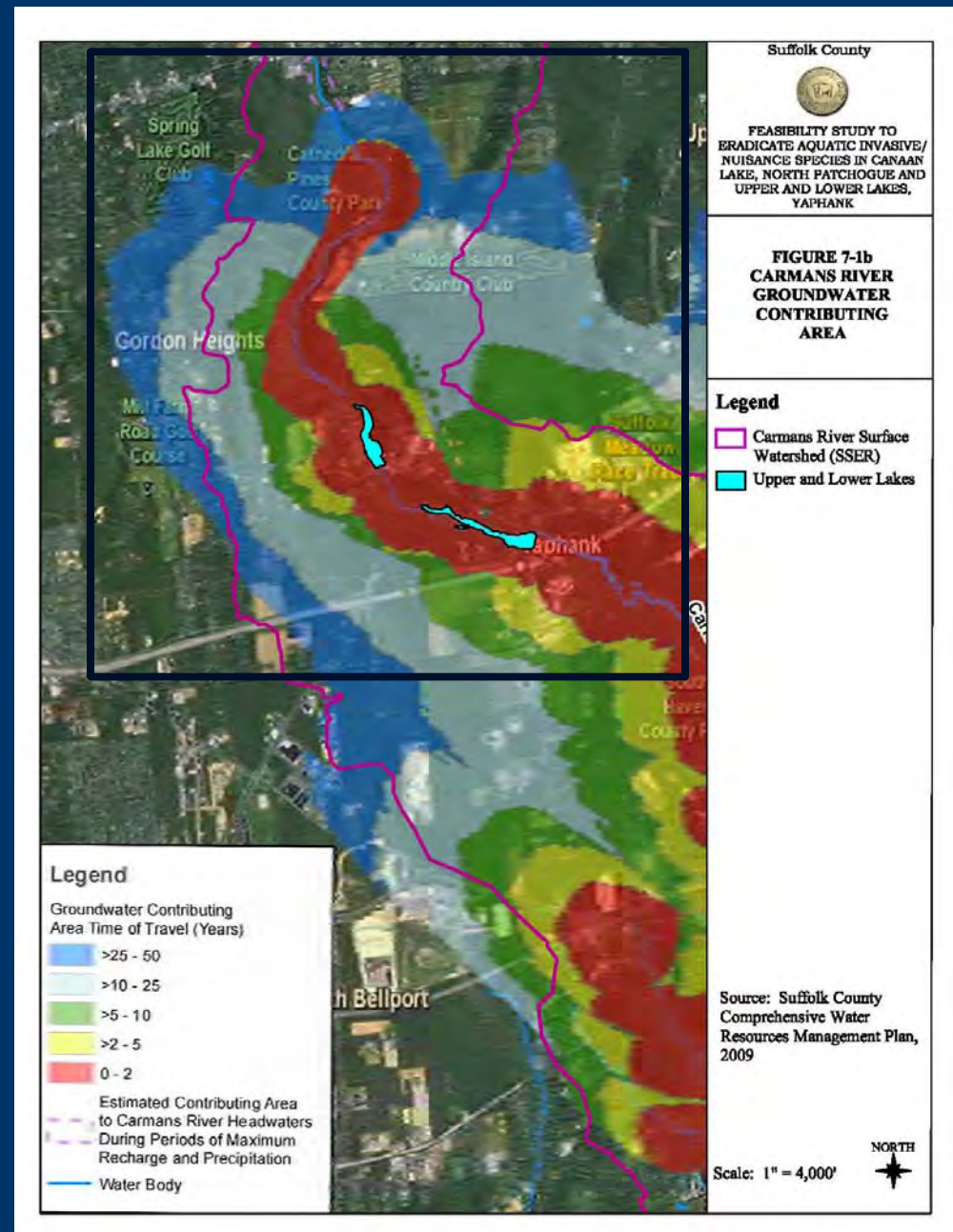
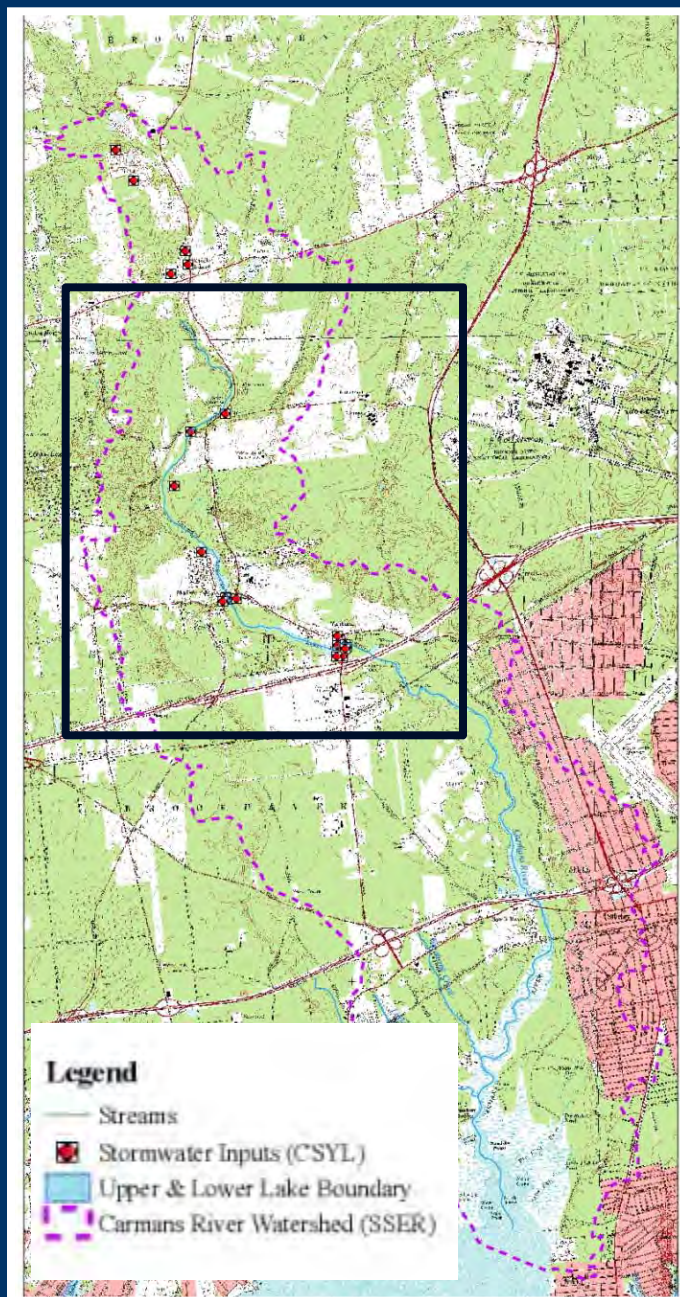
- **Task 1: Lakes Characterization & Existing Conditions** *(through **Summer** 2010)*
- **Task 2: Management Alternatives**
(Draft – Summer 2010; Finalized Winter 2010/11)
- **Task 3: Meetings & Stakeholder Involvement**
*(Steering Committee Meetings: Interim - Spring 2010, Progress – Summer 2010, Wrap-up - Winter/Spring 2010/11, Final - Spring 2011;
Public Meetings: Spring & Summer 2010, Final in late Fall 2010)*
- **Task 4: Options for Fish Passage at Upper & Lower Lakes**
*(Draft - **Spring** 2010; Finalized Winter 2010/11)*
- **Task 5: Annual Reports and Public Summary** *(Finalized Spring 2011)*
- **Task 6: Establish & Maintain a Public Domain Website** *(ongoing)*

