

FOR-175

Woodland Invasive Plant Management Series: Bush Honeysuckle

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Several species of Asian bush honeysuckle in the genus *Lonicera* are invasive in North America. The most common invasive bush honeysuckle species in Kentucky is the Amur honeysuckle (*Lonicera maackii*) but other invasive honeysuckle species include *L. morrowii*, *L. tatarica*, *L. x bella*. These species, originally native to China, Korea and parts of Japan, were introduced to the U.S. as far back as the late 1800s and were promoted for conservation and wildlife uses in the 1960s and 1970s. Unfortunately, bush honeysuckles are still popular ornamental plants despite easily escaping into natural areas. The negative impact of dense stands of these species and the ease in which they can escape cultivation is a major concern across the region.

IDENTIFICATION

Form:

- Bush honeysuckle grows as a dense, multi-stemmed shrub, typically ranging from 6 to 15 feet in height (Fig. 1). Larger plants may resemble small trees (Fig. 2).

Leaves and stems:

- Bush honeysuckle is one of the first shrubs to leaf out in the early spring and one of the last to lose its leaves in the late fall (Fig. 3 and 4).
- Leaves are egg-shaped to oblong, opposite, and about 1- 2 ½ inches long (Fig. 5).
- When cut, twigs are hollow inside (Fig. 6).

Fruit and flowers:

- Fragrant tubular white to yellow or pink flowers bloom in the spring (April-May) (Fig. 7).
- Fruits are red or orange berries containing many seeds and develop in the late summer (Fig. 8).

Similar plants:

- Japanese honeysuckle (*Lonicera japonica*) is a related invasive plant widespread in Kentucky. However, it grows as a vine and produces black berries (Fig. 9).
- Coralberry (*Symphoricarpos orbiculatus*) also has opposite leaves (although differently shaped) and purple berries (Fig. 10).
- Native vine honeysuckle (*Lonicera sempervirens*) with large pink to orange flowers (Fig. 11).



Figure 1. Dense shrubby growth form of bush honeysuckle common in the woodland setting. Photo credit: Chris Evans, University of Illinois, Bugwood.org



Figure 2. Large landscape bush honeysuckle, over 15 ft tall. Photo credit: Ellen Crocker



Figure 3. Bush honeysuckle leafing out in early spring. Photo credit: Ellen Crocker



Figure 4. In Kentucky, bush honeysuckle leaf out in early to mid-March, before most other native plants. Photo credit: Ellen Crocker



Figure 5. Opposite leaf arrangement with a reddish stem on new shoots. Photo credit: Chris Evans, University of Illinois, Bugwood.org



Figure 6. Bush honeysuckle has a hollow pith on smaller stems. Photo credit: Chris Evans, University of Illinois, Bugwood.org

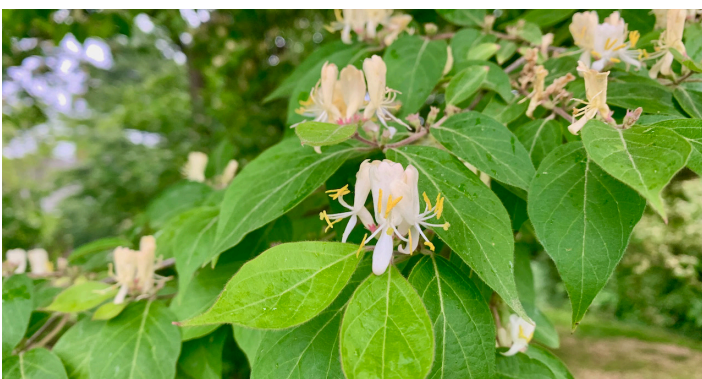


Figure 7. Fragrant flowers with variable color (*L. maackii* starts out white and fades to a yellow cream color while other species may have a pink-ish color). Photo credit: Ellen Crocker

RANGE AND HABITAT

Bush honeysuckles are found in a wide variety of habitats across North America (Fig. 12). Because bush honeysuckles can grow under moderate light conditions and tolerate a range of soils, all of Kentucky is at risk from these species. Currently, bush honeysuckles are dense in woodlands across northern and central Kentucky. Once thought to be restricted to central Kentucky soils, it is now believed that bush honeysuckles can and will spread throughout the state.

