Invasive Plants in New Hampshire

How to identify them, when and how to eradicate them, and how to dispose of them








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What are Native Plants?

- **A native plant is a species that originated in a certain place or region and has adapted to local ecosystems, geology, soil, and climate.**
  - **Insects and animals have co-evolved with the native plants for thousands of years and play a crucial role in supporting wildlife and maintaining ecosystem balance.**
  - **Native plants are important because many are the sole host of native pollinators. For example, monarch butterfly caterpillars are dependent on milkweed for nutrition.**

What are Invasive Plants?

- **An invasive plant is a plant that causes, or is likely to cause, ecological or economic harm in an environment where it is not native.**
- **An invasive plant is always non-native; however, invasive and non-native are not always interchangeable terms.**
  - **A non-native plant may not be invasive. An example is peony.**
  - **A native plant may be aggressive, but is not invasive. An example is poison ivy.**
- **Many invasive plants were intentionally introduced as ornamental plants in the late 1800's.**

NH Law Regarding Prohibited Invasive Species

- **“No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties listed in Table 3800.1 New Hampshire prohibited invasive species list”** (Agr 3802.01(b)).
  - **NH Department of Agriculture, Markets & Food (DAMF) has enforcement authority of these rules.**
- **Disposal of viable invasive plants is <u>restricted</u> at most transfer stations in NH.**

Why are Invasive Plants Harmful to the Environment?

- **They have no predators (biologic controls).**
- **They spread rapidly and out-compete native plants for resources such as water, nutrients, and sunlight.**
- **They can be a threat to native plant communities causing extinction of native plants and animals.**
  - **Can overtake native trees and shrubs, leading to a decline in biodiversity**
  - **Altered habitats impact wildlife that depend on native plants for food and shelter**
  - **Often seed prolifically, have high rates of seed viability, and can remain viable in the soil for many years before germinating**
  - **Can leaf out earlier in spring and lose leaves later in the fall**
    - **Tend to have longer flowering and fruiting periods**
    - **Have more time to store energy in their roots for the next year**

Why are Invasive Plants Harmful to the Environment? (continued)

- **Most are adaptable to various environmental conditions.**
  - **Can grow in sun or shade**
  - **pH tolerant**
  - **Can grow in all soil types- from sand to clay**
- **Some have allelopathic tendencies.**
  - **Bio-chemical 'warfare' which reduces competition for resources such as light, water, and nutrients**
    - **Aids in the survival of the producing (invasive) plant**
- **Many have multiple means of reproduction- seed, spreading roots.**
- **Invasive aquatic plants can form thick mats and kill fish by reducing oxygen in the water.**

What Plants are Invasive in NH?

From the NH Prohibited Invasive Plant Species List Table 3800.1

Norway maple	Oriental bittersweet*	Glossy buckthorn*	Spotted knapweed	Tartarian honeysuckle	Giant Knotweed
Tree of heaven	Water Flag	Dames rocket	Autumn olive *	Moneywort	Multiflora rose*
Garlic mustard	Pale swallow-wort	Reed sweet grass	Common privet	Bella honeysuckle	Common buckthorn*
European black alder	Black swallow-wort*	Japanese knotweed*	Japanese honeysuckle*	Japanese stilt grass	European barberry
Japanese barberry*	Blunt-leaved privet	Ornamental jewelweed	Amur honeysuckle	Morrow's honeysuckle	Perennial pepperweed
Giant hogweed	Burning bush*	Kudzu	Mile a minute vine	Bohemia knotweed	Spotted Knapweed

Oriental Bittersweet: How to identify it

- **Botanical name**: Celastrus orbiculatus.
- **Description**: Woody, perennial vine that can climb 60-100 feet. Vines are multi-branched and range from brown to gray. New growth is green.
- **Bark**: Tannish, furrowed.
- **Leaves**: Alternate, ovate, bluntly toothed. Can vary in shape from oblong to round to tapered. 3-4 inches long by 2/3 as wide, tapered at base.
- **Flowers**: Clusters of small, 5-petaled, greenish-yellow blossoms form in leaf axils in May or June.
- **Fruit**: Clusters of round, green fruit matures to bright red when the yellowish-orange outer membrane opens in fall.
  - Each fleshy scarlet red aril has 3 to 6 seeds.
  - Fruit persists through winter.
- **Root**: Bright **orange roots**.
- **Habitat:** Grows on woodland edges, and in open forest areas, roadsides, old fields, grasslands, along rivers and streams, and hedgerows.

