

Restoration, Replication and Mitigation Plan

for

444 East Central Street
Franklin, MA
(Assessor's Map 284, Parcel 66)

DATE:

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ADDRESSED TO:

Franklin Conservation Commission
355 East Central Street
Franklin, MA 02038

PREPARED BY:

Goddard Consulting LLC
291 Main Street, Suite 8
Northborough, MA 01532

PREPARED FOR:

TAG Central LLC
275 Regatta Drive
Jupiter, FL 33477

A. Site History

The locus site, 444 East Central Street in Franklin, is presently in use as a nursery and landscape facility known as Stobbart's Nursery. The site has been used as such for several decades. The Franklin Assessor's records indicate that the main building on the site was built in 1950, and historic aerial imagery corroborates that the site has been used for farming, nursery, and/or landscape operations since at least the mid-1960s. The site has been used, cultivated and altered repeatedly over the last 75 or more years.

The land had historically been used primarily as a nursery grow operation, cultivating plants for sale. Over time, as nursery cultivation and sale operations dwindled, portions of the site went unmaintained. This has resulted in the presence of large stands of nonnative species that were never harvested for sale. In addition to the nonnative landscape plants that have been allowed to grow to maturity, the site contains a significant contingent of both invasive species, and nonnative species that have escaped from cultivation.

While the storefront remains active, the nursery no longer cultivates plants for sale on the site. However, portions of the site do continue to be used sporadically as a construction and landscape yard, primarily on the eastern half of the property. Large brush, compost and fill piles are present variously throughout the site, along with laydown areas for construction materials, equipment and abandoned vehicles.



Photo 1: View of contractor yard area in eastern portion of the site.

B. Proposed Development

As part of the construction of a residential development on the site as a “friendly 40B,” consisting of multiple residential buildings and one clubhouse building with associated interior and exterior amenities, parking, and open areas, this document has been prepared to outline proposed restoration, replication and mitigation efforts. Because much of the site is encompassed by wetland resource areas and their buffer zones, extensive restoration of the site is proposed as part of the project.

C. Restoration Programs

Based on Goddard’s detailed observation of the site on multiple occasions, there are four components of proposed restoration, replication and mitigation activities. These programs are as follows:

- Brush, Fill and Compost Pile Removal
 - o This program consists of the removal of several large piles consisting of C&D waste, brush, compost and fill materials, which have accumulated over years of activities on the site. These piles are located primarily in the southeastern quadrant of the site.
- Contractor Laydown Yard Cleanup
 - o This program consists of the removal of the abandoned vehicles, construction materials and various equipment that are present scattered throughout the site. This work will be focused on the north-central portion of the site and will continue southerly along the eastern side of the river.
- Invasive Species Management
 - o This program consists of the management of large stands of invasive species by mechanical, chemical and cultural practices.
- Wetland Replication
 - o This program consists of the replication of impacted isolated vegetated wetlands (IVWs) as a Bordering Vegetated Wetland in the southeast corner of the site, with associated grading and planting.

Large portions of the above restoration programs will be addressed through site preparation, grading, and demolition required for the proposed development. However, additional restoration activities will be undertaken to ensure that the site is satisfactorily restored and, in fact, improved over existing conditions. Restored areas that are intended to naturalize will be planted and seeded with appropriate native species to aid in the protection of the interests of the Wetlands Protection Act.

D. General Procedures

Supervision:

Work specific to carrying out the Restoration Programs outlined in Sections E through H shall be supervised by a qualified wetland scientist with experience in ecological restoration and invasive species management. The supervisor shall submit monitoring reports to the Conservation Commission as described below. Reports shall contain written details of all work performed and photographs of completed work.

Timing:

Removal of brush, fill and compost piles may be accomplished at any time of year but should be coordinated such that the area can be stabilized, if necessary, either temporarily or permanently, shortly after the

completion of removal. Similarly, wetland replication should also be executed such that the replication area can be stabilized with vegetation shortly after completion of grading.

The timing of invasive species management activities will be dependent on the target species and means of management as outlined in section G.

