INVASIVE PLANT SPECIES MANAGEMENT PLAN

DUNHAM POND
AND HIKING TRAIL PROJECT
NEW FAIRFIELD, CONNECTICUT

June 24, 2013

MMI #2534-14-1

Prepared for:

Town of New Fairfield
4 Brush Hill Road
New Fairfield, Connecticut 06842

Prepared by:

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Executive Summary

The Dunham Pond restoration and linear trail project includes the management of invasive species, replanting with native vegetation, and construction of hiking trails within the Dunham Pond property in New Fairfield, Connecticut. The following *Invasive Species Management Plan* pertains to the proposed restoration activities adjacent to wetlands along Dunham Pond. The *Invasive Species Management Plan* contains the following information:

- Lists the predominant undesirable invasive plant species that may occur in the wetlands and uplands along the project corridor
- Presents the treatment options for controlling invasive plant species
- Provides a site-specific plan of implementation and anticipated monitoring schedule (which will involve monitoring and control implementation during initial site work and the year following implementation and annually for three years thereafter)
- Recommended restoration plantings and seed mixes

Project Background and Need for Invasive Species Control

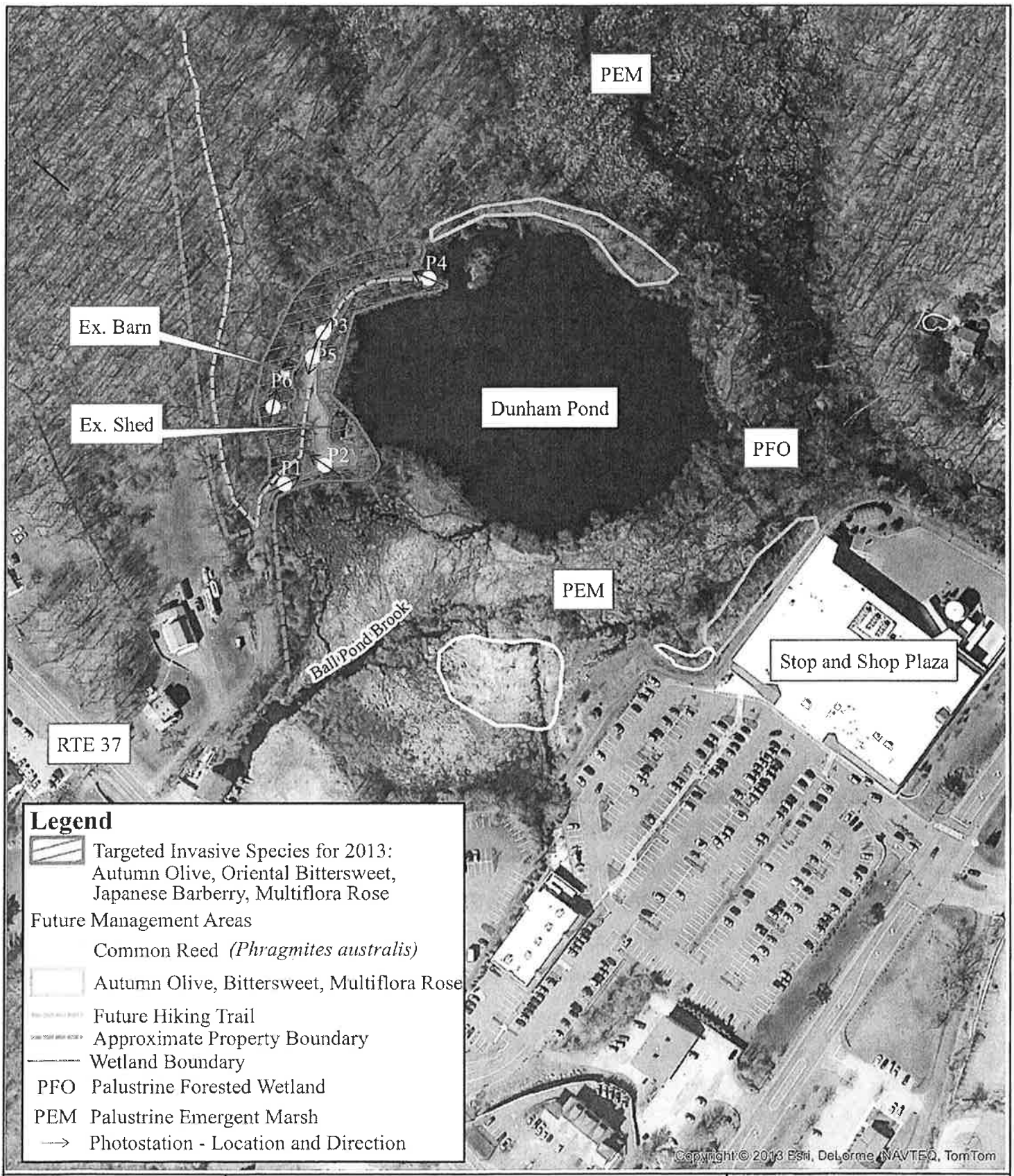
There are a number of plant species in Connecticut that were introduced from other countries, and several of these plant species have become aggressive and persistent enough to threaten the natural biodiversity of our wetlands and uplands. Most of these non-native plants do not have any natural control measure such as insects, diseases, and/or wildlife that feed on the plants to keep said plant species under control. Table 1-1 provides a list of the undesirable invasive plant species that have been documented within the project site and/or within the wetlands surrounding Dunham Pond.

