



Supporting Sustainable Management of Private Woodlands

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Buckthorn - Control of an Invasive Shrub

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Glossy buckthorn (*Frangula alnus*) and common/European buckthorn (*Rhamnus cathartica*) are common in many parts of NY, and can aggravate many ownership objectives. A variety of chemical and mechanical (i.e., organic) methods are available to control these species.

The buckthorns originated in Europe, northern Africa and western Asia. Their history of introduction into the US is poorly recorded, but many other examples of species that have become interfering were introduced in the middle 1800's (Figure 1). Glossy buckthorn was formerly known as *Rhamnus frangula* and is different but looks similar to the native alder-leaved buckthorn (*Rhamnus alnifolia*). Glossy buckthorn is a small shrub that is most common on moist soils, often near wetlands. As with other interfering species, the interfering buckthorn species can dominate a site resulting in complicated access, reduced success with forest regeneration, and a reduction in plant species diversity. Recommendations for the treatment of glossy buckthorn will usually apply to common buckthorn (*Rhamnus cathartica*; Figure 2). Care should be taken to avoid mis-identification with the native non-invasive alder-leaf buckthorn (*Rhamnus alnifolia*). More information about these species can be found by a search for "buckthorn" at <https://gobotany.newenglandwild.org/>



Figure 1. Glossy buckthorn (pictured) typically is found on moist soils. It lacks the thorn and toothed leaf margin of common buckthorn. The bud, foliage and habitat are similar to true alder and care should be used to avoid confusing these species. Both invasive species have dark-colored fruit. However, alder-leaved buckthorn, a native non-invasive, has only 5 – 6 pairs of veins, reddish fruit, fine teeth on the leaf edge, and less than 3 ft tall.

Many interfering plant species become problematic because of a current of historic over-abundance of deer. Further, once an interfering plant is controlled, consideration for the plants that may occupy the site is warranted especially with high deer impact. If deer impacts are currently high, removing the interfering plant won't necessarily result in the desired outcome for the owner. A simple field measurement protocol is available to assess the extent of deer impact; a description is available at www.AVIDdeer.com

Control of interfering forest plants is guided by principles of Forest Vegetation Management (FVM). FVM includes (1) certain identification of the interfering plant species and understanding its biology, (2) inspection for the abundance of co-occurring desirable species that should be retained, (3) consideration of any current or planned management activities, deer impacts and site conditions that might enhance or complicate treatment, (4) an evaluation of the costs and logistics for all feasible treatment methods and modes (described below), and (5) a determination and strategy for those plants desired on the site after treatment. Webinars about FVM are archived at www.youtube.com/ForestConnect



Figure 2. Common (AKA European) buckthorn leaves are hairless and have toothed edges. Glossy buckthorn leaves have a smooth edge, unlike common and alder-leaved buckthorn, and may have fine hairs on the lower side.

Methods of treatment are either mechanical (i.e., organic) or chemical. Both methods have advantages and disadvantages depending on the circumstances. Modes of treatment are either selective or broadcast. Selective treatments will isolate and treat a single stem of the interfering species. Broadcast treatment are applied to an area and all stems of all species present are affected. All treatments can be described by a method and mode, or an integration of methods and mode. For example, hand pulling is selective mechanical, and cut-stump is integrated because it involves cutting (mechanical) followed by an herbicide (chemical) treatment to the freshly cut stump (Figure 3).

The selection of a broadcast versus selective treatment for buckthorn or other woody interfering species depends on the number of stems per acre and the abundance of desirable species. If a relatively low number of desirable species are intermixed with the interfering species, or if the total number of stems to be treated requires too much labor, a broadcast treatment may be more appropriate. Many of the treatments described below will include specific product information, none of which should be considered to imply an endorsement.

Herbicides can be an efficient and effective tool, but involve additional considerations. The use of herbicides in New York requires that the name of the target species be included on the product label. Chemical treatments are complicated by the fact that invasive species have only relatively recently been recognized in New York, and only a few herbicides list these species on the label. Fortunately, many labels are being adjusted to address invasive plants. Also, home remedies and off-label applications of an herbicide are illegal. Herbicide treatments in general require extra care because it involves the use of a chemical, and specifically for glossy buckthorn to ensure there is not movement of the herbicide into nearby

		Method	
		Mechanical	Chemical
Method Target Specificity	Selective	<i>Examples</i> Hand pulling Flame weeding	Cut-stump Basal bark
	Broadcast	Mowing MIG	Mist blower

Select a management option(s) that is compatible with owner objectives, efficient, effective, and minimizes negative impacts

Figure 3. All treatments can be described by a method and a mode. Each combination of method and mode has advantages and disadvantages depending on the circumstances. Combinations of methods and modes result in an integrated treatment, often providing greater efficiency and effectiveness.

classified wetlands. Research data is scant, but movement to wetlands would typically result from a saturating rain within 12 to 24 hours of the herbicide application.