Oriental Bittersweet: How to identify it

Oriental Bittersweet: Why it is a Problem?

- **Significant threat to native plant communities.**
- **Climbs and overtakes native trees and shrubs.**
- **Grows rapidly and can shade out the vegetation that supports it.**
- **Girdles trees and shrubs, cutting off the flow of water and nutrients.**
- **Weakened trees, burdened with the weight of massive woody vines and leaves, are vulnerable to damage from ice and windstorms.**
- **Can spread from tree to tree in the forest canopy.**
- **When one tree falls or is cut down, attached trees may be pulled down.**
- **Although most productive in full sun, bittersweet germinates readily in low light.**
- **Responds to increased light and maximizes stem growth to reach the forest canopy.**

Oriental Bittersweet: Why it is a Problem?

- **Reproduces from seeds that are widely dispersed by birds and wildlife.**
- **Nutritious fruit is eaten by birds and small mammals late in winter.**
- **Seed can be retained in a bird's gut for a long time, aiding in long-distance dispersal.**
- **Seeds can have 95% germination rate. While rates may be higher on sites with sparse leaf litter, a thick leaf litter will not prevent all germination.**
- **Most seeds germinate within one year.**
- **Reproduces vegetatively by spreading underground roots that form new stems.**
- **Large colonies can develop from one or a few seedlings.**
- **Plants mature quickly and can produce flowers at two years of age.**
- **Mature female plants produce prolific fruit.**
  - **Fruit production is highest in full sun.**

Oriental Bittersweet: How to Eradicate it

- **No biologic controls.**
- **Option for small to medium plants, often requires repeated efforts.**
  - **Small- hand pull to remove entire root.**
  - **Medium- use hand tools remove root or cut stem and paint with herbicide.**
    - **This method is not recommended for large infestations.**
- **Seedlings are easiest to remove, especially when the soil is moist.**
  - **Pull slowly to minimize soil disturbance.**
- **It is critical to prevent seed production and dispersal.**
- **Can combine mechanical and chemical controls to manage large infestations.**

Oriental Bittersweet: How to Eradicate it

- **Options for large plants:**
  - **Cut vines at the base in late June- early July to prevent the vines from storing energy in their roots.**
  - **Paint cut stump with herbicide.**
    - **Not effective until sap no longer moves upward (late June- early July).**
    - **If signs of regrowth, reapply herbicide.**
  - **Repeated cutting or weekly mowing is necessary. Can take up to 5 years to kill the plant without herbicide, depending on size.**
  - **Vines left hanging will die in two or three years.**
    - **<u>It is dangerous to try to remove vines by pulling.</u>**
  - **If spraying foliage, late fall treatment minimizes damage to surrounding plants.**

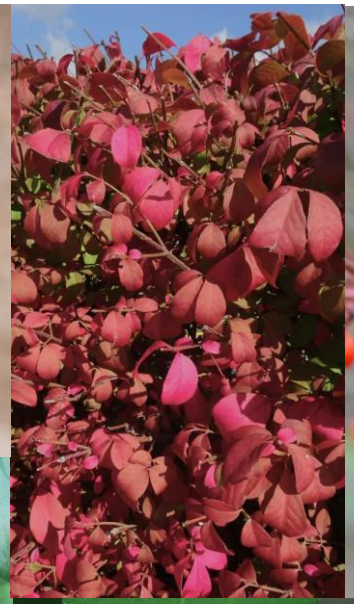
Oriental Bittersweet: How to Dispose of it

- **Do not compost!**
- **If fruit is not present, cut vines can be left in place to decay.**
- **Stems and roots that have been pulled can also be left on site as long as the roots are left in full sun for several days (driveway, tarp) to dry out and have no chance of re-rooting.**
- **Fruit should be bagged and disposed of.**
- **If dried stems are burned, ensure there is no poison ivy in any part of the plant!**

Burning Bush: How to Identify it

- **Botanical name**: Euonymus alatus.
- **Description**: A woody, multiple stemmed shrub that thrives in a shady understory with well drained soil, but it can also grow in full or part sun. Mature plant can be from 10-20 feet tall.
- **Stems**: Greenish with corky wings.
- **Leaves**: Oppositely arranged, simple and elliptic, 1-3'' long by half as wide, pointed tip, light green, with fine toothed margins.
- **Flowers**: Inconspicuous greenish-yellow, May to June.
- **Fruit**: Fleshy green capsule turning red in fall.
  - Not showy.
  - Red with split purplish husk about ½ inch in diameter. Splits to expose 4 red-orange seeds.
- **Habitat**: Prefers dry upland soils, full sun to heavy shade, pH adaptable.

