



LAND STEWARDSHIP, INC.

Invasive plant management activities are planned for managing Japanese knotweed at Kettle Brook, 25 Auburn Street, Leicester, MA.). This Invasive Plant Management Plan contains the treatment schedule designed to manage Japanese knotweed in the project area.

Site Conditions

There are 0.49 acres of Japanese knotweed at the Kettle Brook site. LSI project manager Lucy Gross conducted a site visit with Jan Parke on March 29th, 2021 to collect the information that informs this proposal. A locus map for the project site may be found in Figure 1. A map of jurisdictional resource areas relative to the treatment area may be found in Figure 2. A map of site may be found in Figure 3.

Project Goals

The goal of this project is to control populations of Japanese knotweed that are growing in proximity to Kettle Brook. Dense infestations of knotweed result in reduction of plant and animal diversity. Dense knotweed growth is poorly suited to preventing soil erosion, and can contribute in increased sedimentation input to Kettle Brook. Elimination of knotweed and the resulting regeneration of native plant species will benefit both biodiversity in the area, as well as protecting the water quality of the waterbody.

Table 1. Invasive species to be managed at Kettle Brook, 25 Auburn St., Leicester, MA

Common Name	Scientific Name	Notes
<i>Herbaceous Species</i>		
Japanese knotweed	<i>Polygonum japonica</i>	Suitable for foliar application, hand wiping and stem injection depending on size class, density, and proximity to wetlands.