THREAT

Bush honeysuckles form a dense shrub layer that crowds out native plant species. This can reduce tree regeneration and eliminate understory species due to deep shade that occurs under dense thickets of bush honeysuckles. Studies have shown that bush honeysuckle invasion decreases overall plant diversity, reduces fitness of herbaceous plants, and even reduces the growth of overstory trees. From a wildlife perspective, bush honeysuckle fruits are rich in carbohydrates but do not offer migrating birds a high-fat, nutrient-rich food source. Increased nest predation has also been attributed to its branching structure and lack of thorns which enables predators easy access.

Bush honeysuckles also have the competitive advantage of being some of the first species to leaf out in spring, and some of the last to lose their leaves in the fall. They are also thought to be allelopathic, producing chemicals that hinder native plant growth. Collectively, these attributes have caused bush honeysuckles to have severe ecological and economic impacts where they have established.

SPREAD

Bush honeysuckles are spread by seed which they produce abundantly. The seeds are consumed and spread by some species of songbirds only after other more nutritious native foods are gone. While they thrive in disturbed habitats, unfortunately, seeds can also germinate and grow in moderately shaded woodlands. Because of this, bush honeysuckles that are growing in the understory in wooded areas should be controlled prior to creating openings in the forest canopy that increase the light they receive. The arrival of the emerald ash borer, which has killed a large number of ash trees in the state, has facilitated the proliferation of bush honeysuckles in ash dominated woods, allowing them to take advantage of canopy openings from killed trees. The same pattern of proliferation can be expected to occur when man-made or natural events create canopy disturbances in any woods containing bush honeysuckles in the understory.

MANAGEMENT

Determining the best management approach for controlling or eliminating bush honeysuckles depends on plant size, density, and area invaded. Because bush honeysuckles can sprout prolifically from stumps, any

control method must ensure that stumps are killed or removed. There are many ways to effectively manage bush honeysuckles and the most appropriate option depends on the size of plants, severity of infestation, site, and landowner preferences.

Seedlings and Small Shrubs (*less than six to eight feet tall*)

Mechanical:

- Small seedlings can be pulled up manually, most easily when soil is moist. Small, knee-high plants can be pulled by hand. Larger plants can be removed with devices (e.g., weed wrenches and poppers) that are designed to remove shrubs. The larger versions of these devices are typically effective on bushes up to two inches in diameter, which is roughly a plant six to eight feet in height. The disadvantages of mechanical control include the significant labor times and the size limitation and the possibility of creating soil disturbance that can result in the colonization by bush honeysuckles and other invasive plants. Cutting the above-ground portion alone is typically ineffective as plants will rapidly re-sprout and grow back even denser than initially.

Foliar Spray:

- Foliar spray can be effective for plants less than head height, taller if a machine-mounted power sprayer is used. Typically, power spraying is reserved for fence lines or edges of woodlands. While it is relatively fast to foliar spray, this method often results in damage to other non-target native plants, and foliar spraying should not be used if desirable native seedlings and forbs are present. Common brush herbicides, such as glyphosate, can be used at recommended foliar rates (for example, 2% solution from concentrated glyphosate [$> 40\%$ active ingredient]). Because plants often have several stems, it is important to ensure that all leaves and branches are sprayed. Because honeysuckle keeps its leaves longer than most native species, spraying can be done in the late fall (while honeysuckles have their leaves but other plants do not) to minimize non-target damage.

Larger Shrubs or Small Trees

Cut Stump Treatment:

- Cut stump treatments, where stems are cut down and herbicide is applied to the cut stump, are the most common and effective approach for managing large bush honeysuckle plants. Cut the stem close to the ground and spray on any of the listed herbicides at or near full-strength (greater than 40% active ingredient) or as the label specifies for cut stump treatment. Potential chemicals include glyphosate herbicides (Accord™ is a glyphosate herbicide labeled for use in woodlands, agricultural brands can be used for fence rows and field edges) or other concentrated forestry chemicals such as Pathway™ (active ingredients are Tordon™ labeled for forestry use and composed of picloram and 2,4-D™), Arsenal™ (imazapyr), or Garlon 3a or 4™ (triclopyr). Spray the entire stump until runoff and any branches or stems that were cut at the ground line. Typically, herbicides are applied with a backpack sprayer or handheld spray bottle. For water-soluble herbicide mixtures, stumps should be treated when freshly cut (the sooner the better) to facilitate efficient uptake by the tree. Allowing the cut surface to dry will reduce herbicide effectiveness. The time window is much wider for applying oil-soluble herbicides, anytime between cutting and resprouting. In settings where non-target effects of herbicide are a major concern, care must be taken to ensure that the herbicide is applied only to the cut surface. This can be accomplished by adjusting spray nozzles so they spray only a narrow stream and reduce the spray pressure, or by painting herbicide onto cut stumps with a dauber (e.g., Buckthorn Blaster™). This method should not be used in late winter or early spring prior to leaf-out, as sap rising at this time will reduce the amount of herbicide taken up by the plant. The best way to cut stems depends on the size of plants. While chainsaws are effective for larger stems, having to bend down to cut the stems close to the ground can be both fatiguing and the risk of contacting the ground with the chainsaw is high the latter resulting in quickly dulling



Figure 8. Red berries in the late summer to fall that are favored by birds. Photo credit: Chris Evans, University of Illinois, Bugwood.org



Figure 9. Japanese honeysuckle, an invasive vine honeysuckle with black berries. Photo credit: Chris Evans, University of Illinois, Bugwood.org



Figure 10. Coralberry leaves and dense shrubby growth form may be confused with bush honeysuckle. Photo credit: Ellen Crocker



Figure 11. Native *L. sempervirens* is distinguished from bush honeysuckle by its vine growth form and beautiful bright pick to orange flowers. Photo credit: Ellen Crocker

the chain or causing a kick back that is dangerous to the operator. A steel brushcutter blade is an alternative method that can provide increased safety and longevity of cutting instrument. Handsaws and loppers are effective options for small and medium sized stems. When implementing this treatment, working in tandem or in small groups is recommended so that the cutting, herbicide application, and dragging brush if needed can be distributed effectively. After being cut, brush can be left in place (and will break down rapidly, within several years) or be stacked to create brush piles that is advantageous for wildlife and for facilitating applicator movement in treated areas.

Basal Bark Spray:

- Basal bark treatments require spraying the outer bark of small trees and shrubs (less than four to five inches in diameter). The herbicide penetrates the relatively thin bark and is an effective option, but only if special chemical carriers and mixes are used. Normally, Garlon 4™ is mixed in crop oil or diesel fuel to form a 25% Garlon 4™ solution. However, this traditional basal bark mix provides inconsistent results on bush honeysuckles. The current recommendation from Purdue University requires the use of Ax-it™ basal oil (instead of diesel fuel or crop oil) and 15% Garlon 4™ and 3% Stalker™. If native species, either large or small trees, or native herbaceous plants are present, and a large amount of honeysuckle must be controlled this technique is not recommended as there is a potential of Garlon 4™ and Stalker™ harming or killing native plants.

Hack and squirt/ injection:

- Hack and squirt is a simple technique to kill bush honeysuckle. This method is called hack and squirt because you are “hacking” into the plant to cause a small cut in the trunk, using a hatchet or machete, and then “squirting” or spraying herbicide into the cut trunk. Because of having to bend down this technique suffers from the same application difficulties as the cut stump method. Tree injection using the E-Z-Ject™, which allows

applicators to remain in a standing position compared to hack and squirt, has also been used. However, it can be more time consuming than cut stump treatments because the injector has to be lined up precisely to correctly inject a capsule, which can be difficult to accomplish with the multiple stems often present and having to maneuver under spreading branches. Further, research using glyphosate capsules has shown it to be inconsistent with relatively high levels of resprouting using the recommended rate of herbicide. Doubling the rate is required to achieve a good kill.