Burning Bush: How to Identify it



Burning Bush: Why is it a Problem?

- **It is a threat to natural areas because they seed prolifically and become dominant in the landscape outcompeting and displacing native species.**
  - **Seeds are dispersed by birds and wildlife.**
- **Burning bush was used extensively by the landscape industry and homeowners are often reluctant to remove these shrubs, as they are often centerpieces of their yards.**
- **Leaf out is earlier in spring and leaf loss is later in fall than many native plants.**
- **No biologic controls.**
- **It is adaptable to various environmental conditions.**
  - **Grows well in several soil types and pH levels.**
  - **Tolerant of full shade.**

Burning Bush: How to Eradicate it

- **Burning bush shrubs, while prolific seeders, are not difficult to control individually, nor do they spread as aggressively as other invasive shrubs.**
- **Young plants (up to 2 feet tall) can be pulled effectively by hand.**
- **For larger plants, a spade or root-wrenching tool can be used to remove the majority of the roots.**
- **It can be cut to the ground with two methods to control resprouts.**
  - **Repeated cutting to the ground.**
  - **Use of herbicidal stem/ stump treatment.**
- **It leafs out early and drops its foliage late compared to most native woody species, thus creating a longer window for herbicide treatments.**
  - **Early summer treatments (before flowering) are most effective.**

Burning Bush: How to Dispose of it

- **The cut plant can be dried.**
  - **Leave the plant on the ground with its roots exposed.**
  - **Place the plant in a heavy-duty black plastic bag and leave it in a sunny location for several weeks.**
    - **If there are flowers or seeds, place them in the bag first to prevent dispersal.**
- **Ensure it is dead before placing it in a compost pile.**
  - **Be careful to ensure there are no seeds or flowers going into the compost.**
- **The plant can be burned or chipped.**

Common Buckthorn: How to Identify it

- **Botanical name**: Rhamnus cathartica.
- **Description:** Deciduous single or multi-stemmed shrub or small tree measuring 20' by 15’.
- **Bark:** Grayish to brown with raised lenticels.
- **Stems:** Cinnamon colored with terminal spine.
- **Leaves:** Alternate, simple, and broadly ovate with toothed margins. The lowest leaves are rectangular in the seedling stage.
- **Flowers:** Inconspicuous, 4-petaled, greenish-yellow, mid-June.
- **Fruit:** Fleshy, 1/4” diameter turning black in the fall.
- **Habitat:** Adapts to most conditions including pH, heavy shade to full sun.

Common Buckthorn: How to identify it

Glossy Buckthorn: How to Identify it

- **Botanical name**: Rhamnus Frangula.
- **Description**: Tall single or multi-stemmed deciduous shrub up to 20’ high by 15' wide.
- **Bark**: Grayish with whitish lenticels.
- **Twigs**: Reddish-brown.
- **Leaves**: Glossy on top, ovate, 4-5'' long by 3- 4'' wide, arranged alternate or whorled on stem.
- **Flowers**: Small, greenish-white, mid-June.
- **Fruit**: Produces round, fleshy fruit about ¼ inches in diameter from July through September, turning black in the fall.
- **Habitat**: Highly adaptable and pollution tolerant. Grows in open fields, along road and path edges. Full sun to partial shade.

Glossy Buckthorn: How to Identify it

Buckthorn: Why is it a Problem?

- **Buckthorn has high seed production and good viability. Seeds can remain in the soil for 2 to 6 years.**
- **Seeds are dispersed by birds and other berry feeding animals, sometimes over great distances.**
- **Vegetative reproduction can occur when stems are cut or broken.**
- **No biologic controls.**
- **Leaves emerge earlier than native plants in spring and holds onto leaves longer in the fall, allowing for more energy storage in winter.**
- **Longer flowering and fruiting periods than most native plants.**
  - **Common- Flowering May through June, fruiting July to mid-September.**
  - **Glossy- Flowering April through June, fruiting July to mid–October.**
- **Very fast growing.**
- **Dense canopy shades out native species.**
- **Sun and shade tolerant.**