Project Overview

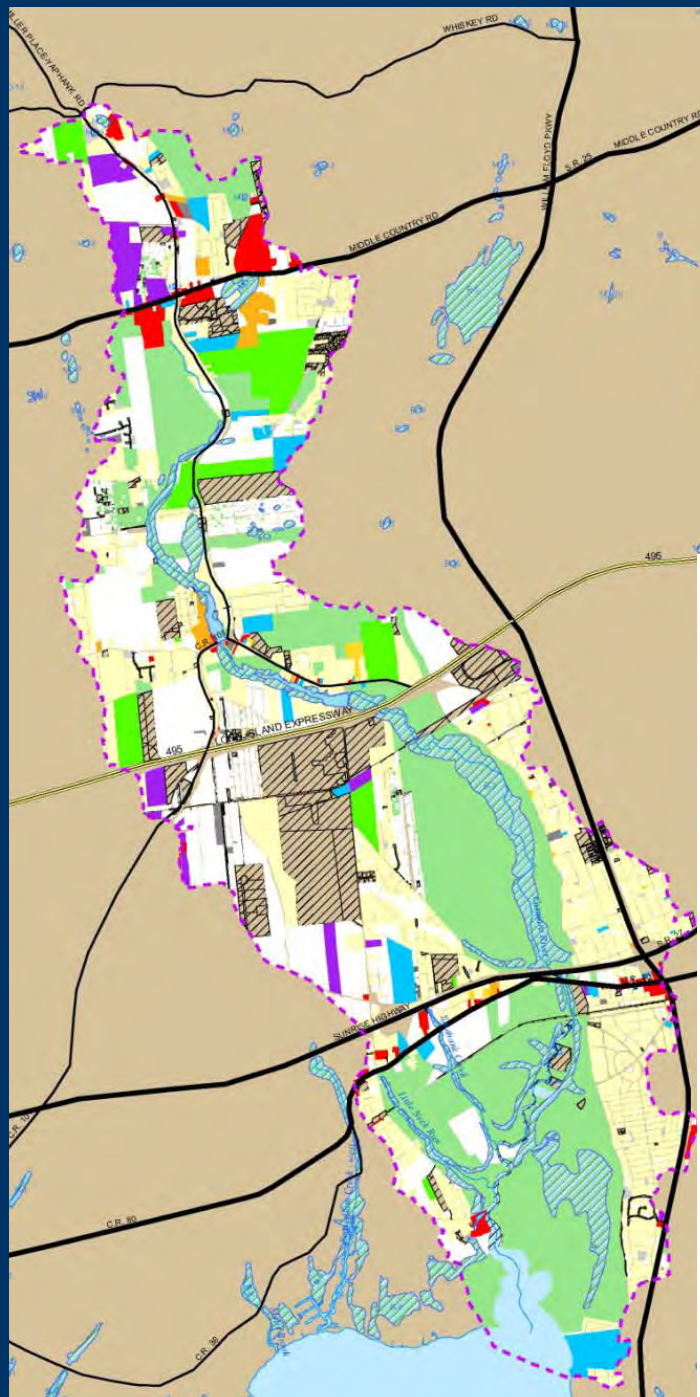
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Watershed Area & Characterization

95% of Carmans River is Groundwater Fed



Watershed Area Land Use & Public Lands

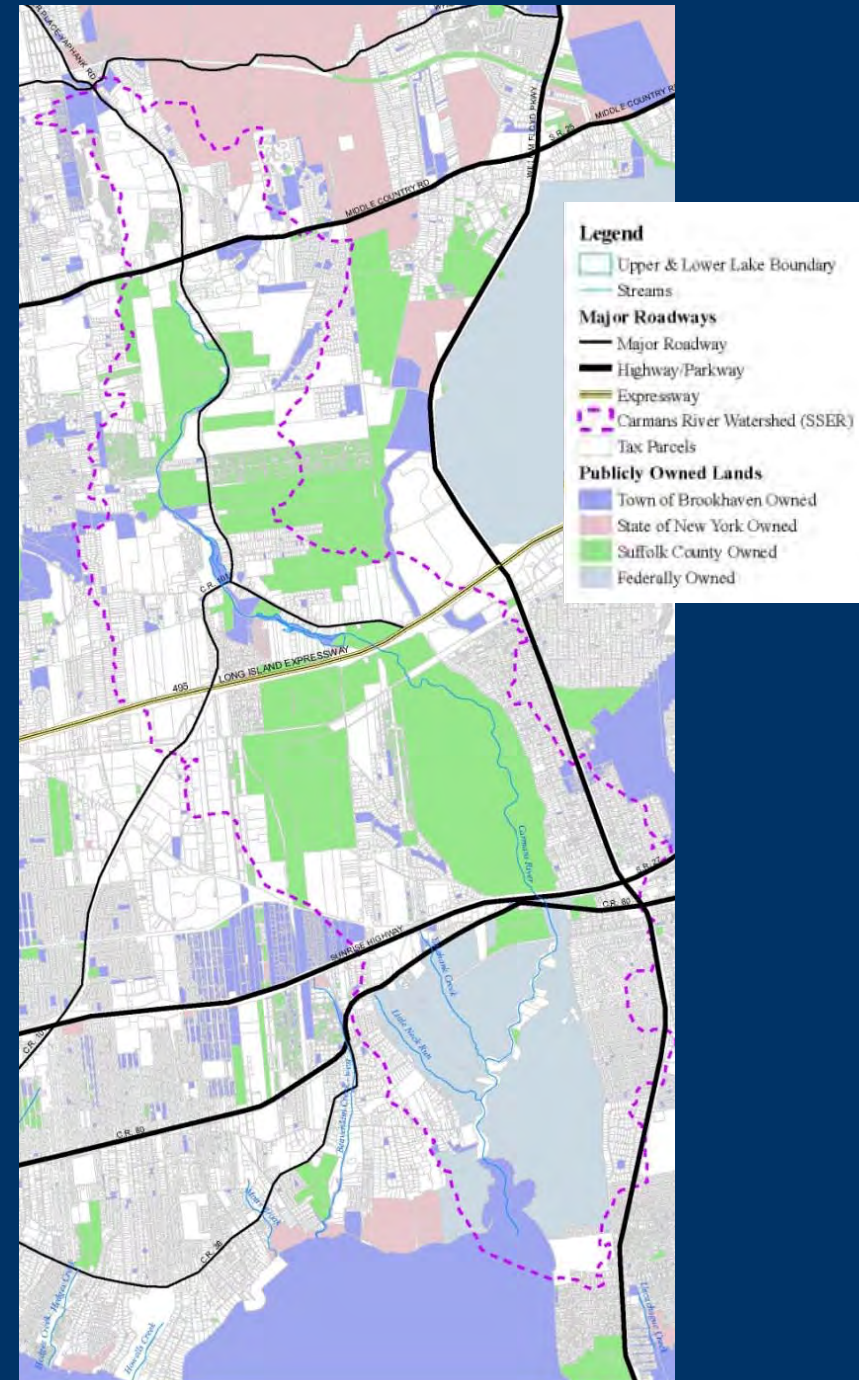


Land Use:

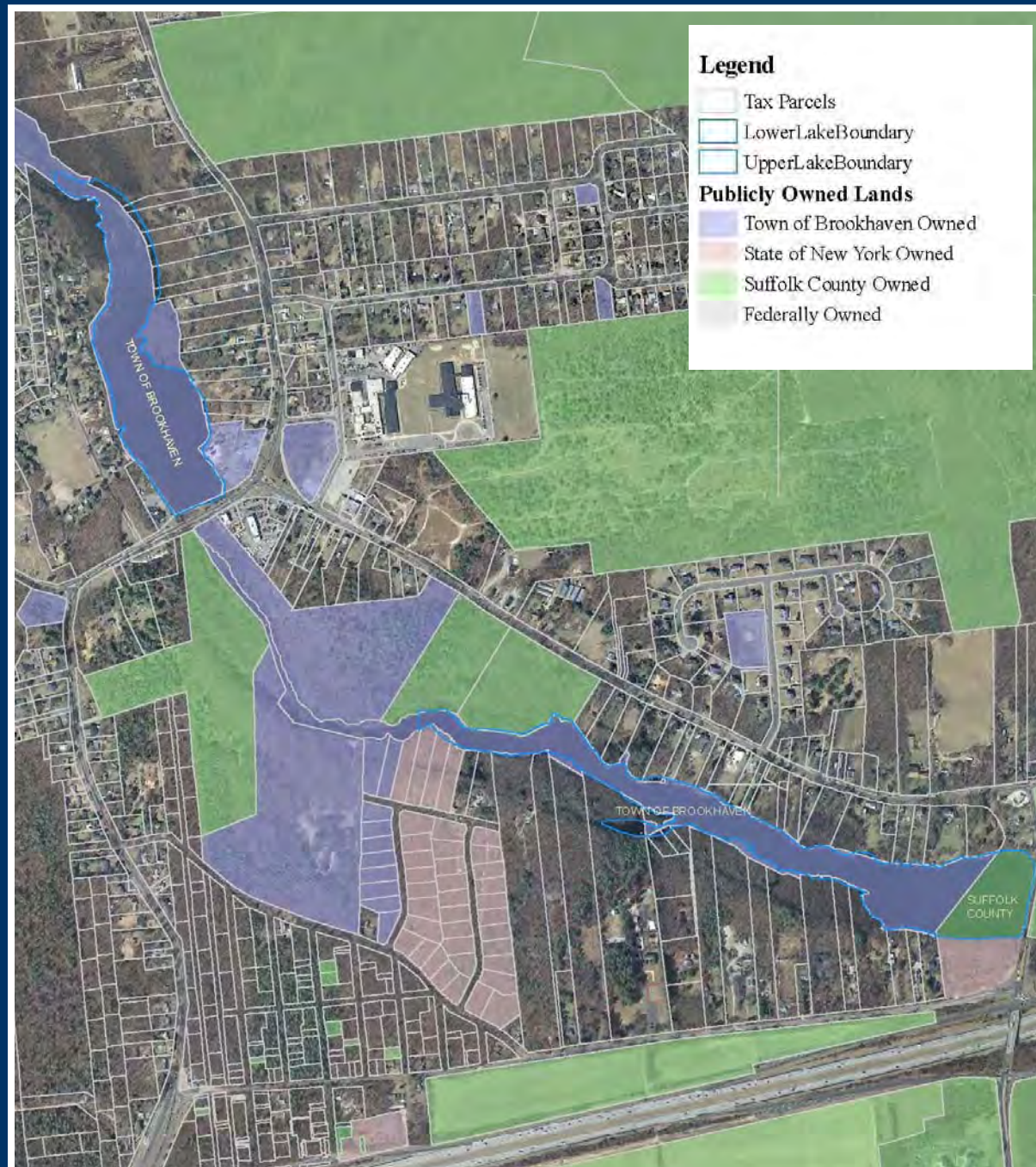
Low density residential
(some high density)

