

Invasive Honeysuckles

(*Lonicera* spp.)

Best Management Practices in Ontario



ontario.ca/invasivespecies

Foreword

These Best Management Practices (BMPs) provide guidance for managing invasive honeysuckles (*Lonicera spp.*) in Ontario. Funding and leadership for the production of this document was provided by the Invasive Species Centre. The BMPs were developed by the Ontario Invasive Plant Council (OIPC) and its partners to facilitate the invasive plant control initiatives of individuals and organizations concerned with the protection of biodiversity, agricultural lands, infrastructure, crops and natural lands.

These BMPs are based on the most effective and environmentally safe control practices known from research and experience. They reflect current provincial and federal legislation regarding pesticide usage, habitat disturbance and species at risk protection. These BMPs are subject to change as legislation is updated or new research findings emerge. They are not intended to provide legal advice, and interested parties are advised to refer to the applicable legislation to address specific circumstances. Check the Ontario Invasive Plant Council website (www.ontarioinvasiveplants.ca) for updates.

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For more information on invasive plants in Ontario, visit www.ontario.ca/invasivespecies,
www.ontarioinvasiveplants.ca, www.invadingspecies.com or www.invasivespeciescentre.ca

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Tatarian Honeysuckle in fruit.
Photo courtesy of Wasyl Bakowsky.



Bells Honeysuckle.

Photo courtesy of Danielle Tassie.

Introduction

There are over 180 honeysuckle species in the genus *Lonicera*. These include honeysuckles native to North America, Asia, Europe, Russia and India. Sixteen honeysuckle species are found in Ontario, including ten introduced species. The species are considered invasive in North America, and Ontario in particular, include the Tatarian (*Lonicera tatarica*), Amur (*L. maackii*), Morrow, (*L. morrowii*) and Bells (*L. xbella*) honeysuckles. These are the honeysuckles featured in these Best Management Practices (BMPs).

Invasive honeysuckles is the collective term for several shrub-form plants in the *Lonicera* genus. These plants were valued additions to gardens and were deliberately brought to North America from their native Korea, China, Japan, Europe and Russia. As far back as the 18th century, the honeysuckles were prized for their attractive flowers and were imported and promoted as a garden ornamental, as a shrub for wildlife and to prevent soil erosion. After several tries, honeysuckles were successfully cultivated in North America. There was even a program through the United States Soil Conservation Service to develop cultivars of certain honeysuckles for soil stabilization and wildlife habitat.

As early as the 1920s it was noted that invasive honeysuckles were spreading beyond their original planting sites and were reproducing and becoming established in natural areas. By the 1960s they were widely reported as abundant in pastures and forested areas alike.

Over time they have naturalized and become an invasive problem in North America, dominating forest understories as well as more open sites, such as fields and pastures. In Canada, invasive honeysuckles are found from as far west as Alberta and east to the Maritime provinces, with infestations primarily in Ontario.

While there are differences among these plants, all of them share characteristics such as rapid growth, high reproduction and an ability to outcompete native vegetation and take over the understory of forest and woodland habitats. For the purpose of these BMPs, differences between the four problematic invasive honeysuckle species will be highlighted, but the invasive honeysuckles will be treated as a group (given their shared range, ecology, and control options).

Invasive honeysuckles can look similar to some of our native honeysuckles particularly when young. They outcompete native honeysuckles and other native shrubs and herbaceous plants, and they impact forest regeneration. These shrubs also reduce the quality of wildlife habitat, particularly for forest dependent song birds. Invasive honeysuckles are not listed on any federal or provincial weed lists.

Description

Invasive honeysuckles are deciduous, multi-stemmed woody shrubs. The exact form they take depends on the particular species.

Identification features that are common to the invasive honeysuckles addressed in these BMPs include:



Common feature of invasive honeysuckles are simple, opposite leaves.

Photo courtesy of James H. Miller, USDA Forest Service, Bugwood.org.



Showy flowers

Photo courtesy of Patrick Breen, Oregon State University, Bugwood.org.



Thornless branches

Photo courtesy of Annemarie Smith, ODNR Division of Forestry, Bugwood.org.



Berries of most invasive honeysuckle species remain on the plant through the winter.

Photo courtesy of Chuck Barger, University of Georgia, Bugwood.org.

Invasive honeysuckles

Amur Honeysuckle (*Lonicera maackii*)



Photo courtesy of John M. Randall, The Nature Conservancy, Bugwood.org.

Tatarian Honeysuckle (*Lonicera tatarica*)



Photo courtesy of Patrick Breen, Oregon State University, Bugwood.org.

Morrow Honeysuckle (*Lonicera morrowii*)



Photo courtesy of Chris Evans, Illinois Wildlife Action Plan, Bugwood.org.

Bells Honeysuckle (*Lonicera xbella*)



Photo courtesy of Leslie J. Mehrhoff, www.discoverlife.org.

Stem

- Up to 6 metres

- Up to 5 metres

- Up to 2.5 metres

- Up to 6 metres

Leaves

- Opposite and acuminate, tapering to a narrow, longer, more pronounced point compared to other species
- Fruit/flower stalk shorter than leaf stalks
- Leaf sparsely hairy above and below leaves end in a sharp point at the tip
- Underside of the leaf has hair along the veins
- Dark green leaf appears much earlier in spring than other vegetation

- Opposite and obtuse, more rounded and shorter leaf shape, like a spade
- Leaves and buds hairless, buds ovoid shaped

- Opposite and oval-acute, tapering to a wide, sharp point
- Hairy underside, upper leaf surface usually hairless
- Leaf buds sparsely hairy or hairless, short cone shaped

- Opposite and oval-acute-obtuse, tapering to a more blunt point intermediate shape between Tartarian and Morrow but roughly same size as Morrow
- Leaves only slightly hairy or hairless, slightly hairy underside
- Leaf buds sparsely hairy or hairless, short cone shaped

Amur Honeysuckle
(*Lonicera maackii*)



Photo courtesy of John M. Randall, The Nature Conservancy, Bugwood.org.

Tatarian Honeysuckle
(*Lonicera tatarica*)



Photo courtesy of Patrick Breen, Oregon State University, Bugwood.org.

Morrow Honeysuckle
(*Lonicera morrowii*)



Photo courtesy of Chris Evans, Illinois Wildlife Action Plan, Bugwood.org.

Bells Honeysuckle
(*Lonicera xbella*)



Photo courtesy of Leslie J. Mehrhoff, www.discoverlife.org.

Flowers and Seeds

- White/yellow flowers
- Red berries (can be slightly orange)
- Peduncles (flower stems) short (2-4mm) and pubescent (downy)

- White to dark pink flowers
- Red berries (rarely yellow) Fruit/flower stalk longer than leaf stalks
- Peduncles long (10-15mm) and hairless

- White to pink
- Red berries
- Flower stalks hairy
- Fruit/flower stalk longer than leaf stalks
- Peduncles long (10-12mm) and pubescent

- Pink fading to yellow with age
- Red berries (occasionally yellow)
- Peduncles long (10mm) and sparsely hairy to hairless
- Fruit/flower stalk longer than leaf stalks

Bark/ Branches

- Often hollow between nodes or with brown pith

- Branchlets hollow between nodes, twigs grey or yellow brown

- Branchlets with brown pith, twigs hairy

- Branchlets with brown pith, twigs hairy, twigs grey to dark grey brown and hairy

Note

- Does not hybridize as much as others, characteristics more stable; Infestations are much more localized for this species.