Seeding and installation of plantings should ideally be accomplished during the spring or fall growing seasons (i.e. approximately between April 16 and May 31 or between September 16 and October 30). Work outside of these windows is acceptable, but plant mortality may be greater.

E. Brush, Fill and Compost Removal

Brush, fill and compost piles are present sporadically throughout the site. Materials in these piles will be removed with machinery. This work can be largely accomplished simultaneously with site preparation and grading. Access will be obtained via upland routes to the greatest extent practicable. Any debris or intact brush will be exported from all wetland resource areas.

Some of these piles are present in very close proximity to wetland resource areas. Care shall be taken to ensure that erosion control barriers remain intact and functional throughout this work. In areas to be revegetated, loam will be spread to provide a suitable medium for planting and seeding.

F. Contractor Laydown Yard Cleanup

Similarly to the brush, fill and compost pile removal, the majority of the cleanup of the existing contractor yard will be accomplished in tandem with site preparation and grading. This effort will consist of the removal of all abandoned and dilapidated vehicles and machinery, construction materials such as masonry stone and pallets, and other scattered anthropogenic debris. All of these items shall be disposed of offsite in accordance with any applicable local, state and federal laws. In areas to be revegetated, loam will be spread to provide a suitable medium for planting and seeding.

G. Invasive Species Management

Invasive species management is proposed as part of restoration and mitigation activities for the project. Invasive species present on site consist primarily of common reed (*Phragmites australis*), Japanese knotweed (*Reynoutria japonica*), buckthorn (*Rhamnus cathartica*) and Asiatic bittersweet (*Celastrus orbiculatus*). These four species will be the primary targets of the invasive species management program. Additional invasive species present on site also include purple loosestrife (*Lythrum salicaria*), multiflora rose (*Rosa multiflora*), garlic mustard (*Alliaria petiolata*), Norway maple (*Acer platanoides*), autumn olive (*Elaeagnus umbellata*), winged euonymus (*Euonymus alatus*), and honeysuckle (*Lonicera spp.*). These seven additional species will also be targets of the invasive species management program.

MANAGEMENT GOALS:

The invasive plant species onsite have varying densities, distributions, and effects on the natural ecosystem. As a result, we will have different management goals for each species and area. Due to the massive extent of invasive species pressure on site and on neighboring sites, total eradication of invasive species is likely not feasible. Therefore, the goal of this management plan is to control invasive species on site. Control consists

of the reduction of a species' density and abundance to a level that does not compromise the integrity of the ecosystem and allows native species to repopulate and thrive. For invasive plant populations which are large and pervasive, eradication is not feasible. In this situation, the more realistic management goal is to control the invasive species, primarily to deter the spread into new areas and reduce invasive species pressure in existing areas.

INVASIVE SPECIES DESCRIPTIONS:

Common Reed (*Phragmites australis*):

Common reed is a tall (up to 15 ft.), densely growing, perennial grass with purple or golden flowers in bushy panicles. It was likely introduced to North America from Europe by accident in ballast material in the late 1700s or early 1800s. It is similar to a native North American subspecies, *Phragmites australis* ssp. *americanus*. Common reed is a vigorous growing plant that forms dense stands that push out other plants including the native subspecies. It also alters wetland hydrology and degrades wetland wildlife habitat due in part to its very dense growth habit.

Glossy Buckthorn (*Rhamnus frangula*, aka *Frangula alnus*):

Glossy buckthorn is a perennial understory shrub or a small tree that can reach heights of 20 ft. It has oval, smooth, glossy, toothless, leaves that stay green late into the fall. Its berries transition from green to red before finally ripening to a dark purple in August and September. This species was introduced to North America as an ornamental shrub and used for living fence rows and wildlife habitat. It has spread aggressively and become a threat to the degradation of native forest habitats where it out-competes native plant species.

