

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES

102 Grove Street
Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

Bordering Vegetated Wetland & Buffer Zone Restoration Protocols

**Cavicchio Greenhouses Fire Site
110 Codjer Lane,
Sudbury, MA**

Prepared for:
Cavicchio Greenhouses, Inc.
Paul Cavicchio and Rachel Harrington,
110 Codjer Lane
Sudbury, MA 01776

Prepared by:
ECOTEC, INC.



Paul J. McManus, PWS, LSP
President



Kate O'Donnell, WPIT
Environmental Scientist

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INTRODUCTION

The following protocol has been prepared by EcoTec, in accordance with the Emergency Certification issued by the Sudbury Conservation Commission on November 22, 2022, to provide restoration of Buffer Zone and Bordering Vegetated Wetland (BVW) impacted by a fire at Cavicchio Greenhouses at 110 Codjer Lane, Sudbury (a.k.a., “the site”). The Emergency Certification was issued to address the required remediation of the area under the Massachusetts Contingency Plan (MCP) (310 CMR 40.000) and associated restoration of the wetland that was impacted by the fire at the site. The fire resulted in the burning of several trees as well as the release of fertilizers into the wetland. The protocols are based upon observations made by EcoTec, Inc. on November 17, 2022, and January 19, 2023, and have been designed to provide comprehensive restoration of the altered Buffer Zone and BVW on the site, including planting plans and erosion and sediment control.

FINDINGS

EcoTec was present on the site on the previously referenced dates to determine the extent of the disturbance within the BVW resource area, delineate the disturbed resource area, and to collect information to prepare the following restoration protocols. EcoTec delineated the boundary of the BVW area. The portions affected by the fire are located between wetland flags A7 and A22. Additional details regarding the wetland delineation are included in the Wetland Resource Evaluation report by EcoTec, Inc, dated December 19, 2022. Additionally, during EcoTec's evaluation, the number of trees with significant fire damage, as well as the total disturbed area within the BVW and within the Buffer zone, were estimated. Based upon observations made during the site inspection, EcoTec approximated the number trees that presented a safety hazard due to the fire damage and determined that approximately twelve (12) red maple and white pine trees, ranging from 6 inches to thirty-six (36) inches dbh, had significant fire damage. Nine (9) additional clumped and split red maples along the slope above the BVW ranging from 3 inches to 10 inches dbh, also had significant fire damage. These trees, as well as any other trees on the site that were determined to be a safety hazard, were removed from the site on January 18 and 19, 2023 by Weston Landscape & Tree Co., Inc. The disturbed area within the BVW was roughly measured to equal approximately 4,600 square feet and the disturbed area within the Buffer Zone was approximately 2,250 square feet. This BVW area and Buffer Zone area shall be restored under the protocols below.

Remediation work at the site to remove the released fertilizer was completed at the site under the direction of Jeffrey Garretson, LSP of Common Sense Environmental, Inc. Remediation consisted of removal of ash, fertilizer pellets and associated leaf litter with the use of a vactor truck operated from the paved parking lot. Only a trace of the underlying soil in the BVW and on the slope was removed.

In addition to the vactor removal operation, it was necessary to cut down the trees described above. Photographs of the site immediately following the tree removal are provided below. As noted in the photographs, the trees were cut to a sufficient height to eliminate the safety hazard, but no stumps were removed. For the red maples in particular, it is likely that at least some of the stumps will exhibit coppice growth and send up multiple live shoots.

BVW RESTORATION PROTOCOL

The following restoration protocol has been designed to provide for the restoration of areas altered by the required remediation of fertilizer-impacted and fire-impacted wetland and buffer zone areas.. This includes, native woody and herbaceous plantings, and surface stabilization of the 4,600 square foot BVW restoration area. Photo 1, below shows the delineated boundary of altered BVW (blue flags) and the lower limit of the BVW to be restored (edge of silt fence). Please note that the erosion control barrier installation and tree removal were conducted during approved remediation work on January 18 and 19, 2023.