- *Lonicera xbella* is a hybrid between *L. morrowii* and *L. tatarica*.

These species, and other non-native bush honeysuckles **can hybridize, which may make identification more difficult**. Due to frequent hybridization the above characteristics can only be considered general tendencies. Most importantly, the differences between invasive and native shrubs should be studied before starting control efforts.

Amur honeysuckle
(*Lonicera maackii*)

Amur honeysuckle is a native of central and northeastern China, Korea and parts of Japan. The earliest record of the plant in North America is from the Dominion Arboretum in Ottawa, Ontario, which suggests the plants were first cultivated there in 1896. It is a deciduous multi-stemmed shrub that can grow to a height of 6 metres.

Tatarian Honeysuckle
(*Lonicera tatarica*)

This honeysuckle is native to western and central Russia. Introduced to North America in the 1750s and widely used in horticulture. It grows up to 3 metres tall.

Morrow Honeysuckle
(*Lonicera morrowii*)

Morrow honeysuckle is native to Japan. It was brought to North America in the late 1800s and was considered a solution for areas prone to soil erosion. It is smaller than the other bush honeysuckles, growing up to 2.5 metres tall.

Bells Honeysuckle
(*Lonicera xbella*)

Bells honeysuckle is a hybrid of *L. morrowii* and *L. tatarica* and shares characteristics of both parent plants (although it is usually taller, growing up to 6 metres). Perhaps due to its “hybrid vigor” Bells honeysuckle is considered to be a particularly aggressive invasive shrub.



Left: *L.morrowii*, Centre: *L.xbella*, Right: *L.tatarica*.

Photo courtesy of Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Similar Species:

Invasive honeysuckle plants can look similar to some of the native honeysuckles, such as Fly Honeysuckle (*Lonicera canadensis*), Swamp Fly Honeysuckle (*Lonicera dioica*), Northern Bush Honeysuckle (*Diervilla lonicera*).

There are a few ways to differentiate between the native and invasive honeysuckles. The native species have solid stems while the invasive stems are usually hollow. The filling inside the branches (pith) of invasive honeysuckles is often light-colored or white while in the natives it is dark brown. The invasive honeysuckles leaf out earlier than most native species and retain their leaves later into the fall, making identification easier during those times.

Morrow, Tatarian & Amur honeysuckles may be confused with young Dog-strangling vine (*Cynanchum rossicum*) plants (before dog-strangling vine start to "climb"). Amur honeysuckle leaves have long pointed tips, while Dog-strangling vine leaves have a shorter tip. With Morrow honeysuckle, the distinguishing feature is the leaves, which are opposite and oval-acute, tapering to a wide, sharp point. Tatarian leaves look similar to Dog-strangling vine but have a slightly heart-shaped tapering at the base of the leaf.



Amur Honeysuckle leaves have long pointed tips.

Photo courtesy of Chris Evans, Illinois Wildlife Action Plan, Bugwood.org.



Dog-strangling vine leaves have pointed tips, but are shorter than Amur Honeysuckle.

Photo courtesy of Greg Bales.

Native Honeysuckles

Fly Honeysuckle (*Lonicera Canadensis*)



Photo courtesy of Wikipedia.org, 2011.

Swamp Fly Honeysuckle (*Lonicera oblongifolia*)



Photo courtesy of Britton, N.L., and A. Brown. USDA-NRCS PLANTS Database.

Northern Bush Honeysuckle (*Diervilla lonicera*)



Photo courtesy of John Hixson., Lady Bird Johnson Wildflower Center.

Stem	<ul style="list-style-type: none"> • Up to 2 metres 	<ul style="list-style-type: none"> • Up to 1.5 metres 	<ul style="list-style-type: none"> • Up to 1 metre
Leaves	<ul style="list-style-type: none"> • Opposite and simple, pointed and oval in shape • Leaf edges are finely hairy 	<ul style="list-style-type: none"> • Opposite and simple. oval in shape • Leaves are stalkless • Usually hairy, more prominent on underside of leaf 	<ul style="list-style-type: none"> • Opposite and simple, oval to lance shaped, tapering to a long, sometimes curved tip • Edges of leaves sharply toothed, with short fine hairs
Flowers and Seeds	<ul style="list-style-type: none"> • White bell flowers, hanging downward in pairs from long peduncle (1 inch), appearing in late spring • Flowers surrounded by cuplike bracts • Reddish orange berries ripening in mid to late summer 	<ul style="list-style-type: none"> • Yellow to pink flowers, two-lipped and narrow • Flowers appearing in May to June • Fleshy red berries that occur in pairs 	<ul style="list-style-type: none"> • Yellow flowers (sometimes orange or brownish-red with age), narrow and funnel shaped, forming clusters at branch tips • Fruit are slender, long-beaked, brown capsules • Flowers and fruit appearing in June and early July

Fly Honeysuckle
(*Lonicera Canadensis*)



Photo courtesy of Wikipedia.org, 2011.

Swamp Fly Honeysuckle
(*Lonicera oblongifolia*)



Photo courtesy of Britton, N.L., and A. Brown. USDA-NRCS PLANTS Database.

Northern Bush Honeysuckle
(*Diervilla lonicera*)



Photo courtesy of John Hixson., Lady Bird Johnson Wildflower Center.

**Bark/
Branches**

- Branches slender, silvery to reddish-grey, buds small and pointed
- Reddish/grey bark finely peeling and shredding on larger branches

- Branches are upward pointing and covered with small hairs
- Bark is greyish and smooth

- Often has two lines of fine hairs along branches
- Older branches brownish to grey
- Smooth brown bark

Note

- Non-flowering specimens may be confused with Spreading Dogbane which has a milky sap while the Swamp Fly Honeysuckle does not

Biology and Life Cycle of Invasive Honeysuckles

Invasive honeysuckles are multi-stemmed deciduous woody shrubs that can form dense thickets. They can tolerate shade, but seedlings do better in full sunlight and take advantage of gaps in forest canopies and open habitat. They reproduce primarily via seeds, although cuttings have been used successfully in horticultural settings.

Like another invasive shrub, Common Buckthorn (*Rhamnus cathartica*), the honeysuckles leaf out earlier and retain their leaves later into the fall than many native species.

Invasive honeysuckles can outcompete their native counterparts in several ways. They often have greater biomass than native honeysuckles, allowing them to outcompete for light and nutrient resources. They have a high seed production, producing seeds after 3-5 years. Seeds remain on the plants well into winter and are eaten and dispersed by a variety of birds and small mammals.

Plants that have naturalized in North America produce more seeds compared to plants in their native ranges in Asia and Europe. This is likely due to the selection of certain genotypes of the invasive honeysuckles which would produce more fruit during its early stages of cultivation.



