



Weston Conservation Commission Invasive Plant Management Policy

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The following information was excerpted from *Principles and Policies for Management of Lexington Conservation Land, Mass Audubon, 2015* and modified and updated for Weston.

Invasive Species Management

Invasive species pose one of the greatest threats to the biodiversity, natural landscapes, agricultural interests, recreational activities, and scenic beauty of our conservation properties here in Weston. There are many ways to deal with this threat, including initial prevention, early detection, and control through manual removal, mechanical treatment, pesticide application, biological control, grazing, and fire. Invasive species are difficult to eradicate. Without multiple seasons of dedicated management, infestations will rebound despite one's best efforts. Prioritization of targeted management is essential to successfully manage an area for invasive species.

Invasive species control efforts can be divided into two categories: species-based and location-based. The species-based approach will focus on individual species no matter where they occur on conservation properties. The five elements of the species-based approach are:

- Preventing invasion by new species;
- Early detection of new invasions;
- Eliminating or effectively controlling species with recent or limited presence;
- Limiting the spread of highly noxious invaders; and
- Directing effort at species that are particularly susceptible to control.

Location-based efforts will focus efforts on all invasive species within specific areas of the conservation property. The three elements are:

- Protecting sensitive habitats;
- Establishing invasive species-free zones; and
- Restricting the spread and reducing the extent of heavily invaded zones.

The approaches will overlap at times and taken together will define a comprehensive approach to reducing the presence of invasive species across our conservation properties.

Management of invasive species should follow an adaptive approach – a continuous process that allows for flexibility in management based on the inclusion of the most recent management options. As new information becomes available on plant biology and treatment methods, it will be incorporated into future management decisions. An adaptive approach will also allow property managers to learn from the efficacy of current treatment methods and adjust future management actions.

Species-Based Efforts

Prevent spread of existing invasive species and introduction of new invasions

The primary element of a proactive prevention plan is limiting the introduction of new invasive species to individual conservation properties. Spread of existing invasive species will be reduced by limiting soil disturbance and implementing restoration when soils are disturbed, by washing equipment that has been used in heavily invaded areas before moving to an un-invaded area, and by implementing practices to reduce likelihood of seed spread by individuals working on invasive species control projects. Soil disturbance from plowing, tree removal, trail building, etc., should be limited, and all disturbed soil should be covered with leaf litter at the very least, with larger areas restored with a fast-growing native seed mix. All equipment used for maintenance operations in heavily invaded areas should be cleaned before moving to non-invaded areas; staff and volunteers should take special care to pat down, wipe, and/or rinse clothes and shoes after working with invasive plants.

Early Detection/Rapid Response

Any comprehensive invasive species control program must also include early detection of new invaders and rapid response (EDRR) to eliminate new invasions before they become well-established. EDRR efforts will focus on the list of early detection species identified by the Sudbury-Assabet-Concord Cooperative Invasive Species Management Area (SuAsCo CISMA). SuAsCo CISMA’s current EDRR list is presented in Table 1, and updates can be found on their website: <https://cisma-suasco.org/invasives/early-detection-invasives/>. Volunteers and staff should be trained to identify the EDRR species that are not yet well-known in this part of the state, such as Japanese stiltgrass and mile-a-minute vine. The Commission, staff, and volunteers should be prepared to collaborate on planning and implementing the rapid response element to eliminate new invasions as quickly as possible.

Table 1. Early Detection (ED) invasive plants as identified by the SuAsCo CISMA as of March 2022.

Common Name	Scientific Name
Amur Cork Tree	<i>Phellodendron amurense</i>
Brazilian Waterweed	<i>Egeria densa</i>
Broad-leaved Pepperweed	<i>Lepidium latifolium</i>
Callery Pear	<i>Pyrus calleryana</i>
Creeping Buttercup	<i>Ranunculus repens</i>
European Alder	<i>Alnus glutinosa</i>
European Rusty Willow and Gray Willow	<i>Salix atrocinerea</i> and <i>Salix cinerea</i>
Fig Buttercup	<i>Ficaria verna</i>
Giant Hogweed	<i>Heracleum mantegazzianum</i>
Hydrilla	<i>Hydrilla verticillata</i>
Japanese Stiltgrass	<i>Microstegium vimineum</i>
Kudzu	<i>Pueraria montana ssp. lobata</i>
Mile-a-minute Vine	<i>Persicaria perfoliata</i>
Narrow-leaf Bittercress	<i>Cardamine impatiens</i>
Wall lettuce	<i>Mycelis muralis</i>
Wineberry	<i>Rubus phoenicolasius</i>