Spring mechanical mulch/fall herbicide spray system:

- Mechanical removal and follow-up foliar spray can be used for severe infestations when a rotary brush hog can be driven through the woods, cutting down

Table 1. List of some commonly used herbicides for bush honeysuckle¹

Active ingredient	Common brands	Treatment	Cautions
glyphosate	Roundup™, Accord™, and others ²	foliar, cut stump (fresh), hack and squirt	<ul style="list-style-type: none"> • Make sure that you follow label directions. • Mix and apply the chemical in the proper manner and at the recommended times. • Protect your eyes during mixing and application (where necessary) and check label for personal protective equipment and other precautions.
triclopyr-amine	Garlon 3a™	foliar, cut stump (fresh), hack and squirt	
triclopyr-ester	Garlon 4™	basal bark, cut stump (fresh and dry)	
picloram/ 2,4-D™	Pathway™	foliar, cut stump (fresh), hack and squirt	

¹ Other herbicide brands can be used for autumn olive control. The herbicides that are listed are those that have widespread and traditional use.

² There are currently a large number of brand names for glyphosate herbicides. Many are for use in fields or fencerows. Few such as Accord™ are labeled for use inside a forest (see Kentucky Woodland Magazine July 2006 issue for more information on glyphosate herbicides).

and effectively mulching all of the bush honeysuckle. Implement this procedure directly after bush honeysuckle has leafed out in the spring. Follow this with a foliar glyphosate spray of the stump sprouts at or near the end of the growing season (around late fall). This timing allows enough leaf area to be produced so that an adequate amount of herbicide can be sprayed on a plant to provide for effective control. This method results in killing both the bush honeysuckle and co-occurring plants (native or otherwise). In addition, this method is not easily accomplished on steep terrain but has been used for woodland savanna restoration with native warm- season grasses under sparse overstory trees.

Aerial herbicide:

- Promising research has been done using aerial herbicide application (largely via helicopter) to treat

large areas of dense bush honeysuckle. Timing is critical in this to minimize non-target effects on desirable native plants and should be done in the fall, after other plants have lost their leaves while bush honeysuckle retains its leaves. In addition, finding a knowledgeable and reasonably priced helicopter pilot for this type of application may prove an impediment. However, preliminary data on cost effectiveness of this approach has great potential.

Treatment costs:

- Treatment of significant infestations of invasive plants can be expensive. Treatment cost can vary greatly by site, size of plants, severity of infestation, and management practice used. In addition, if hiring a professional to conduct this management, costs can be much higher and depend on accessibility of local assistance.

Table 2. Control methods for bush honeysuckle*

Method	Timing	Details and cautions
hand pulling	anytime	Plants less than 3 feet high.
mechanical puller or popper	anytime	Plants 3 feet to head height.
herbicide ¹ - foliar	April - September	Plants head height or less. Foliar applications of 2% glyphosate. Accord™ is labeled for use in woodlands. Use other glyphosate products for other areas.
herbicide ¹ - cut stump	June - January	Plants greater than 1 inch in diameter. Thoroughly wet stump with concentrate preferably as soon as possible and less than 2 hrs after cutting. Example: Accord™ herbicide concentrate (> 40% active ingredient - glyphosate) spray on stump mildly diluted to facilitate spray. Several herbicides can be used including those containing triclopyr (e.g. Garlon™) and glyphosate. Glyphosate poses the least carry-over problems to native plants.
herbicide - basal bark	fall, winter, early spring	Plants greater than head height. Wet lower 18 inches of ALL stems on a plant. 15% Garlon 4™, 3% Stalker™ in Ax-it™ basal oil. Do not use when large amounts of honeysuckle are present among or underneath native trees as carryover from large application rates of these herbicides could occur.

**Other herbicide brands can be used for control. The herbicides that are listed are those commonly used regionally and are labeled for use in forests (woodlands).*

Table 3. Examples of bush honeysuckle treatment costs*

Practice	Description of technique	Time to remove head-high bush	Amount of glyphosate per plant	Approx. cost per acre (~500 plants per acre)
mechanical removal	WeedWrench™ or similar device	6.3 minutes	0	\$1,040 for mechanical (52 hours at \$20 per hour)
cut-stump herbicide treatment	cutting stump with a saw and then treating with herbicide	2.1 minutes	0.18 ounces concentrate	\$408 for cut stump (17.2 hours at \$20 per hour [\$344] and \$64 for herbicide)
EZ-Ject™ herbicide treatment	system to inject herbicide into trunks using small herbicide shells and an EZ-Ject™ lance	2.2 minutes	5.5 capsules	\$1,171 for EZ-Ject™ (18 hours at \$20 per hour [\$360] and \$811 for herbicide)
foliar treatment	spraying herbicide onto leaves of shrub	0.55 minutes	0.03 ounces concentrate	\$103 for foliar (4.6 hours at \$20 per hour [\$92] and \$11 for herbicide)