Japanese Knotweed (*Fallopia japonica*, aka *Polygonum cuspidatum* & *Reynoutria japonica*):

Japanese knotweed is a shrubby, herbaceous perennial which grows 4-10 ft. tall. It is often compared to bamboo, with smooth hollow stems, and stem leaf junctures with a membranous sheath. Its leaves are approximately 6 in by 4 in and range from oval to triangular with a tapered tip. In the summer it produces clusters of small white flowers. It was introduced to North America from East Asia in the 1800s as an ornamental plant and is now invasive throughout the northeastern and northwestern United States. It forms dense monotypic thickets which displace native vegetation. In addition to reproducing by seed, it also spreads through long rhizomes that can be challenging to remove completely.

Oriental Bittersweet (*Celastrus orbiculatus*):

Oriental bittersweet is a deciduous, woody vine, sometimes occurring as a trailing shrub, with alternate, rounded, finely toothed leaves. It has globular, green to yellow fruits which split open at maturity to reveal fleshy red-orange arils that cover the seeds. Originally from east Asia, it was introduced into the United States in the 1860s as an ornamental plant and has been widely dispersed by the many bird species who consume its fruit. Oriental bittersweet is a vigorous growing plant that threatens native vegetation from the ground to the canopy. Thick masses of vines sprawl over shrubs, small trees, and other plants, producing dense shade that weakens and kills them. Oriental bittersweet also appears to be displacing the native American bittersweet (*Celastrus scandens*).

DESCRIPTIONS OF TREATMENT METHODS:

When treating invasive vegetation on site, mechanical removal methods will be prioritized over herbicidal treatment whenever it can be practicable and effective. However, due to the aggressive and pervasive nature of invasive plants, herbicide treatment may be necessary. Herbicide treatment will selectively target invasive

vegetation, taking care to avoid impact to surrounding native vegetation. More detailed information on the appropriate removal methods that may be utilized as part of the proposed work are as follows:

Mechanical Treatment Methods

- *Cutting:* Cutting entails the gross removal of above ground plant material, either by manual cutting, mechanical cutting, or mowing. This method only removes the surface vegetation, and, in most circumstances, invasive plants regrow from the rootstock or latent seeds. Treatments using only this method will usually require repeated follow-up treatments. The timing of cutting should occur and be species specific to avoid inadvertent spread of any mature seed (i.e. cutting shall not occur when viable seeds are present on target species). It is anticipated that mechanical cutting will comprise the majority of post-construction invasive management activities, particularly in addressing Phragmites. Cutting of Japanese knotweed shall only be done by hand, in a stalk-by-stalk manner, and all cut material must be exported from the site, as this species is capable of resprouting from small amounts of vegetative material.

Mowing may be conducted with hand-operated power tools or a walk-behind brush mower in any locations where target vegetation is located, provided however that mowing of Japanese knotweed is not acceptable. Alternatively, target vegetation may be mowed with a brush-cutting attachment on a machine such as an excavator or bobcat; however, such machinery shall not drive into or otherwise track through or across any BVW, Bank, or LUW in any manner which would compact or destabilize soils.

- *Weed Wrench:* The weed wrench is a tool which is used to uproot saplings of woody plants. The weed wrench grasps the base of the plant and uses a lever to uproot the entire plant including the roots. Using the weed wrench results in minimal disturbance to the surrounding soil and plants and is usually successful at removing the majority of the target plant's roots. Invasive plants to be targeted using this method include any woody species. This method will be used on scattered woody individuals of relatively small size.
- *Deadheading:* Deadheading is the removal of a plant's seed head before it goes to seed. This will not kill the plant but can prevent it from reproducing and spreading. It is also useful in depleting the plant's energy reserves for future herbicide applications. This method is useful primarily for herbaceous plants. At the moment this plan does not include deadheading, but it may be recommended during post-management monitoring.
- *Excavation:* In cases where the invasive species are particularly dense, the most efficient way to remove the bulk of the invasive plant species will be to remove the topsoil and root mass. Further, site work that is otherwise required for development can additionally serve this purpose. Removal of soil containing invasive species also removes the latent seed stock, thereby reducing the need for follow-up treatments of newly sprouting invasive plants. Any topsoil removed will be replaced with an equal amount of topsoil imported from off-site and inspected for evidence of invasive species prior to use.