Buckthorn: How to Eradicate it

- **Optimal time for removal is late spring before the plant flowers.**
- **Remove seedlings and saplings by hand or with a weed wrench ideally, before July.**
- **Chemical control from March through June is to cut the stump high (six to twelve inches) and let it sprout. Then cut the sprouted plant from July through early September to one inch from the ground and stump-applicate using a paint brush or sponge applicator with straight glyphosate herbicide.**
- **Repeated cutting on a monthly basis stunts the plant and inhibits flower and fruit production.**
  - **Every time you cut the plant it reduces root energy reserves.**
- **Foliar application of herbicide works best on multi-stemmed plants between July and mid-September.**
  - **It may take 1-2 years to kill the plant using this method.**
  - **If applying herbicide, do so immediately after cutting.**

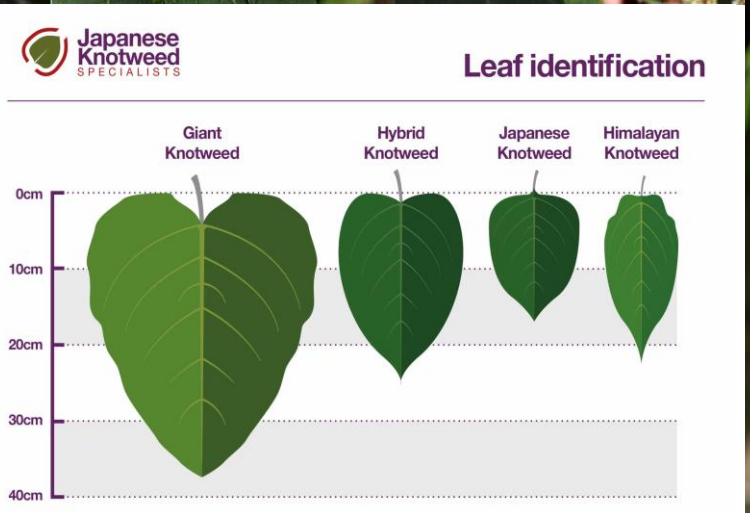
Buckthorn: How to Dispose of it

- **Buckthorn is slow to degrade, so burning (after cutting) or mulching with a wood chipper are good options.**
  - **Makes good firewood (long burning, good heat.) Can be burned in a stove.**
  - **If mulching, ensure there are no berries.**

Japanese Knotweed: How to Identify it

- **Botanical Name**: Reynoutria japonica.
- **Description**: Perennial reaching 10' in height and width.
- **Stems**: Greenish, hollow and jointed, similar to bamboo. Stems have reddish-brown solid nodes surrounded by a papery sheath. New stems emerge late March to early April.
- **Leaves**: Alternate, broadly ovate to triangular, 3-7'' long.
- **Flowers**: Small, whitish, forming panicles, August-September.
- **Seeds**: Calyx, brown, triangular.
- **Fruit:** Winged, triangular, shiny, and very small.
- **Roots:** Horizontal root system that grows very quickly and can spread 35 feet away from the parent plant.
- **Habitat**: Woodland sites, open spaces, ditches, roadsides, riverbanks. Prefers moist, well-drained soils.

Japanese Knotweed: How to Identify it



Japanese Knotweed: Why is it a Problem?

- **Spreads rapidly forming dense thickets that crowd and shade out native vegetation. It also has allelopathic properties.**
- **New plants can grow from twigs.**
- **Burning is not the best solution because the plant has adapted to lava flows and any scrap not burned can lead to new plants!**
- **Bagging is also not a solution because it can continue to grow inside the bag.**
- **Digging, mowing, and cutting are not effective and can cause knotweed's large underground root system to launch a massive growing spree.**
- **Aggressive, spreads quickly along surface waters and in right-of-ways.**
- **Its roots or rhizomes can grow more than 10 feet deep and 35+ feet beyond where you see aboveground stems.**
- **The root system can stay dormant for more than 20 years before popping up again.**
  - **Moving soil that may have knotweed root fragments in it can also lead to new stands.**
- **It can grow through concrete, damaging foundations, walls, pathways and drainage systems.**

Japanese Knotweed: How to Eradicate it

- **The most effective control method is applying glyphosate weedkiller after flowering, but at least 2 weeks before the first frost.**
  - **This often controls rather than eradicates Japanese knotweed.**
  - **May require repeated applications for 3-5 years.**
- **Smothering may be an effective alternative; however, roots may extend outside the covered area and generate new plants.**
  - **Allow knotweed to grow in the spring.**
  - **Around the 1st week of June, cut it close to the ground. Pile stems on tarp to dry.**
  - **Spread 3-4 inches of mulch, or grass clippings to protect the tarp.**
  - **Cover with a large heavy–duty tarp or 7mil black plastic. Allow 2” overlap if more than 1 sheet is used.**
  - **Weigh the top of the tarp and seal edges with rocks, soil, sand, etc.**
  - **After 5 years the covering material can be removed and the area replanted.**
- **A possible biologic control is being studied, but is not available at this time.**

