Mercer Island
Open Space Conservancy Trust
Herbicide Use Protocol

Prepared for:

The Mercer Island Open Space Conservancy Trust

Prepared by:

Mercer Island Public Works | Parks & Natural Resources
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Introduction

Pioneer Park and Engstrom Open Space contain non-native plant species that are crowding out native species and preventing native tree regeneration, a condition that was documented in the 2008 Pioneer Park Forest Health Survey. This study showed that large populations of regenerating non-native trees (particularly English holly and cherry laurel) cover the forest floor while English ivy, a non-native vine, was found growing on 20% of the native canopy trees. In addition, there are very few naturally regenerating conifer trees, suggesting that without active management, the conifer-dominated canopy may be lost.

The ordinance that established the Open Space Conservancy Trust charges the trust's board with "protecting, maintaining and preserving" its properties. The Trust's document ***Policies for Protecting, Maintaining and Preserving Mercer Island Open Space Conservancy Trust Properties*** states: "6. Exotic Species…c) Eradication methods must cause minimal damage to surrounding native species and ecological communities" (p. 8). From the results of restoration work over the past 18 years, the Trust recognizes that in some instances the disturbance resulting from manual removal techniques has more impact on the ecology of the forest than does a low-toxicity herbicide. This protocol identifies instances where this is most likely the case. It guides City of Mercer Island staff in application procedures which have been approved by the Open Space Conservancy Trust. It requires feedback to the Trust so that herbicide use can be reviewed annually and adjusted in consultation with City staff. The Trust has the authority to add new uses or discontinue existing uses of herbicide on its properties.

This document contains Herbicide Use Fact Sheets. Each fact sheet represents a Trust-approved use of herbicide. The fact sheets are to be used as an educational tool for trustees, City staff, City Council, and the public. Fact sheets will be added and removed to this document as the Trust approves or disapproves particular herbicide uses. The associated protocol follows these fact sheets and explains in detail how the application will be carried out. This is for the benefit of all involved, and will be particularly useful to Parks staff in contracted work in the future.

Invasive Trees
Herbicide Use Fact Sheet

What is the problem?

Invasive trees in Pioneer Park and Engstrom Open Space suppress the growth of native plants by creating dense shade and competing for space, nutrients and water. Holly and laurel have been spreading prolifically throughout both properties, creating "deserts" underneath larger trees.

Invasive trees found in Pioneer Park and Engstrom Open Space:

- cherry laurel (*Prunus laurocerasus*)
- English holly (*Ilex aquifolium*)
- European mountain ash (*Sorbus aucuparia*)
- English hawthorn (*Crataegus monogyna*)
- wild cherry (*Prunus avium*)
- Portugal laurel (*Prunus lusitanica*)
- black locust (*Robinia pseudoacacia)*
- cherry plum (*Prunus cerasifera*)
- tree-of-heaven (*Ailanthus altissima*)

Photos courtesy of King County Noxious Weed Control Program

What non-chemical methods of control have been used and/or considered?

Small trees are cut down and dug out. Larger trees have been cut down, however they re-sprout from their bases and continue to live. Due to their extensive root systems, larger trees are very difficult to manually remove in their entirety. Such removal also causes damage to surrounding native vegetation and creates large piles of brush.

What type of herbicide application is used to control these species?

Invasive trees are most effectively killed by injecting small shells filled with dry imazapyr using the EZ-Ject lance. No spray is used. The herbicide is taken up and circulated throughout the tree, affecting the entire plant. If a tree is too small to inject (less than 2 inch DBH), trees will be cut and painted with an aquatic formulation of glyphosate or triclopyr.

What should park users know to protect their health and safety?

Invasive tree herbicide treatment takes place during the spring and autumn. Because herbicide is directly injected into the trunks of the trees, there is little chance of park users coming into contact with the chemical. Park users should avoid touching copper-colored shells injected into the base of invasive trees. Signs are posted to alert park users after treatment.

Where can I get more information?