Tatarian Honeysuckle seed.

Photo courtesy of Bruce Ackley, The Ohio State University, Bugwood.org.



Young Bells Honeysuckle.

Photo courtesy of Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Habitat

In its native range, honeysuckles are commonly found in floodplains and mixed forests, often alongside oaks, elms, fir, spruce and hemlock. In Japan, honeysuckles are associated with mesic (moist) sites and acidic soils, while in Eurasia, the plants do well in dry, cool areas. They can also be found in disturbed sites and forest edges.

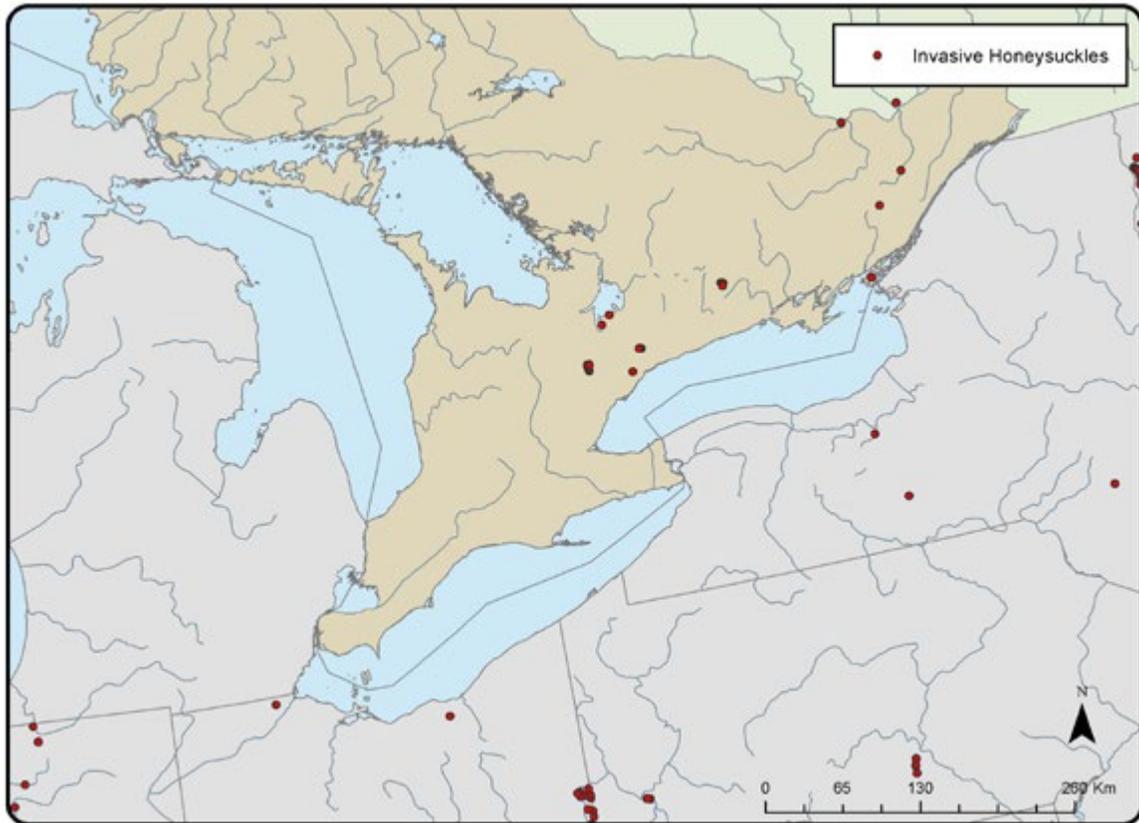
Here in North America invasive honeysuckles adapt well to a variety of habitats and soil types. They are established in habitats such as thickets and floodplains. Invasive honeysuckles are successful edge colonizers, often found along the transition zones between woodlots and open areas such as old farm fields and pastures, as well as along shorelines and areas such as road sides, and railroad rights-of-way.

The invasive honeysuckles also do well in disturbed habitats. They are often found in urban forests and in forests with a history of disturbance (fragmentation, forestry, grazing). The Amur in particular is often found in or near cities and towns, where they were planted as ornamentals or for soil stabilization. Tatarian and Morrow have been known to invade the interior of otherwise healthy, intact forests.

The shrubs adapt to a variety of soil types and have been found growing in well drained, moist soils, and can tolerate low nutrient availability. Invasive honeysuckles are also shade tolerant. They grow particularly well in calcareous soils, and in the case of Amur honeysuckle, may be found growing in fens, grasslands and barrens.

Distribution

Invasive honeysuckles have become established in over 24 American states, across the northeastern and central U.S., down into the mid-Atlantic states and north into southern Ontario, western Quebec and the Maritime provinces. There are also reports of invasive honeysuckles as far west as Alberta.



Invasive Honeysuckles Distribution Map courtesy of EDDMapS (www.eddmaps.org/ontario). The map point data is based on records contained in the Invasive Species Database, compiled from various sources as of February 13, 2014. This map is illustrative only. Do not rely on this map as a definitive distribution as it is subject to change based on additional confirmed invasive species sites. This map may contain cartographic errors or omissions.

Impacts

Biodiversity

Invasive honeysuckles grow quickly, forming dense patches, which prevent other plant species from growing. The shade produced by these thickets reduces the light and nutrients available to other plants. The ground beneath a dense patch of honeysuckles can be absent of any other plant species. Invasive honeysuckles also have allelopathic qualities - they release a chemical that inhibits the growth of neighboring plants. Research has shown that the presence of invasive honeysuckles is directly linked to a decrease in other herbaceous plants.

The shrubs may negatively impact songbirds. Migratory songbirds feed on the abundant fruits of the invasive honeysuckles, but the berries are less nutritious than native shrub species. Secondly, songbirds will nest in invasive honeysuckles, but research on American robins (*Turdus migratorius*) and Wood thrushes (*Hylocichla mutelina*) showed that these birds nesting in both invasive honeysuckles and buckthorn shrubs experienced higher rates of nest predation. This is possibly due

to nesting closer to the ground than they would have in native trees and shrubs.

When these honeysuckles invade the interior forest, they change the vegetation community by outcompeting native species. This disturbs the site, making it unsuitable for many interior forest species. In Ontario, invasive honeysuckles are identified as a threat to several plant species at risk. These include, American Columbo (*Frasera caroliniensis*), Hoary Mountain-mint (*Pycnanthemum incanum*), Drooping Trillium (*Trillium flexipes*), and Spoon-leaved moss (*Bryoandersonia illecebra*). Small scale removal of invasive plants at hoary mountain-mint sites has shown at least short term success for species recovery.

Invasive honeysuckles could also threaten other species at risk including the Acadian flycatcher (*Empidonax vireescens*); the Bobolink (*Dolichonyx oryzivorus*) and various turtles such as the Wood turtle (*Glyptemys insculpta*) and Spotted turtle (*Clemmys guttata*).