Limit spread of highly noxious invaders

Special attention should be paid to particularly aggressive invaders, such as those species with wind-dispersed seeds, aggressive root suckering, allelopathic characteristics, rapid growth, and high resistance to control. Species in this category are shown in Table 2.

Table 2. Particularly aggressive invasive species.

Common Name	Scientific Name
Black swallowwort	<i>Cynanchum louiseae</i>
Common reed	<i>Phragmites australis</i>
Garlic mustard	<i>Alliaria petiolata</i>
Japanese knotweed	<i>Fallopia japonica</i>
Japanese stiltgrass	<i>Microstegium vimineum</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Tree of heaven	<i>Ailanthus altissima</i>
Water chestnut	<i>Trapa natans</i>

Control species with recent or limited presence

Early invasions are much more easily eradicated than well-established stands of any species. Removing young woody plants before they reach a fruiting size prevents further spread, and it is critical to remove aggressively rooting species before they establish a dense underground network. Vining species are more easily removed before they tangle with native shrubs and trees.

Control relatively easily managed species

Japanese barberry and garlic mustard are examples of species that can be controlled with dedicated manual effort. Such species should be the focus of eradication efforts before they spread.

Location-Based Efforts

For areas that are particularly sensitive habitat, contain species of concern, or hold high aesthetic value, location-based methods, which *prioritize certain areas and take a systematic approach to large infestations*, will direct control efforts.

Protect and restore rare species habitat and uncommon or exemplary natural communities

Invasive species control should be a priority at any sites within the Town's conservation properties that support state-listed species. Invasive control activities that occur near these populations will be conducted in a manner that does not have a negative effect on these populations.

Invasive Species-Free Zones

Larger parcels of conservation land will typically have some sections that do not contain invasive plant species. These resilient parcels should be identified and monitored on an annual basis in the late summer to determine if these areas have remained pristine or if new invasions have started to become established. If a new infestation is found, efforts should be made to eradicate those plants and keep the "clean" areas "clean".

Limit expansion of heavily invaded areas

An area that is completely covered in invasive species or has several species of invasive plants growing in the same location should be contained to prevent further spread of the infestation. This can be done by identifying the boundary of the heavily invaded area(s) and creating a treatment area buffer zone (e.g., 50 feet around the perimeter of infestation) for targeting management efforts. This prevents encroachment of invasive species in cleaner areas without getting overwhelmed or tackling a project that is too big for the available resources.

If highly noxious species are present in the densely invaded area, extra measures may need to be taken to truly prevent further spread of the infestation. Some options include increasing the treatment area to a 100-foot buffer zone or hiring outside contractors to treat the infestation chemically. Goat grazing may be a suitable option in this type of situation, particularly where access from adjacent yards or nearby trailheads can be utilized.

Treatment Methods

Different invasive species respond to different management techniques, several of which are summarized here and detailed in Appendix B.

Manual and mechanical control, which involves pulling plants by hand or with light tools such as loppers, weed wrenches, or mowers, may be effective for small infestations and where volunteer capacity permits repeated effort.

Large infestations and certain problematic species will require more intensive management, often involving the use of herbicides. Herbicides can only be applied on public land and in road rights-of-way by an individual duly licensed by the Department of Agricultural Resources. Because licensure requires liability insurance coverage, it is more likely that herbicide will be applied by a contracted professional than by volunteers. For specific, up-to-date recommendations on herbicides, the Commission will consult with an experienced licensed applicator or defer to recommendations provided by SuAsCo Cisma for individual species.

Biological control (through the release of specific beetles that feed heavily on the plant) is available for purple loosestrife but requires sourcing the beetles and will contain but not eliminate the population. Biological control is also available for black swallowwort (through the release of a *Hypena* moth subspecies) and is currently being deployed in partnership with the University of Rhode Island at the Sears Driveway Field (Field #9). Future biological controls may be deployed in Weston as they become available.

