



Bioengineering GROUP

Building Sustainable Communities
on an Ecological Foundation

FRESH POND RESERVATION
DRAINAGE AND HABITAT IMPROVEMENTS
CONTRACT 2

12 March 2009

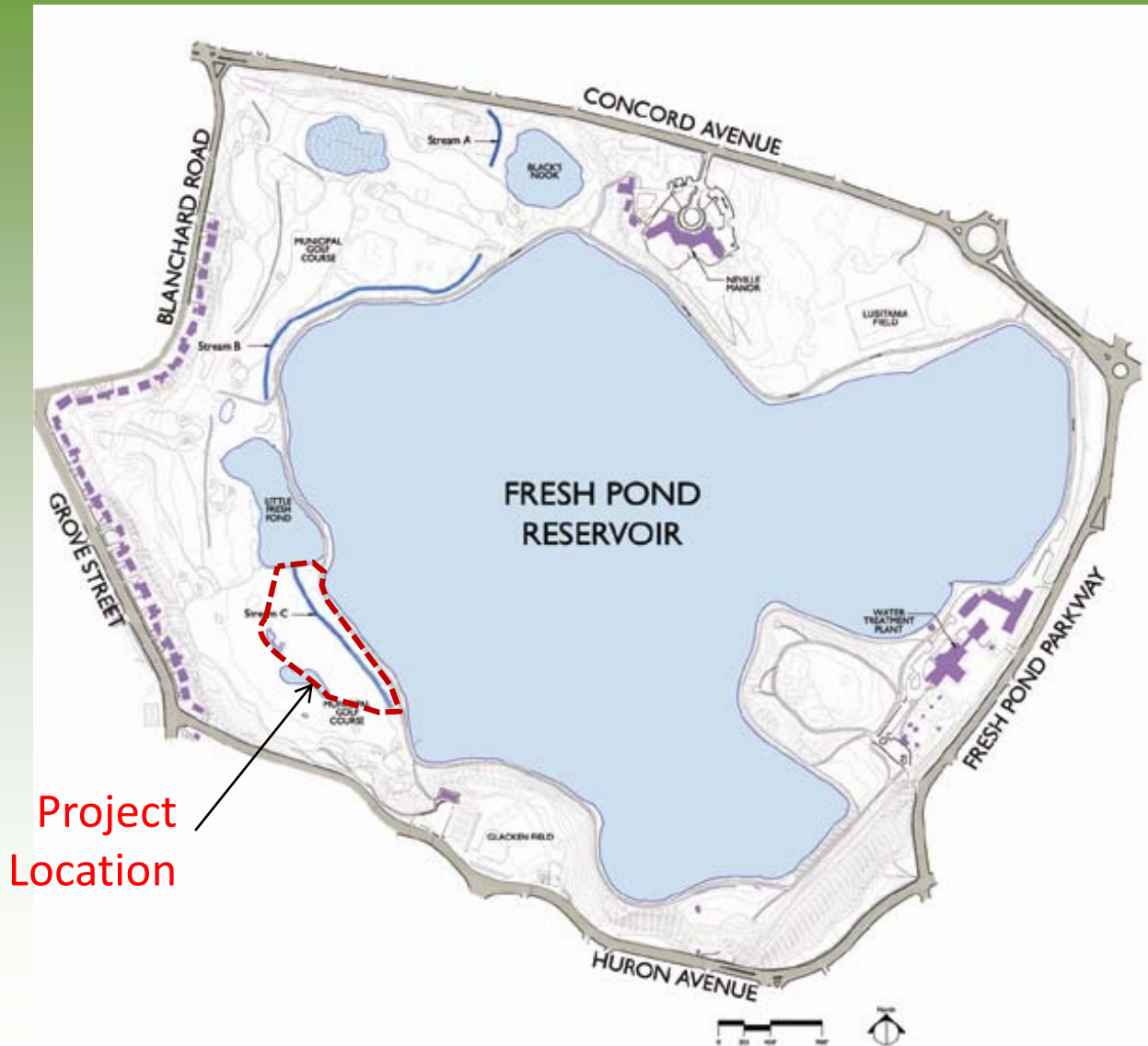
FRESH POND RESERVATION

Drainage and Habitat Improvements Contract 2

Agenda:

- Overview, Project Scope and Construction
- Proposed Design, Woodland Restoration

Project Location Map



Project
Location

Summary of Master Plan Recommendations

Priority Areas:

Golf Course South

- Source area for hydrology and stormwater management (very high priority)
- Wetland restoration and stream channel enhancement (high priority)



Drainage and Habitat Improvements Contract 2

Project Goals:

- Reduce stormwater impacts to Fresh Pond Reservoir below golf course clubhouse
- Enhance ecological function and value, Stream C and wet meadow swale
- Enhance the habitat diversity of 1-acre woodland
- Improve drainage within and beneath the golf course



Drainage Improvements (Overview)

Includes:

- 4,100 lf of pipe rehabilitation (72" dia. storm sewer)
- Installation of 2 surcharge relief structures
- Construction of a detention storage berm

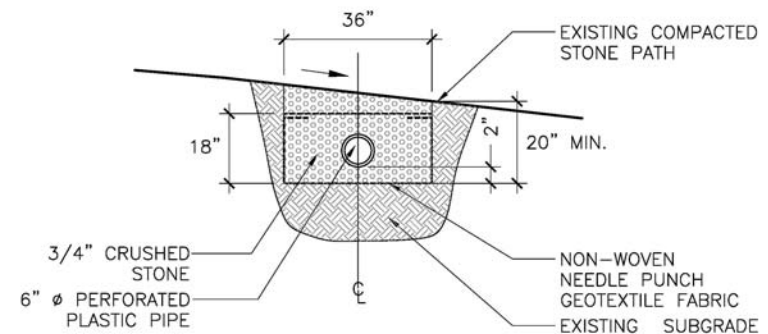


Proposed Improvements: Fairway 9 and Stream C



Drainage Improvements: Wet Meadow Swale

Drainage Improvements: Gravel Infiltration Trench, 9th Green



Habitat Improvements: Stream C Grading and Planting



Woodland Restoration

Process:

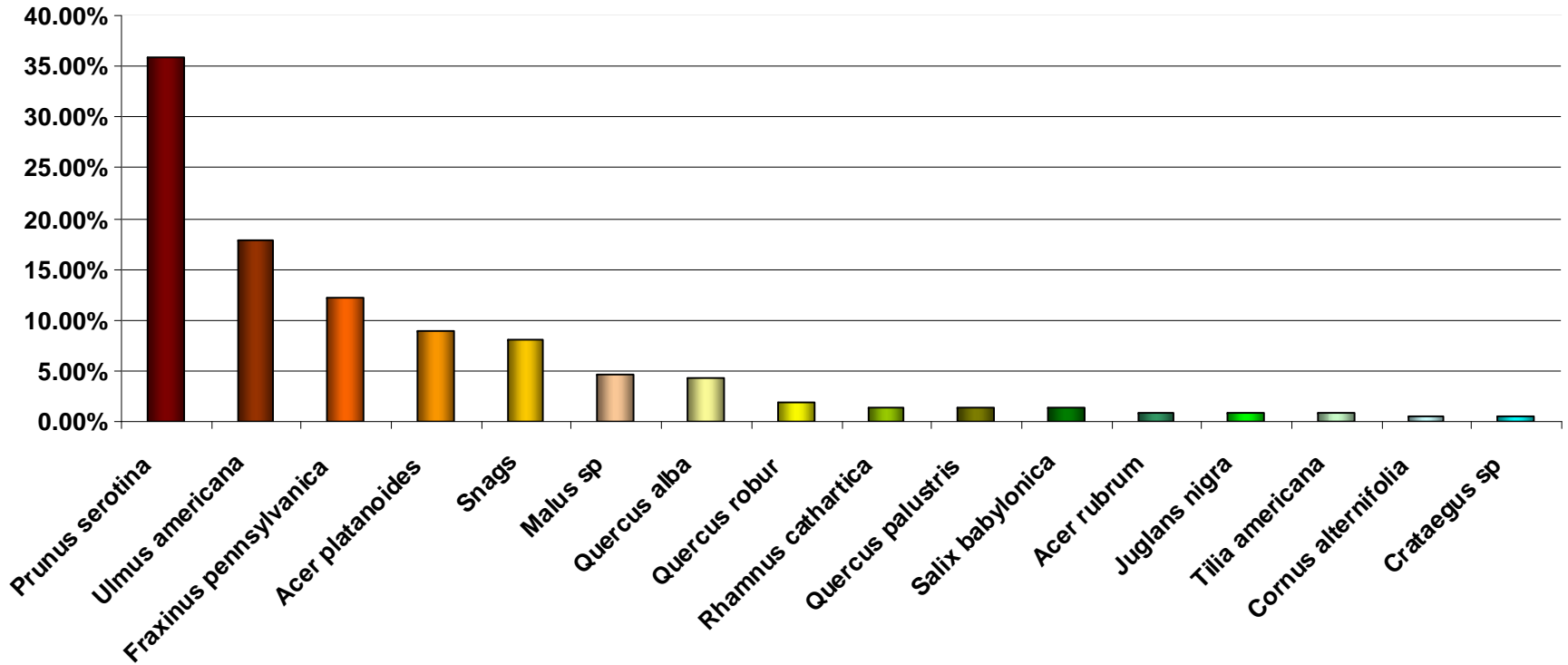
1. Inventory Existing Woodland
2. Target and Remove Invasive Species
3. Develop Planting Plan
4. Install and Monitor

Insert photos, existing woodland here



Woodland Restoration Inventory

Percentage Contribution Of Tree Species



Woodland Restoration

Existing Conditions



Woodland Restoration Invasive Species Removal (Fall 2008)

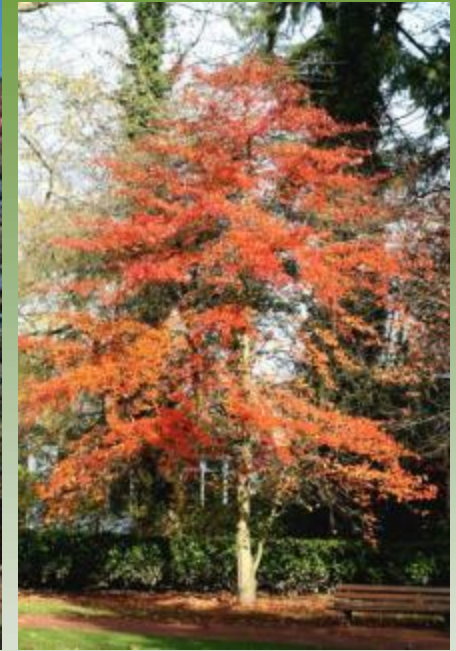
- Invasives removed include:
 - Buckthorn
 - Norway Maple
 - Oriental Bittersweet
 - Poison Ivy
- Damaged trees that posed a threat to safety along the Perimeter Road



Woodland Improvements: Spring 2009

Enhance tree canopy

- Red Maple
- Black Tupelo
- Shagbark Hickory
- White Pine
- White Spruce



Woodland Restoration: Spring 2009

Enhance Understory Plantings

- Hornbeam
- River Birch
- Pagoda Dogwood
- Serviceberry
- Witchhazel



Woodland Restoration

Enhance Understory Plantings



Woodland Restoration

Enhance Herbaceous Understory

Woodland Restoration



Next Steps

March 2009

- Stream C live stake plantings
- Specimen tree planting at detention ponds

April/May 2009

- Plug planting at Stream C and Wet Meadow Swale

May/ June 2009

- Woodland restoration plantings
- 2-year Monitor and Maintenance Period