**Estimates created from unpublished research by Stringer, Thomas, and Cox 2015 and adjusted for inflation using the U.S. Bureau of Labor Statistics calculator.*

Follow-up:

- After initial management, follow-up visits are needed to ensure that treated shrubs die, and to scout for the presence of new seedlings that may occur from the spreading of seed by birds and plants that were missed in the initial treatment. Re-treatment may be necessary to deal with these issues.
- If stems are cut and herbicide is not applied to cut stumps (or was applied ineffectively) you will see abundant sprouts. In general, it is best to deal with these through foliar herbicide application when shoots are small.

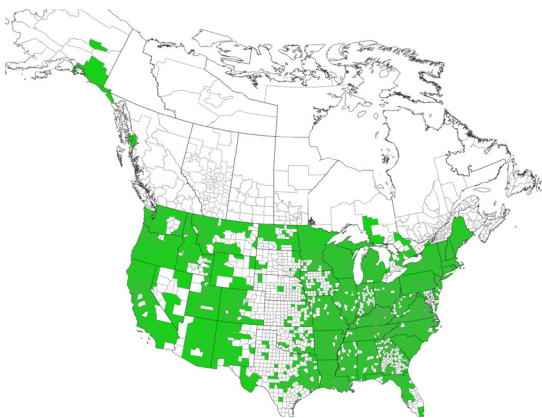
NATIVE ALTERNATIVES TO BUSH HONEYSUCKLE

A wide range of native plants provide good options for replacing bush honeysuckles in both woodland and home landscape settings. For each, however, it is important to consider your site and select plants that will thrive given the light level, moisture, and soil there.

After bush honeysuckles have been removed from woodland settings, replanting and seeding may be required if existing native vegetation and native seedbank is lacking. Look for a diverse range of species that can rapidly grow and compete with bush honeysuckles in the future. A few species to consider when replanting in natural areas after bush honeysuckle removal include:

- Sumacs, *Rhus sp.*
- River cane, *Arundinaria gigantea*
- Spicebush, *Lindera benzoin*
- Bottlebrush buckeye, *Aesculus parviflora*
- Wahoo, *E. atropurpureus*
- Native viburnums like rusty blackhaw, *Viburnum rufidulum*
- Oak leaf hydrangea, *Hydrangea quercifolia*
- Pawpaw, *Asimina triloba*
- Hazelnut, *Corylus americana*
- Ohio buckeye, *Aesculus glabra*
- Ironwood, *Ostrya virginiana*
- Muscledwood, *Carpinus caroliniana*
- Witch-hazel, *Hamamelis virginiana*
- Elderberry, *Sambucus sp.*

Figure 12. Map of bush honeysuckle distribution (July 2022). Photo credit: EddMaps.org



When removing bush honeysuckles in the home landscape, there are many native shrubs that provide great ornamental appeal, from attractive blooms to winter appeal. A few alternatives include:

- Chokeberry, *Aronia sp.*
- Spicebush, *Lindera benzoin*
- Ninebark, *Physocarpus opulifolius*
- Strawberry bush, *Euonymus americanus*
- Carolina buckthorn, *Frangula caroliniana*
- Elderberry, *Sambucus sp.*
- Bottlebrush buckeye, *Aesculus parviflora*
- Oak leaf hydrangea, *Hydrangea quercifolia*
- Red twig dogwood, *Cornus sericea*

RESOURCES

If you have questions on invasive plant identification or management, contact:

- Your local Kentucky Division of Forestry forester: <https://eec.ky.gov/Natural-Resources/Forestry/Documents/2018%20reorg%20field%20office%20contact.pdf>
- Your county extension agent: <http://extension.ca.uky.edu/county>
- Kentucky Invasive Plant Council, <https://www.se-eppc.org/ky/>

If you are looking for assistance in managing your invasive plants, contact:

- A consulting forester: <https://kacf.org/>
- A technical service provider: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/ky/technical/cp/tsp/>
- The Natural Resource Conservation Service has several cost-share programs that support invasive plant management, contact your local agent for more information: <https://offices.sc.egov.usda.gov/locator/app>

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