Invasive Honeysuckles can negatively impact forest ecosystems and wildlife.

Photo courtesy of Danielle Tassie.



American Columbo
(*Fraseria caroliniensis*)



Drooping Trillium
(*Trillium flexipes*)



Hoary-Mountain mint
(*Pycnanthemum incanum*)

Photos courtesy of C.D. Jones, NHIC Archives, Copyright Queens Printer for Ontario, 2014.

Regulatory tools

Federally

Invasive honeysuckles are not federally regulated.

Provincially

Invasive honeysuckles are not provincially regulated.

Municipal – Property Standards Bylaw

Municipalities can pass property standards bylaws under the Building Code Act to address the presence of weeds deemed noxious or a threat to the environment or human health and safety.

Invasive honeysuckles are a regulated species in other North American jurisdictions (i.e. in Wisconsin invasive honeysuckles are a restricted species, meaning they are an “invasive species that are already established in the state and cause or have the potential to cause significant environmental or economic harm or harm to human health.”)

Best Management Practices

To successfully manage any invasive species it is important to use a control plan that incorporates integrated pest management principles. This means using existing knowledge about the pest species and its surrounding environment to prevent and fight infestations and may require more than one type of measure to be successful.

Once invasive honeysuckle has been confirmed at a location, a control plan should be developed based on infestation size, site accessibility, potential for spread and the risk of environmental, economic or social impacts. Site specific conditions such as native plant diversity, wildlife usage and water table fluctuations should also be considered. A detailed inventory of each site is strongly recommended before starting control efforts. This will help ensure proper methods and timing are used to minimize negative impacts and maximize effective control.

After an infestation of invasive honeysuckle is confirmed, land managers should focus their first efforts on preventing spread. Isolated seedlings and small populations (satellite infestations) outside the main infested area should be removed first. When action is taken early it can significantly reduce the cost of control and long term efforts required.

With large infestations and limited time and resources, control work can seem daunting. It is important to develop a feasible, long-term strategy with the following considerations:

1. Remove the outlying populations (isolated plants or satellite populations) first, to prevent further spread.
2. Concentrate on high-priority areas such as the most productive or sensitive part of an ecosystem or a favourite natural area.
3. Consider dedicating a certain time each year to control efforts, and make it a joint effort with neighbouring landowners/land managers.
4. Plan to replant native tree and shrub species once the honeysuckle population is eradicated or under control. This will help jump-start natural succession and increase biodiversity in the area.
5. Follow-up monitoring is crucial to remove seedlings that may sprout after initial control efforts.

The following BMPs can be used as a guide in the development of a control plan. Natural resource considerations such as species at risk and habitat disruption should be applied before starting control efforts.

Natural Resource Considerations

You are responsible for ensuring that your project follows all relevant laws, including the Endangered Species Act (ESA). If protected species or habitats are present, an assessment of the potential effects of the control project could be required. Consult with your local MNR district office early in your control plans for advice. If controlling invasive honeysuckle in riparian areas, shoreline health must also be considered.

Setting Priorities

When creating management plans, it is important to make the most of resources by prioritizing invasive species control. The following flow chart will help you to prioritize control of invasive honeysuckle shrubs.

Site Prioritization

(This section modified from "The Landowners Guide to Managing and Controlling Invasive Plants, published by Credit Valley Conservation)

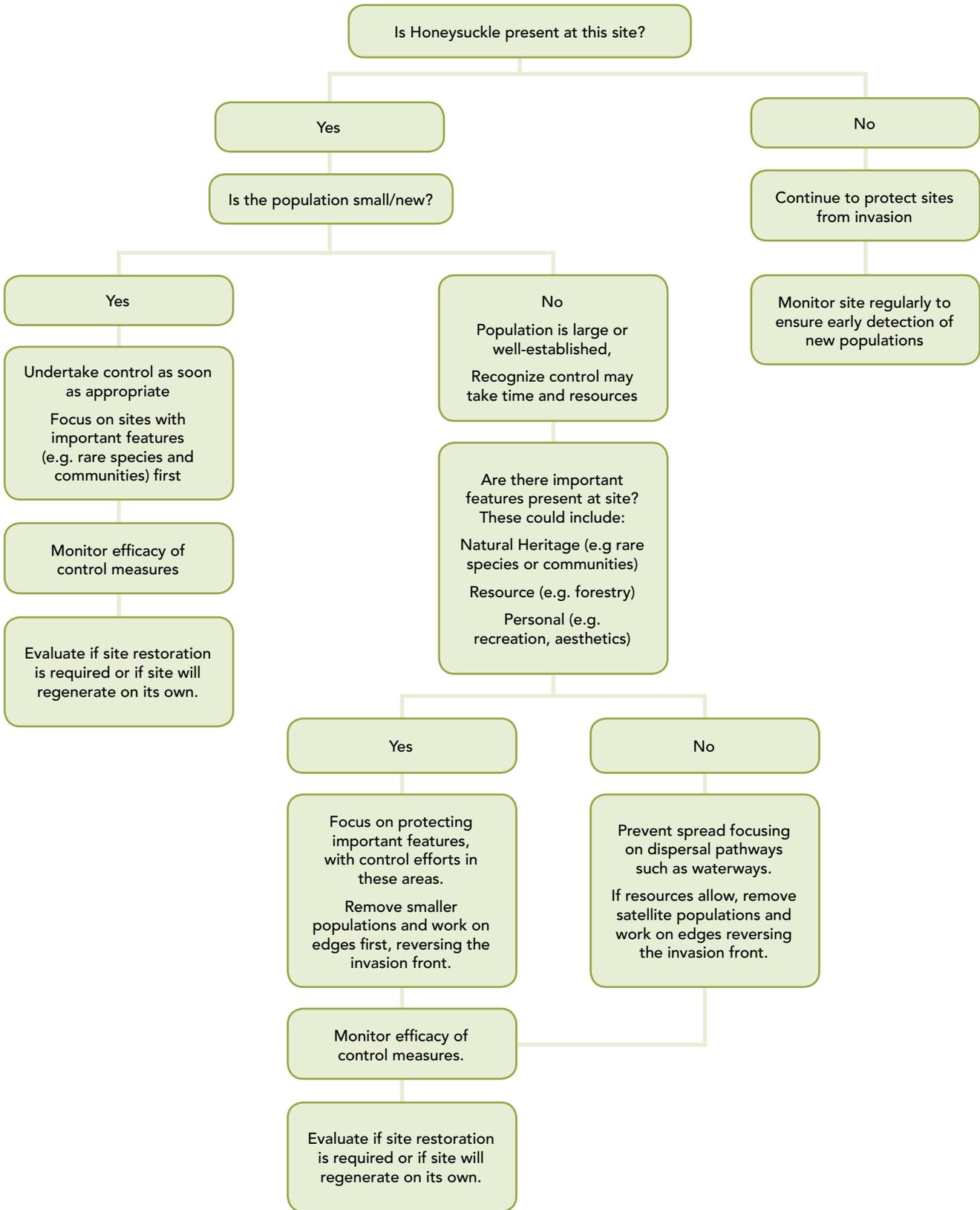
1. Protect areas where invasive honeysuckle is absent or just appearing.
2. Protect rare species and communities. These include federal, provincial and regionally listed rare species.
3. Protect important habitats and land values (i.e. agricultural, forestry, maple syrup production).
4. Cost and effort: Will the area where invasive honeysuckle has invaded require restoration or can it be left to regenerate naturally? (Note – it is usually recommended to restore control areas to make them more resilient to future invasions).