Go to http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds.aspx for more information about noxious weeds. Call 275-7882 or email restoration@mercerisland.gov for questions about this project or any other restoration work in Pioneer Park or Engstrom Open Space.

English Ivy
Herbicide Use Fact Sheet

What is the problem?

Photo courtesy of King County Noxious Weed Control Program

English ivy (*Hedera helix, H. hibernica*) is an aggressively spreading non-native vine. Its growth in the understory of Pioneer Park and Engstrom Open Space crowds out the growth of native herbs, shrubs and trees. English ivy also grows vertically into trees, creating heavy 'sails' that increase the risk of treefall in windstorms.

What non-chemical methods of control have been used and/or considered?

English ivy growing on the ground has been removed by hand pulling. Because this plant can re-grow from small pieces of roots or stems, roots must be carefully grubbed from the soil. Complete removal of English ivy usually takes many years. Manual removal is used in most areas of the park. However, on steep slopes where English ivy is the dominant plant, removing it by hand is very labor intensive and can lead to severe erosion. English ivy that grows into trees is cut at the base of the tree – no herbicide is used in these situations.

What type of herbicide application is used to control this species?

Only steep slopes (>60% grade) that are covered with more than 50% English ivy are treated with herbicide. A formulation of aquatic glyphosate and an aquatic surfactant is used. These chemicals have been selected because of their low toxicity. They are not toxic to frogs, salamanders and other amphibians. In early spring, the leaves are sprayed with a low concentration mixture just to the point of wetness. Herbicide is applied using a backpack sprayer, which allows the applicator to focus the spray onto targeted plants and minimize damage to native species.

What should park users know to protect their health and safety?

Treatments take place in the spring. Areas of English ivy within 20 ft. of trails are not sprayed. If English ivy is treated within 30 ft. of a trail, signs are posted at the trail edge to alert park users. The herbicide is usually taken up by the plant within 24 hours. As a precaution, dogs and people should stay out of treated areas for a week after treatment.

Where can I get more information?

Go to http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds.aspx for more information about noxious weeds. Call 275-7882 or email restoration@mercerisland.gov for questions about this project or any other restoration work in Pioneer Park or Engstrom Open Space.

Knotweed
Herbicide Use Fact Sheet

What is the problem?

Knotweed (*Polygonum* spp.) is an aggressively growing, non-native perennial that forms large thicknesses. The dense shade created by the large leaves and the dense underground root system block the growth of native species. Populations are able to grow rapidly and are difficult to control.

Several types of knotweed are present on Mercer Island – in parks, on private land, and along roadways. Control of knotweed should begin as soon as a population is found.

What non-chemical methods of control have been used and/or considered?

On other sites, knotweed has been controlled by digging out the roots. However, because knotweed regrows from very small root fragments, manual removal usually removes only a portion of the plant. The plant regrows prolifically within a year.

Photos courtesy of King County Noxious Weed Control Program

What type of herbicide application is used to control this species?

For knotweed with larger stems, the first treatment is a stem injection of small amounts of concentrated aquatic approved glyphosate. This method forces the herbicide directly into each bamboo-like cane, and eliminates herbicide drift to desirable plants. If knotweed regrows after the injection treatment, or if the stems are very narrow, the regrown leaves are sprayed during the following summer with a low concentration mixture of aquatic glyphosate or imazapyr and an aquatic surfactant, just to the point of wetness. These chemicals have been selected because of their relative low toxicity.

What should park users know to protect their health and safety?

Knotweed is treated in June - September. If knotweed is treated within 30 ft. of a trail, signs are posted at the trail edge to alert park users. The herbicide is usually taken up by the plant within 24 hours. As a precaution, dogs and people should stay out of treated areas for a week after treatment.

Where can I get more information?

Go to http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds.aspx for more information about noxious weeds. Call 275-7882 or email restoration@mercerisland.gov for questions about this project or any other restoration work in Pioneer Park or Engstrom Open Space.

Himalayan and Evergreen Blackberry Herbicide Use Fact Sheet

What is the problem?