Japanese Knotweed: How to Dispose of it

- **Japanese knotweed crowns and rhizomes can be disposed of by burning/incinerating, burying (>5’ below ground), chipping, or sending to a landfill that will accept it.**
- **It cannot be stockpiled near wetland or surface waters unless killed by an herbicide or heat treatments.**
- **Composting crowns and rhizomes is not recommended.**
- **If the stems are freshly cut they pose a risk of spreading. They need to be completely dry before disposal.**
- **Never dispose of Japanese knotweed into wetlands, surface waters, or in areas with moist soil as the stems may take root.**

Multiflora Rose: How to Identify it

- **Botanical Name**: Rosa multiflora.
- **Description**: Hardy shrub/ climber reaching up to 15' or more in height and 10’ in width.
- **Stems:** Long and arching, forming dense clumps, thorns may or may not be present.
- **Leaves**: Alternate and compound, ovate, with 5-11 leaflets and having feather margins at base.
- **Flowers**: Clusters of white or pink, June to July.
- **Fruit**: Rose hips turn red in fall. Persist in winter providing food for birds and other wildlife.
- **Habitat**: Prefers moist, well drained soils, full sun.

Multiflora Rose: How to Identify it

Multiflora Rose: Why is it a Problem?

- **High seed production and good seed viability. Individual plants may produce as many as 500,000 seeds per year. Seeds stay viable in the soil bank for 10 to 20 years depending upon soil condition.**
- **Seed is dispersed by birds and other berry feeding animals, sometimes over great distances. However, most seeds fall relatively close to the parent plant which is why this species grows as clumps or thickets.**
- **It only takes one multiflora rose to produce a colony of reproducing plants if left unchecked.**
- **No biologic controls.**
- **Leaves emerge very early in the spring, earlier than most native plants, and this species holds onto its leaves a little longer in the fall than most native plants.**
- **Multiflora rose is sun and shade-tolerant.**

Multiflora Rose: How to Eradicate it

- **Remove seedlings and saplings by hand or with a weed wrench before August.**
- **Spring or summer cutting of multi-flora rose will slow growth, but may not inhibit flower, fruit, or seed production.**
  - **Repeated cutting on a monthly basis stunts the plant and inhibits fruit and seed production. Every time you cut the plant it reduces root energy reserves.**
  - **For established thickets, repeated cutting 3-6 times per growing season for 2-4 years will control spread and reduce its existence. However, increased sunlight on the ground will cause increased seed germination.**
- **The chalcid wasp is becoming a naturalized beneficial insect, however, spread is slow, and may take decades to become effective.**
- **Chemical control: March thru May- cut stump to 6-12 inches and let it sprout. July thru mid Sept, cut to one inch from ground and stump-applicate using a paint brush or sponge applicator with straight glyphosate herbicide.**
- **Foliar application of herbicide works best on multi-stemmed plants between July and mid-September, It may take 1-2 years to kill the plant using this method. Foliar application enters the leaves more easily during humid weather.**

Multiflora Rose: How to Dispose of it

- **Remove flowers, seeds, roots, and fruits and place in a heavy black plastic garbage bag to dry out. Typically, these bags need to sit in the sun for up to a month to fully kill the plants. At this point, the plant can be disposed of as garden waste.**

Autumn Olive: How to Identify it

- **Botanical name**: Elaeagnus umbellate.
- **Description**: Weedy deciduous shrub measuring 20' by 20’.
- **Bark**: Silvery-gray and smooth with whitish lenticels.
- **Stems**: Cinnamon-brown.
- **Leaves**: Elliptical, 2-3'' long, glossy, green above and silverish below.
- **Flowers:** Solitary, whitish, 4-petaled, mid-June.
- **Fruit**: Drupe. Edible.
- **Habitat**: Naturalizes in open spaces exposed to full sun.

Autumn Olive: How to Identify it

Autumn Olive: Why is it a Problem?