Prioritizing within a Control Area

1. Focus on large blocks of un-invaded areas and keep them free of invaders
2. Control small, younger, outlier (satellite) populations first
3. "Unfragment" the boundaries of invaded areas by removing outlying plants
4. Reverse the invasion, expand the un-invaded area outward

It is crucial to prioritize control by determining where the satellite populations are, and eradicating those before they join up with larger populations.

This flow chart can help land managers choose which site to first focus control efforts:



Assessing Regeneration vs. Restoration

Consider the following factors:

- **Level of disturbance at the site**

What is the level of disturbance at site? Was it a heavily invaded site? (I.e. a lot of disturbance was caused when things were removed) Will it continue to be disturbed? (i.e. through trail use and management)

- **Invasive Species Biology**

What is the biology of the invasive species removed and is there a seed bank to consider?

- **Re-invasion Risk**

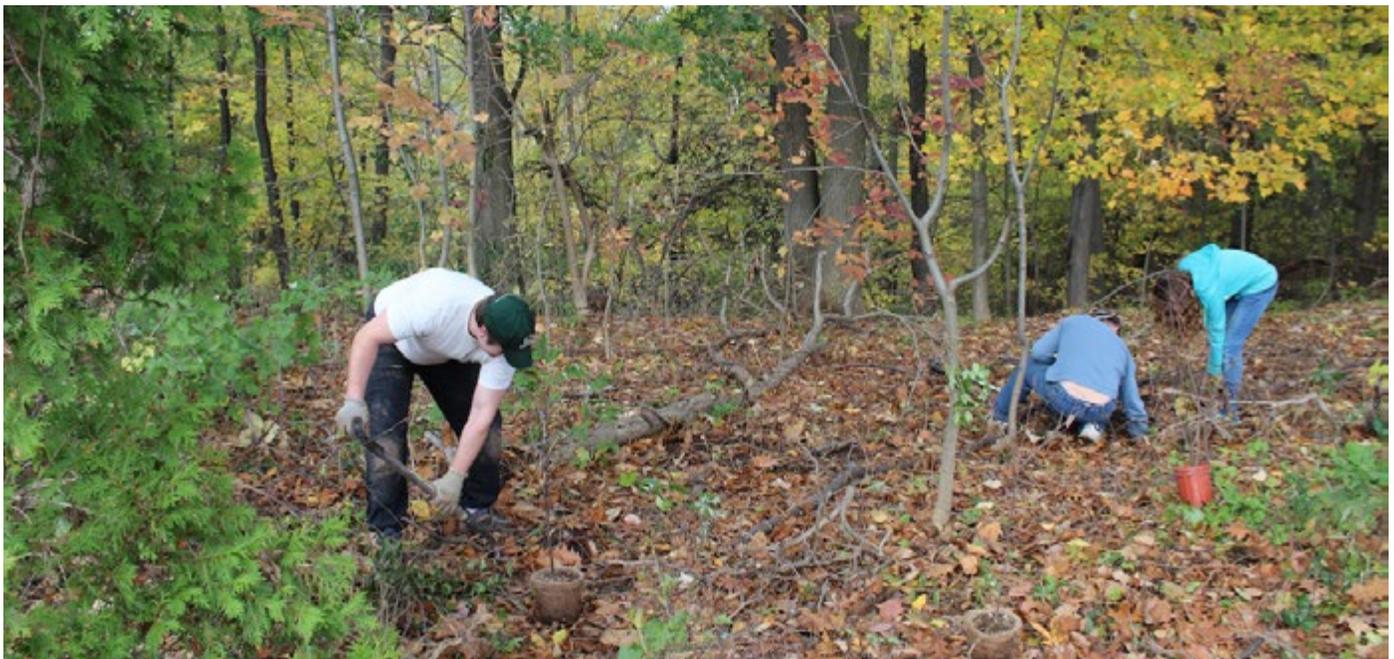
Are there invasive species in the area that could re-invade the site from certain pathways of introduction, such as nearby trails or watercourses?

- **Existing native vegetation**

What native vegetation is left? How long before it regenerates by itself? Does it need help?

If you answered yes to most of the questions above, it is most likely that the site will be re-invaded before it has a chance to regenerate on its own. Restoration will reduce the risk of re-invasion.

See page 27 for restoration methods.



Replanting after invasive honeysuckle removal.

Photo courtesy of David d'Entremont.

Control Measures

Invasive honeysuckles will most likely require a combination of control methods, as well as a management plan that includes long term monitoring and revisiting sites.

Controlling invasive honeysuckle before it becomes well established will minimize its negative impacts. For most control methods, the best time to remove honeysuckles is before fruit develops, which is typically at 3-5 years old. Removing young, small plants is the most effective course of action when possible.

Manual Control

Pulling

Hand pulling can be an effective method for eradicating small young populations of invasive honeysuckle. Young shrubs can be hand pulled when soils are moist. It is easier to remove shrubs in the spring due to easy identification of the species, however, hand-removal at this time of year can disturb the soil and impact spring ephemerals. Therefore, it is better to conduct hand-pulling in the fall. Hand-pulling should not be done in sensitive habitats.

The root systems of invasive honeysuckles are shallow, allowing even large plants to be manually pulled. When individual plants or infestations are too large for effective hand pulling, a digging tool may be used to remove the entire plants (roots included). For stems up to 6cm, use a Weed Wrench or similar tool to remove the entire root. Any root that remains has the potential to re-sprout.

For larger shrubs, mechanical levers such as root wrenches should be used to pry up the root systems. Shrubs can be left on site if the soil has been removed from the roots and they are exposed to the air. This allows the roots to dry out

and eliminates any chance of re-rooting. Shrubs can be cut and roots removed with a shovel. Re-sprouts must be continually clipped until the root reserves are exhausted. This method is effective but labour intensive and works best when dealing with just a few individual plants. Another approach to pulling is to use a tractor, paying special attention to restoration and replanting of the area afterwards.

If berries are present on shrubs, take care to collect them and dispose of them in the trash.

(Manual removal can disturb the soil, creating ideal conditions for other invasive species to become established. See Restoration page X for techniques to prevent this.



A hand tool may be necessary for removing larger shrubs.

Photo courtesy of Dan Bechard.



It is important to remove the roots of Invasive Honeysuckles.

Photo courtesy of David d'Entremont.

Clipping:

Repeated clipping of invasive honeysuckles over a prolonged period of time (3-5 years) can effectively control infestations. Clipping should not be done in the winter, as this will cause extensive re-sprouting in the spring.



Roots of invasive honeysuckle.