Grazing and prescribed burning are also sometimes used for control of certain invasive species; specific recommendations should be sought from experienced professionals if there is interest in exploring these methods.

Property-specific management plans should identify infestations and recommended approaches for control that align with the site conditions and management goals. The Commission, staff, and volunteers should plan and budget for involvement of professional herbicide applicators as necessary.

Table 3: Season-specific Management for Commonly Found Invasive Plant Species.

Common Name	Spring	Summer	Fall
Autumn olive	manual		chemical
Black swallowwort		chemical/manual	
Burning bush	manual		chemical
Bush honeysuckle	manual	chemical	
Common reed			chemical
Garlic mustard	chemical/manual		
Glossy buckthorn	manual		chemical
Japanese barberry	manual		chemical
Japanese knotweed	manual		chemical
Japanese stiltgrass		chemical/manual	chemical
Multiflora rose	manual	chemical	
Oriental bittersweet	manual		chemical
Purple loosestrife		biological	
Spotted knapweed		chemical/manual	
Tree of heaven	manual		chemical
Water chestnut		manual	

Disposal, Restoration, and Record-Keeping

Disposal

Invasive plants that have been hand pulled or cut can be bagged, burned, or composted. To bag invasive species material, remove flowers, seeds, roots, and fruits and place them in heavy black garbage bags to dry out before disposing of them. Typically, these black plastic bags need to sit in a sunny spot for up to 1 month to fully kill the plants and seeds inside. After the plant material has fully died, it can be composted in a regular compost pile.

Most invasive species can be burned in a brush pile, following local safety regulations and restrictions. Burning should only be done with a burn permit from the Fire Department during the burning season.

Plant parts that can't re-sprout or that don't have fruits and seeds on them, such as woody stems and trunks, herbaceous stems (except from those species list below), and leaves, can be left in brush or compost piles to decompose.

The site(s) used to compost invasive species should be monitored to ensure that invasive plants are not establishing themselves from the materials deposited there. Staff and volunteers should take extreme care to avoid spreading seed or other material from which plants can re-sprout. Herbaceous stems that can re-sprout must be burned or bagged. These species include: oriental bittersweet, multiflora rose, the bush honeysuckles, common reed, and Japanese knotweed.

Restoration

Many of our invasive species are adapted to pioneer disturbed soils. For this reason, all control efforts and general site work that results in exposed mineral soil should incorporate restoration with fast-growing native species. Small patches of exposed soil, e.g. from root wrenching a shrub, should be tamped down by foot and covered with leaf litter from on-site. Non-forested sites, such as meadows, should be seeded with a grass mix including annual rye (*Lolium perenne*) which can provide a quick cover to open soils and allow non-invasive species time to self-germinate.

Record-keeping

All invasive plant species management actions should be documented with a field datasheet and records kept in a central file. Information collected should include the location, date, species targeted, phenology of plant (vegetative, flowering, fruiting), type of management used (manual, mechanical, chemical), the size of the infestation and an estimate of what percent of the area was managed (See Appendix C for a sample field sheet). Recording these data allow conservation staff to track progress in management efforts, adapt tactics in future years if needed, and have a sense of the expanse of targeted invasive species.

Appendix A: Invasive Plant Management Options

Foliar spray- This method is usually applied with a type of sprayer (backpack, mist blower, or tank). The percent of solution depends on the target species, the time of year, and type of sprayer. Triclopyr will only target broadleaf plants and will have minimal impact if any on grasses.

Bloody glove- A more intensive method of herbicide application often used in place of foliar spray when impacts to non-target species is a concern. Herbicide is applied directly to leaves and stems of target species from a soaked cotton glove worn over a rubber glove. Triclopyr will only target broadleaf plants and will have minimal impact if any on grasses.

Cut and paint- The stem of the plant is cut so a cross section is showing. The outer edge of the stem is then painted in herbicide; if the stem is hollow herbicide can be injected into the hollow stem. Triclopyr will only target broadleaf plants and will have minimal impact if any on grasses.