Parks/Rec/ Open Space

Major roadways



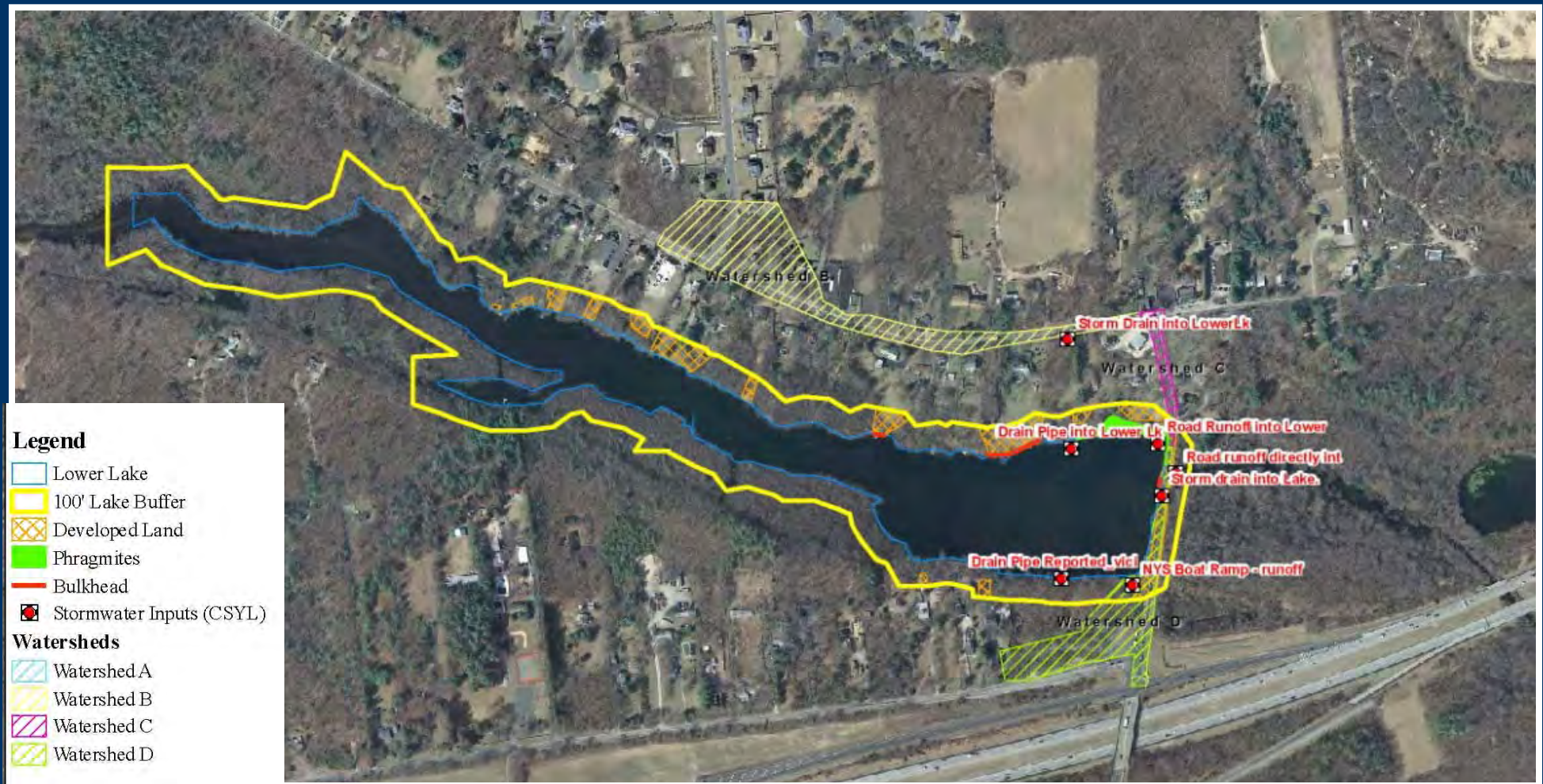
Ownership of Underwater Land



Pollution & Shoreline Inventory (100' Buffer) – Upper Lake



Pollution & Shoreline Inventory (100' Buffer) – Lower Lake



Stormwater Inputs
(CSYL Survey)

Bulkheads

Developed Lands

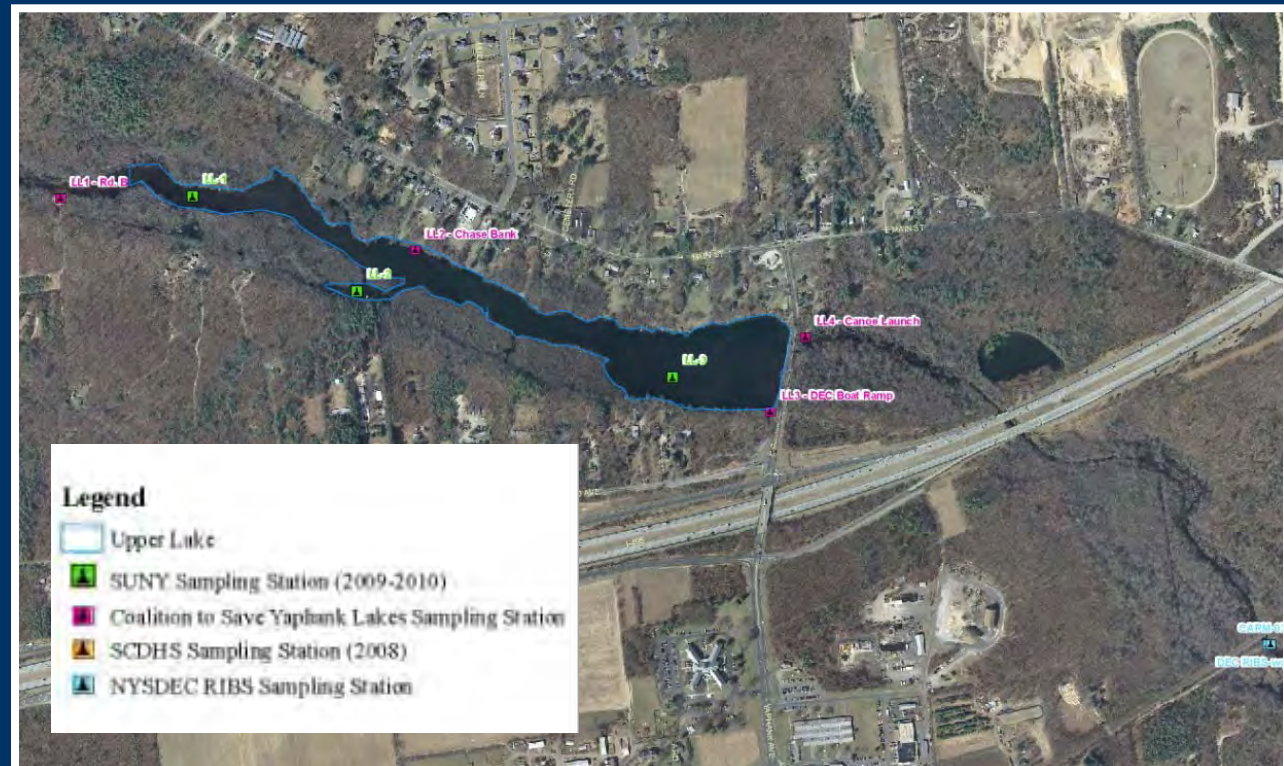
Direct Stormwater-contributing Watersheds
(SCDPW, 2008)