Photo 1. Southeasterly view of disturbed area. The delineated boundary of BVW is shown with the blue flags and the lower limit of the BVW to be restored is shown at the silt fence and straw wattle limits. The upper limit of the Buffer Zone to be restored is the edge of the existing pavement.



Photo 2. Northwesterly view of disturbed area. The delineated boundary of BVW is shown with the blue flags and the lower limit of the BVW to be restored is shown at the silt fence and straw wattle limits.

It is EcoTec's opinion that upon completion of the BVW restoration, the subject restoration area shall restore and protect the interests of the Wetlands Protection Act and Bylaw and shall provide similar functions and values of the Wetland Resource Areas and Riverfront Area prior to the documented impact. We note that large canopy trees were impacted and had to be removed, and that the habitat provided by these trees will not be restored for many years. However, if the anticipated red maple coppice growth occurs, the area will become a much denser thicket than previously existed, and provide thick cover habitat.

The protocol for restoration of the impacted BVW is as follows:

1. A qualified wetland scientist will be on hand during the restoration work to ensure that the work is completed with minimum impact to underlying soils and vegetation.
2. Restoration work shall commence as soon as possible and is anticipated to take 1 to 2 days to complete, and in no event is anticipated to take more than one contiguous week. Temporary stabilization to include tarpaulins, erosion control blanketing, mulch, etc. shall be installed at the end of each workday as deemed necessary if rain is imminent until the impact area restoration is completed, and temporary slope stabilization has occurred.
3. A staked 10" to 12" straw wattle and a silt fence sediment barrier was installed at the limit of work prior to earth work and fill removal. The silt fence and wattle will be left in place until the restoration area is stable with vegetation and upon approval for removal from the Sudbury Conservation Commission.
4. The woody plantings proposed in the table below shall be planted within the restoration area. The selected species are native to the region and indigenous to the site. Planting within the restoration area will be done only during the beginning (April 15 through June) or end (September 1 to November 15) of the growing season. Planting in the mid-growing season is only acceptable if irrigation is provided. Planting materials shall be obtained from nursery stock. The shrubs will be planted with the average spacing between shrubs approximately 6 feet on-center. The saplings shall be planted 15-20 feet apart. The planting holes shall be approximately 1.5 times the diameter of the planting root mass. The herbaceous plantings shall be planted in clumps of 2 to 3 specimens per clump. It is proposed that the red maples not be planted during the first growing season, and that the existing stumps be evaluated for sprouts after one growing season. Red maple saplings will only be planted where there is not vigorous coppice sprouting from the stumps.

Table 1: 4,600 Square Foot BVW Restoration Planting Table

SPECIES; SIZE; SPACING	NUMBER
Saplings; 4 to 6' height, min. 2-gallon container or balled & burlapped; +/- 15-20' on-center avg. (TO BE PLANTED AFTER ONE GROWING SEASON, ONLY IN AREAS WITHOUT STUMP SPROUTS)	25
Red Maple (<i>Acer rubrum</i>)	
Shrubs; min. 3' in height, min 1 gal container; 6' on-center average spacing	total*
Highbush blueberry (<i>Vaccinium corymbosum</i>)	125
Arrow-wood (<i>Viburnum recognitum</i>)	
Sweet pepperbush (<i>Clethra alnifolia</i>)	
Nannyberry (<i>Viburnum lentago</i>)	
Common winterberry (<i>Ilex verticillata</i>)	
Silky dogwood (<i>Cornus amomum</i>)	
Red-osier dogwood (<i>Cornus stolonifera</i>)	
Swamp Azalea (<i>Rhododendron viscosum</i>)	
Herbaceous; 2-inch plugs	
Cinnamon fern (<i>Osmunda cinnamomea</i>)	50
Sensitive fern (<i>Onoclea sensibilis</i>)	50

* Depending upon availability from local nursery stock, at least five (5) of the listed shrub species will be selected, with at least twenty (20) specimens of each selected species planted, for a total of at least 125 shrubs (minimum).

