Invasive Species Management Plan

4 Wildmeadow Road
Boxford, Massachusetts

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Applicant:
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W&S Project No:
BOXF-0087A

1. Initial Inventory of Material to be Removed

1.1 The first task to be completed within the treatment areas will be to inventory the existing conditions of the treatment areas and assess what invasive species are scheduled to be removed from the site. A Professional Wetland Scientist will mark each plant, or cluster of plants, to be removed with orange surveyors tape.

1.2 Invasive species of concern at 4 Wildmeadow Road:

1.2.1 Asiatic Bittersweet (*Celastrus orbiculatus)*

1.2.2 Common Reed (*Phragmites australis)*

1.3 Information sheets for each species attached.

2. Removal of Invasive Plant Material from Treatment Areas

2.1 Use whole plant removal techniques for the Asiatic Bittersweet, the entire plant will be removed from the ground by hand pulling. Material will be cut, bagged and removed from site or removed for composting and or burning. It may be necessary to cut the base of vines that are entangled in trees so that they can be removed at a later date. Trying to remove vines that are too entangled can often times damage the tree. Once the cut vines are dead, they can often times be removed more easily.

2.2 Roots of wood plants are to be removed carefully, and with slow, extraction methods, using hand tools.

2.3 Once roots are removed, hand tools are used to remove any broken roots by hand by a thorough inspection of the treated area is made to ensure the maximum removal of broken roots and twig material is advanced.

2.4 The clusters of Common Reed shall be cut, using hand tools, just before the end of July. One of the best ways to manage the Common Reed without the use of herbicides is to exhaust the root system. Repeated cutting of the green growth above the ground will eventually exhaust the root system. If cut just before the end of July, most of the food reserves produced that season are removed with the aerial portion of the plant. It is important to note that this method needs to be carried out annually for several years.

2.5 Careful attention must be taken to remove cut shoots to prevent re-growth.

3. Stabilization of Treatment Area

3.1 The treatment area(s) shall be seeded and straw mulched immediately, if applicable, to stabilize the area from erosive forces.

3.2 The treatment areas should be seeded with a drought tolerant, native grass seed mix at approximately 4 to 5 times the normal application rate to insure a dominant native plant community within the disturbed area. A shade or sun tolerant seed mix should be used where conditions dictate. A mixture of all three (3) seed mixes can also be used in areas where conditions vary.

3.3 Salt hay should be hand cast over the area to establish protection over the newly seeded areas and to act as a velocity attenuation system to reduce rilling and erosive forces of rain and/or snow and ice melt.

4. Long Term Monitoring and Aftercare

4.1 Routine surveys of each of the treatment areas will occur on a monthly basis during the first six months after initial removal of the invasive species material.

4.2 Inspections will be focused on removal of new invasive material principally starting from seed sprouts remaining from the plant extraction process.

4.3 Seedlings should be handpicked and placed in plastic bags or use 5-gallon plastic buckets to contain the material. Harvested material should be either composted or burned according to local fire department rules and regulations.

4.4 Routine surveys and harvests of invasive species should be made on a monthly basis for the first 6 months, post removal and quarterly thereafter until such time that the environmental monitor is confident that invasive species are controlled and new invasions are limited.

4.5 Annual inspection should then follow for the remainder of the 5-year monitoring period following the same harvesting protocol as in the initial inspection process.

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American and Oriental Bittersweet Identification

Invasive species are one of the greatest threats to native ecosystems. They can crowd out native species and change the natural nutrient cycling processes that take place in ecosystems.


Oriental bittersweet

One of the best ways to combat invasive species is by identifying small infestations and removing them.

One invader threatening midwestern ecosystems is oriental bittersweet (*Celastrus orbiculatus*). This woody vine was introduced to the eastern United States in the mid-1800s. It has spread from the east to the south and west and is now moving into midwestern natural areas. Oriental bittersweet can be found in a variety of habitats, from roadsides to interior forests and sand dunes. It has the ability to girdle and overtop adjacent vegetation – often to the detriment of native species. To halt the spread of oriental bittersweet, significant control measures are needed.