Photo courtesy of David d'Entremont.

Cutting:

Larger stems can be cut using hand tools, chainsaws or brushcutters. Keep in mind that cut stumps will re-sprout quite vigorously in the spring, and therefore, this control method is often followed by an application of a herbicide. Stumps should be cut sharp and straight across, particularly when followed up with chemical control.

In a 2010 study, Amur honeysuckle was removed mechanically with a chainsaw and hand clippers. By the following spring the cleared area had a lush regrowth of Amur Honeysuckle from stump sprouts, new subterranean shoots and emerging seedlings. Another invasive plant Common Chickweed (*Stellaria media*) had also colonized the area.

The following year (May 2011) an area was cleared of Amur honeysuckle and other woody invaders using hand clippers and chain saws, followed by a herbicide application to the cut stumps. By mid-July, this method had proven more effective than using only manual removal.

Girdling:

Girdling (a cut groove down to the heartwood all the way around the stem) is also a feasible control option. Herbicide must be applied to fresh stumps or girdled areas to prevent resprouting. Applying the herbicide right after cutting allows for better absorption and may reduce the need for repeat applications. A precise application of herbicide from a small hand-pump bottle can be done at any time of the year, although late spring/early summer is the best time. See “Chemical Control” section for more information on the use of pesticides, including herbicides.

The site must be monitored for the next few seasons to ensure control of seedlings or re-sprouts. Girdling can weaken larger honeysuckle shrubs that can't be pulled by hand or by mechanical means. This makes the shrub easier to remove mechanically the following year. Cutting the shrub down to a stump will cause sprouting and make stump removal very difficult. Sprouting will still occur with girdling but won't be as vigorous as with cutting. Over time (1-2 years, girdling may need to be repeated after the first year) the canopy will begin to die, the roots will die back and the shrub will become easier to pull out. When girdling, the band should be at least 3" wide to prevent wound closure and the recovery of the shrub.

Mowing:

Bush honeysuckles can be mowed immediately after the plants leaf out. Begin by cutting shrubs to within 5 cm of the ground. Monitor closely for re-sprouts, and repeat later in the season. This method must be continued for several seasons and is best suited for small populations.

Cultural Control

Grazing:

Goats will browse invasive honeysuckle and heavy deer populations limit regrowth.

Burning

Where possible, fire can be an effective tool in controlling invasive honeysuckle. Over time, prescribed burns during the plant's growth period can exhaust the root reserves of honeysuckle and top-kill the plants. Invasive honeysuckles will quickly resprout after an initial burn. For effective control, repeated burns may be necessary every year or every other year for at least 3-5 years. A handheld propane torch can be used for seedlings.

Land managers have reported successful control using prescribed fires as long as fires are hot enough and repeated at regular intervals.

Burning should also be used in conjunction with monitoring and removal of new seedlings.



Invasive honeysuckle bush.
Photo courtesy of Diana Shermet.

Chemical Control

Herbicide Application

Herbicides must be applied in accordance with all label directions. For an up-to-date list of herbicides labelled for Honeysuckles control, visit the Pest Management Regulatory Agency's web site at www.pmra-arla.gc.ca. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)'s Publication 75, Guide to Weed Control is an excellent reference for all aspects of weed control, and includes a section on invasive plant management. To determine if a federally registered herbicide is also classified for use in Ontario, visit <http://app.ene.gov.on.ca/pepsis/>.

Anyone using a pesticide is responsible for complying with all federal and provincial legislation. Most non-domestic (i.e. commercial, restricted etc.) herbicides can only be applied by licensed exterminators. For more information, refer to the Ontario Pesticides Act and Ontario Regulation 63/09 (available on <http://www.e-laws.gov.on.ca>), or contact the Ontario Ministry of the Environment (<http://www.ene.gov.on.ca/environment>).

Foliar Spray:

Foliar spray is the recommended control method for large thickets of invasive honeysuckle where there is little risk for harming non-target species. Plants should be sprayed between August and October. Spraying during the fall is recommended because other non-target plants will be dormant. Refer to the herbicide label for rates and instructions for foliar application.

Legislation governing pesticide use:

The Ontario Pesticides Act and Ontario Regulation 63/09 provide natural resources, forestry and agricultural exceptions which may allow chemical control of invasive plants on your property. Other exceptions under the Act include golf courses, and for the promotion of public health and safety.

Natural Resources Exception:

A 'natural resources' exception exists for the use of prohibited pesticides to manage, protect, establish or restore a natural resource. In order to qualify for this exception, your project must meet the criteria specified in section 33 of Ontario Regulation 63/09 including the use of pesticides in accordance with Integrated Pest Management (IPM) principles outlined in this BMP guide. You will need to contact the Ontario Ministry of Natural Resources (<http://www.ontario.ca>) to obtain a written letter of opinion from the MNR Regional or Branch Director.

Cut Stump Method:

This method of chemical application is more appropriate when dealing with individual shrubs or in an environmentally sensitive area where foliar application is not possible. The shrubs are horizontally cut at or near ground level, and herbicide is immediately applied to the cut stump.

Forestry Exception:

A forest is defined as a treed area of land that is one hectare in size or larger. Class 9 pesticides may be used in a forest for the purposes of harvesting, renewing, maintaining or establishing a forest, protecting forest resources derived from a forest, and accessing a forest for these purposes under the forestry exception.

The control of invasive honeysuckle may fall under the forestry exception; a Forestry Class of land exterminator licence would be required to use commercial pesticides in a forest.

Refer also to the Ministry of Environment's factsheet titled "Pesticides Act and Ontario Regulation 63/09 Private Land and Woodlot Owners April 2011" http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/stdprod_085367.pdf



Bells Honeysuckle.

Photo courtesy of Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Agriculture Exception:

The agriculture exception allows a farmer to use Class 9 pesticides for the purposes of the agricultural operation that he or she owns or operates. This exception may apply to the control of invasive honeysuckle if it impacts their agricultural or horticultural operation.

An agricultural operation is an agricultural, aquacultural or horticultural operation and includes:

- growing, producing or raising farm animals;
- production of crops, including greenhouse crops, maple syrup, mushrooms, nursery stock, tobacco, trees and turf grass, and any additional agricultural crops prescribed under the Nutrient Management Act, 2002;
- activities that are part of an agricultural operation such as maintenance of a shelterbelt for the purposes of the agricultural operation, and;
- the production of wood from a farm woodlot, if at least one of the activities described earlier is carried out on the property where the farm woodlot is located.

Some activities are not included in the definition of an "agricultural operation", please refer also to the Ministry of the Environment's factsheet titled "Pesticides Act and Ontario Regulation 63/09 Agriculture May 2011" http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/stdprod_080128.pdf

Biological Control

Biological control is the use of an herbivore, predator, disease or other natural enemy to reduce established populations of invasive species. Most invasive species have no natural enemies in their new habitats. Biological control aims to re-establish an ecological balance between the invasive species and its natural enemies by selecting highly host-specific natural enemies from the country of origin, and moving them to the country where the invasive species is a problem. This is only done after extensive host-range testing in the country of origin or quarantine, to ensure that the potential biocontrol agent is host-specific to the targeted invasive species. This method has been used successfully for invasive plants in North America, including Purple Loosestrife (*Lythrum salicaria*), Leafy Spurge (*Euphorbia esula*), Diffuse Knapweed

(*Centaurea diffusa*) and St John's Wort (*Hypericum perforatum*).