- **Due to its nitrogen fixing capabilities, it can adversely affect the nitrogen cycle changing the soil chemistry (allelopathy).**
- **Rapid and uncontrolled spread across forest edges, roadsides, meadows, and grassland where it displaces native plants.**
- **Can grow in the poorest of soils.**
- **Prolific seed producer. A single plant can produce up to 200,000 seeds per year.**
- **Birds spread the seeds.**
- **Attempts to remove by cutting or burning create even more plants.**
- **As the climate warms, autumn olive can gain more of a foothold over native plants.**
- **It leafs out earlier than native plants and keeps it leaves longer.**
- **Autumn olive can sprout faster than native plants after fire.**

Autumn Olive: How to Eradicate it

- **Remove seedlings and saplings by hand before fruiting.**
- **Larger shrubs can be mechanically removed.**
- **Cut and treat the stump with herbicide repeatedly from summer through fall.**
- **Girdling of the trunk can reduce vigor and even kill the tree. Use a cut through the bark all around the trunk about 6” above the ground. Resprouts may occur.**
- **Root crowns must be removed to prevent resprouting.**

Autumn Olive: How to Dispose of it

- **Autumn olive can be dried and then either bagged and disposed of at the transfer station or burned.**

Japanese Barberry: How to Identify it

- **Botanical name**: Berberis thunbergii.
- **Description:** Deciduous shrub 2-4.5 feet tall.
- **Leaves**: Alternate, ovate, simple. Arranged in clusters along stems. Vary from ½ to 1 ¼ inches long with short petioles. Color varies, depending on variety.
- **Stems:** Young stems are reddish, turning grayer as they age. Spines along the stems can be painful during pruning.
- **Flowers**: Small, yellowish. Bloom in May in clusters of 2-4.
- **Fruit**: Fruits from July through October. Drupe. About ¼" long, oval elongate. Turning red in summer. Persist in fall and winter.
- **Roots:** Root system is shallow with fibrous fine roots. Rhizomes grow out from the root crown.
- **Habitat:** Prefers well drained soil in semi-shade. Often occurring in forests, roadsides, and open fields.

Japanese Barberry: How to Identify it

Japanese Barberry: Why is it a Problem?

- **TICK MAGNET!**
- **Forms dense thickets in natural environments where it becomes established, resulting in impacts to native flora and fauna.**
- **Seeds are dispersed by birds and other berry feeding wildlife over great distances.**
- **It has good seed production and viability. Seed production is related to stem density, higher when plants grown in direct sun light.**
- **Most seeds fall relatively close to the parent plant which is why this species grows as clumps or thickets.**
- **It only takes one Japanese barberry to produce a colony of reproducing plants if left unchecked.**
- **Vegetative reproduction occurs when stems are cut or broken. It also reproduces asexually by root suckers and stem layering.**
- **No biologic controls. Thorns help protect this plant from most grazing animals.**
- **Leaves emerge earlier in the spring than most native plants, and it holds onto its leaves longer in the fall than most native plants.**
- **Barberry is sun and shade-tolerant.**

Japanese Barberry: How to Eradicate it

- **Remove seedlings and saplings by hand or with a weed wrench ideally, before August.**
- **Small plants can be burned with propane torches. Two treatments recommended.**
  - **Initial treatment in early spring before leaf-out (or any time from March through June) and follow- up treatment from July through August is effective at controlling growth and spread.**
- **Spring or summer cutting will slow growth, but may not inhibit flower, fruit, or seed production.**
  - **Repeated cutting on a monthly basis stunts the plant and inhibits fruit and seed production.**
    - **Every time you cut the plant it reduces root energy reserves**
- **Chemical control before July is to cut the stump to 6-12 inches and let it sprout. During July through mid-Sept, cut to one inch from the ground and stump-applicate using a paint brush or sponge applicator with straight glyphosate herbicide.**
- **Foliar application of herbicide works best on multi-stemmed plants between July and mid-September. It may take 1-2 years to kill the plant using this method. Foliar application enters the leaves more easily during humid weather.**

Japanese Barberry: How to Dispose of it

- **Prior to fruit/seed ripening, barberry cuttings can be made into a brush pile, chipped, or burned.**
- **After fruit/seed has ripened, keep it on site. It can be burned, chipped (after fruit has fallen off), or made into a covered brush pile.**

Black Swallowwort: How to Identify it

- **Botanical name**: Vincetoxicum nigrum.
- **Description**: Perennial herbaceous vine that grows to 6’.
- **Leaves**: Opposite, lanceolate, dark glossy green, simple with a smooth edge, 2-4'' long.
- **Flowers**: Small 1 /4'', 5-petaled, purplish, from June to September.
- **Seed**: Seeds are similar to those of milkweed.
- **Habitat**: It prefers full to partial sun.
- **Spread:** Seeds dispersed by wind.
- **Comments:** Invades roadsides, fields, disturbed sites, meadows, and woodlands, outcompeting native species.