However, a native bittersweet species, American bittersweet (*Celastrus scandens*), can be mistaken for oriental bittersweet. Although American bittersweet is also a


American bittersweet

vine and climbs on nearby vegetation, it does not appear to grow as rapidly or as large as oriental bittersweet. In the northeastern United States, American bittersweet is declining because of habitat change and possible hybridization, while in the Midwest, it is still common.

Because the two bittersweet species look so similar, there can be difficulty knowing which plants to target for control. Using fruit and leaf characters, the two species can be discriminated from each other. However, certain traits are more reliable for correct identification than others. Classically, the position of the fruit and flowers on the stems has been cited as the most definitive means of discriminating between the species.

Oriental bittersweet has fruit and flowers located in the leaf axils along the length of the stem. American bittersweet, however, only has fruit and flowers in terminal clusters. There is also a difference in the color of the capsules surrounding the ripened fruit in the fall. Oriental bittersweet has yellow capsules, while those of American bittersweet are orange. Another difference in color is the pollen color of the male flowers. The pollen of oriental bittersweet is white while that of American bittersweet is yellow.

Some less definitive fruit traits for discrimination are size of the fruits and number of seeds per fruit. American bittersweet has generally larger fruit than oriental bittersweet. If fruits have a volume of greater than 250 mm^3, there is a 90% probability of a plant being American bittersweet, while if the fruit has a volume of 115 mm^3 or less; it has a 90% chance of being oriental bittersweet. Values in between these numbers overlap to some extent between the species. Similarly, if the fruit has one or fewer seeds, it is 90% likely to be American bittersweet, while five or more seeds have a 90% chance of being oriental bittersweet. The greater number of seeds of oriental bittersweet gives it a reproductive advantage over the native species.

The problem with using fruit and flower traits for discriminating between the two species is that, for fruits, only mature female plants have this character available for identification. In terms of flowers, only mature male and female plants have these present, and only for a brief time of the year during the spring.

Vegetative traits apply to plants regardless of their sex or maturity. The most definitive vegetative trait is the posture of the leaves at leaf out of the first buds in the spring. The leaves of oriental bittersweet are conduplicate (two sides of the leaf folded against each other) and tightly packed in the bud when they emerge in the spring. The leaves of American bittersweet are involute (leaf margins rolled in like a scroll) and not as tightly packed in the bud.

Other leaf traits are not as reliable as the leaf-out posture. Although the ratio of length-to-width (length:width) of the leaves is generally greater for American bittersweet, this trait is quite variable. If the length:width of the leaf is greater than or equal to 2, there is a 90% chance of the plant being American bittersweet, while if the ratio is less than or equal to 1.4, there is a 90% chance of it being oriental bittersweet. The tips of the leaves of American bittersweet are also generally longer than those of oriental bittersweet. Plants with leaf tips of 1.5 cm or greater have a 90% chance of being American bittersweet, while plants with leaf tips of 0.3 cm or less have a 90% chance of being oriental bittersweet.

By using these traits, plants could be marked at the appropriate time of year (spring or fall) for control at a later point. In this manner the invasive species can be targeted without harming the native. The key on the next page summarizes the key traits for discrimination of these two species in the field.

U.S. Department of the Interior
U.S. Geological Survey

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Is plant in fruit? **Yes** → Are ripe fruit capsules orange? → *C. scandens*

yellow? → *C. orbiculatus*

No → Are fruit borne in terminal panicles? / axillary cymes?

C. scandens

C. orbiculatus

Do fruits have ≤ one seed?* → *C. scandens*

≥ five seeds?* → *C. orbiculatus*

Is plant in bloom? **Yes** → Are flowers borne in terminal panicles? → *C. scandens*

No → axillary cymes? → *C. orbiculatus*

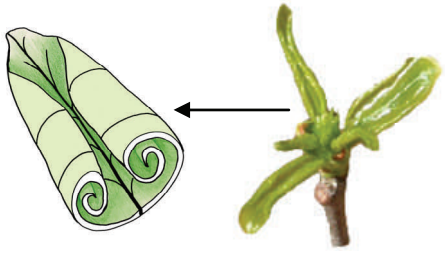
Are flowers staminate? **Yes** → Is pollen yellow? / white?