Figure 4. Stump sprouts from common buckthorn following cutting. Failure to treat the sprouts either mechanically or chemically will negate management efforts within a few years.

Labels for the herbicides listed below can be obtained at <http://www.dec.ny.gov/nyspad/products>. All herbicide products described in this article are unrestricted in New York, and thus can be purchased without a pesticide applicators license. NYFOA members have a “member benefit” that allows for the less expensive contractor pricing on herbicides through www.Arborchem.com; some of the products listed below are available from this vendor. Herbicides labeled for treatment of buckthorn are listed in Table 1. Some of these products require the person making the application to also possess a supplemental label called a “2ee.” 2ee labels, in addition to the product label, can be obtained from the URL previously listed. Other products may also be available.

A small area with scattered buckthorn may be appropriately managed with a selective treatment. Buckthorns typically sprout from the stump following cutting (Figure 4), so some post-cutting treatment is required. One mechanical treatment is a new strategy that uses black plastic baggies on cut stumps. This is a new product that appears to have good potential, but there is no apparent research to document its effectiveness. More information is available at www.buckthornbaggie.com. Another selective mechanical option with small plants is to pull them. A potential disadvantage to pulling is that soil disturbance may stimulate the germination of seeds of the buckthorn or other undesirable species.

Because many non-native woody plants expand leaves before native species, a selective chemical foliar treatment in early spring can target the buckthorn with limited potential for collateral damage (Figure 5). The early emergence of buckthorn leaves may provide a window of opportunity of a couple weeks for a selective chemical foliar treatment.



Figure 5. Many non-native invasive species will expand their foliage early than other species. This picture illustrates multiflora rose in early spring that has leafed out beneath black locust.

There are only few herbicides labeled in New York for foliar treatment of buckthorn (Table 1). An Internet search will provide vendors of these products. If there are no or few desirable species intermixed with the buckthorn, or overspray would result in limited collateral damage, then the foliar treatment could be extended into the growing season. If all circumstances allow, a foliar treatment may be the most efficient way to control a small area of small buckthorn. Because Gordon’s Brushkiller (Table 1) also acts by penetration through bark, care should be made to avoid overspray onto nearby desired woody stems, even though their foliage may not have emerged.

A second selective mechanical/chemical treatment is “cut-stump.” This treatment involves cutting each stem and applying an appropriate herbicide

to the freshly cut surface (Table 1). On large stumps, a chemical-grade spray bottle may be most effective. On smaller stumps a sponge-type paint brush may be more efficient. With care, there will be little or no collateral damage. The cut-stump treatment is likely more labor intensive than a foliar treatment because it involves cutting the stem, handling the stem, and applying the herbicide. The advantage is the potential for treatment from June through October, and little to no collateral damage, or movement from the treated stem.

A third selective chemical treatment, more appropriate if there are few and larger diameter stems, is a basal bark treatment (Table 1). Penn State University Cooperative Extension has a fact sheet on the general use of basal bark treatment, not specifically about control of buckthorn (shortened URL <https://goo.gl/yZvnR6>). For areas with small buckthorn, a basal bark treatment is not likely to be the best treatment option because of the effort and overspray when applying to small diameter stems.

Regardless of the treatment option selected, there are likely buckthorn seeds in the soil that will germinate (Figure 6). Scout the area to ensure that any mature, fruiting buckthorn are controlled. Newly germinated seedlings should be controlled regularly, but certainly before they mature and produce fruit. Annually, inspect the treatment area for seedlings. Hand pulling may control these small plants if they are not too numerous or as time permits. Patches of seedlings might also be controlled with a foliar spray or brush saw, essentially a broadcast treatment but in a localized area. Each subsequent year should produce fewer new seedlings and less effort.

Table 1. A partial list of products registered in NY for control of buckthorn. Obtain and read label. Note that label specifications may change. Annually refer to details at <http://www.dec.ny.gov/nyspad/products>

Product	EPA Number	Species	Methods
Gordon's Pasture Pro "Hard to Kill Brush"	2217-952	<ul style="list-style-type: none"> • glossy buckthorn • common (European) buckthorn 	foliar basal bark cut stump
Pathfinder II	62719-176 (plus 2ee)	<ul style="list-style-type: none"> • glossy buckthorn • common (European) buckthorn 	basal bark cut stump
Accord XRT II	62719-556 (plus 2ee)	<ul style="list-style-type: none"> • glossy buckthorn • common (European) buckthorn 	foliar (only for common buckthorn) cut stump (both species)
Bayer Advanced Brushkiller Plus (concentrate)	72155-19	<ul style="list-style-type: none"> • glossy buckthorn • common (European) buckthorn 	cut stump



Figure 6. Following treatment, the increase of sunlight on the soil and the potential of soil disturbance may stimulate the germination of buckthorn seeds. Pictured are new germinants of common buckthorn following cutting of the overstory.

For additional information on woodland management go to:
www.ForestConnect.com
www.CornellForestConnect.ning.com



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