Excavation will be employed heavily during construction-phase activities. Within the limit of work, dense stands of invasive species will be excavated along with their root masses and associated

topsoil. These excavated materials will be exported offsite and disposed of in accordance with any applicable regulations.

Excavation shall be employed only within the limits of work as shown on the approved plans. As such, impacts caused by excavation do not extend beyond areas that are otherwise approved for excavation associated with site work. Excavation shall not impact Bank, Bordering Vegetated Wetlands, or Land Under Water Bodies and Waterways.

Chemical Treatment Methods

Herbicide application is the most effective way to ensure the long-term removal of target species. All use of this method would be conducted by a licensed herbicide applicator with specific herbicide and concentrations as outlined on the herbicide's label. Deviation from the stipulations of the herbicide's label is a violation of federal law. The herbicides recommended for the target species in this management plan include Glyphosate (RoundUp Custom or equivalent) and Triclopyr (Garlon 4 or equivalent). Glyphosate is recommended for most cut-stem applications and as a foliar application for phragmites, knotweed, and oriental bittersweet. Triclopyr is preferred for foliar applications of most invasive trees and shrubs because it primarily affects broadleaf plants and not grasses or conifers. These herbicides are effective and have a short half-life. Both are registered by the US EPA and MA Department of Agricultural Resources for aquatic use and are proposed for use here for this reason. Appropriate use by a licensed herbicide applicator will have a limited impact on surrounding non-target vegetation. Herbicide treatment will not be employed until it has been demonstrated that mechanical treatment methods have not been sufficient. It is not anticipated that chemical treatment will occur often or regularly.

- *Cutting and Dabbing with Herbicide:* Cutting & dabbing involves removing most of the above-ground plant material as described above, and then immediately treating the remaining cut surface with herbicide. This is the easiest and most efficient method to remove invasive trees and shrubs with woody stems. It is also effective against Phragmites reeds. It is a very controlled treatment method, leaving the surrounding non-target native vegetation unaffected. This method also decreases the likelihood of regrowth and the need for repeated treatments.
- *Bundle, Cut, & Treat:* This method is similar to the Cut & Dab treatment method, but is used exclusively on densely clustered vegetation with tall, narrow stems/canes. In this management plan, it will be used to target Phragmites. Treatment involves bundling large groups of phragmites canes and tying them together with twine at approximately waist height. Then the canes are cut just above the twine. Finally, an appropriate herbicide is painted directly onto the cut surfaces of the canes. Applying herbicide directly to the cut surface of the stems is a very controlled treatment method and limits potential herbicide exposure to non-target vegetation. Bundling the canes prior to treatment allows for greater efficiency.
- *Stem Injection Herbicide Application:* Stem injection involves the use of an injector gun with a hollow needle to inject herbicide directly into the inside of plants with hollow stems. Examples of these injector guns include JK Injector Systems. Injecting herbicide directly inside the plant stem is a very controlled method of herbicide application and significantly limits risk of herbicide exposure to non-target plants. This treatment method may be used on Japanese Knotweed.

- *Foliar Herbicide Application (Spray)*: Foliar herbicide application is a method of control which involves a tank-mixed solution of herbicide diluted with water to a concentration specified by the herbicide's label. This treatment method will be used as a last resort only, after all other treatments are considered and eliminated as viable options. A non-ionic surfactant is added to improve coverage and penetration of the herbicide. A non-toxic forestry dye is also added to allow for visibility of treated areas. This solution is sprayed from a backpack tank sprayer to thoroughly wet the majority of the target plants' leaves. Application will be carefully targeted to invasive vegetation and will cease before herbicide drips from leaves. The herbicide is absorbed through the leaves and transported into the plant's tissues. This treatment method will be conducted by an herbicide applicator trained to use foliar spray appropriately and will have limited impact on surrounding non-target vegetation. All invasive plant species in this management plan will likely be targeted using foliar spray, primarily for repeat or follow-up treatments.