Girdling- This method used for trees involves making a shallow cut through the bark and outer cambium tissue; the plant is slowly killed due to the inability to transport water and nutrients up the trunk. Girdling is particularly effective for species that sprout aggressively from root suckers, particularly black locust, since it seems to bypass the signal to respond to a dead main stem by sprouting from root suckers. Care must be taken not to cut too deeply into the trunk as too deep a cut can sever all phloem tissue which transports nutrients down into the roots of the plant and is necessary to transport herbicide into the roots. If the phloem is all cut, downward transport will cease and black locust will respond by sprouting aggressively from root suckers.

Basal bark- Herbicide is applied to the outer surface of the stem. Triclopyr will only target broadleaf plants and will have minimal impact if any on grasses. There should not be any standing water present or moisture on the stem. The application can be made with a paint brush or backpack sprayer from the base of the stem to about 1 foot up the stem.

Commonly used herbicides for invasive species control:

Triclopyr- Triclopyr is a selective herbicide that will affect broad leaf plants and will have minimal to no impact on monocots. This is due to the fact that it stimulates cell growth elongation. Since monocots grow naturally by elongating their cells it will have little to no affect where since dicots grow laterally, they burst their cell walls and cause damage to the plant when they are stimulated for cell elongation. Since this herbicide can be mixed with water or oil it can be used for foliar sprays, cut and paint, or basal bark applications. It is recommended to use this herbicide when there is a dense native grass understory surrounding a target plant.

Glyphosate- Glyphosate is a broad-spectrum herbicide that affects all species. Due to its non-selective nature and potential for impacting non-target species, it should be used in specific, targeted situations (i.e. for foliar and “bloody glove” applications to Japanese knotweed) and only as a last resort or in combination with other techniques as part of an Integrated Pest Management (IPM) approach.

Table A-1. General Management Options

Method	Good for Volunteers?	Timing	General guidelines	Target Species
Cut and paint	Yes	Late August to November	Preferably done in the fall when woody plants are translocating energy towards roots. Can be done to all trees/ shrubs except black locust (signals root suckering). Preferred treatment for multiflora rose. If berries are present take extra precaution to not spread seed. Best when left in local area and burned in brush pile. Good for volunteers working together with staff: have volunteers cut and haul brush while licensed applicator paints herbicide.	Common reed (stem injection) Japanese knotweed (stem injection) Burning bush Oriental bittersweet Multiflora rose (preferred) Bush honeysuckle (fall) Glossy buckthorn Autumn olive
Hand pulling	Yes	Spring and Summer	Great for herbaceous plants with taproot and shallow root system. Best for small infestations. All trees/ shrubs can be hand-pulled when in seedling stage. Garlic mustard should be hand-pulled when second year plants start sending up seed stalk and all plant parts should be bagged and kept out of the sun (seeds can still develop if sunlight is available).	Spotted knapweed Garlic mustard All seedlings for trees and shrubs

Method	Good for Volunteers?	Timing	General guidelines	Target Species
Mechanical (weed wrench/ shovel)	Yes	Spring through Fall, although better before seed set.	Great for small shrubs/ trees. Best when done in early spring when leaves start coming out but before berries develop. Shovels can be used to dig up herbaceous plants with fibrous root systems (Black swallowwort) care needs to be taken to make sure all root system is dug up. Soil should be tamped down after removal or native species planted soon after disturbance to keep additional invasive species from re- colonizing area.	Japanese knotweed Burning bush Japanese barberry Black swallowwort Autumn olive Tree of heaven
Basal bark herbicide	No	August through October	This method is best when done in late summer mid fall (Aug-Oct) when sap flow is towards roots. Can be performed on all trees/ shrubs.	Burning bush Autumn olive
Biological	Yes	Dependent on insect.	This method of treatment works well for containing populations of purple loosestrife. It is the least disruptive method of treatment currently available. Usually agents are released in July/ August. The affect the biological agent will have on the environment should be taken into consideration and the relative ease of other forms of treatment. Depending on infestation size this could	Purple loosestrife (preferred) Spotted knapweed (needs research)