Water Quality Review, Monitoring & Sediment Composition



Existing Data

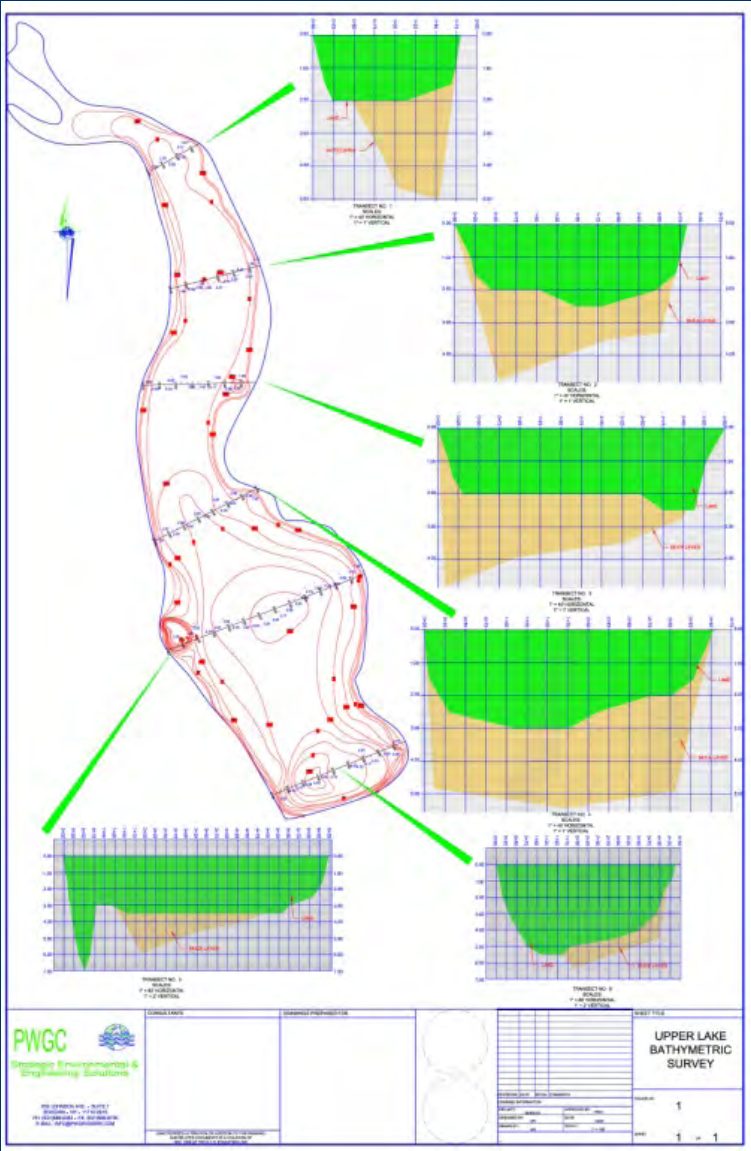
- 2007 Depth & Sediment Maps (A. Graves, Town)
- June 2009 – 2010 Water Quality Data (CSYL)
- Oct/Dec'08 WQ at Upper Spillway (SCDHS)
- SUNY 4-season wq and sediment sampling (1st, October 2009; 2010: April, June, July)
- B. Laing Depth updates (2009)



Fall
2009
(B. Laing)

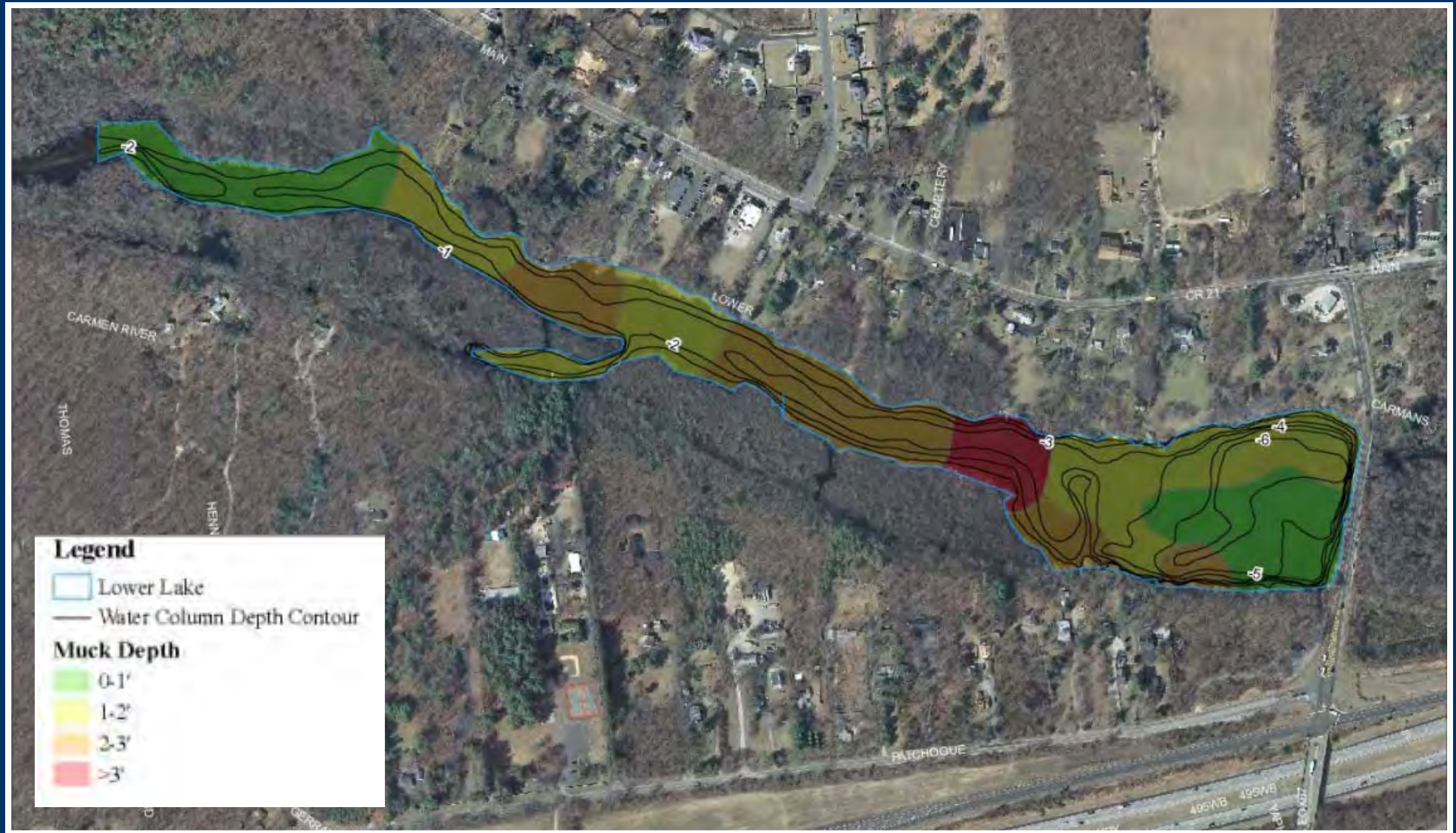


Bathymetry & Muck Depth – Upper Lake



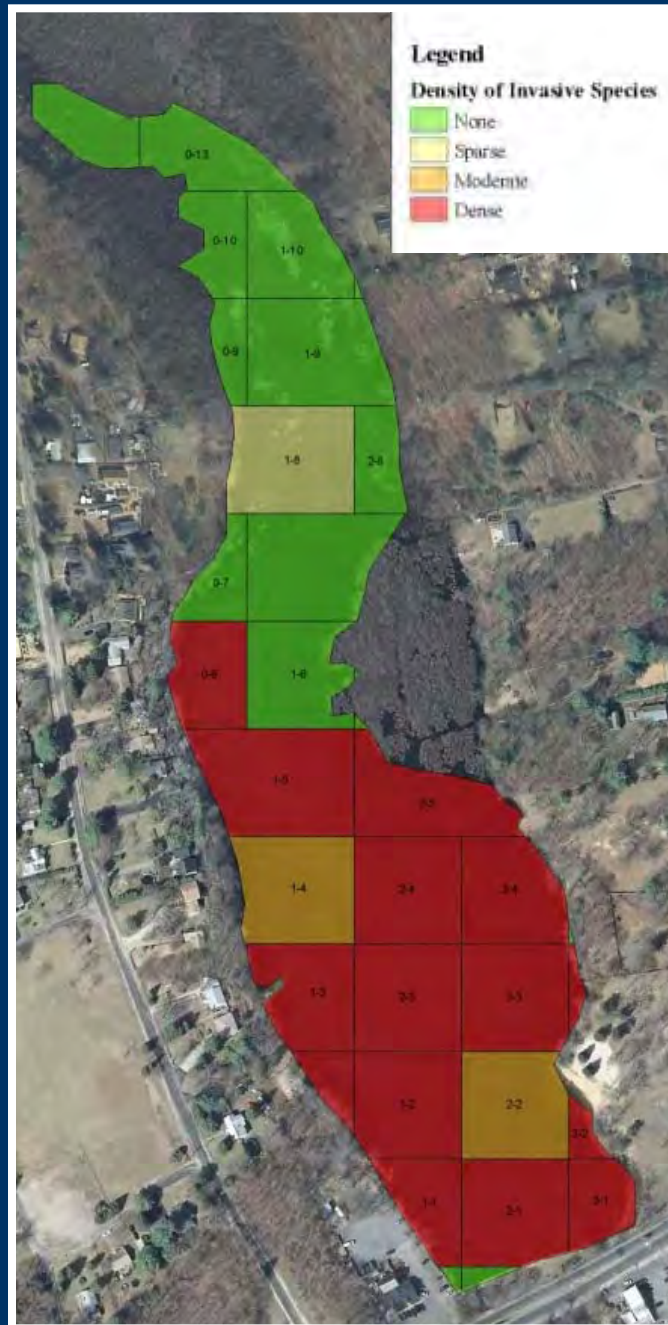
January
2008
(PWG)