Himalayan blackberry (*Rubus bifrons, syn. Rubus armeniacus*) and evergreen blackberry (*Rubus laciniatus*) are non-native shrubs that can form impenetrable thickets that reach up to 15 feet in height. These thickets prevent native plants from regenerating and can outcompete understory plants that are already established. Blackberry populations can be spread by seed or vegetatively by sprouting from their extensive root systems and forming new roots from stem tips when in contact with soil.

Photos courtesy of King County Noxious Weed Control Program

What non-chemical methods of control have been used and/or considered?

Most non-native blackberry plants are cut down and their roots are manually dug out. Manual removal requires multiple years of follow up, as plants can sprout from root fragments remaining in the soil. In large monocultures of blackberry and when blackberry is growing up through native plants, digging roots can cause significant soil and root disturbance, damaging existing native vegetation and creating disturbed soil conditions that invite new weedy species.

What type of herbicide application is used to control these species?

In areas where blackberry is growing up through native plants, stems are cut and immediately painted with an aquatic formulation of glyphosate or triclopyr. No spray is used. These chemicals have been selected because of their relative low toxicity. Herbicide is applied using a paint brush or dropper, which allows the applicator to treat only the cut stems of targeted plants and minimize damage to native species.

What should park users know to protect their health and safety?

Cut and paint treatment takes place in the summer and early fall. If blackberry plants are treated within 30 ft. of a trail, signs are posted at the trail edge to alert park users. The herbicide is usually taken up by the plant within 24 hours. As a precaution, dogs and people should stay out of treated areas for a week after treatment.

Where can I get more information?

Go to http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds.aspx for more information about noxious weeds. Call 275-7882 or email restoration@mercerisland.gov for questions about this project or any other restoration work in Pioneer Park or Engstrom Open Space.

Invasive Herbaceous Plants Herbicide Use Fact Sheet

What is the problem?

Several species of invasive herbaceous plants are beginning to grow in Pioneer Park and Engstrom Open Space. Although their populations are currently small, control will become very difficult and costly if they are allowed to spread. These species grow aggressively and compete with native plants for light and water, and eventually blanket entire areas!

Invasive herbaceous species currently found in Pioneer Park and Engstrom Open Space:

- yellow archangel (*Lamiastrum galeobdolon*)
- reed canarygrass (*Phalaris arundinacea*)
- bindweed (*Calystegia sepium, Convolvulus arvensis*)
- yellow flag iris (*Iris pseudacorus*)
- shiny geranium (*Geranium lucidum)*

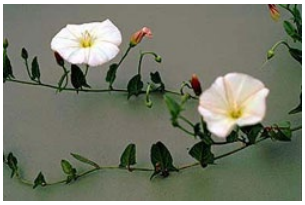
In addition to these identified weeds, Mercer Island Natural Resources staff is continuously monitoring for new populations of regulated noxious weeds throughout Open Space properties. These plants fit into Class A, Class B, or regulated Class C designations, meaning that control is required in King County.

What non-chemical methods of control have been used and/or considered?

The tops of these plants can be manually removed. However, because of their deep and extensive root systems, the plants begin to grow again very quickly. Excavating their root systems is extremely disruptive to surrounding vegetation, and rarely results in adequate control of the plant. Small areas can be smothered by cardboard or plastic. This also kills any native plants in the area.

What type of herbicide application is used to control these species?

During the growing season (specific timing varies for each species), the leaves are sprayed with a low concentration mixture of aquatic glyphosate and an aquatic surfactant, just to the point of wetness. For certain plants that are particularly difficult to control, (*i.e.* yellow archangel and shiny geranium) a low concentration of aquatic-approved triclopyr may be used on its own or added to the glyphosate mixture to improve control. Herbicide



Photos courtesy of Washington and King County Noxious Weed Control Programs

is applied using a backpack sprayer, which allows the applicator to focus the spray onto targeted plants and minimize damage to native species. Any new regulated weed infestations will be treated using the least toxic, effective method recommended by the King County Noxious Weed Control Program.

What should park users know to protect their health and safety?