Method	Good for Volunteers?	Timing	General guidelines	Target Species
			be a good way to treat Spotted knapweed.	
Foliar spray herbicide	No	When leaves are out.	For trees and shrubs best when done in the fall when sap flow is towards roots. Can be done any time for herbaceous plants. When spraying, the least amount of herbicide at the smallest effective percentage should be used. The surrounding habitat (wetland vs upland), nesting/ breeding animals, and whether it is a necessary treatment should be considered.	All species
Girdling	If certified in chainsaw safety	Fall	A chainsaw is used to create a ~2" wide cut all around the tree between knee and waist height taking care to remove only the outer layer of cambium, then the fresh cut is painted with herbicide.	Larger trees
Mechanical (tractor/machine)	No	Year-round; Fall-early Spring/Dormant Period preferable to minimize ground disturbance	Great for high density areas, thick roots, heavy entanglement with other vegetation, etc.	Oriental bittersweet Greenbriar Multi-flora rose Most woody growth

Method	Good for Volunteers?	Timing	General guidelines	Target Species
Bloody glove	No	When leaves are out.	A rubber glove is worn on the hand with an absorbent cotton glove over it. The cotton glove is dipped in a Triclopyr solution (strength depending on target species) then used to directly apply herbicide to leaves, stems, and inflorescences of target plants. Herbicide is absorbed directly into the plant via the stem and leaves, however, breaking the stem aids in more rapid absorption.	Small patches of common reed, seedlings, etc. particularly in wetlands where impacts to non-target species is a concern.

Appendix B: Control Measures for Invasive Plant Species in Weston

Table B-1 provides recommendations for manual and mechanical control methods for species identified by SuAsCo CISMA as the most common and aggressive invasive plant species to be found in our area. Note that these recommendations can change over time as new techniques are developed and new information becomes available.

Table B-1. Manual and Mechanical Control Methods for Common Invasive Species in Weston

Species	Biology	Manual & Mechanical Control Methods	Monitoring Period
Autumn Olive <i>Elaeagnus umbellata</i>	Flowers May to July. Sets seed August to October. Seeds are dispersed by birds and mammals. Adults produce less seed in the shade than the sun. Reproduces primarily by seed with some vegetative spreading.	Seedlings can be hand-pulled. Bigger plants can be removed with a weed wrench. Care should be taken to get entire root system. Plants re-sprout vigorously when cut or mown unless treated with herbicides after cutting. Prioritize removal of heavily-fruiting plants.	3 years Seeds do not persist in seed bank, but quickly-germinating berries spread easily from nearby plants. Monitor for re-sprouting.
Black Swallowwort <i>Cynanchum louiseae</i> syn: <i>Cynanchum nigrum</i>	Flowers June to August. Seeds released August to October and spread long distances by wind. Local spread and establishment is frequently through clonal growth from rhizomes.	Plants can be dug up with a shovel. Care should be taken to remove entire root system to prevent re-sprouting. Mowing, even several times a year, will not eradicate plants but is useful for preventing a seed crop. Cutting early in the season to mid-July (when there are small, immature pods on the plants) is effective at preventing a mature seed crop.	6 years Seeds remain viable up to 5 years. Monitor for re-sprouting.