5. Upon completion of the shrub plantings, a 2-inch to 3-inch layer of partially decomposed leaf mold compost shall be added to the restoration area to restore the duff layer and promote moisture retention.
6. Upon completion of planting and leaf compost, stick/limb debris shall be placed randomly within the restoration area and to provide for wildlife cover, forage, and basking opportunities.

BUFFER ZONE RESTORATION PROTOCOL

The following restoration protocol has been designed to provide native species planting, and stabilization of the approximately 2,250 square foot disturbed Buffer Zone area on the site. Upon completion, it is anticipated that the subject restoration area shall restore and protect the interests of the Wetlands Protection Act and Bylaw and shall provide similar functions and values of the Buffer Zone prior to the documented impact. The protocol for restoration of the impacted Buffer Zone is as follows:

- a. A qualified wetland scientist will be on hand during the restoration work.
- b. Restoration work shall commence as soon as possible and is anticipated to take 1 to 2 days to complete, and in no event is expected to take more than one contiguous week. Temporary stabilization to include tarpaulins, erosion control blanketing, mulch, etc., shall be installed at the end of each workday when rain is imminent until the impact area restoration is completed and temporary slope stabilization has occurred.
- c. Following remediation activities, a 2-inch layer of partially decomposed leaf mold compost or high-quality topsoil shall be added to the restoration area.
- d. The woody plantings proposed in the table below shall be planted within the Buffer Zone restoration area at the spacing provided below. The selected species are native to the region and indigenous to

the site. Planting within the restoration area will be done only during the beginning (April 15 through June) or end (September 1 to November 15) of the growing season. Planting in the mid-growing season is only acceptable if irrigation is provided. Planting materials shall be obtained from nursery stock. The saplings and shrubs shall be mixed and planted at an average 10 feet on-center spacing between the plants. The planting holes shall be approximately 1.5 times the diameter of the planting root mass. The area will then be lightly raked for good seed to soil contact, seeded with a New England Conservation/Wildlife Mix at ½ the recommended application rate, and no closer than 5 feet from the woody plantings to prevent choking of the plantings.

Table 2. 2,250 Square Foot Buffer Zone Restoration Planting Table	
SPECIES; SIZE; SPACING	NUMBER
Saplings: 2-4 ft in height; Container or balled and burlapped; Planted at 15-20 foot on-center spacing. Choose at least two of the species below:	
Northern red oak (<i>Quercus rubra</i>)	10 total saplings
Black birch (<i>Betula nigra</i>)	
White pine (<i>Pinus strobus</i>)	
White oak (<i>Quercus alba</i>)	
Shrubs: 2-4 ft in height, Container or balled and burlapped; Planted at 10-foot on-center spacing between saplings; Choose at least 2 of the species below:	
Witch-hazel (<i>Hamamelis virginiana</i>)	22 total shrubs
Alternate leaf dogwood (<i>Cornus alternifolia</i>)	
American hazelnut (<i>Corylus americana</i>)	
Herbaceous seed mix: Lightly rake soil, apply seed at 12.5 lbs./acre (1/2 rate), and then lightly rake over. Stabilize with stapled erosion control blanketing.	
New England Conservation/Wildlife Mix	0.5 lbs

- e. Upon completion of the plantings, the sloped portion of the restoration area shall be covered with a stapled erosion control blanket.
- f. A restoration completion report shall be provided to the Conservation Commission.

RESTORATION MONITORING

A qualified wetland scientist shall inspect the restoration areas two times during the growing season (late spring and fall) for 2 years following the completion of the mitigation work. A written report shall be submitted to the Sudbury Conservation Commission at the end of each growing season. The inspections shall include a soil stability evaluation and vegetation survey to determine the health and vigor of the existing vegetation and plantings. The report shall include all data collected during the inspections and photographs and shall include recommendations for additional plantings or other remedial work as required, to ensure successful restoration.

After the restoration areas have become vegetatively stabilized, and following approval of the Sudbury Conservation Commission, the wattle netting and all wooden stakes will be removed and disposed of properly.

KO/E/P/ Sudbury Codjer Ln. 110 Restoration Protocol 2023.01.30