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Invasive Removal and Control- 20 Henry Graf Jr. Road

The invasive management program's purpose is to remove the invasive woody plants growing within two areas shown on the project landscape plan and maintain the planted and seeded areas free of these invasive plants. Additionally, the plan seeks to control the growth of phragmites within these areas. Over time, if the treatment is successful, the methodology may be expanded to other areas of the site. It is important to note that since invasive plants are present throughout the area, total eradication for the long term is not likely. By following this protocol, the native plants should be able to thrive without being hampered by the existing and recurring invasive plants. Generally initial treatment will be done after rough grading is complete, since the initial site work will remove much of the existing invasive plants. Species noted on site or nearby that could populate the area include, but are not limited to Autumn olive (*Elaeagnus umbellata*), Common Reed (*Phragmites australis*), Oriental bittersweet (*Celastrus orbiculatus*), Common buckthorn (*Rhamnus cathartica*), bush honeysuckles (*Lonicera* spp.), Norway maple (*Acer Platanoides*), Black locust (*Robinia pseudoacacia*) and multiflora rose (*Rosa multiflora*).

The herbicides to be used are the aquatic safe versions of imazapyr (such as Habitat) for Common Reed (which may be substituted with aquatic safe Glyphosate such as Rodeo) and aquatic safe triclopyr (such as Renovate 3) for woody plants. Note that application of herbicides to herbaceous plants must be done during the growing season, and is most effective from June through September. Triclopyr can be applied to woody vegetation year-round, but is most effective in June through September. These herbicides should be applied by a Massachusetts Certified applicator. The recommendation is to use the triclopyr on woody vegetation and imazapyr on herbaceous plants.

HEC has developed this protocol to prevent any impact to non-target species and prevent water quality impacts. In some areas, the invasive plants on site are so dense that we the protocol involves both summer and fall treatment for the first two years.

Invasive Species Removal Methodology

June/July of first year or at beginning of construction if during planting season

1. Mark outer limits of removal area as shown on approved plan.
2. Mark example invasive plants and/or go over how to tell invasives with crew.
3. Cut and remove dead growth from prior season from areas of phragmites.

4. For woody plants: In 25-foot linear sections apply herbicide as follows (NOTE see item 5 for more detail on herbicide mixing and application.):
 - a. For woody invasive plants with a stem diameter of less than ½ inch use a low-pressure nozzle to apply triclopyr to downward cuts in the bark and as a foliar application to maximize absorption. Take care not to impact non-target native plants.
 - b. For stems over ½ inch application of herbicide to downward cuts in the bark should be sufficient and may be supplemented with foliar application to lower branches easily reached.
 - c. Observe plants after treatment for 2 to 3 weeks. Remove any dead plants and retreat any invasive plants that were missed, or failed to fully die off.
 - d. Invasive species shall only be disposed of in a manner that renders them nonliving and nonviable.
 - e. Plants should be chipped and either composted on site outside of Conservation Commission jurisdiction or removed from site for off-site composting, use as biomass fuel, etc...
 - f. Ensure that any plants with viable seeds are transported to the chipper in tarps to avoid spreading seeds.
 - g. Start from top of bank and work left to right down towards water/wetland, removing brush as you go.
 - h. Do not pull bittersweet from native vegetation that it is wrapped around. Bittersweet vines entangled in vegetation should be pruned out of vegetation or left in place to dry up.
5. Treat all invasive stems while leaving the plant standing by cutting downward into the stem in several places and applying the herbicide directly into the cut within 15 minutes of the cut. The herbicide should be mixture should be 25% Triclopyr in its aquatic safe formulation (such as Renovate 3 mixed with water at a 1:1 ratio) and a marking dye. Do not exceed 8lbs of triclopyr per acre (2.67 gallons).
 - a. If it has been longer than 15 minutes since the cut, make fresh cuts before treating,
 - b. Do not use herbicide in temperatures above 85 degrees or when rain is forecast within 24 hours.
 - c. All herbicide for woody plants is to be applied using the cut bark method, with supplemental foliar application. Herbicide is to be contained in spill proof containers during application to avoid any spills or discharges to the brook or non-target species.
 - d. Move on to the next 25-foot section, Multiple teams may work on 25-foot sections concurrently.
6. Evaluate areas for stabilization needs based on density of remaining native plants. Stabilization will be based on best professional judgement of environmental monitor based on conditions after removal of vegetation. Stabilization will include one of the following methods (or in some cases a combination)
 - a. Plant native plants consistent with the landscape plans for the project. (Plants sourced from New England Wetland Plants or equivalent)
 - b. Install jute matting or straw mulch (with netting where appropriate)
 - c. Seed with native conservation mix
7. For Common Reed: After growth has reached 2 to 3 feet, apply herbicide according to mixing instructions on the label with a low-pressure nozzle or using the bloody glove method (a cotton glove over a protective inner rubber glove soaked in herbicide) to avoid

impacts to non-target plants. In particular, there is speckled alder growing amongst the phragmites near Henry Graf Jr. Road. Follow up with additional treatment in 3 weeks.

Late September through mid October (or following June if project initial treatment was in the fall:

1. Evaluate site for invasive plants and re-mark all remaining invasives with survey marking paint (bright pink or orange).
2. Repeat above procedure if necessary, to kill off any remaining invasive or new growth.

Monitoring:

First Year

While work is ongoing in the summer, a wetland scientist will work with the contractor to ensure plant identification is accurate and to review procedures. Monitoring will be on going after treatment with re-treatment required for any new growth. Photo documentation will be taken.

Year 2

Photograph treatment areas and document effectiveness of treatment will continue. Since the goal is to have no woody invasive plants remaining within the proposed areas, the monitoring will document any observed live growth.

Follow up monitoring should be conducted after leaf out in late spring. It is likely that the soil in some areas contains sufficient seed stock so that there will be multiple small invasives. These should be removed by hand-pulling after the monitoring inspection, bagged and disposed of. (In the event cut stems from prior years treatment show signs of growth, they should be treated with herbicide following the procedures above.)

Note for permit close out, the areas should be 95% free of invasive woody plants and there should be no “stands” of phragmites that are limiting growth of non-target species.

Ongoing Maintenance:

After treatment has essentially pushed invasive plants to a minor constituent within the treatment areas, the ongoing landscape maintenance should prevent invasive plants from returning. Once per year, the landscaper should pull woody invasive growth or use the above methods to apply herbicide. Phragmites should be cut when it reaches 3 feet within the control areas. Larger stands of phragmites can be treated as described above. Stubborn smaller areas can be treated using the bloody glove method.