Species	Biology	Manual & Mechanical Control Methods	Monitoring Period
<p>Burning Bush</p> <p><i>Euonymus alatus</i></p>	<p>Flowers late April to June. Seeds dispersed September to October by birds. Reproduces by seed and vegetatively.</p>	<p>Small plants can be hand-pulled. Bigger plants can be removed with a weed wrench. Pulling is best done when there is enough moisture to ensure the full root is removed. Mowing, cutting, and burning are not recommended, as they promote vigorous regrowth. Care should be taken to remove entire root system to prevent re-sprouting.</p>	<p>5 years</p> <p>No data available on seed viability over time.</p> <p>Monitor for re-sprouting.</p>
<p>Bush Honeysuckles</p> <p><i>Lonicera maackii</i>, <i>Lonicera morrowii</i>, <i>Lonicera tatarica</i>, <i>Lonicera x bella</i></p>	<p>Flowers April to June. Fruits prolifically and is highly attractive to birds, which widely disseminate seeds. One of the earliest plants to leaf out in the spring and one of the latest to drop its leaves in the fall, allowing it to outcompete other plants. The berries are mildly poisonous if eaten.</p>	<p>Small plants can be hand-pulled. Bigger plants can be removed with a weed wrench. Care should be taken to remove entire root system to prevent re-sprouting and not to spread berries. Alternatively, cut stumps back in fall or winter, then wrap with thick plastic; check and cut back any new growth. Herbaceous stems will re-sprout in compost or brush piles; burn or bag to prevent spreading during disposal.</p>	<p>3 years</p> <p>Few seeds viable for more than 1 year.</p> <p>Monitor for re-sprouting.</p>
<p>Common Reed</p> <p><i>Phragmites australis</i></p>	<p>Inflorescences develop in late June. Reproduces by seed and vegetatively. Each plant may produce thousands of seeds annually, which are dispersed by wind. Along rivers and shorelines, fragments of rhizomes may be washed down to new sites where they can become established.</p>	<p>In summer, cut stems beneath the lowest leaf, before the flowers produce seed. In loose or sandy soil, hand cut individual stalks below the soil surface. In water, cut below water surface level and deep enough that new shoots cannot reach the surface – this cuts off access to oxygen. Smothering can be effective. Herbaceous stems will re-sprout in compost or brush piles; burn or bag to prevent spreading during disposal.</p>	<p>2 years</p> <p>Seed viability is typically low, although it may vary year to year.</p> <p>Monitor for re-sprouting.</p>

Species	Biology	Manual & Mechanical Control Methods	Monitoring Period
<p>Eurasian Watermilfoil</p> <p><i>Myriophyllum spicatum</i></p>	<p>Aquatic plant found in ponds, lakes, slow-moving streams, and reservoirs. Grows rapidly and aggressively, forming dense mats. Reproduces vegetatively from rhizomes, fragmented stems, and axillary buds that develop throughout the year. Tolerant of many water pollutants.</p>	<p>Large harvesting equipment can be used to mechanically remove milfoil in larger areas; a sturdy hand-rake can be used for smaller areas. For the single harvest, removal should take place just before the population peaks in early summer. Substantial re-growth may occur if control is implemented too early. Better results appear with multiple harvests in the same growing season. If multiple harvests are not possible, then regular annual harvests over a period of years is an option. All fragments of milfoil plants must be removed to achieve adequate control.</p>	<p>Ongoing – manual and mechanical control methods are only likely to contain a population, not eliminate it.</p>
<p>Garlic Mustard</p> <p><i>Alliaria petiolata</i></p>	<p>Flowers April to May, sets seed in June. A biennial plant. After spending the first half of the two-year life cycle as a rosette of leaves (“basal rosette”), plants develop rapidly the following spring into mature plants that flower, produce seed and die by late June. A single plant can produce thousands of seeds, which scatter as much as several meters from the parent plant.</p>	<p>Basal rosettes and full plants can be hand-pulled. Plants should be pulled at base near ground to ensure that the entire taproot is removed. At minimum, cut plants to ground before or during spring bloom to prevent seed production (since seeds are viable for many years).</p>	<p>10 years</p> <p>Seeds remain viable for 5 or more years.</p>

Species	Biology	Manual & Mechanical Control Methods	Monitoring Period
<p>Glossy Buckthorn</p> <p><i>Frangula alnus</i></p>	<p>Flowers May to September, fruits late July to September. Seeds are dispersed by birds and small mammals. Reproduces by seed.</p>	<p>Small plants can be hand-pulled. Bigger plants can be removed with a weed wrench. Care should be taken to remove entire root system to prevent re-sprouting. Alternatively, cut plants back at any time of year, then wrap with thick plastic; check and cut back any new growth (google "Buckthorn Baggie" for more information).</p>	<p>7 years</p> <p>Seeds remain viable for 5-7 years.</p> <p>Monitor for re-sprouting.</p>
<p>Japanese Barberry</p> <p><i>Berberis thunbergii</i></p>	<p>Flowers April to June, fruits July to October. Spreads by seeds and vegetatively. The seeds have a 90% germination rate. Seeds are dispersed by birds and small mammals.</p>	<p>Small plants can be removed by hand- pulling or using a weed wrench. Care should be taken to remove entire root system to prevent re-sprouting. Alternatively, cut stumps back in fall or winter, then wrap with thick plastic; check and cut back any new growth.</p>	<p>2 years</p> <p>Seeds do not persist in seed bank.</p> <p>Monitor for re-sprouting</p>
<p>Japanese Knotweed</p> <p><i>Fallopia japonica</i></p>	<p>Flowers mid-August for approximately 3 weeks, then sets seed. Pollinated by bees, which visit the plants in copious amounts when flowering; chemical applications can impact pollinating bees. Can regrow full plants from cuttings as well as from rhizomes. Often transported to new sites as a contaminant in fill-dirt.</p>	<p>Hand-pull or uproot young plants in spring. Cut stalks repeatedly throughout the growing season each time they reach 12" high, being careful not to scatter fragments that might re-sprout. Smothering can be effective. New treatment involving mesh wire has potential: https://vtinvasives.org/news-events/news/a-new-way-to-treat-knotweed. Herbaceous stems will re-sprout in compost or brush piles; burn or bag to prevent spreading during disposal.</p>	<p>4 years</p> <p>Seeds do not remain viable beyond 1 year, but rhizomes and other plant parts can sprout up to 3 years after treatment.</p> <p>Monitor for re-sprouting.</p>