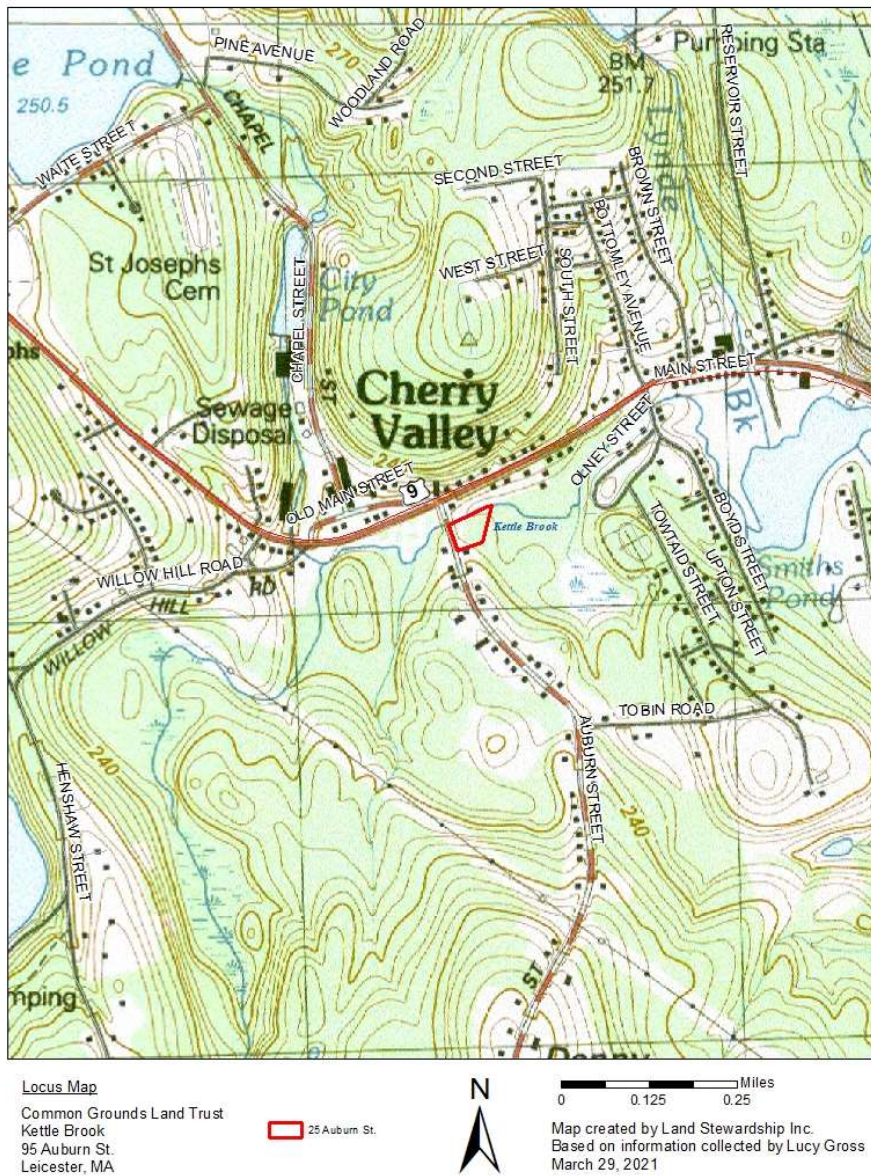


Figure 1. Kettle Brook locus map, Leicester, MA

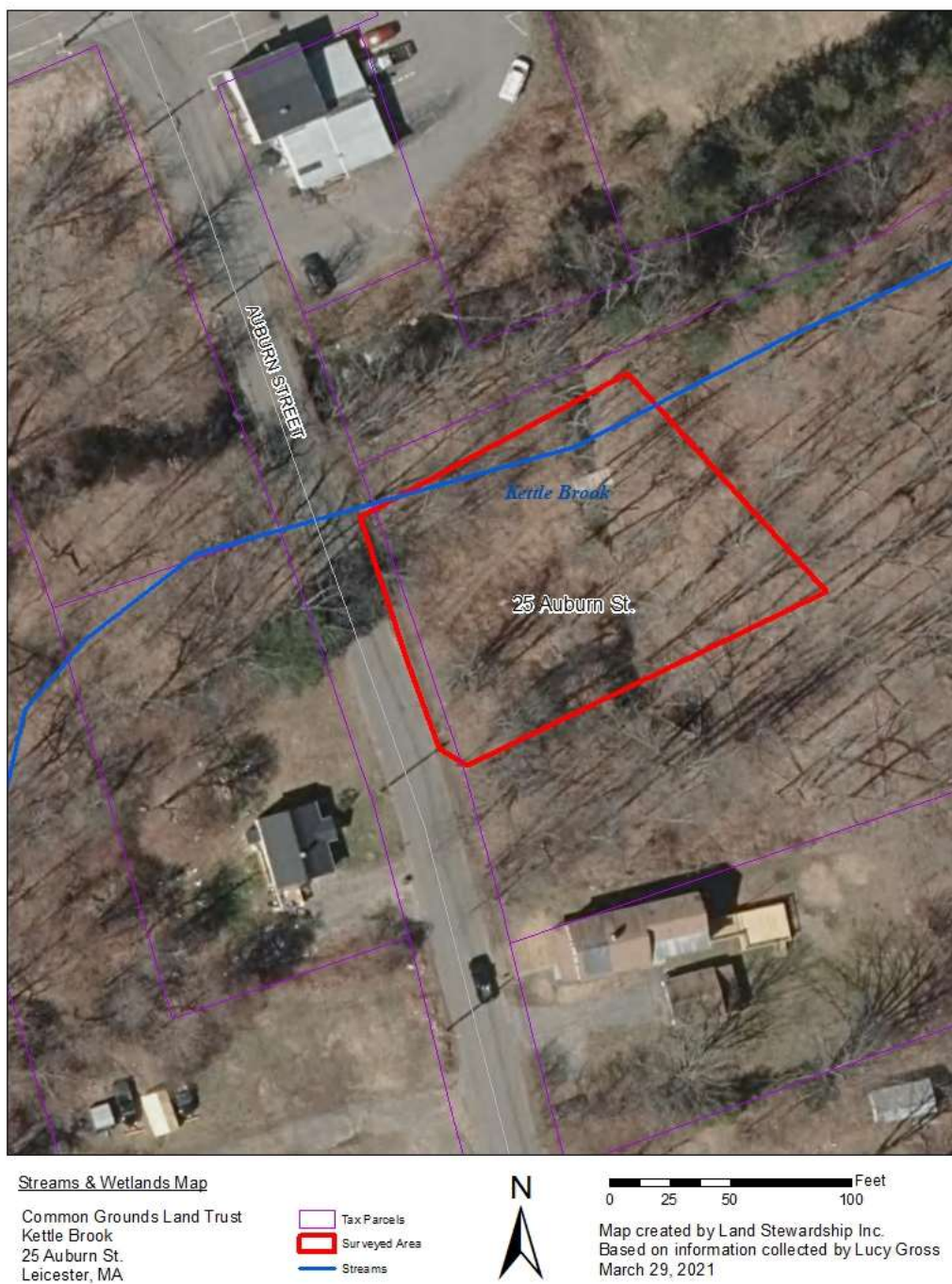


Figure 2. Kettle Brook wetlands map, Leicester, MA



Figure 3. Japanese Knotweed distribution at Kettle Brook, 25 Auburn Street, Leicester, MA

Permitting

This project falls under the jurisdiction of the Wetlands Protection Act (WPA). Therefore, a Notice of Intent (NOI) will need to be filed with the Leicester Conservation Commission (the Commission) and with the Massachusetts Department of Environmental Protection (DEP).

The following are permitting possibilities with associated costs:

- We prepare a management plan to be submitted with your permit application if you do it yourself.
- Request for Determination of Applicability. You can easily file this permit yourself for little to no cost. Our cost for this permit includes phone attendance at a commission hearing and the development of the requisite management plan.
- Notice of Intent. You may be able to file this yourself, but it is very detailed and

We propose to use the following methods for invasive plant management:

Targeted Herbicide Application Methods

We will use targeted methods when appropriate to ensure that herbicide is applied carefully only to the Japanese knotweed. A brief description of the targeted methods follows.