TABLE 1-1
Non-native Invasive Plant Species

Common Name	Latin Name
Trees	
Norway maple	*Acer platanoides*
Shrubs	
Japanese barberry	*Berberis thunbergii*
Autumn olive	*Elaeagnus umbellate*
Burning bush	*Euonymus alatus*
Glossy buckthorn	*Frangula alnus*
Morrow's honeysuckle	*Lonicera morrowii*
Tartarian honeysuckle	*Lonicera tartarica*
Multiflora rose	*Rosa multiflora*
Herbs	
Garlic mustard	*Alliaria petiolata*
Japanese knotweed	*Fallopia japonica*
Purple loosestrife	*Lythrum salicaria*
Common reed	*Phragmites australis*
Vines	
Asiatic bittersweet	*Celastrus orbiculata*
Black swallowwort	*Cynanchum louiseae*
Japanese honeysuckle	*Lonicera japonica*
Poison ivy	*Toxicodendron radicans*
Wild grape	*Vipes* sp.

Most of the species listed above are aggressive and usually suffocate and outcompete native plants, resulting in lower biodiversity, wildlife habitat value, and aesthetic value. The existing Dunham Pond site consists of a large pond; several wetland types including palustrine forested, emergent marsh, and scrub shrub wetlands; open meadow; and upland shrubby zones. A photo log of the site conditions is found in Appendix A. For the Dunham Pond project site, the town would like to focus on certain target species and management areas within the property boundary. Figure 1 illustrates the target areas and invasive species for management in 2013. The target species that will be managed beginning in summer 2013 include:

- Japanese barberry
- Multiflora rose
- Autumn olive
- Burning bush
- Asiatic bittersweet
- Poison ivy
- Wild grape



SOURCE(S): Bing Maps, 2012	**Figure 1: Dunham Pond Project Site**	LOCATION: **New Fairfield, CT**
	Invasive Species Management Plan	Map By: JDW MMI#: 2534-14 Original: 6/6/2013 Revision: 6/13/2013 Scale: 1 inch = 175 feet
MXD: H:\2534-14\GIS\Maps\base2.mxd		MILONE & MACBROOM 99 Realty Drive Cheshire, CT 06410 (203) 271-1773 Fax: (203) 272-9733 www.miloneandmacbroom.com

Treatment Options

Following is a summary of alternative treatment options for controlling invasive species. A plan of implementation for the selected contractors for the Dunham Pond project site is presented in the next section of this report.

