

# Methods for Mechanical Removal of Select Invasive Plant Species

Mayne Island, BC  
2018  
Rob Underhill



# Acknowledgements

This manual was created as part of the *Priority Ecosystems Restoration Project*. Funding for that project was provided by the following partners:

This project was undertaken with the financial support of:  
Ce projet a été réalisé avec l'appui financier de :



Environment  
Canada

Environnement  
Canada



**VICTORIA  
FOUNDATION**



**Friends of the  
Environment  
Foundation**



## Scotch broom (*Cytisus scoparius*)



**Mechanical Removal Methods:** Scotch broom will not re-sprout from root tissues. Therefore a plant that is cut below the uppermost root will die 100% of the time. The larger the stem diameter, the less likely it is to re-sprout from a stem cut and the harder it is to cut below the uppermost root. Therefore stems larger than 3cm in diameter should be removed using the saw and chop method described in the table below. Plants that re-sprout due to incorrect cutting are harder to manage. Care must be taken to minimize soil disturbance in order to limit new seed germination and impact to existing native vegetation. Therefore plants should never be pulled if the goal is to manage a population of Scotch broom long-term, or to improve habitat for native plants and animals.

Stem Diameter	Method
0-1.5cm	Cut below the uppermost root with hand pruners
1.5-3cm	Cut below the uppermost root with loppers
>3cm	Cut 5-10cm above the ground with a hand saw, and then split the stem with an axe

**Disposal:** All broom plants must be gathered in a tarp and transported to an appropriate disposal location. Do not leave piles of broom to rot within management areas, this will kill the underlying vegetation and create conditions conducive to germination of new broom seeds and other weedy exotics. Two recommended methods for disposal are burning or composting. If composting you should choose a shaded site in the forest and pile the broom as high as possible in order to limit the footprint. If burning, choose one location rather than multiple locations, and be sure to follow best practices for outdoor burning prescribed by your local Fire Department.

## Daphne (*Daphne laureola*)

Daphne is a poisonous shrub introduced sometime in the early 1900s from Eurasia. Daphne shrubs produce black berries in the summer each year; these berries fall off in August or are eaten by birds, which carry the seeds to new areas.

Daphne is a health hazard to humans and causes habitat loss for native plants and animals. Although Daphne is slow to establish, it will spread and create large dense patches where few other plants can survive.

Unlike Scotch Broom, Daphne is shade tolerant; this means Daphne has the potential to spread widely throughout forested areas. Daphne contains a poisonous chemical called mezerin. Mezerin is found in all parts of Daphne including the leaves and berries. Daphne is listed as a poisonous plant with the Canadian Poisonous Plants Information System. If ingested, the berries can cause death. The sap can cause an itchy rash if it comes into contact with your skin. Crushing or burning daphne will release a gas that can cause respiratory problems, nausea, and unconsciousness.



**Mechanical Removal Methods:** Manual removal is the most effective method for managing Daphne. Some basic knowledge of how the plant grows will ensure your efforts do not go to waste. Like Scotch Broom, Daphne does not have the ability to re-sprout from roots, but will readily re-sprout from stems. Therefore an effective removal method is to cut the plant below the root collar. The root collar is the place where the stem becomes root. To make sure you are cutting below the root collar, cut below the uppermost lateral root. The best tools for cutting Daphne are hand pruners and loppers. Using brushsaws, weedwhackers, or chainsaws will cause the sap of Daphne to volatilize, which will cause respiratory problems. Small plants less than 15cm tall can usually be pulled out by hand easily without causing soil disturbance.

**Disposal:** Do not burn daphne. Inhaling smoke from burning Daphne is hazardous to your health. The best way to dispose of Daphne is to pick a place to pile it and allow it to decompose. Do not use Daphne in your food or garden compost.

## English holly (*Ilex aquifolium*)

English holly is one of the most concerning plant introductions. This species is tolerant of a broad range of sun and moisture conditions. Its preferred habitat is wet soils with full sun, but it will grow happily in full shade. A relatively slow growing plant, holly at first may not seem alarming. However, this species is long lived and increases its rate of growth as it matures. This is a particularly difficult species to manage once established because it is dispersed by birds, and it readily re-sprouts from root tissues.