Species	Biology	Manual & Mechanical Control Methods	Monitoring Period
<p>Japanese Stiltgrass</p> <p><i>Microstegium vimineum</i></p> <p>(not a Sour 16 species but a high priority Early Detection species that has been located in Weston)</p>	<p>Flowers late summer, fruits early fall. By mid-fall, the stems turn purplish—this is when the plant is most recognizable. Seeds sticks to animal fur, clothing, boots, tires, and other surfaces. Wind and water currents also spread the seed. During the growing season, sprawling stems root at the nodes, sending up new shoots.</p>	<p>Small patches can be hand-pulled and bagged or weed-whacked repeatedly each year before flowering and seeding. When pulling, care should be taken to remove entire root system to prevent re-sprouting.</p>	<p>7 years</p> <p>Seeds remain viable for 5-7 years.</p> <p>Monitor for re-sprouting</p>
<p>Multiflora Rose</p> <p><i>Rosa multiflora</i></p>	<p>Flowers April to June, fruits July to December. Reproduces by seed and by forming new plants that root from the tips of arching canes that contact the ground. Seeds dispersed by birds. Average plants may produce a million seeds per year, which remain viable for up to twenty years.</p>	<p>Plants can be hand-pulled, easiest in spring. Use a weed wrench on large plants. Repeated cutting 3-6 times a growing season for several years can be effective. When pulling, care should be taken to remove entire root system to prevent re-sprouting. Herbaceous stems will re-sprout in compost or brush piles; burn or bag to prevent spreading during disposal.</p>	<p>20 years</p> <p>Seeds remain viable for up to 20 years.</p> <p>Monitor for re-sprouting</p>

Species	Biology	Manual & Mechanical Control Methods	Monitoring Period
<p>Oriental Bittersweet</p> <p><i>Celastrus orbiculatus</i></p>	<p>Flowers May to June, fruits later summer through fall. Reproduces prolifically by seed, which is readily dispersed to new areas by many species of bird. Seeds germinate in late spring. Also spreads vegetatively.</p>	<p>Seedlings are easy to hand-pull. Bigger vines can be removed by cutting as high up as you can reach, then unwinding the bottom section from its host and using a weed wrench to uproot it. Care should be taken to remove entire root system to prevent re-sprouting. Alternatively, cut stems close to root collar every two weeks throughout entire growing season (spring to fall). Herbaceous stems will re-sprout in compost or brush piles; burn or bag to prevent spreading during disposal.</p>	<p>5 years</p> <p>Seeds remain viable for several years.</p> <p>Monitor for re-sprouting.</p>
<p>Purple Loosestrife</p> <p><i>Lythrum salicaria</i></p>	<p>Flowers June to September, sets seed in late July or August. A mature plant may produce three million seeds per year. Also readily reproduces vegetatively through underground stems at a rate of about one foot per year.</p>	<p>Plants can be removed by hand-pulling or using a garden fork to remove the deep roots of older plants. Care should be taken to remove entire root system to prevent re-sprouting. Some beetle species (<i>Galerucella</i> and others) are recommended as biological control agents; useful if a beetle source can be found.</p>	<p>Ongoing</p> <p>Produces nearly inexhaustible seed bank.</p> <p>Monitor for re-sprouting</p>
<p>Spotted Knapweed</p> <p><i>Centaurea stoebe</i></p>	<p>Flowers July to September, sets seed mid-August. Reproduces by seed. Most seeds are dispersed near the parent plant but can be transported by people, wildlife, livestock, vehicles, and in soil, crop seed, and contaminated hay.</p>	<p>Plants can be hand-pulled and bagged. Care should be taken not to distribute seeds if present when pulling and disposing. Mowing can be effective with multiple mows/year; be sure to mow prior to seed-set.</p>	<p>10 years</p> <p>Seeds remain viable for 8 or more years.</p>