Norway Maple

- Girdle larger trees using a chain saw or cutting tool.
- Cut tree entirely down with a chain saw.
- Apply herbicide to the cut stump to prevent sucker growth and/or remove the stump depending upon existing site conditions.
- Remove seedlings and saplings by hand or shovel.

Multiflora Rose, Burning Bush, Morrow's and Tartarian Honeysuckles, Autumn Olive, Japanese Barberry, and Buckthorns

- Small stands can be removed by mechanical methods or by hand. The root balls should be removed entirely from the soil.
- Larger stands should be cut in the fall, and stems should be painted with herbicides such as Roundup™, Rodeo™, Accord, Glypro, Scythe, or Burnout II™.
- No biological control is available.

Asiatic Bittersweet, Poison Ivy, Black Swallowwort, and Japanese Honeysuckle

- Small stands can be removed by mechanical methods or by hand. Extensive root systems will be encountered, and it is imperative that all roots be removed. Removal of vines should be completed before the plant fruits. All removed plant material should be placed into plastic bags for disposal.

- Larger stands should be cut and sprayed with herbicide during the late summer. Follow-up treatment may be required the next summer.
- Vines are to be cut at the base, and the stump is to be sprayed or painted with herbicide. Follow-up treatment may be required the next summer.
- Girdle vines at the base.
- No biological control is available.

Japanese Knotweed

- Mow stands of knotweed at least five times during the growing season to deplete nutrient reserves and remove photosynthetic tissue. Repeat mowing for at least five years.
- Repeat cutting and herbicide application to cut stems. Use organic or chemical herbicides or some combination to treat recently cut stems. Effective herbicides include glyphosate, imazapyr, and/or triclorpyr-based products. Follow-up treatments the following year may be required.
- Small stands of knotweed can be covered with black plastic tarps for the year, suffocating the plant.
- No biological control is available.

Common Reed

- Apply the herbicide that is glyphosate and/or imazapyr based to each shoot/leaf blade during late summer preferably during flowering, when the plant is supplying nutrients to the rhizome. An imazapyr-based herbicide is typically translocated into the rhizome of the plant and, therefore, it is more effective at killing common reed than glyphosate. Glyphosate treatment methods may take three to four years whereas using imazapyr treatments typically takes two years.
- Mow stands of treated common reed after the first killing frost and retreat common reed stands in mid spring.

- Small stands (< than 20 stalks) that are accessible can be removed using a small excavator.
- Follow-up treatments the following years may be required.

Plan of Implementation and Anticipated Monitoring Schedule

Invasive species monitoring and control will be completed by the town during project implementation and for a period of three years following implementation of proposed site improvements. It should be noted that this project may take several years to implement, so invasive plant species monitoring and control will be ongoing tasks.

The following management strategies are recommended as the most effective methods of suppressing and/or eradicating the targeted species within the project site. Some of the management strategies include the use of a pesticide, so it is important that any pesticide used to manage invasive species be approved by the State of Connecticut. Application of any pesticide will need to be applied by a Connecticut licensed pesticide professional applicator. The pesticide products listed in the management strategies below are subject to change dependent upon the licensed pesticide applicator's professional judgment and/or current state pesticide certification status.

Norway Maple

Trees should be cut and removed. The stumps should be grubbed where feasible and, for stumps that cannot be removed, apply Roundup™ and/or Garlon 4™ to the stump to prevent sucker growth. Seedlings should be removed by hand or shovel.

Multiflora Rose, Burning Bush, Morrow's and Tartarian Honeysuckles, Autumn Olive, Japanese Barberry, and Buckthorns

Cut stems and remove during any part of the year. Dig root clumps out with a shovel or pull by mechanical methods. Large infestations should be removed using a skid steer-type machine with special grapple apparatus. Any plant material removed shall be loaded into a dumpster or truck and hauled to a landfill or nearby transfer station.

Asiatic Bittersweet, Black Swallowwort, Japanese Honeysuckle, and Porcelainberry

Cut and remove vines from trees. During the spring, recut stems and treat with herbicide. To ensure uptake of the herbicide by the plant, apply within five to 15 minutes after cutting. Apply with a sponge or paintbrush. Smaller stands of the vines can be uprooted by hand; however, this method should be conducted when plants are not in fruit. The vines should be removed and placed in garbage bags for disposal. Follow-up treatment of vines may be needed the following year.