Bathymetry & Muck Depth – Lower Lake



Density of Aquatic Invasive Plants – Upper Lake

Fall
2007
(Town)



Density of Aquatic Invasive Plants – Upper Lake

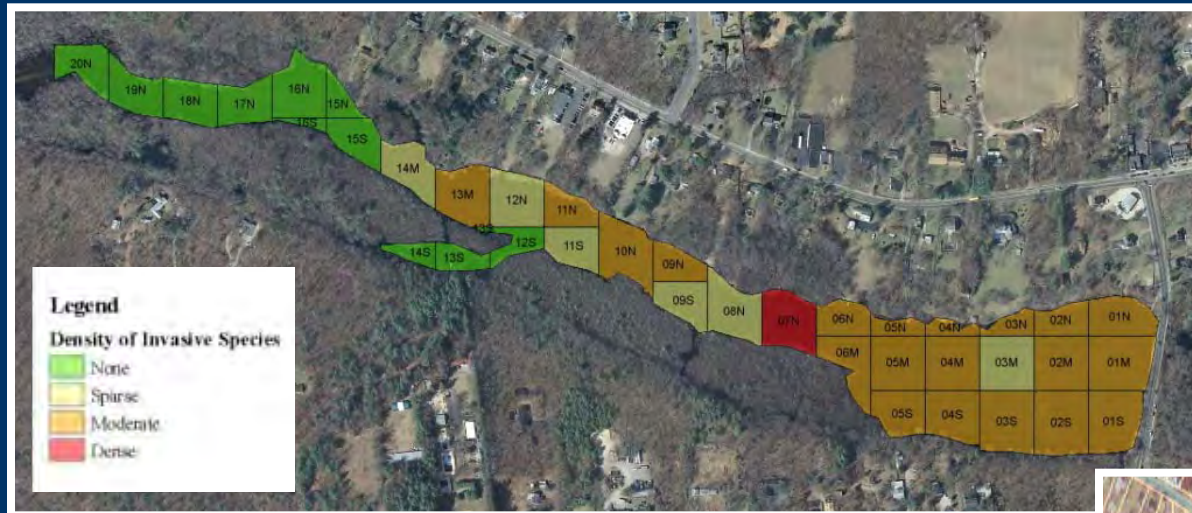
Fall
2007
(Town)



Fall
2009
(B. Laing)

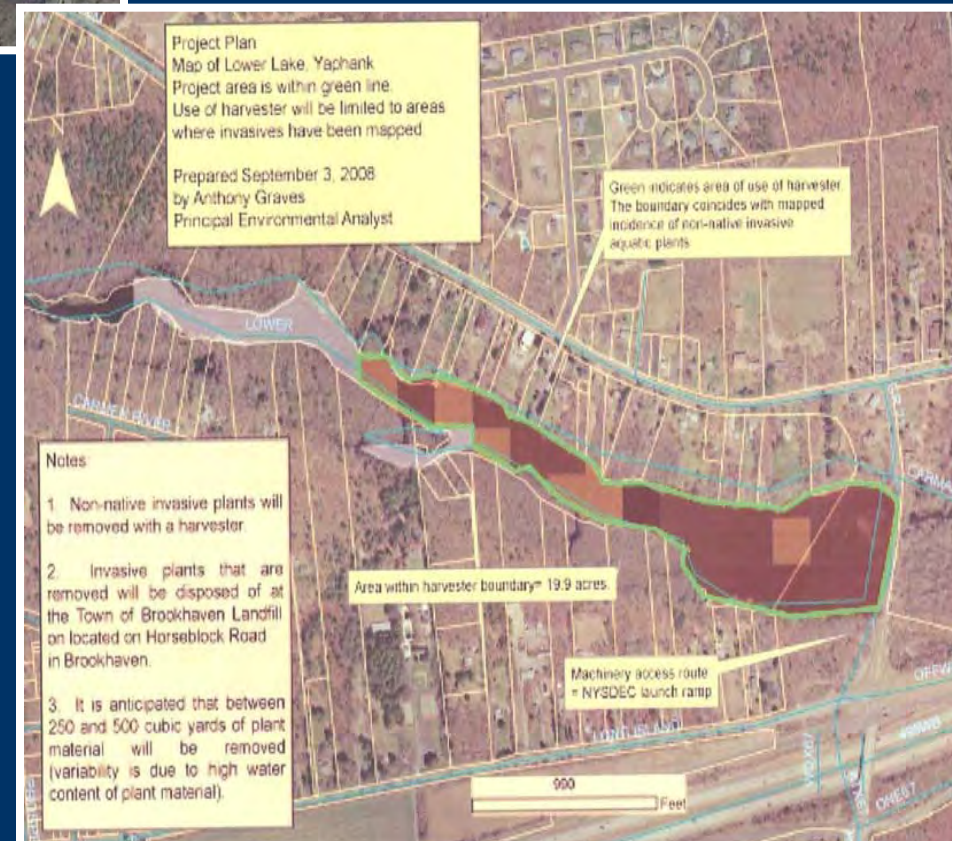


Density of Aquatic Invasive Plants – Lower Lake NYSDEC Mechanical Harvesting Permit (9/9/08)

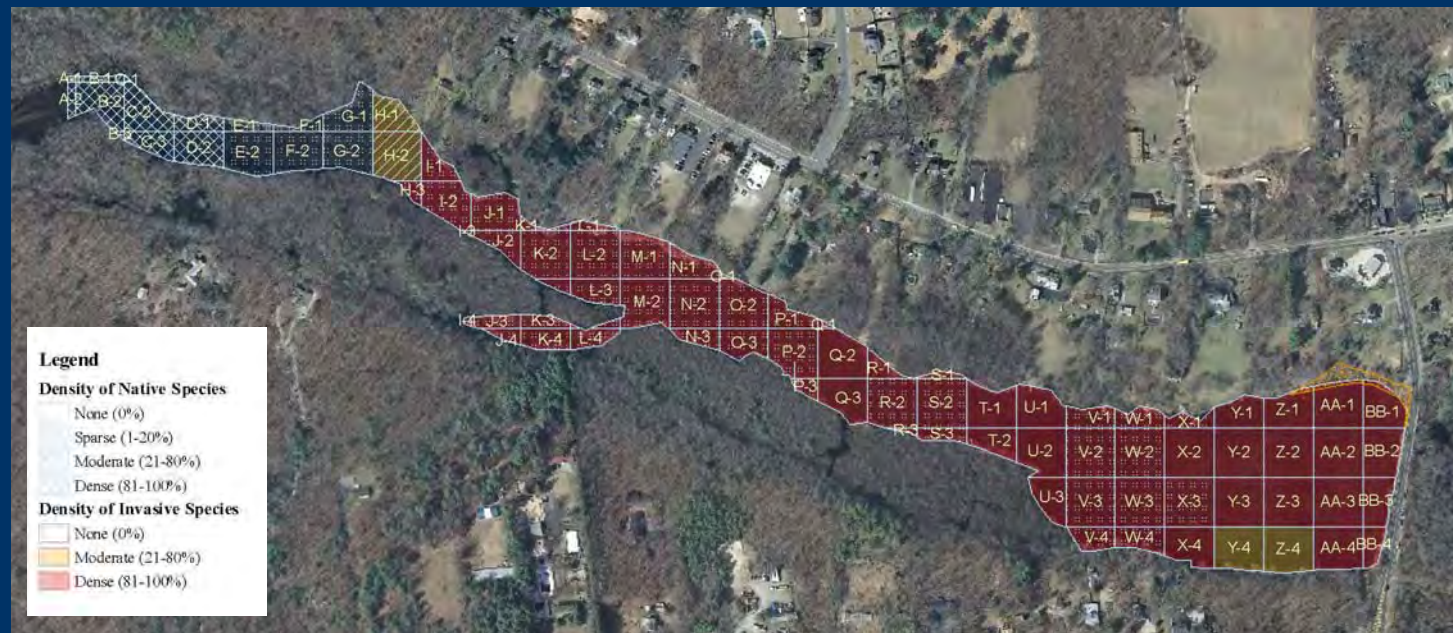


Fall
2007
(Town)