Timing of treatment varies with the target plant, but is generally in early to mid-summer. If invasive herbaceous plants are treated within 30 ft. of a trail, signs are posted at the trail edge to alert park users. The herbicide is usually taken up by the plant within 24 hours. As a precaution, dogs and people should stay out of treated areas for a week after treatment.

Where can I get more information?

Go to http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds.aspx for more information about noxious weeds. Call 275-7882 or email restoration@mercerisland.gov for questions about this project or any other restoration work in Pioneer Park or Engstrom Open Space.

Mercer Island Open Space Conservancy Trust
Herbicide Use Protocol

1. Purpose

This protocol is intended to guide City of Mercer Island (City) staff in application procedures approved by the Open Space Conservancy Trust (Trust) for managing vegetation in Pioneer Park and Engstrom Open Space. Pioneer Park and Engstrom Open Space contain non-native invasive plant species that are crowding out native species and preventing native tree regeneration. The Trust desires to use the lowest impact approach to managing invasive plants. The Trust recognizes that in some instances the disturbance resulting from manual removal techniques has more impact on the ecology of the forest than does a low-toxicity herbicide.

2. Scope

This application protocol provides guidelines for City staff and City-hired contractors in the methods and restrictions of herbicide application. It also provides guidelines for when City staff must inform and/or request approval from the Trust board for new and existing herbicide uses.

3. Applicable Regulations and Standards

All herbicide applications must conform to Washington State Department of Agriculture (WSDA) pesticide regulations. The intent of this protocol is to meet or exceed the criteria set by Salmon-Safe Certification Standards for Parks and Natural Areas.

4. Definitions

Application – means the use of the product as a fumigant, direct surface spray, treatment, drench, injection, incorporation, side-dressing, pre-emergent, furrowed spread, or broadcast agent.

Commercial Applicator - A WSDA licensed pesticide applicator owning or managing a business of applying pesticides to the land or property of another. This land can either be publicly or privately owned.

Commercial Operator - A WSDA licensed pesticide applicator employed by a WSDA-licensed Commercial Applicator to apply pesticides to the land or property of another.

Direct On-site Supervision – A Public Operator (or Commercial Operator, if services contracted) is physically present and available, on-site.

Herbicide – A common pesticide focused on killing weeds and other plants that grow where they are not wanted.

Manufacturer's Label – The main source of information on how to use the product correctly, safely, and legally. The main sections of a label are: common name and brand name, active ingredient, EPA registration number, signal words, first aid, directions for use, and storage/disposal.

Material Safety Data Sheet (MSDS) – An information sheet provided by a chemical manufacturer describing chemical qualities, hazards, safety precautions, and emergency procedures to be followed in case of a spill, fire, or other emergency.

New Use – The use of an herbicide on a target species not identified in Section 7 (below), or the use of a herbicide formulation that is not identified in Section 7.

Pesticide – Defined by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as "…any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, nematodes, fungi, weeds, or any other forms of life declared to be pests, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Public Operator – A WSDA licensed pesticide applicator who, while acting as an employee of a governmental agency, applies restricted use pesticides by any means or any pesticide by power equipment on public or private property.

Restricted Use Pesticide - Any pesticide that is classified as restricted use by the Environmental Protection Agency or the Washington State Department of Agriculture (WSDA) at the time of registration. All pesticides applied to water are designated as state restricted use by WSDA.

Storm Event – A weather event that produces more than 0.25 inch of precipitation.

5. Responsibilities

A. Open Space Conservancy Trust shall:

1. Review and approve or reject any new uses of herbicides in its properties.
2. Receive reports each year on what herbicides have been applied to specific plant species.
3. Receive reports of issues, problems or emergencies related to the use of herbicides on Trust properties at the meeting that follows the date of the incident and as new information is available on such incidents.