1. Hand wiping: To hand wipe knotweed plants, an herbicide applicator wears a chemical resistant glove underneath an absorbent cotton glove (Figure 4). The applicator then moistens the glove with herbicide from hand-pumped low volume backpack sprayer equipped with specialized ultra-low-volume nozzles backpack sprayer and wipes the stem and leaves of the individual knotweed plants.



Figure 4. Hand wiping technique.

2. Stem injection: Using the JK Injection System®, the technician injects each individual knotweed cane with herbicide (Figure 5).



Figure 5. Stem injection of Japanese knotweed

Foliar spray application (backpack sprayers)

Foliar applications will be conducted for invasive shrubs < 5' tall and/or with stems < 1" diameter using hand-pumped backpack sprayers (Figure 6). Leaves should be uniformly wetted, but not to the point of runoff. A 2% herbicide solution will be used (volume/volume) along with a non-ionic surfactant at 0.25% solution (v/v). Treated invasive plants will be left to degrade in place over time and will not be cut or mowed.

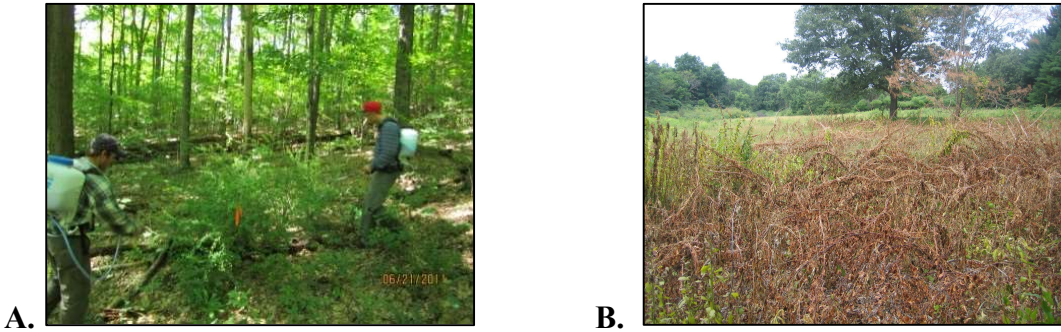


Figure 6. A. Crew members conducting a foliar spray herbicide application with backpack sprayers.
B. The result of a foliar spray herbicide application on invasive vine species 3 weeks after treatment.