ONGOING MANAGEMENT:

All areas within the limit of work will be subject to ongoing invasive species management activities while native vegetation becomes established. All management techniques described above may continue to be used after the completion of construction to manage any regrowth of invasive species. Monitoring, as outlined below in Section I, will evaluate the effectiveness of invasive management activities and make recommendations for continued management. Repeated mechanical removal/cutting of invasive species is an acceptable method of control. However, it should be noted that naturalized areas should not be mowed in a wholesale fashion. If mechanical management is to be employed in these areas, it should be done by targeted cutting with hand-operated tools or equipment. Targeted herbicide application is also acceptable if mechanical removal is exhausted as a viable option. Again, any mechanical removal of Japanese knotweed shall only be done by hand, in a stalk-by-stalk manner, and all cut material must be exported from the site.

If necessary, additional native seed mix shall be spread, and/or potted specimens planted, within areas cleared of invasive species that are not otherwise specified to be planted as part of landscaping plans. Only native species (no cultivars) with an appropriate wetland indicator status for the area shall be planted in areas where invasive species have been thoroughly removed.

H. Wetland Replication

The Isolated Vegetated Wetlands (IVWs) proposed to be impacted will be replicated contiguous with the BVW system onsite in the southeastern corner of the property. Grading of the replication area shall be overseen by a qualified wetland scientist with authority to make field decisions in order to ensure sufficient wetland hydrology and a successful replication area. Wetland replication protocols shall adhere to the following sequence.

Step 1: Stake Limits of Work, confirm wetland flags in place & install ECB

Stake out limits of work for replication areas and confirm wetland flags are in place on site. Erosion control barriers shall then be installed in the form of straw wattles (or similar invasive-free barrier) placed at the limit of work for the replication area. These will remain in place and be maintained until the areas are completely stabilized and then may be removed after approval of the Conservation Commission or its Agent.

Step 2: Remove trees and vegetation

Save woody debris specimens and stockpile for reuse. Clear and remove all remaining vegetation as necessary within the replication areas and the IVW alteration areas in preparation for excavation and grading. If native vegetation can be retained, it shall. Access to the replication area will be obtained via an existing cart path, which will avoid the destruction of vegetation to the greatest extent possible.

Step 3: Excavation of IVW Alteration Areas

Pull all invasive plants and shrubs prior to transporting soils. Excavate IVW alteration areas and transport organic-rich topsoils to the wetland replication area for reuse if possible. Topsoil originating from areas known to contain invasive species shall not be reused.

Step 4: Excavation of new BVW Replication Area

An excavator or backhoe shall remove existing soils up to the edge of the staked BVW replication area boundary. Excavation will continue until redoximorphic features are reached in the soil profile. Once redoximorphic features are reached, excavation will cease. Subsoil of the C-horizon shall be loosened prior to Step 5 to ensure soils are not compacted prior to topsoil placement. Care will be taken to remove any invasive roots and plants within the area to ensure soils used in the replication area are uncontaminated.

Step 5: Final Grading of Replication Area

The target finished elevation of the replication area is anticipated to be approximately 270', subject to final grading plans and observed field conditions. Upon removal of existing soils down to the proper depth (as determined by the wetland scientist based on the presence of redoximorphic features in the soil profile), 6-12" of organic rich topsoil will be spread throughout the replication area. Soil excavated from the IVW impact areas may be reused for this purpose. If necessary, supplemental material to be added to the replication area shall consist of a 50:50 mix of loam and organic material with an organic content between 12 and 20%. This material shall be placed within the replication area to a total depth 6-12" and even with the surrounding proposed elevation on design plan, to be determined by the supervising wetland scientist. Final grade shall be confirmed to be proper by the wetland scientist prior to plantings. Placement of soil shall be such that no equipment drives over, or compacts placed soils. Final grading will result in microtopographic relief of pits and mounds. Topography will create areas that pool and flood during heavy rain events and see water near the surface during the wet seasons. Slopes around the replication area shall be graded to less than 2H:1V where practical and shall have erosion control mats installed as necessary. The wetland scientist onsite has authority to adjust grade based on field observations during construction in order to ensure sufficient wetland hydrology within the replication area.