B. Parks Natural Resources Staff shall:

1. Implement this protocol on Trust properties.
2. Propose updates to the protocol as new research or site conditions warrant.
3. Propose new uses of herbicides as new research or site conditions warrant.
4. Report to the Trust each year on areas where herbicides have been applied.
5. Report to the Trust each year on areas where herbicides are expected to be applied.
6. Include protocol requirements in contracts that include or may include herbicide application on Trust properties.
7. Communicate protocol specifications to contractors and field staff verbally before an application begins.
8. Provide on-site quality control for applications by City staff and contractors.
9. Keep copies of the Public Operators' and Commercial Operators' records on file in City office.

C. Pesticide applicators shall:

1. Be certified as, or under the supervision of, a Public Operator or Commercial Operator and be properly trained to work with herbicides.
2. Follow manufacturer's label instructions and this protocol. When such instruction is in conflict with this protocol, the label instructions will be followed.
3. Ensure that only approved herbicides are applied on Trust properties.
4. Follow the policies and procedures established in this application protocol.
5. Report any unsafe work practices to their respective supervisors.

6. Environmental Conditions

Environmental conditions (weather and site conditions) required for application of herbicides are dependent upon label and WSDA pesticide regulation requirements. Conditions are determined by visually observing the area and by collecting information from recognized weather forecasting organizations. Minimum environmental requirements: herbicides will not be applied on a site experiencing winds of greater than 10 mph or forecasted to receive a storm event within 12 hours, or label restrictions, whichever is more restrictive.

7. Application Specifications

A. Invasive Trees

Species: English laurel (*Prunus laurocerasus*), English holly (*Ilex aquifolium*), European mountain ash (*Sorbus aucuparia*), English hawthorn (*Crataegus monogyna*), wild cherry (*Prunus avium*), Portugal laurel (*Prunus lusitanica*), black locust (*Robinia pseudoacacia),* cherry plum (*Prunus cerasifera*) and tree-of-heaven (*Ailanthus altissima*)

Primary Method of application: EZ-Ject lance. Herbicide injected into the truck of the tree.

Time of year: Year-round, but most effective in the spring and fall: April 1 – June 1; September 1–November 1

Product: Imazapyr shells (EZ-Ject Copperhead Herbicide Shells)

Suggested application rate: One shell for trees with dbh less than 2 inches; then one shell every four inches around the trunk of the tree. Signage/trail buffer: Information about invasive tree herbicide treatments will be posted anywhere that treatment comes within 30 ft. of a trail, notification signs will be posted every 50 ft on the trail edge. Notification signage will be posted at nearest trail entrance. Area limits: Per label limits.

Secondary method of application for resprouts: Cut-stem

Method of application: Cut through stem completely with pruners, no more than 6" above grade or attachment to stump/trunk. Apply herbicide within 1 hour of fresh cut.

Time of year: April 1 – July 1

Product: Aquatic approved glyphosate or triclopyr (50-100% concentration)

Signage/trail buffer: Information about invasive tree herbicide treatments will be posted anywhere that treatment comes within 30 ft. of a trail, notification signs will be posted every 50 ft on the trail edge. Notification signage will be posted at nearest trail entrance.

Area limits: Per label limits.

B. English ivy

Species: English ivy (*Hedera helix*)

Method of application: Backpack sprayer, low pressure

Time of year: Feb 1 – May 1

Product: Aquatic glyphosate formulation (maximum 3% concentration) with aquatic surfactant (maximum 5% concentration)

Suggested application rate: Spray-to-wet. Do not spray to run-off.

Signage/trail buffer: Areas within 20 ft. of maintained trails will not be treated. Anywhere that treatment comes within 30 ft. of a trail, notification signs will be posted every 50 ft on the trail edge. Notification signage will be posted at nearest trail entrance.

Area limits:

1. Only steep slopes (>60% grade) with greater than 50% ivy cover on the ground will be treated.
2. Total herbicide application for English ivy is limited to 5 acres/year.

C. Knotweed

Species: Knotweed (*Polygonum* spp.)

Method of application: Injection tool, backpack sprayer (for regrowth only)

Time of year: June 1 – September 1

Product:

Stem injection: Aquatic glyphosate (100% concentration)

Foliar spray: Aquatic glyphosate or aquatic imazapyr(2% concentration), with an aquatic surfactant (maximum 2% concentration)

Suggested application rate:

Stem injection: 5 mL/stem

Foliar spray: Spray-to-wet. Do not spray to run-off.