Japanese Knotweed

Cut or mow down stalks. Remove cut stalks from the site. Allow knotweed to regrow, then spray knotweed with Polaris™ and/or Habitat™. The whole stand must be treated to be effective. A follow-up treatment should be applied two weeks after the initial treatment. The following year, repeat treatment methods on remaining seedlings and on any new growth. All treated areas will need to be inspected annually to ensure success.

Common Reed (*Phragmites*)

All plants must be sprayed with the herbicides such as Habitat™ and/or Rodeo™. Both herbicides are not selective and will kill grasses and broadleaved plants alike. Toxicity tests indicate that they are virtually nontoxic to all aquatic animals. The selected herbicide must be

mixed with water and a surfactant. The surfactant will thicken the viscosity of the herbicide, allowing it to stick to leaves and subsequently be absorbed by the plant. The application must take place after the tasseling (e.g., flowering) stage when the plant is supplying nutrients to the rhizome because when the herbicide is sprayed onto the foliage of aquatic emergent weeds it translocates into the roots. Mowing of the *Phragmites* is also recommended following the first hard frost. This can be completed with a Marshmaster mulching machine or for small patches by a handheld weed whacker.

Restoration Planting Plan

Following removal of invasive vegetation, the areas that are cleared will be restored to a natural state. Following are plant recommendations for the invasive species removal areas. The invasive species management areas consist of areas within forested wetlands, upland areas, and pond edge. The following list of plants has been subdivided into the management areas based on site conditions including sunlight, hydrology, and soil conditions.

Wetland Areas

Shrubs

Northern Arrowwood – *Viburnum dentatum*
Silky Dogwood – *Cornus amomum*
American elderberry – *Sambucus canadensis*
Nannyberry – *Viburnum lentago*
Highbush blueberry – *Vaccinium corymbosum*
Sweet pepperbush – *Clethra alnifolia*
American cranberry bush – *Viburnum trilobum*

Herbaceous

Cinnamon fern – *Osmunda cinnamomea*
Royal fern – *Osmunda regalis*
Sensitive fern – *Onoclea sensibilis*

Seed Mix

New England Erosion Control Mix for Moist Sites and Detention Basins

Species: Virginia Wild Rye (*Elymus virginicus*), Creeping Red Fescue (*Festuca rubra*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Fox Sedge (*Carex vulpinoidea*), Switch Grass (*Panicum virgatum*), Rough Bentgrass (*Agrostis scabra*), New England Aster (*Aster novae-angliae*), Boneset (*Eupatorium perfoliatum*), Grass Leaved Goldenrod (*Euthamia graminifolia*), Green Bulrush (*Scirpus atrovirens*), Blue Vervain (*Verbena hastata*), Soft Rush (*Juncus effusus*), Wool Grass (*Scirpus cyperinus*)

Pond Edge

Shrubs

Speckled Alder – *Alnus rugosa*
Pussy Willow – *Salix discolor*
Silky Dogwood – *Cornus amomum*
Highbush blueberry – *Vaccinium corymbosum*

New England Erosion Control Mix for Moist Sites and Detention Basins

Species: Virginia Wild Rye (*Elymus virginicus*), Creeping Red Fescue (*Festuca rubra*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Fox Sedge (*Carex vulpinoidea*), Switch Grass (*Panicum virgatum*), Rough Bentgrass (*Agrostis scabra*), New England Aster (*Aster novae-angliae*), Boneset (*Eupatorium perfoliatum*), Grass Leaved Goldenrod (*Euthamia graminifolia*), Green Bulrush (*Scirpus atrovirens*), Blue Vervain (*Verbena hastata*), Soft Rush (*Juncus effusus*), Wool Grass (*Scirpus cyperinus*)