**Mechanical Removal Methods:** The best method for removal is to use a mechanical pulling tool before the plant gets too large. Care should be taken to remove as much as the root as possible, so try to avoid breaking the stem when pulling the plants out. Larger plants (stems thicker than 3cm) are usually too difficult to pull and must be dug out with a mattock/shovel. Application of a systemic herbicide is an alternative treatment for large plants.

**Disposal:** If the stems are laid on wet ground it's possible they may layer themselves and grow a new plant. Care should be taken to hang the pulled plants in a tree or shrub to keep them off the ground. Burning is also an appropriate disposal method if it is efficient to do so.



## Bull thistle (*Cirsium vulgare*)

Bull thistle is a biennial species that should be manually pulled in June. The timing of removal applications is important. The stems should be tall and mature enough that you can locate the plants, but not so mature that the seed heads will mature on the pulled plants. If the flower heads have opened and you can see the purple ray flowers, you must cut off and bag the flower heads prior to pulling the plant. Repeat surveys are required because this species is difficult to spot, and some plants mature later than others. As a result, you may keep finding more plants in areas you thought you had completed. Even a small number of plants left unmanaged will result in the expansion of this species, so diligence is required to remove all individuals.



**Mechanical Removal Methods:** Pull plants in June using a weed wrench. We found the larger the plant, the more effective the weed wrench tool was. Plants with thin stems tend to slip out from the tool; however, these small plants are relatively easy to pull by hand. With practice, you should be able to decide whether pulling with the tool or by hand is the best method for each individual plant. Make sure to wear at least one layer of thick leather gloves, and smooth the prickles against the stem before gripping the plant. Failure to remove the taproot will result in the plant living into a third year and turning into a multi-stemmed monster.

**Disposal:** Plants can be pulled and left on site if they are few and far between. In the event flowers have opened, the flower heads must be cut off and bagged before the plants are pulled. Cut flowers should be burned or buried in a landfill.

## Himalayan Blackberry (*Rubus armeniacus*) and Evergreen Blackberry (*Rubus laciniatus*)

Himalayan blackberry is more aggressive and abundant than the evergreen blackberry, but the management method is the same for both. These species create a dense thicket in deeper soils and where there is significant sun exposure. Staff and volunteers should be able to tell the difference between these species and the native trailing blackberry (*Rubus ursinus*).

**Mechanical Removal Method:** The best method for removal is to cut the stems back to about 12” off the ground, and then dig out the root balls using a shovel. First, use loppers and hand pruners to reach into the thicket as far as possible to cut the stems. Second, use a hard rake to pull the cut canes out and roll them into a spike ball (the cut stems will stick to each other nicely, allowing the stems to be maneuvered with the rake onto a durable tarp for transport. Once you are left with 12” canes, use the shovel to dig out the root balls. Repeat treatments will be required to successfully eradicate patches of these species. Small plants can sometimes be pulled by hand, but care must be taken to remove all roots larger than 1cm in diameter or they will re-sprout. Thick gloves and protective eyewear are recommended when working with these species. Note that these species grow most prolifically in areas that would normally contain a tree canopy dense enough to prevent the establishment. Consider restoration of a canopy as a long-term management strategy.

**Disposal:** Treat this species like Scotch broom. If a suitable burn location is nearby, then burn. If no suitable burn location is nearby, transport to a shady site and make a pile with as limited a footprint as possible. Compost piles must be monitored, because this species will layer itself provided wet conditions.



**Figure 1.** On left, Himalayan blackberry. On right, evergreen blackberry.

## English Ivy (*Hedera helix*)

This species thrives in a variety of moisture and sun exposure conditions, including deep shade; making it a priority for management due to its ability to thrive in a broad range of habitats. In most areas of the Southern Gulf Islands, this species establishment is currently being prevented by heavy deer browse.

**Mechanical Removal Methods:** Hand pull small plants, taking care to remove all stems and roots.

**Disposal:** Like English holly, English ivy can later itself if pulled stems are lain on wet ground. Make sure to hang pulled stems in trees or shrubs to allow them to desiccate.



## Foxglove (*Digitalis purpurea*)

This biennial species is shade intolerant. Priority should be on managing this species in ecosystem types that are naturally open such as woodlands and meadows. In deeper soil sites, consider re-establishing a canopy as the most appropriate management method.

**Mechanical Removal Method:** Hand pull plants at any stage of their life. The roots readily break off below the crown, which minimizes soil disturbance and is effective in killing the plant.

**Disposal:** To date we have been leaving pulled plants on site to compost in deep shade.