**NYSDEC
Mechanical
Harvesting Permit
(9/9/08)**



Density of Aquatic Invasive Plants – Lower Lake

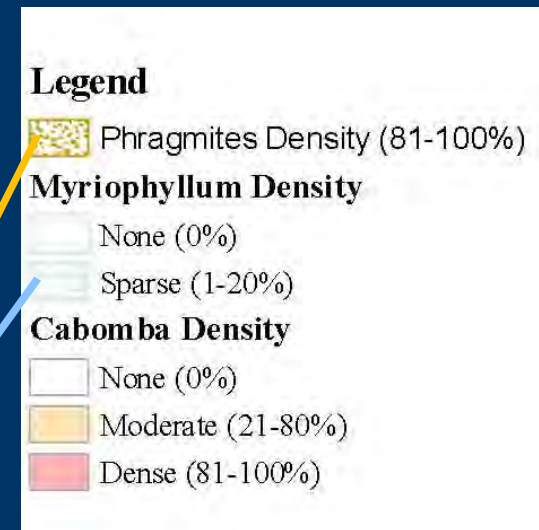


Fall
2009
(B. Laing)



Fall
2007
(Town)

2009 Invasive Plant Distribution Map – Upper Lake



Invasive Plant Distribution Maps – Upper & Lower Lake



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- Task 1: Lakes Characterization & Existing Conditions
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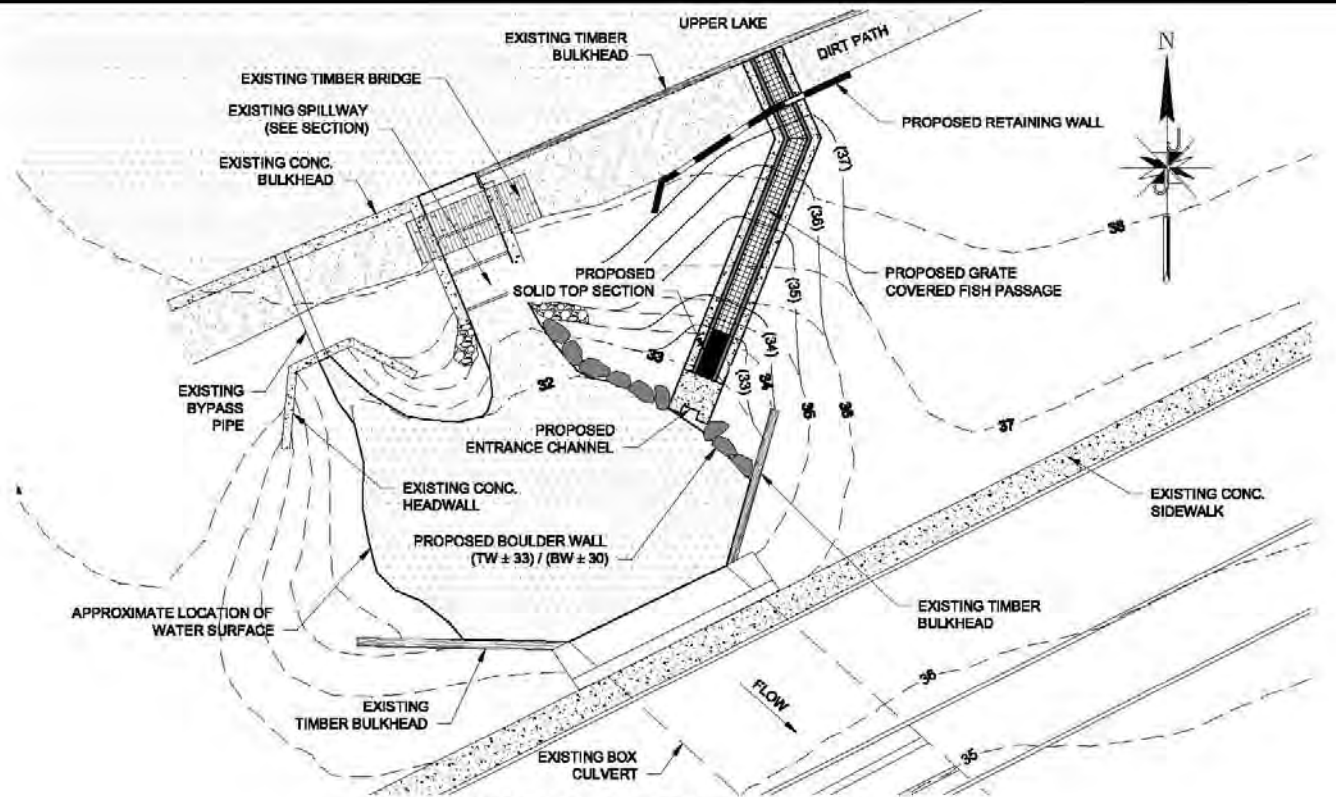
Task 4: Options for Fish Passage at Upper & Lower Lakes

- Dams inventoried by NP&V in 2007 (SSER Barrier Inventory/Prioritization Project)
- Prior Engineering/DPW Rehabilitation Reports (e.g. 2007 Dam Inspection Report for Upper Lake - PWG Engineering)
- Previous options considered & funded, but never proceeded
- *Fresh look* with public meetings to gather input & build consensus
- Partner with USFWS through formal DEC request
- Additional conceptual alternatives by N&P/OEC



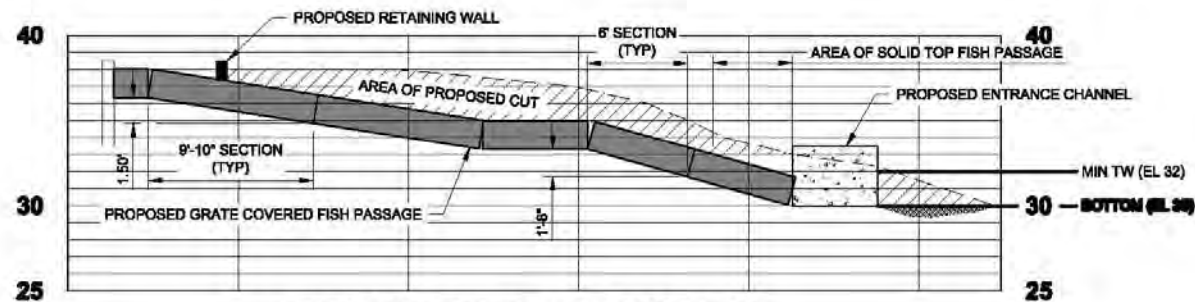
Upper Lake Dam, as seen from Mill Road.

Upper Lake – Conceptual Fish Passage Design



UPPER LAKE PLAN VIEW

SCALE: 1"=20'



FISH LADDER SECTION VIEW

SCALE: 1"=10'

LOWER LAKE

PROPOSED FISH PASSAGE TURN BOX

SAWCUT EXISTING OUTLET CONTROL STRUCTURE

EXISTING OUTLET CONTROL STRUCTURE

PROPOSED EXIT POOL

EXISTING SPILLWAY BYPASS 2

EXISTING SPILLWAY BYPASS 1

EXISTING STONE SLOPE STABILIZATION

PROPOSED STONE WALL

EXISTING GUARD RAIL

EXISTING BYPASS CULVERT

EXISTING CHAIN LINK FENCE

PROPOSED FISH PASSAGE (TYP.)

EXISTING CONCRETE ARCH CULVERT (SEE SECTION)