Species	Biology	Manual & Mechanical Control Methods	Monitoring Period
<p>Tree of Heaven</p> <p><i>Ailanthus altissima</i></p>	<p>Flowers May to June, fruits July. Individual trees may produce an estimated 325,000 seeds per year. Reproduces by seed and vegetatively with vigorous re-sprouting at cutting.</p>	<p>Small plants can be removed by hand-pulling or using a weed wrench. Care should be taken to remove entire root system. Spring or early summer cutting will slow growth, but may not inhibit flower, fruit, and seed production. Repeated cutting of big plants or mowing seedlings on a monthly cycle will be more effective at stunting the plant and inhibiting fruit and seed production. Targeting large female trees for control will help reduce spread by seed.</p>	<p>2 years</p> <p>Few seeds remain viable after 1 year.</p> <p>Monitor for re-sprouting.</p>
<p>Water Chestnut</p> <p><i>Trapa natans</i></p>	<p>Aquatic plant. Emerges in June, sets seed July to August. Spreads by leaf rosette and seed. The fruit can detach from the stem and float to another area on currents or by clinging to birds and other floating objects.</p>	<p>Small patches can be hand-pulled in canoes and kayaks. Important to pull before seed-set. Complete removal of plants is important, as floating, uplifted plants and plant parts can spread the plant to new locations.</p>	<p>15 years</p> <p>Seeds remain viable for 12 or more years.</p>
<p>Wild Chervil</p> <p><i>Anthriscus sylvestris</i></p>	<p>A biennial plant. Flowers May-June, sets seed July-August. During the first growing season, the plant produces a rosette of leaves; the next year, the plant produces a stem and flowers. After the seeds ripen, the plant dies. Reproduces by seed and vegetatively. Seeds are spread by birds and humans. New plants sprout from lateral buds that form at the top of the taproot.</p>	<p>Plants can be hand-pulled and bagged. Care should be taken to pull prior to seed-set so as not to distribute seeds while pulling. Mowing can be effective in containing spread with multiple mows/year; be sure to mow prior to seed-set. Herbaceous stems will re-sprout in compost or brush piles; burn or bag to prevent spreading during disposal.</p>	<p>2 years.</p> <p>Few seeds remain viable after 1 year.</p> <p>Monitor for re-sprouting.</p>

Appendix C: Invasive Species Treatment Record Datasheet

Weston Conservation Department Invasive Species Treatment Record

Property: _____ Date: _____
 Location: _____ UTM (WGS84/NAD83): _____
 Target species: _____

Weather (include 24 hours before and after for chemical treatment)

	Current	24 hours before	24 hours after
Temp.			
Wind speed/direction			
Cloud Cover			
Precipitation			

Method: Chemical Manual Mechanical Biological

Chemical

Chemical used: _____ % Solution Used: _____ Amount of solution used: _____
 Amount of herbicide used: _____ Mix date: _____
 Adjuvants/Carriers etc.: _____
 Method of Application: _____
 Name of applicators: _____

Biological

Biological control agent: _____ # Released: _____ Stage: _____

Mechanical/Manual

Equipment used: _____
 Acres/number of plants treated: _____ % of infested area treated: _____

Growth stage of target:

Total Volunteers:

Total Volunteer Hours:

Comments:

Date current treatment mapped w/ GPS:

Efficacy notes:

Date/type of last treatment:

ATTACH MAP OF TREATMENT AREA
or hand draw on back of this sheet