Upland Areas

Shrubs

Grey Stemmed Dogwood – *Cornus racemosa*
Meadowsweet – *Spirea latifolia*
Shadblow – *Amelanchier Canadensis*
Sweet pepperbush – *Clethra alnifolia*

New England Erosion Control Mix for Dry Sites

Species: Creeping Red Fescue (*Festuca rubra*), Canada Wild Rye (*Elymus canadensis*), Annual Ryegrass (*Lolium multiflorum*), Perennial Ryegrass (*Lolium perenne*), Blue Grama (*Bouteloua gracilis*), Little Bluestem (*Schizachyrium scoparium*), Indian Grass (*Sorghastrum nutans*), Rough Bentgrass (*Agrostis scabra*), Upland Bentgrass (*Agrostis perennans*)

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Dunham Pond and Hiking Trail Project Site
Invasive Species Management Plan
Existing Conditions Photolog

Photo Station 1 Entrance Drive to Dunham Pond

Photo Station 2 Invasive Shrubs looking northwest towards Red Barn

Photo Station 3 Existing overgrown path looking towards peninsula

Photo Station 4 Existing overgrown path looking away from peninsula

Photo Station 5 Existing upland meadows to remain

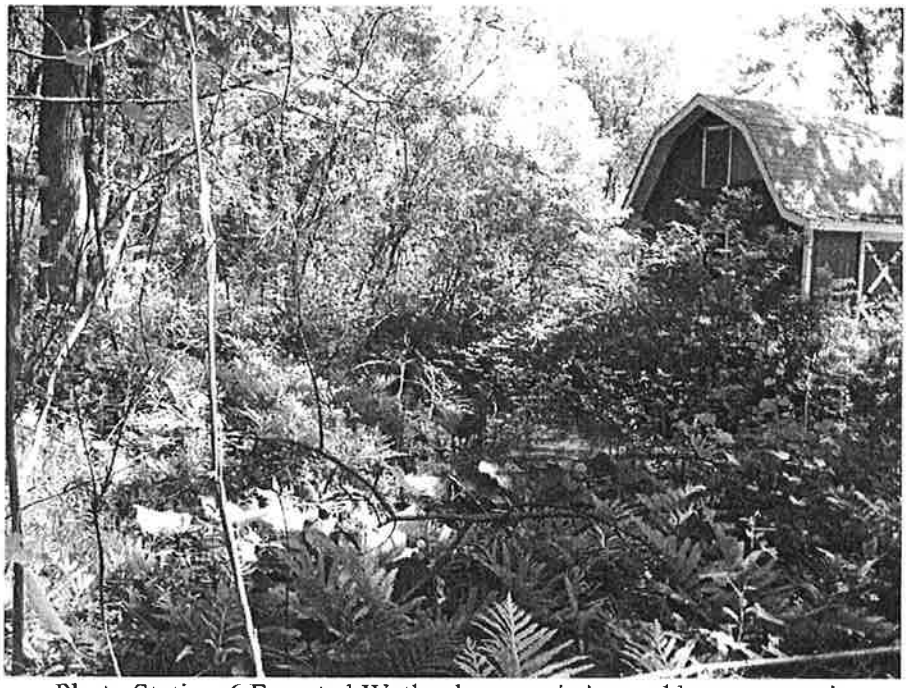
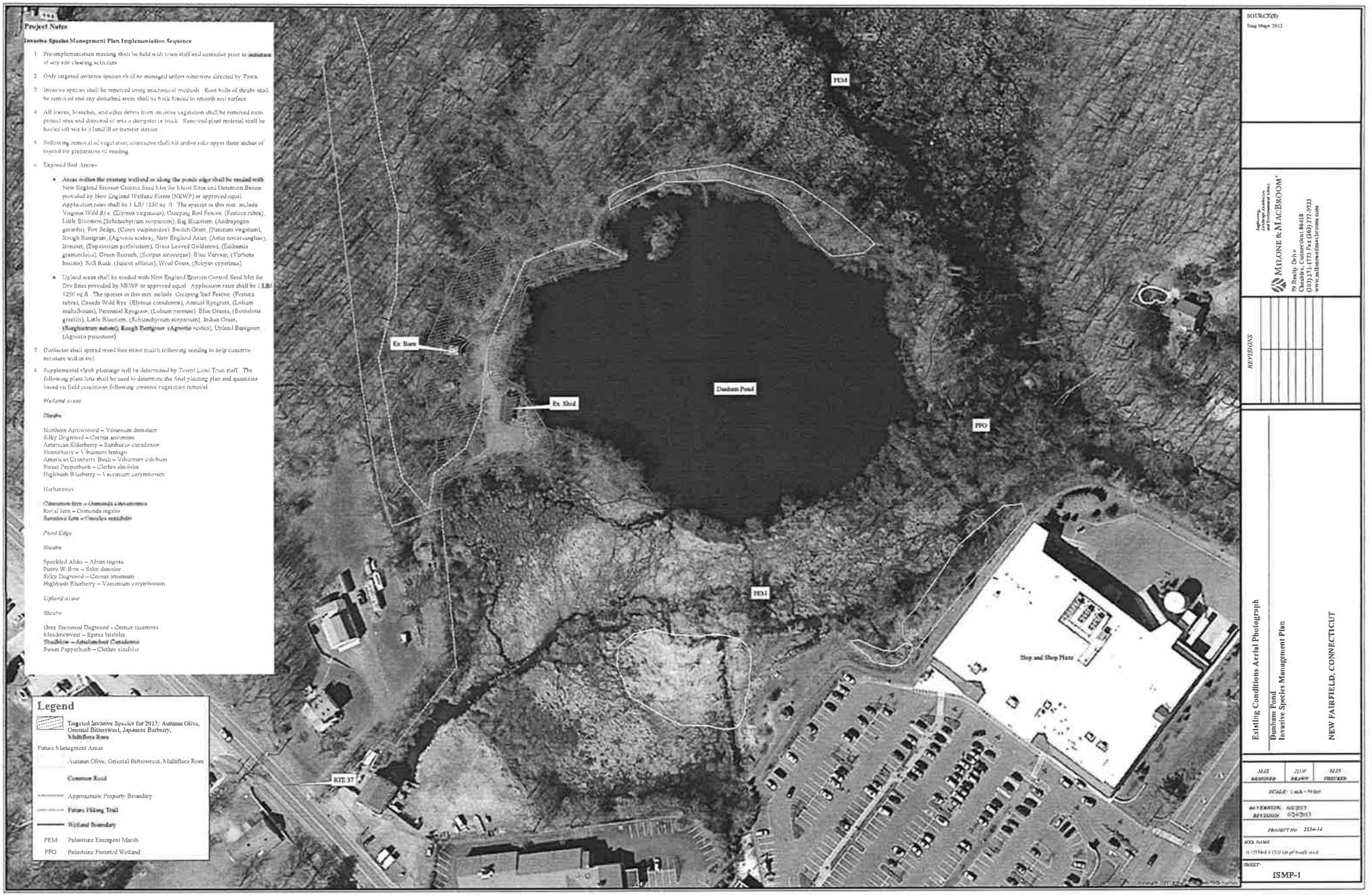