There are many species, which will feed on invasive honeysuckle, but most do not cause enough damage to the plants to provide control. Deer will browse honeysuckle species (although given the choice, they prefer native species), sometimes enough to eradicate it from small areas. Another introduced species, the European honeysuckle aphid (*Hyadaphis tatarica*) will reduce flower and fruit production in invasive honeysuckles, but the aphid in turn is controlled by the native ladybird beetles.

Some research has suggested the allelopathic compounds in members of the Juglandaceae (Walnut) family, can reduce germination rates in Amur honeysuckle. Other reports suggest that invasive honeysuckles can grow quite well alongside *Juglans nigra* (black walnut).



Invasive honeysuckles can be found along forest edges.

Photo courtesy of Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Disposal

Several options exist for disposal of invasive honeysuckles. Branches can be piled and burned on site (check with your municipality for burn permits). If you are chipping the invasive honeysuckles, fruit should be removed and placed in the regular trash. Check with your municipality re: available composting options. Like other invasive plants, invasive honeysuckles should never be composted in backyard composters, as these generally are not large enough to produce the heat required to break down plant material, including seeds.



Invasive Honeysuckle branches can be piled and burned on site with the proper permits.

Photo courtesy of David d'Entremont.

Choosing the Best Control Method

		Isolated Plants	Small (.1-.5ha)	Medium (.5-2ha)	Large (more than 2 ha)
Density of Infested Area	Low Density (1-50 plants or less than 10% cover)	<ul style="list-style-type: none"> • Pulling 	<ul style="list-style-type: none"> • Pulling, clipping, cutting, girdling, mowing, burning, cut stump method 	<ul style="list-style-type: none"> • Pulling, clipping, cutting, girdling, mowing, burning, cut stump method 	<ul style="list-style-type: none"> • Mowing, burning, cut stump method
	Medium Density (50-1000 plants or between 10% and 30% cover)		<ul style="list-style-type: none"> • Clipping, girdling, mowing, burning, foliar spray 	<ul style="list-style-type: none"> • Mowing, burning, foliar spray 	<ul style="list-style-type: none"> • Grazing, mowing, burning, foliar spray
	High Density (more than 1000 plants or 30 – 100% cover)		<ul style="list-style-type: none"> • Mowing, grazing, burning, foliar spray 	<ul style="list-style-type: none"> • Mowing, grazing, burning, foliar spray 	<ul style="list-style-type: none"> • Grazing, burning, foliar spray, biological



Amur Honeysuckle.

Photo courtesy of Lindsay Barr.

Control Measures Summary

Method	Population Characteristics	Purpose of Control	Notes
Pulling	<ul style="list-style-type: none"> Small to medium, young shrubs 	<ul style="list-style-type: none"> Removal of entire smaller seedlings by hand, or a weed wrench or other digging tool 	<ul style="list-style-type: none"> Roots must be removed
Clipping	<ul style="list-style-type: none"> Small to medium 	<ul style="list-style-type: none"> Reduce seed production and plant density 	<ul style="list-style-type: none"> Should not be done in the winter, will encourage extensive re-sprouting in spring
Cutting	<ul style="list-style-type: none"> Small to medium, adult shrubs 	<ul style="list-style-type: none"> Removal of larger shrubs 	<ul style="list-style-type: none"> Often done in conjunction with cut stump herbicide treatment
Girdling	<ul style="list-style-type: none"> Small to medium, adult shrubs 	<ul style="list-style-type: none"> Removal of adult shrubs 	<ul style="list-style-type: none"> Done in conjunction with herbicide treatment and pulling to remove shrub following season
Mowing	<ul style="list-style-type: none"> Small to medium, young shrubs 	<ul style="list-style-type: none"> Reduce seed production and plant density 	<ul style="list-style-type: none"> Must be repeated for several seasons
Grazing	<ul style="list-style-type: none"> Large populations 	<ul style="list-style-type: none"> Deplete root reserves for eventual plant death 	<ul style="list-style-type: none"> Not recommended for high quality natural areas
Burning	<ul style="list-style-type: none"> Small to large 	<ul style="list-style-type: none"> Removal of top growth, depletion of root reserves 	<ul style="list-style-type: none"> Must be repeated for several seasons
Foliar Spray	<ul style="list-style-type: none"> Large populations, younger trees 	<ul style="list-style-type: none"> Spraying of herbicide on the leaves of plants to get absorbed in to the plant 	<ul style="list-style-type: none"> This method is used on large thickets where there is little risk for non-target species
Cut Stump Herbicide Application	<ul style="list-style-type: none"> Small to large populations, adult shrubs 	<ul style="list-style-type: none"> Used in conjunction with cutting to prevent new shoots from sprouting on cut trees 	<ul style="list-style-type: none"> Used when dealing with individual shrubs or in an environmentally sensitive area
Biological	<ul style="list-style-type: none"> Large populations 	<ul style="list-style-type: none"> Introduction of a predator or pathogen to provide limited levels of control 	<ul style="list-style-type: none"> No large scale biological control is currently available

Restoration

Removal of invasive plants may be considered one of the first steps in the restoration of a property or habitat. Restoration is an important aspect of a successful plant removal. Site restoration will result in a healthier ecosystem, more resistant to future invasions. Monitor all restoration activities to ensure native species are becoming established, and continue to remove invasive honeysuckles and other invasive plants that remain onsite.

Types of Restoration

During Control:

Mulching:

Mulching sites immediately after invasive species control (i.e. mechanical or chemical control of honeysuckle) may aid in the recovery of native species and prevent immediate re-colonization by other invaders when the invasive honeysuckle dies back. Mulching reduces light availability, allowing more shade-tolerant native plant species to germinate and colonize the gaps left by removing the honeysuckle.

Seeding:

Seeding an area with an annual cover crop or native plant species, immediately after management activities, may be necessary to prevent the establishment of new invasive species. This will give desirable native species the chance to establish themselves.

After Control:

Planting:

If there are invasive plants nearby which may colonize the control area, planting larger native species stock (potted etc.) will help outcompete invasive seedlings. Wait until all management is complete before doing a large stock re-planting, as it may be difficult to distinguish between newly planted native species and invasive seedlings. When completing planting at control sites, it is important to consider conditions such as earthworm impacts (little to no leaf litter) and light availability (have any trees recently been removed which have opened up the forest canopy?). These environmental changes will affect the growing and soil conditions. Also, additional management activities may disturb the newly planted materials, so it is best to postpone planting until all control is complete.

Alternatives to Invasive Honeysuckles

Replanting with native non-invasive species after removal of invasive honeysuckle can be an important component of a management plan.



Alpine Currant
(*Ribes alpinum*)

Photo courtesy of Wikipedia.org.



