

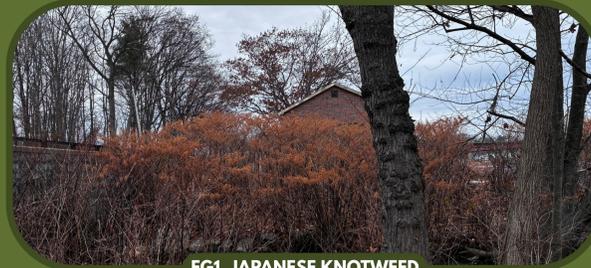
## WHAT ARE INVASIVE SPECIES?

Non-native organisms (i.e. bacteria, plants and animals) that, when introduced to new environments, reproduce aggressively and out compete native species for vital resources, causing those native species to die off.

## IN WORCESTER

Invasive species have massively impacted the City of Worcester. Species such as Japanese Knotweed, Mugwort, and Oriental Bittersweet have taken over Worcester's roadsides, river beds, and neighborhoods.

### WORCESTER'S MOST POPULOUS INVASIVES



FG1. JAPANESE KNOTWEED



FG2. MUGWORT



FG3. ORIENTAL BITTERSWEET

## OUR RECOMMENDATIONS FOR WORCESTER'S INVASIVE SPECIES MEDIATION

### 1 Apply for Invasive Species management grants

Many struggles with invasive species removal stems from a lack of funding. A sufficient grant source will allow for DPW staff to be hired specifically for invasive removal. It will also help fund disposal tactics.

### 2 Create educational programs

By educating the general population on the issue of invasive species we can help people understand the issue of invasives, how they can help, and what they should do. By educating young students, we can support an up and coming society where all people know how to handle invasives

### 3 Create a species-specific mitigation plan

Knowing which removal method is best for the specific type of invasive will help in the long run to help keep the invasive species away. We know what invasives Worcester struggles with the most, so we can then plan which mediation methods would be best suited for that species

## GRANTS

MassWildlife's grant is a model for Worcester to secure funding for invasive species management and habitat restoration.

Worcester could explore similar opportunities, like the MHMGP, to support conservation efforts.

These funds would aid in habitat restoration, invasive plant control, and promoting biodiversity.



FG10. MHHMGP GRANT

## EDUCATION

Education is an important part of mitigating the current and future problem with invasive species

By educating young students on the issue of invasive species we can be proactive about our future by teaching about how to remove invasives at a young age

We can also educate the general population in how they can make a change in their lives.

These educational goals can be achieved by holding community workshops, public signage, classes, etc.



FG11. NATURE ED. CLASS

## WORCESTER'S CURRENT INVASIVE SPECIES MANAGEMENT

Currently, Worcester has no plans or resources for the management of invasive species.

Because of this, invasives run wild, overtaking native plants, depleting natural resources, and overall negatively affecting the environment. Worcester also has to current staff to mitigate invasive species, meaning the rapidly reproducing plants are overwhelming current DPW workers.



FG4. INVASIVE OVERGROWTH

## COMMUNITY NON-PROFITS

Due to the cities lack of resources against Invasive Species, local community non-profits have instead started doing their part in the fight against invasives.

Organizations like the Worcester Native Plant Initiative and the Worcester Garden Club take on the responsibility of managing invasive species and educating youth on how to fight against.



FG5. WORCESER NATIVE PLANT

## METHODS FOR PREVENTION, MANAGEMENT, AND DISPOSAL

### MECHANICAL

Mechanical control involves the physical removal of a plant. This includes pulling, digging, cutting, or sawing. By doing a continuous mechanical removal of a plant, photosynthesis is halted causing the plant to die.



FG6.

### BIOLOGICAL

Biological control methods use insect predators and plant diseases from an invasive species' native habitat in order to combat their population growth and effects.



FG7.

### SUFFOCATION

To suffocate small seedlings and herbaceous plants, cover the area with 2-3 layers of UV-stabilized plastic sheeting, secured with stakes or weights, extending five feet beyond the edge. Leave for at least two years, then plant a cover crop to prevent regrowth.



FG8.

### CHEMICAL

Chemical control is one of the most effective and efficient ways to deal with invasive species. In chemical control, herbicides such as glyphosate and triclopyr are used to control and eliminate invasive species in a given environment.



FG9.

## PLANT SPECIFIC MITIGATION PLAN

### JAPANESE KNOTWEED

We recommend either a combination of mechanical control with chemical control, or suffocation to deal with this plant. If you were to use chemical control combined with mechanical control, following the initial cutting down of the plant, someone would need to go out every 2-3 days and trim new growth, and then spray herbicides. If the significant time commitment could not be met, we recommend suffocation.

### MUGWORT

For this plant, we recommend a combination of pulling and digging with chemical control. Pull up the initial plant, making sure to get as much of the root as possible, and then spray the site with herbicides for several months after to prevent regrowth.

### ORIENTAL BITTERSWEET

For this plant, we recommend that a combination of mechanical and chemical control are used. Trim the plant down as low to the ground as possible and do your best to remove it from the body of the tree without damaging the tree itself. Then, use a medium such as a paintbrush to apply herbicides to the stump. Continue to do this until the plant is dead.

## REFERENCES

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 Figure 2. Mugwort in Coal Mine Brook Park, Sean Keady  
 Figure 3. Oriental Bittersweet in Coal Mine Brook Park, Sean Keady  
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 Figure 5. Worcester Native Plant Initiative, City of Worcester Public Presentation  
 Figure 6. Removal of tree, Invasive Plant Control  
 Figure 7. Amphispitella Beutli, Nature Spot  
 Figure 8. Suffocation of poison ivy, HouseDigest  
 Figure 9. Spraying, Santa Lucia Conservatory  
 Figure 10. Mike Bobolink, Mass.gov  
 Figure 11. Nature education class, Worcester Public Schools  
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## ACKNOWLEDGEMENTS

We would like to acknowledge the incredible help we received from our sponsor Katie Liming and Eric Flint from the Worcester Conservation Committee, Lakes and Ponds Department, for all of their help and guidance.

We would also like to extend a huge thank you to Nicole Conzo and Elizabeth Fleming with the Worcester Native Plant Initiative for generously welcoming us to one of their project sights, and a acknowledgement of all the hard work they have been putting in the fight against invasive species.