Black Swallowwort: How to identify it

Black Swallowwort: Why is it a Problem?

- **Grows rapidly and can form extensive patches that crowd out native vegetation.**
- **Roots are toxic.**
- **Thick infestations in full sun can produce 2000 seeds per square meter.**
- **Resembles native milkweed and can confuse female monarch butterflies into laying their eggs on a plant that can’t support the caterpillars.**
  - **Plants are toxic to many insect larvae including monarch caterpillars (close relative to milkweeds).**

Black Swallowwort: How to Eradicate it

- **Hand pull young plants.**
- **Remove and destroy seed pods before they open.**
- **Apply herbicides as a foliar spray when they begin flowering. Repeat applications may be necessary.**
- **Plants can be mowed every year. This only prevents seed dispersal.**
- **Plants should be dug before seeds mature. Use a spade and make sure that the root crown and root fragments are removed.**
  - **Pods can mature even after plants have been dug up.**
  - **Plants can be burned.**
  - **Plants can be bagged, dried (killed) and disposed of.**

Black Swallowwort: How to Dispose of it

- **Prior to flowering, plant material can be disposed of by:**
  - **A small infestation can be left on the ground with the roots exposed.**
  - **A large infestation can be made into a covered brush pile and monitored for resprouting.**
- **During and after flowering, remove flower heads and bag and let rot.**
  - **A small infestation can be left on the ground with the roots exposed.**
  - **A large infestation can be made into a covered brush pile and monitored for resprouting.**

Japanese Honeysuckle: How to Identify it

- **Botanical name**: Lonicera japonica.
- **Description**: Climbing vine. Can grow to 30 feet in length.
- **Stems**: Young stems are reddish-brown and hairy. Old stems can be hollow.
- **Bark:** Peels easily on older stems.
- **Leaves**: Opposite and not clasping the stem as opposed to the three native honeysuckle vines that do clasp the stem, oblong, 1 1 /2 -2" long, rounded at base. May retain leaves into winter.
- **Flowers**: Tubular, white or yellow, fragrant, May to mid-July.
- **Fruit**: Berry, smooth, blackish to slightly purplish.
- **Roots:** Depth can be up to 12” on moist sites. May extend laterally up to 8’ or more from the crown.
- **Habitat**: Prefers moist soils and full sun to partial shade.

Japanese Honeysuckle: How to Identify it

Japanese Honeysuckle: Why is it a Problem?

- **Vines grow quickly (30’ of stem per year), covering native vegetation, resulting in loss of habitat.**
- **Prodigious seeds, which are spread by wildlife.**
- **Can form dense thickets, robbing light, nutrients, and moisture from native plants.**
- **Weight of vine can break tree branches and even topple whole trees.**
- **Adaptable to a variety of site conditions.**

Japanese Honeysuckle: How to Eradicate it

- **Hand pull small plants.**
- **For infestations and larger plants, cut the vines close to the ground in summer and apply an herbicide to the cut stems. Repeat applications may be necessary.**

Japanese Honeysuckle: How to Dispose of it

- **Prior to fruit/seed ripening:**
  - **Small plants can be left onsite with roots exposed. No special care required.**
  - **Large plants can be made into a brush pile, chipped, or burned.**
- **After fruit/seed has ripened, keep it on site. It can be burned, chipped (after fruit has fallen off), or made into a covered brush pile.**

What to Grow Instead

Invasive	Replacement
Oriental Bittersweet	Trumpet Vine, American Bittersweet
Burning Bush	High Bush Blueberry, Fothergilla, Fragrant Sumac, Ninebark, Oak leaf Hydrangea
Buckthorn	Hazelnut, Spicebush, Ninebark, Nannyberry Viburnum
Japanese Knotweed	Raspberry (once the knotweed is completely dead)
Multiflora Rose	Winterberry, Ninebark, Fothergilla, Red Chokeberry
Autumn Olive	Hazelnut, Winterberry, Staghorn Sumac
Japanese Barberry	Red Chokeberry, Winterberry
Black Swallowwort	Virginia Creeper, Native Wisteria
Japanese Honeysuckle	Clematis Virginiana, Trumpet Honeysuckle

Glossary

Alternate: Arranged singly at each node, as leaves or buds on different sides of a stem

Allelopathic: Describes the ability of a plant to produce and release biochemicals that inhibit or influence the germination, growth, survival, and reproduction of neighboring plants or organisms

Annual: Living or growing for only one year or season

Aril: Fleshy, usually brightly colored cover of a seed that develops from the ovule stalk and partially or entirely envelops the seed

Axis: Point at which the leaf is attached to the main stem or branch

Biennial: Having a life cycle that normally takes two growing seasons to complete lifecycle

Capsule: Dry dehiscent fruit that develops from two or more united capsules

Dehiscent: The spontaneous opening of a fruit at maturity

Drupe: Fleshy fruit usually having a single hard stone enclosing a seed

Glabrous: Having no hairs or projections; smooth

Inflorescence: Cluster of small flowers arranged on a flower stalk.