EXISTING CONC. HEADWALL

PROPOSED 2' DEEP ENTRANCE POOL

PROPOSED STONE WALL

APPROXIMATE LOCATION OF STREAM EDGE

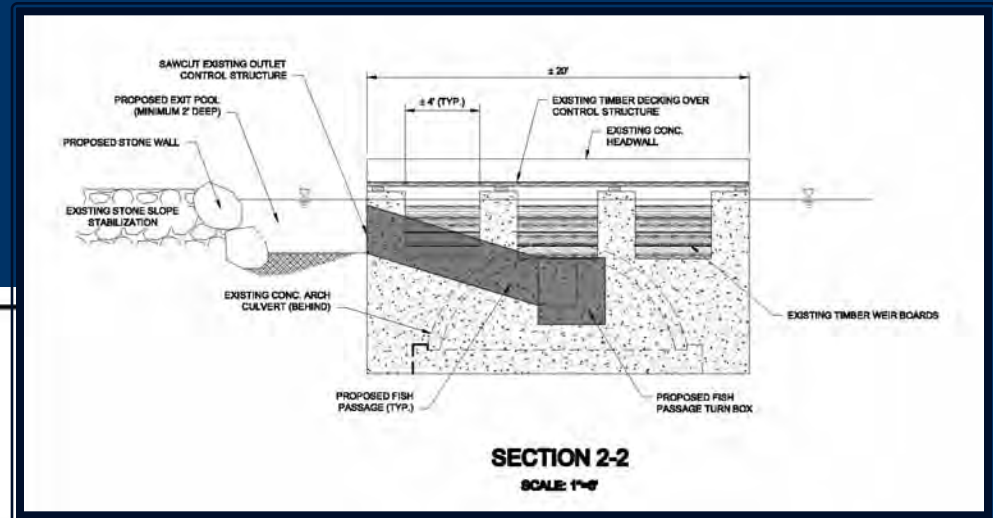
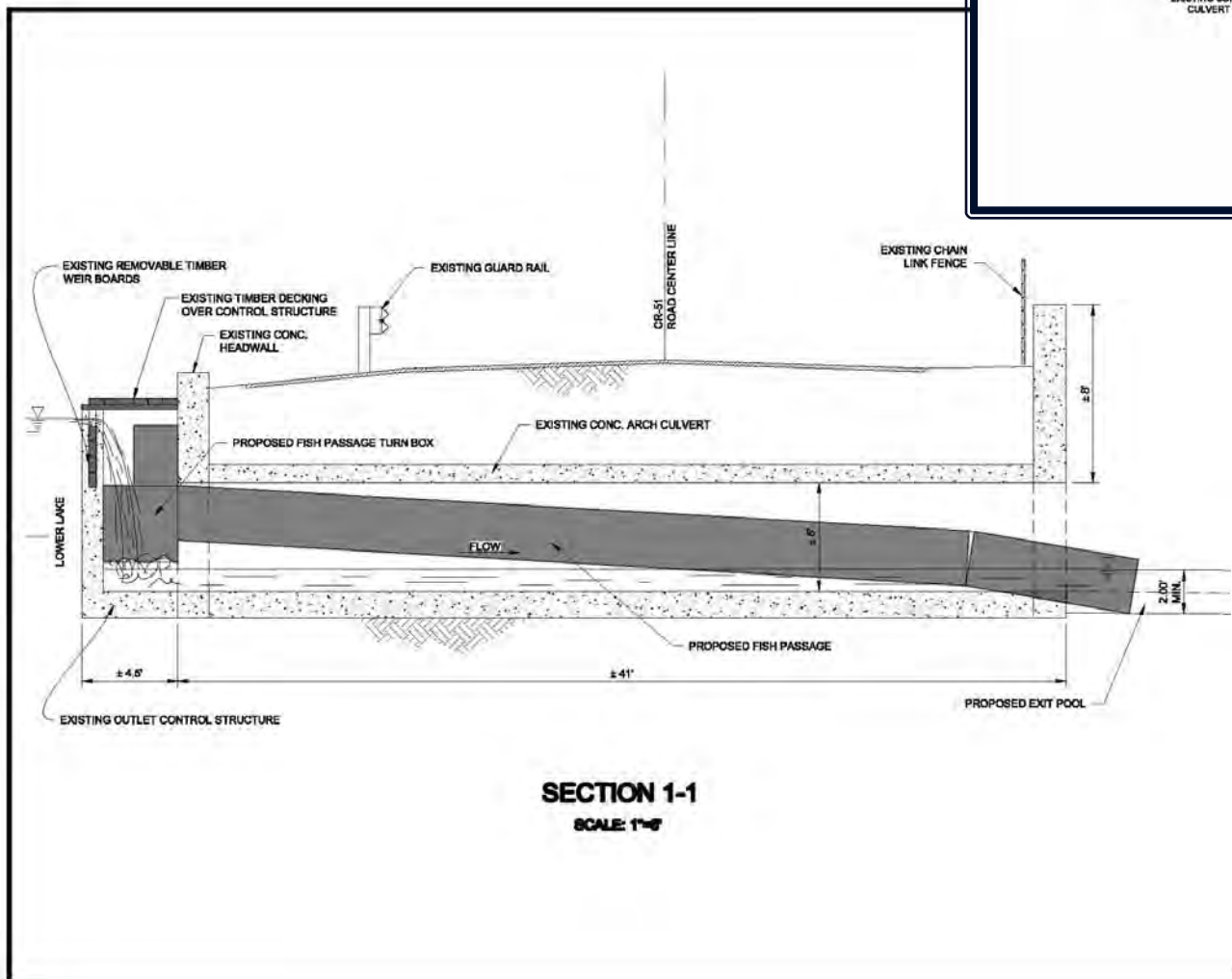
CR-21

EP 32.26, EP 32.19, EP 32.05, EP 32.12, EP 32.11, EP 32.17, EP 32.24, EP 31.93, EP 32.06, EP 32.13, EP 32.21, EP 32.25

LOWER LAKE PLAN VIEW

SCALE: 1"=20'

Lower Lake – Conceptual Fish Passage Design



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Task 2: Management Alternatives

- Matrices to assess alternatives (Pros/Cons/Costs)

- Dredging
- Aquatic herbicide
- Shading (chemical dyes)
- Mechanical harvesting (*existing*)
- Benthic barriers (blanketing)
- Hand/suction harvesting
- Drawdown/Drawup
- Biological control (grass carp)
- Dam removal/modification
- Combination (Integrated Plant Management)
- No action

- Impacts Analysis

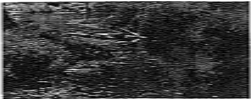
- Direct/Indirect Impacts
- Maintenance Effort/Cost
 - Short & long-term control
- Regulatory Requirements/Considerations
- Community Support



Build on Existing Information – Work With Stakeholders – Equally Assess ALL Options – Work Toward Consensus

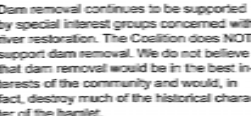

About The Coalition

The Coalition to Save the Yaphank Lakes was founded in October 2007, and is committed to protect and preserve the Upper and Lower Lakes of Yaphank, N.Y. Working with local and state organizations, and environmental organizations, we will continue to actively participate in efforts to find a solution to the invasive weed problem.



Serious About Saving The Lakes

Dam removal continues to be supported by special interest groups concerned with river restoration. The Coalition does NOT support dam removal. We do not believe that dam removal would be in the best interests of the community and would, in fact, destroy much of the historical character of the hamlet.

Coalition Initiatives

Outreach

- Contacted local Environmental, Educational, & Research Groups

Engineering Studies

- Obtained bathymetric survey of Upper Lake depths and sediments
- Obtained structural analysis of Upper Lake dam & spillway

Requests For Information

- Contacted Aquatic Analysis for harvesting Proposal
- Contacted Dr. Ken Wagner, Pres. Natl. Assoc. Lake Mgmt. (NALMS)

Carmans River Working Group

- Signage at Both Lakes

The Future

LAKE MANAGEMENT PROGRAM

PREVENT SPREAD OF INVASIVES

FISH PASSAGES

ADOPT-A-WATERSHED

VOLUNTEER PROGRAMS

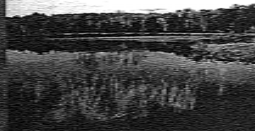
CONTROL STORMWATER RUNOFF

MONITOR HEALTH & BIODIVERSITY

Contact Us

Save The Yaphank Lakes
P.O. Box 623
Yaphank, N.Y. 11980
www.savetheyaphanklakes.org
email: CSYL@SaveTheYaphankLakes


Coalition To Save The Yaphank Lakes




PAST

"Since the first dam was built in 1739, the community has looked to the Mill Pond that was formed for recreation. People swam off the dam until the Town Beach was created behind the Swezey-Avey House in 1965. Boating and fishing are popular pastimes here, as is ice skating in the wintertime. Though Yaphank is no longer dependent on its mills for lumber, grain and cloth, we are dependent on our mill ponds for our recreation and our quality of life."

- Yaphank Historical Society
Karen Mouzakes, Historian
September, 2007



Bridge at Mill Pond, Upper Lake, Yaphank (Photos courtesy Yaphank Historical Society.)

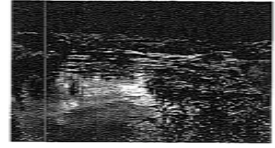


Fourth of July, Gerard's Mill Pond, Lower Lake, Yaphank

PRESENT

"The Carmans River is one of only 4 relatively large, undisturbed, riverine ecosystems on Long Island. Despite the presence of small dams on the river, it remains an outstanding fish and wildlife habitat in the region."

- NYS DOS Div. of Coastal Resources




"Of all the ponds and lakes on Long Island, I find Lower Yaphank Lake to be one of the most intriguing. This pretty, 25-acre impoundment of the Carmans River seems to be a lake in almost perfect balance with nature."

-Tom Schilder, "Long Island Best Freshwater Fishing"


A Healthy Ecosystem

The Upper and Lower Lakes are home to a wide variety of native aquatic plants, fish, amphibians, reptiles, mammals, birds, and waterfowl.



Wood ducks nest in secluded areas of Upper Lake.

The Problem




Upper & Lower Lakes are choked with invasive aquatic plants: Cabomba and Variable-leaf Watermilfoil. These non-native plants limit use of the Lakes as recreational resources and put a survival burden on native plants and wildlife.