Herbicide Selection and Environmental Conditions

All applications will be conducted with the wetland approved glyphosate-based herbicide *Rodeo*® (EPA Reg. No. 62719-324) along with a non-ionic wetland surfactant and indicator dye. This herbicide formulation is not volatile. There should be no rain for a 12-hour period after application and several hours prior to any herbicide application. A wind meter will be used to measure wind speed and wind direction. Wind speeds should be less than 10 mph and ideally in the range of 2-5 mph to avoid non-target damage resulting from a temperature inversion. Temperature should be less than 95 degrees Fahrenheit to avoid aerating the herbicide mix.

Treatment Schedule

2021

- Task 1. Permitting (May). This project falls under the jurisdiction of the Wetlands Protection Act (WPA). Therefore, a Notice of Intent (NOI) will need to be filed with the Leicester Conservation Commission (the Commission) and with the Massachusetts Department of Environmental Protection (DEP). Joan Deely will be complete the NOI for Kettle Brook.
- Task 2. Mow (June). Dead knotweed plant material will be mowed with a walk behind mower and brush clearing saws. The material with be mulched down and left onsite.
- Task 3. Herbicide treatment (Mid-August/Late September). Japanese knotweed will be foliar sprayed with specialized backpack sprayers fitted with ultra-low volume nozzles for targeted application procedure. Individual Japanese knotweed stems that occur near structures will be injected with JK Injection System® (Figure 2). in addition to Japanese knotweed, there were sparse Japanese barberry and winged euonymus, which will receive

a foliar application with the knotweed. There are a couple concerning Oriental bittersweet vines near the stream that will receive a cut stem treatment while we are there.

2022

- Task 4. Follow-up herbicide treatment (June). Follow-up herbicide application to resurgent knotweed plants.
- Task 5. Follow-up herbicide treatment (September). Follow-up herbicide application to resurgent knotweed plants.

2023

- Task 6. Follow-up herbicide application (June).
- Task 7. Follow-up herbicide application (September).

Success Criteria

Japanese Knotweed Management: 3 Year Program

Objective: 80% knotweed control resulting from 2021 initial foliar treatment and targeted methods; 90% resulting from 2022 follow-up treatments; and 95% resulting from 2023 follow-up treatments.

Knotweed can be managed/controlled, but not eradicated within the 3-year timeline presented here. The knotweed plants will persist in the treatment area as stunted or otherwise degraded-appearing specimens for several more years. It is very important to continue careful and thorough chemical treatment until the knotweed stops reappearing. Although we cannot guarantee complete eradication of the knotweed, we are confident that 99% control can be maintained with annual maintenance and stewardship which may be estimated at \$400/year. We can continue this work. Alternatively, we can train you to continue the work, or you may hire another contractor to continue the work.

We will establish several photo monitoring plots within the project area each area and will monitor the results at the end of the project. Our work is guaranteed to meet the stated success criteria.

Quality Assurance and Reporting

Lucy Gross will serve as project manager for your project and will be your point of contact. She will inspect all crew work firsthand to ensure that the treatment was well executed, thorough and effective. She will keep you informed of our schedule and progress. Our crew leaders use smart phones to submit daily work logs with photos and GPS to demonstrate areas completed. Upon

completion of each task, we will prepare a land management record which will summarize work completed each day (crew, weather, hours worked, herbicide used, herbicide amount and notes).

Maintenance & Stewardship

Successful invasive plant management requires a long-term, ongoing commitment to protect your investment in this project. Invasive plants can be reintroduced to the project area by wind, birds, and other animals. In addition, residual seed bank sources can continue to produce seedlings for several years after the mature plants have been removed from a site. To keep invasive plants out of the area it will be necessary to monitor the area by scouting for new patches and individual plants even after the treatment. Options for managing invasive plants after the initial two years usually include hand-pulling, spot herbicide spraying, and/or repeated cutting. Arrangements can be made for continuous stewardship of the property on an annual basis. LSI can help with planning for invasive plant stewardship treatments.

However, successful long-term maintenance is ultimately the responsibility of the landowner who must actively manage the property to take appropriate preventative management actions.