Lanceolate: Leaf tapering from a rounded base toward an apex, lance-shaped

Lenticels: Small, corky pores or narrow lines on the surface of the stems of woody plants that allow the interchange of gases between the interior tissue and the surrounding air

Native: Species that originated in a certain place or region; adapted to local ecosystems, geology, soil, and climate

Naturalized: Adapted or acclimated to a new environment without cultivation

Opposite: Growing in pairs on either side of a stem

Panicle: Branched cluster of flowers in which the branches are racemes

Peltate: Leaf being round with the stem attached near its center

Perennial: Living three or more years

Perfect: Having both stamens and pistals in the same flower

Pod: Dry, several-sealed, dehiscent fruit

Pubescent: Covered in fine short hairs

Raceme: Elongated cluster of flowers along the main stem in which the flowers at the base open first

Rhizome: Horizontal, usually underground stem that often sends out roots and shoots from its nodes

Umbel: Flat-topped or rounded inflorescence

Resources for Invasive Plant Information

- **New Hampshire Comprehensive Invasive Plant List**
  - https://www.nhdfl.dncr.nh.gov/sites/g/files/ehbemt866/files/documents/nh-invasive-plant-list.pdf
- **NH Guide to Upland Invasive Species**
  - https://fitzwilliam-nh.gov/vertical/sites/%7B5152AF08-0D8E-4832-8682-9F3DC8413E4B%7D/uploads/Guide_to_Upland_Invasive_Species.pdf
- **Alternatives to Invasive Landscape Plants**
  - https://extension.unh.edu/sites/default/files/migrated_unmanaged_files/resource001358_rep1815.pdf
- **Methods for Disposing Non-native Invasive Plants**
  - https://extension.unh.edu/resource/methods-disposing-non-native-invasive-plants
- **Herbicide-free Japanese Knotweed Control, Matt Tarr**
  - https://www.youtube.com/watch?v=Oc_oJ2tuJ6Q
- **Invasive Trees, Shrubs, Vines, and Herbaceous Plants**
  - https://www.agriculture.nh.gov/farms-businesses/plant-industry/invasive-plants/invasive-trees-shrubs-vines-and-herbaceous-plants

Sources

- **Invasive Trees, Shrubs, Vines, and Herbaceous Plants**
  - https://www.agriculture.nh.gov/farms-businesses/plant-industry/invasive-plants/invasive-trees-shrubs-vines-and-herbaceous-plants
- **New Hampshire Comprehensive Invasive Plant List**
  - https://www.nhdfl.dncr.nh.gov/sites/g/files/ehbemt866/files/documents/nh-invasive-plant-list.pdf
- **Invasive Plant Factsheet: Burning bush/Winged Euonymus**
  - https://ipm.cahnr.uconn.edu/invasive_plants_burning_bush-winged_euonymus/
- **Brush Management – Invasive Plant Control Burning Bush – Euonymous alatus**
  - https://efotg.sc.egov.usda.gov/api/CPSFile/21638/314_VT_OTH_Brush_Management-Burning_Bush_#:~:text=There%20are%20a%20few%20general,minimal%20risk%20in%20dispersing%20seed.
- **NH Guide to Upland Invasive Species**
  - https://fitzwilliam-nh.gov/vertical/sites/%7B5152AF08-0D8E-4832-8682-9F3DC8413E4B%7D/uploads/Guide_to_Upland_Invasive_Species.pdf
- **Ecological Landscape Alliance: Invasive Plants**
  - https://www.ecolandscaping.org/
- **Brooklyn Botanical Center**
  - https://www.bbg.org/article/weed_of_the_month_japanese_knotweed
- **Japanese Knotweed BMP Manual**
  - https://mm.nh.gov/files/uploads/agriculture/documents/japanese-knotweed-bmps.pdf
- **N.H. Admin. Code § Agr 3802.01 - NH Prohibited Invasive Species**
  - https://www.law.cornell.edu/regulations/new-hampshire/N-H-Admin-Code-SS-Agr-3802.01