C. scandens

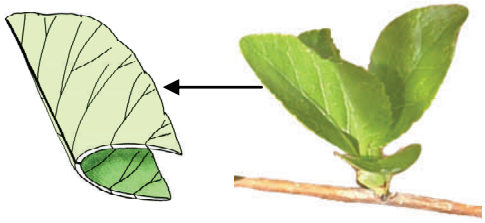
C. orbiculatus

Is plant leafing out? **Yes** → Are leaves involute? / conduplicate?

No



C. scandens



C. orbiculatus

Are mature leaves present? **Yes** → Is length:width ≥ 2.0?* → *C. scandens*

Is length:width ≤ 1.4?* → *C. orbiculatus*

No → Is leaf tip > 1.5 cm?* → *C. scandens*

Is leaf tip < 0.3 cm?* → *C. orbiculatus*

If dormant season, only fruit characters applicable

* Indicates a 90% probability of correct identification based on the data collected for this study.
Colors in text boxes are to be used as a guide only, actual colors seen in the field may differ.

Collaborators: Noel B. Pavlovic, Stacey Leicht Young, Ralph Grundel, and Krystalynn J. Frohnapple

USDA NRCS
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Natural Resources Conservation Service

Plant Fact Sheet

COMMON REED
Phragmites australis (Cav.) Trin. ex Steud.

Plant Symbol = PHAU7

Contributed By: USDA NRCS National Plant Data Center

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Considered a noxious weed in several states.

Alternate Names
giant reed, giant reedgrass, Roseau, roseau cane, yellow cane, cane, *Phragmites communis*

Uses
Although coarse, common reed is readily eaten by cattle and horses. It provides high quality warm-season forage but becomes tough and unpalatable after maturity. Animals grazing this grass during winter should be fed a protein concentrate. This plant has been used in the Southwest for lattices in constructing adobe houses. Indians have used the stems for arrows, weaving mats, and carrying nets.

Status
Considered a noxious weed in several states. Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status, such as, state noxious status and wetland indicator values.

Description
Grass Family (Poaceae). Common reed is a warm-season, rhizomatous, stoloniferous perennial, native to the U.S. The height ranges from 6 to 12 feet. The leaf blade is flat; smooth; 1/2 to 2 inches wide; and 6 to 18 inches long. The seedhead is an open panicle with a purplish or tawny and flaglike appearance after seed shatter. Common reed is readily identified by its height. It is the tallest grass in southern marshes and swamps.

Management
This grass cannot withstand prolonged heavy grazing. Its upright growth makes it easy for livestock to remove all the leaves. For maximum production, no more than 50 percent of current year's growth by weight should be grazed off during growing season. Common reed tolerates burning if water is above soil surface. Burning is not essential for management. Water control that lowers the water level, but does not drain the area, increases production. Grazing deferments of 60 to 90 days every 2 to 3 years during the growing season improve plant vigor.

Establishment
Growth starts in February in some locations. Foliage stays green until frost. New shoots grow from buds at nodes of old, stems, stolons, and rhizomes. It grows in marshes and swamps, on banks of streams and lakes, and around springs. It grows best in firm mineral clays and tolerates moderate salinity. It does best if water level fluctuates from 6 inches below soil surface to 6 inches above. Common reed is often codominant with big cordgrass (Spartina *cynosuroides)* on the gulf coast marsh rangelands.

Cultivars, Improved and Selected Materials (and area of origin)
Please contact your local NRCS Field Office.

Reference

Leithead, H.L., L.L. Yarlett, & T.N. Shiflett. 1976. 100 native forage grasses in 11 southern states. USDA SCS *Agriculture Handbook No. 389*, Washington, DC.

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For more information about this and other plants, please contact your local NRCS field office or Conservation District, and visit the PLANTS Web site<http://plants.usda.gov> or the Plant Materials Program Web site <http://Plant-Materials.nrcs.usda.gov>