Bush Honeysuckle
(*Diervilla lonicera*)

Photo courtesy of Sally and Andy Wasowki,
Lady Bird Johnson Wildflower Center.



Common Ninebark
(*Physocarpus opulifolius*)

Photo courtesy of Sean James.



Fragrant Sumac
(*Rhus aromatica*)

Photo courtesy of S.Smith.



Nannyberry
(*Viburnum lentago*)

Photo courtesy of S.Smith.

When choosing native plants to replant an area, ensure that species that are suitable for the site conditions (soil/moisture/light) are chosen.

See "Grow Me Instead": <http://www.ontarioinvasiveplants.ca/files/GMI2012web.pdf>

Preventing the Spread

Everyone can help prevent the spread of invasive honeysuckles by following these tips:

Report it.

If you think you see invasive honeysuckles in an area where it has not been intentionally planted, take a picture, record the location and contact the Invading Species Hotline to report it. For more information and guidance call the Invading Species Hotline at **1-800-563-7711** or visit www.invadingspecies.com or www.ontarioinvasiveplants.ca.

Watch for it.

Learn what invasive honeysuckles looks like. Monitor property boundaries, roadsides, fence lines and trails. Early detection of invasive plants can make it easier and cheaper to remove or control them.

Stay on trails.

Avoid traveling off-trail in areas known to have invasive honeysuckles or other invasive species.

Look Before You Leave.

Inspect, clean and remove mud, seeds and plant parts from clothing, pets (and horses), vehicles (including bicycles), and equipment such as mowers and tools. Clean vehicles and equipment in an area where plant seeds or parts aren't likely to spread (e.g., wash vehicles in a driveway or at a car wash) before travelling to a new area.

Keep it natural.

Try to avoid disturbing soil and never remove native plants from natural areas. This leaves the soil bare and vulnerable to invasive species.

Use native species

Try to use local native species in your garden. Don't plant invasive honeysuckles and if you have removed it, try to replant with native species. Don't transplant invasive species such as invasive honeysuckles. Encourage your local garden centre to sell non-invasive or native plants. [The Grow Me Instead guides list alternatives to plant instead of invasive species.](#)

Tracking the Spread of Invasive Honeysuckles

Locations of invasive honeysuckles have not been documented in many parts of Ontario. There are gaps in our understanding of its provincial distribution and the scale of its invasion in many locations.

Several reporting tools have been developed to help the public and resource professionals report sightings, track the spread, detect it early and respond quickly. These include:

1) EDDMaps is an on-line reporting tool where users can view existing sightings of invasive honeysuckles and other invasive species in Ontario, and document their sightings.

This tool, at www.eddmaps.org/ontario is free to use.

2) The toll-free Invading Species Hotline (1-800-563-7711) and website (www.invadingspecies.com), which individuals can use to report sightings verbally or on-line.

If you think you have invasive honeysuckles on your property or if you see it in your community where it hasn't been intentionally planted, please report it. You will be asked to send in photos of the leaf, bark and flower for identification.

Best Management Practices Documents Series:

Common Buckthorn Best Management Practices for Ontario

Dog-strangling Vine Best Management Practices for Ontario

Garlic Mustard Best Management Practices for Ontario

Giant Hogweed Best Management Practices for Ontario

Phragmites (Common Reed) Best Management Practices for Ontario

Japanese Knotweed Best Management Practices for Ontario

Wild Parsnip Best Management Practices for Ontario

Invasive Honeysuckles Best Management Practices for Ontario

White Sweet Clover Best Management Practices for Ontario

European Black Alder Best Management Practices for Ontario

Additional Publications from the Ontario Invasive Plant Council:

Clean Equipment Protocol for Industry

Compendium of Invasive Plant Management

Grow Me Instead! Beautiful Non-Invasive Plants for Your Garden, a guide for Southern Ontario

Grow Me Instead! Beautiful Non-Invasive Plants for Your Garden, a guide for Northern Ontario

References/Additional Resources

- Anderson, H. and D. Tassie. 2013. Literature review of existing control measures for selected invasive plant species affecting species at risk. Ontario Invasive Plant Council, Peterborough, ON.
- Batcher, M.S. and S.A. Stiles. 2009 Element Stewardship Abstract for the Bush Honeysuckles. The Nature Conservancy.
- Cope, A.E. and W.C. Muenscher. 1950. Keys to Woody Plants. Comstock Publishing Company.
- Derickx, L.M. and P.M. Antunes. 2013. A Guide to the Identification and Control of Exotic Invasive Species in Ontario's Hardwood Forests. Invasive Species Research Institute. Available at: <<http://www.isri.ca/current-projects/invasive-species-guidebook.html>> (Accessed: November 5 2012)
- Gaertner, M., J.L Fisher, G.P. Sharma, and K.J. Esler. 2012. Insights into invasion and restoration ecology: Time to collaborate towards a holistic approach to tackle biological invasions. *Neobiota* 12: 57-75.
- Jacquart, E. 2009. Where do I start?! Prioritizing Invasive Plant Control. Indiana Chapter of The Nature Conservancy. <<http://www.inwoodlands.org/where-do-i-start-prioritizing/>> (Accessed November 5, 2012)
- Kaufman, S. and W. Kaufman. 2007. Invasive Plants: A guide to identification and the impacts and control of common North American species. Stackpole Books.
- Krick, R., H. Anderson, G. Bales, F. Forsyth, E. Weisz, F. MacDonald, S. Bull, and R. Gagnon. 2012. A Landowners Guide to Managing and Controlling Invasive Plants. Credit Valley Conservation. 116 pp. Available at: <<http://www.creditvalleyca.ca/watershed-science/plants-animals-communities/invasive-species/resources/>> (Accessed September 18 2012)
- Luken O.J. and W. J. Thieret. 1996. Amur Honeysuckle, Its fall from Grace. *Bioscience*. Vol 46, No 1, January 1996.
- Love J.P. and J.T. Anderson. 2009. Seasonal effects of Four Control Methods on the Invasive Morrow's Honeysuckle (*Lonicera morrowii*) and Initial Responses of Understory Plant in a Southwestern Pennsylvania Old Field. *Restoration Ecology*. Vol. 17, No 4, July 2009, pp. 549-559.
- Panke, B and Renz, M. 2012. Management of Invasive Plants in Wisconsin: Bush Honeysuckles. University of Wisconsin. Available at: <<http://www.wrisc.org/Management%20Documents/Honeysuckles.pdf>> (Accessed January 16 2014)
- Reznicek, A.A., E. G. Voss, and B. S. Walters. 2011. Michigan Flora Online University of Michigan. Web. Available at: <<http://michiganflora.net/genus.aspx?id=Lonicera>> (Accessed January 15 2014)
- Rich, Roy. 2000. Beautiful Species to Hate: Non-native Bush Honeysuckles: Invasive *Lonicera* species in the Midwest. *Restoration and Reclamation Review*. Vol. 6, No. 5, Fall 2000. Department of Horticultural Science University of Minnesota, St. Paul MN.

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