Photo Station 6 Forested Wetland near existing red barn to remain



Project Notes

Invasive Species Management Plan Implementation Sequence

1. Pre-implementation meeting shall be held with town staff and contractor prior to initiation of any site clearing activities
2. Only targeted invasive species shall be managed unless otherwise directed by Town
3. Invasive species shall be removed using mechanical methods. Root balls of shrubs shall be removed and any disturbed areas shall be brush hauled to smooth soil surface
4. All leaves, branches, and other debris from invasive vegetation shall be removed from project area and disposed of into a dumpster or truck. Removed plant material shall be hauled off site to a landfill or transfer station
5. Following removal of vegetation, contractor shall till and/or rake upper three inches of topsoil for preparation of seeding
6. Exposed Soil Areas–
   - Areas within the existing wetland or along the ponds edge shall be seeded with New England Erosion Control Seed Mix for Moist Sites and Detention Basins provided by New England Wetland Plants (NEWP) or approved equal. Application rates shall be 1 LB/ 1250 sq. ft. The species in this mix include Virginia Wild Rye, (Elymus virginicus), Creeping Red Fescue, (Festuca rubra), Little Bluestem, (Schizachyrium scoparium), Big Bluestem, (Andropogon gerardii), Fox Sedge, (Carex vulpinoidea), Switch Grass, (Panicum virgatum), Rough Bentgrass, (Agrostis scabra), New England Aster, (Aster novae-angliae), Boneset, (Eupatorium perfoliatum), Grass Leaved Goldenrod, (Euthamia graminifolia), Green Bulrush, (Scirpus atrovirens), Blue Vervain, (Verbena hastata), Soft Rush, (Juncus effusus), Wool Grass, (Scirpus cyperinus).
   - Upland areas shall be seeded with New England Erosion Control Seed Mix for Dry Sites provided by NEWP or approved equal. Application rates shall be 1 LB/ 1250 sq. ft. The species in this mix include: Creeping Red Fescue, (Festuca rubra), Canada Wild Rye, (Elymus canadensis), Annual Ryegrass, (Lolium multiflorum), Perennial Ryegrass, (Lolium perenne), Blue Grama, (Bouteloua gracilis), Little Bluestem, (Schizachyrium scoparium), Indian Grass, (Sorghastrum nutans), Rough Bentgrass, (Agrostis scabra), Upland Bentgrass, (Agrostis perennans)
7. Contactor shall spread weed free straw mulch following seeding to help conserve moisture within soil
8. Supplemental shrub plantings will be determined by *Town/ Land Trust staff*. The following plant lists shall be used to determine the final planting plan and quantities based on field conditions following invasive vegetation removal

Wetland Areas

Shrubs

Northern Arrowwood – Viburnum dentatum
Silky Dogwood – Cornus amomum
American Elderberry – Sambucus canadensis
Nannyberry – Viburnum lentago
American Cranberry Bush – Viburnum trilobum
Sweet Pepperbush – Clethra alnifolia
Highbush Blueberry – Vaccinium corymbosum

Herbaceous

Cinnamon fern – Osmunda cinnamomea
Royal fern – Osmunda regalis
Sensitive fern – Onoclea sensibilis

Pond Edge

Shrubs

Speckled Alder – Alnus rugosa
Pussy Willow – Salix discolor
Silky Dogwood – Cornus amomum
Highbush Blueberry – Vaccinium corymbosum

Upland Areas

Shrubs

Grey Stemmed Dogwood – Cornus racemosa
Meadowsweet – Spirea latifolia
Shadblow – Amelanchier Canadensis
Sweet Pepperbush – Clethra alnifolia

Legend

- Targeted Invasive Species for 2013: Autumn Olive, Oriental Bittersweet, Japanese Barberry, Multiflora Rose
- Future Management Areas
- Autumn Olive, Oriental Bittersweet, Multiflora Rose
- Common Reed
- Approximate Property Boundary
- Future Hiking Trail
- Wetland Boundary
- PEM Palustrine Emergent Marsh
- PFO Palustrine Forested Wetland

SOURCE(S):
Bing Maps 2012

Engineering, Land Planning, Landscape Architecture and Environmental Science
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REVISIONS

Existing Conditions Aerial Photograph
Dunham Pond
Invasive Species Management Plan
NEW FAIRFIELD, CONNECTICUT

MAS	JAW	MAS
DESIGNED	DRAWN	CHECKED

SCALE: 1 inch = 50 feet
DATE: 6/6/2013
REVISION: 6/24/2013
PROJECT NO. 2534-14
MMB NAME
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SHEET:
ISMP-1

After Invasives Removal Page 1

Photo Station 1

Photo Station 2

Photos taken by William McCann 8/23/2013

After Invasives Removal Page 2

Photo Station 3

Photo Station 4

After Invasives Removal Page 3

Photo Station 5

Photo Station 6