Step 6: Call for inspection

After grading activities are complete, the supervising wetland scientist shall contact the Commission for an inspection and approval of final grades and proposed planting stock prior to planting.

Step 7: Place woody debris and boulders

Woody debris and boulders, if available, shall be randomly placed throughout the replication area to provide cover for wildlife.

Step 8: Planting

Precise siting of plants may be determined by the wetland scientist in the field prior to installation. All plantings shall be distributed throughout the area according to the attached planting plan; trees spaced at 10-15' on center; shrubs spaced at 6-10' on center. All plantings will be removed from burlap sacks, wire cages and plastic containers prior to planting. Each plant will have its roots loosened prior to planting to encourage root

Proposed Plantings for Replication Area (+/- 7,145 s.f.)

Common Name	Scientific Name	Number	Minimum Size
Trees (n= 35)*			
Red Maple (FAC)	<i>Acer rubrum</i>	15	3'
Yellow Birch (FAC)	<i>Betula allegheniensis</i>	10	3'
Swamp White Oak (FACW)	<i>Quercus bicolor</i>	10	3'
Shrubs (n=75)*			
Black Elderberry (FACW)	<i>Sambucus nigra</i>	15	1-2 gal. pot
Highbush Blueberry (FACW)	<i>Vaccinium corymbosum</i>	15	1-2 gal. pot
Winterberry (FACW)	<i>Ilex verticillata</i>	15	1-2 gal. pot
Spicebush (FACW)	<i>Lindera benzoin</i>	15	1-2 gal. pot
Swamp Azalea (FACW)	<i>Rhododendron viscosum</i>	15	1-2 gal. pot
Seed Mix- New England Wetland Plants WetMix			6 lbs.

*Planting species and seed mixes may be substituted with similar native species with the same wetland indicator status if certain species are unavailable at the discretion of the supervising wetland scientist.

I. Monitoring

Annual monitoring reports will be prepared by a qualified wetland scientist for a period of 3 growing seasons after completion of restoration activities for the areas that will be left to naturalize. This monitoring program will consist of early summer and early fall inspections and will include photographs and details about the vitality of the mitigation and restoration areas. Monitoring reports shall describe, using narratives, plans, and color photographs, the physical characteristics of the areas with respect to stability, survival of vegetation and plant mortality, areal extent and distribution, species diversity and vertical stratification (i.e. herb, shrub and tree layers). The monitoring program may utilize sampling plots or transects representative of the site to document species diversity, cover, etc. for snapshots of site conditions and/or for documenting change over time.

All areas will be monitored for invasive species to ensure the success of native plantings. Reports shall be submitted to the Commission by the end of each calendar year. Specifically, monitoring reports shall document the status of the following:

- Invasive species management success
 - o Upon completion of the initial implementation of the project, three monitoring plots shall be established in areas representative of the site; a data sheet (comparable to the DEP Bordering Vegetated Wetland Determination Data Form) shall be completed at each monitoring plot during each monitoring event
- Regrowth and/or spread of invasive species
 - o To include specific locations of focus identified with photos and/or graphics
- Establishment of native vegetation (plantings, seeded areas, and volunteers) in all planted areas
- Development of hydrology and hydric soils within the replication area
 - o To include documentation of a soil profile within the replication area
- Overall soil stability and any observed erosion control concerns
 - o To include an attestation that the entire limit of work has been inspected

Monitoring reports shall also recommend corrective actions to be taken if:

- Invasive species regrowth and/or spread appears problematic
 - o (i.e. if invasive vegetation has spread to new areas or if control methods have been ineffective)
- Establishment of plantings or seed appears insufficient
 - o (i.e. if significant die-off of plantings or areas devoid of herbaceous cover are noted)
- Soil stabilization is poor or if erosion issues are noted
 - o (i.e. if erosion or sedimentation is observed)
- The replication area does not exhibit sufficient hydrology
 - o (i.e. the replication area does not exhibit indicators of wetland hydrology)

The revegetation and naturalization proposed as part of this project will be deemed a success if all areas that were planted and/or seeded exhibit at least 75% cover by native vegetation.