Signage/trail buffer: Anywhere that treatment comes within 30 ft. of a trail, notification signs will be posted every 50 ft on the trail edge. Notification signage will be posted at nearest trail entrance.

Area limits: Per label limits.

D. Himalayan and evergreen blackberry

Species: Himalayan (*Rubus bifrons*) and evergreen blackberry (*Rubus laciniatus)*

Method of application: Cut stem

Time of year: June 1 – September 1

Product: Aquatic approved glyphosate or triclopyr (50-100% concentration)

Signage/trail buffer: Anywhere that treatment comes within 30 ft. of a trail, notification signs will be posted every 50 ft on the trail edge. Notification signage will be posted at nearest trail entrance.

Area limits: Per label limits.

E.Targeted species

Species: Yellow archangel (*Lamiastrum galeobdolon*), reed canarygrass (*Phalaris arundinacea*), hedge false bindweed (C*alystegia sepium*), yellow flag iris (*Iris pseudacorus)*, shiny geranium (*Geranium lucidum)*, new populations of Class A, Class B, or regulated Class C weeds.

Method of application: Backpack sprayer, low pressure
Time of year: April 1 – October 1
Product: Aquatic glyphosate (maximum 5% concentration) with an aquatic surfactant (maximum 5% concentration), aquatic triclopyr (2%) with an aquatic surfactant (5%), or a mixture of aquatic glyphosate (3%) and aquatic triclopyr (2%) with an aquatic surfactant (5%).
Suggested application rate: Spray-to-wet. Do not spray to run-off.
Signage/trail offset: Anywhere that treatment comes within 30 ft. of a trail, notification signs will be posted every 50 ft on the trail edge. Notification signage will be posted at nearest trail entrance.
Area limits:
1. Treatment for populations larger than 5000 sq. ft. will be presented to the Trust for approval before herbicide application.

8. Pollution Prevention and Spill Control

A. Storage, mixing and disposal of all chemicals shall not occur on Trust properties to minimize spill risk.

B. Irrigation canals, open trenches, surface waters, wetlands, designated 303(d) waterbodies, and groundwater sources should be noted and application shall be made to prevent contamination of these areas.

C. In the event that herbicides are inadvertently spilled, the following steps are to be taken:

1. Control the flow of the material being spilled.
2. Prevent contamination of water sources by using control measures such as storm drain inlet protection, absorbent materials, sandbags, or trenching.
3. Isolate the area, keeping people at least 30 ft. away.
4. If the spill occurred on an impermeable surface, use absorbent materials to soak up spilled materials. Dispose of absorbent materials according to WA state regulations.
5. If the spill occurred on soil, remove the top three inches of soil, and cover the area with at least 2 inches of lime. Cover the lime with a layer of topsoil. Dispose of the contaminated soil according to WA state regulations.
6. Report the spill to the Department of Ecology at (425) 649-7000.
7. For large spills, contact the Washington Emergency Management Division at (800) 258-5990.

9. Aquatic Herbicide Application

For control of invasive species in open water, storm drainage system, and flood control channel areas, only those materials specifically designed and registered for direct water application may be used. Directions on the label must be followed as well as evaluating the application for the potential to harm the environment.

10. Training and Documentation

City staff will only allow herbicide application by pesticide applicators that are under the supervision of a Public Operator or Commercial Operator. Starting in 2011, on-site supervision by a Public Operator or Commercial Operator will be required. The Public Operator or Commercial Operator must possess a valid and current certification. The applicator is responsible for following any federal and state requirements as well as all label requirements and reviewing the MSDS prior to use.

Each person who applies herbicides must be given the following information before starting work:

1. Appropriate application of the herbicide
2. Type of chemical being used
3. Safety procedures
4. Emergency spill information
5. Use of protective equipment
6. Cleanup procedures
7. Disposal procedures

11. References

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