The Options

HERBICIDES
HARVESTING
HANDPULLING
DRAWDOWN
BENTHIC BARRIERS
COMBINATIONS

What You Can Do:

Prevent the Spread of Invasives



PROTECT YOUR WATERS!
Prevent the Spread of Invasive Species
Aquatic Plants and Animals Can Impact Boating, Fishing, Swimming and the Environment
WHEN YOU LEAVE A BODY OF WATER
REMOVAL AND DISPOSAL OF INVASIVE SPECIES
STOP AQUATIC NITCHWICKERS!

Optimum conditions for Invasive Plants

***Myriophyllum heterophyllum* (Variable watermilfoil)**

- Slow moving, acidic waters (but can exist in any condition due to durability)
- Soft waters (saltier, fewer minerals)
- Depths up to 10 feet
- High nutrient concentrations
- Native to U.S, but not yet known if native to NY; can co-exist peacefully with other plants, but invasive weed growth becoming more commonplace (often competes with fanwort).



***Cabomba caroliniana* (Fanwort)**

- Slow moving, variable pH waters (5.7 to 9.2)
- Depths from 3 to 10 feet (but recently found in deep, coldwater lakes of upstate NY)
- High anaerobic tolerance
- High nutrient concentrations
- Native to Southeastern U.S



Making Conditions Less Favorable for Long-Term Control

Existing Conditions	Cause	Cure/Solution	Progress & Attempts
Shallow Depths <i>(2' to 3' avg; max of 6-7')</i>	<ul style="list-style-type: none"> - natural topography - build-up of organic sediments 	<ul style="list-style-type: none"> - dredge 	none
Nutrients – sediments <i>(short retention time & low retention of nutrients exhibited thus far)</i>	<ul style="list-style-type: none"> - build-up of decomposed plant/animal material 	<ul style="list-style-type: none"> - dredge - reduce biomass (benthic barrier, herbicide, shading, biocontrol, harvesting, etc.) 	<ul style="list-style-type: none"> - mechanical harvesting (limited, very short-term success)
Nutrients – surface/groundwater <i>(low nutrients in October 2009 samples)</i>	<ul style="list-style-type: none"> - fertilizers - sanitary systems - pet waste 	Watershed Management: <ul style="list-style-type: none"> - reduce fertilizer use in watershed - ensure sanitary systems are properly functioning - limit future development that could increase nutrient load - prevent direct stormwater inputs 	-Upper & Lower Lake - CR 21 stormwater improvements - SCDPW RFP issued in 2010 and survey work has begun (Credit to Leg. Kate Browning)
Warm water	<ul style="list-style-type: none"> - shallow depths 	<ul style="list-style-type: none"> - increase depths - decrease retention time 	none
Low Flows	<ul style="list-style-type: none"> - Impoundment on river 	<ul style="list-style-type: none"> - Remove impoundment and restore natural flows 	none
pH <i>(6.18 – 8.09 in 2009; 6.5 and 8.5 are NYS standards)</i>	<ul style="list-style-type: none"> - photosynthesis (pH increases as CO₂ is used up and O₂ levels rise during the day) - pollutants (CO₂ from PAHs - excess CO₂ cannot be consumed by plants and results in acid water; also fertilizers) 	<ul style="list-style-type: none"> - modify plant biomass - add compounds 	none

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Task 3: Meetings & Stakeholder Involvement

- Coordination with:
 - Suffolk County
 - Town of Brookhaven
 - Local Councilperson
 - Stakeholders (e.g. residents)
 - Coalition to Save the Yaphank Lakes
- Public Education (& Collaboration) to
 - Tell a Story (e.g. Historical Modification)
 - Learn modes of introduction
 - Control inoculants
 - Instill responsibility
- Meetings
 - Steering Committee (for each lake)
 - 1 start-up (*September/October 2009*)
 - 1 interim (*March 2010*)
 - 1 Progress (single meeting at end of Tasks 1&2) (*July 2010?*)
 - 1 wrap-up (*January – February 2011*)
 - Public Meetings (for each lake) – *County to publicize two weeks in advance*
 - 1 initial to highlight existing conditions; discuss options (*April 2010*)
 - 1 interim to build consensus toward preferred alternative (*July – August 2010*)
 - 1 additional final (if necessary, to assist in selecting alternative) (*Nov. – Dec. 2010*)



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 - *Public summary to be provided with final annual report & published on website*
- Task 6: Establish & Maintain a Public Domain Website
 - *www.suffolkcountylakes.net*

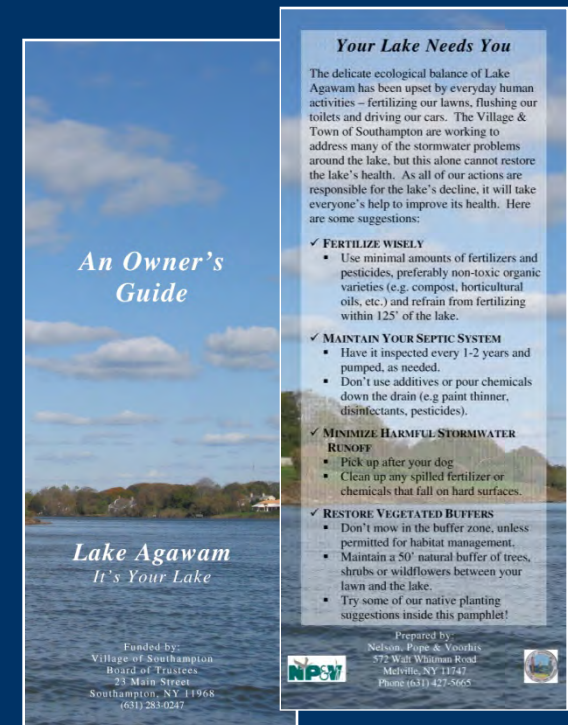


The Consultant Team



Nelson, Pope & Voorhis/Nelson & Pope

- **SSER Fish Barrier Inventory**
 - Including Upper & Lower Lake Dams
 - Habitat assessment; GIS Database; Barrier Prioritization
- **Lake Agawam Comprehensive Management Plan**
 - Worked with Dr. Gobler (wq & nutrient inputs)
 - Shoreline inventory, stormwater improvements
 - Heavy community involvement; public education
- **Lake Ronkonkoma Clean Lakes Study Update**
 - Nutrient inputs/sources; management strategies
- **Mt. Sinai Harbor Management Plan**
 - Balancing recreational, commercial, ecological & residential uses
 - Diverse stakeholders
- **SC North Shore Embayments Watershed Management Plan**
 - Strategy to achieve required nitrogen reductions (Long Island Sound TMDL)
 - wq/natural resource characterizations; pollutant loading models



B. Laing Associates

Artist's Lake, Yaphank, NY

- Control strategies for elodea and watermilfoil (*Myriophyllum sp.*)
- Chemical, harvesting and triploid grass carp considered. Chemical selected.

Private Lake, Ossening, NY

- Problem: coontail (*Ceratophyllum demersum*).
- Nutrient/sediment controls, chemical, harvesting, dredging, water flow, water level, benthic smothering and carp considered. Nutrient/sediment controls, aqua-shade and water flow revisions recommended.

Private Lake, Sullivan County, NY

- Problem: American lotus (*Nelumbo lutea*), Phragmites, purple loosestrife.
- Water level controls, targeted bio release, spot backpack chemical controls used.

Black Pond, Bedford, NY

- Problem: coontail (*Ceratophyllum demersum*).
- Dredging, nutrient/sediment controls, water level control and open water expansion used.



Dr. Chris Gobler, SoMAS

Lake Agawam

- Water quality monitoring
- Cyanobacteria inventory
- Pollutant loading analysis

Suffolk County Cyanobacteria Study

- Not documented on Long Island until 2003
- Assessed multiple lakes throughout County
- Encountered several lakes with elevated levels at times unsafe for public health



Orson Environmental Consulting

Jordan Mill Pond Fish Passage Project, Waterford, CT (2005)

- 15 foot high stone dam at head of Jordan Cove
- Design/funding/installation of Alaskan Steep Pass Fishway

Ingham Hill Fishway, Old Saybrook, CT (2006)

- Design/installation of steep pass fishway & “eellevator” in Oyster River Basin

Saugatuck River Fish Passage Enhancements, Westport, CT (2006)

- Installation of rock fish ramps and modified oil booms to direct fish to entrance pool and around obstructions

Wallace Dam, Wallingford, CT (ongoing)

- Modeled/designed denil fish pass to bypass 8’ stone dam on Quinnipiac River
- Project manager for proposed installation
- Community Lake to remain
- Remote video feeds proposed to monitor fish

Supply Ponds Fish Passage, Branford, CT (2007)

- Design/funding/installation of steep pass fishway on Branford River
- Rock berm to direct fish into entrance pool
- Automated fish counters in place

Nissequogue River Feasibility Study (in early stages)

- Restoring fish passage, beginning at North Dam
- Alternatives include relocating dam, installing fish ladder, or circumventing dam with old bypass channel



Fish Ladder at Jordan Mill Pond, Waterford, Connecticut, created using settlement funds from the *RTC 380* oil spill.

