



## Rhamnus Frangula: From the Wetland and Beyond

By Ryan J. Colliton, Kalamazoo Nature Center

### Characteristics

*Rhamnus frangula* (glossy buckthorn) is an invasive shrub species native to North Africa and the continents of Asia and Europe. Growing to approximately seven meters in height, *Rhamnus frangula* typically invades open, wet communities including fens and bogs, but will also colonize diverse soil conditions.

A prolific producer of fruit, *Rhamnus frangula* contains two to three seeds per berry. Studies have found that plant production of fruit can range from 400–1800 fruit per genet. Seedling establishment is very high; few of these seedlings, however, will reach maturity. Most seed is dispersed via avian vectors and gravity. In a monitoring program run for the Department of Defense, seedling counts per quadrat were as high as 440 seedlings/0.5meter<sup>2</sup>. Seeds mature in late summer and fall in Michigan.



*Rhamnus frangula* (glossy buckthorn)

Mature *Rhamnus frangula* stems are a brown-green while young plants tend to have a purple hue. The plant is also readily identified by its elongated lenticels occurring on the stems. The leaves are glossy, hence the name, with straighter lateral veins than other plants in the genus *Rhamnus*. To the trained ecologist or botanist this plant is easily recognizable from afar and readily distinguishable from Michigan's native shrub species.

### Rhamnus frangula in Michigan

*Rhamnus frangula* is established throughout the state of Michigan. The first record of this species in Michigan is from Delta County in 1934, although introduction to the United States probably occurred much earlier. Glossy buckthorn has been documented in most Michigan habitats, a testament to its ability to tolerate varied

site conditions. Commonly, *Rhamnus frangula* can be found in wet areas dominated by herbs or shrubs. Due to wetland loss and fire suppression these habitats and their unique associated communities can be decimated by low light levels created by a dense canopy of *Rhamnus frangula*. (It is important to note that there is no direct link between this species and a reduction in native diversity. While it is true that unique herbaceous species of these open wetland habitats will likely succumb to low light conditions, these conditions are not unique to the understory of *Rhamnus frangula*. That is, dominates of many species, native or non-native, can produce undesired affects on native communities). Buckthorn often becomes the specific target of control because past disturbance has created conditions more conducive to its survival than native species.

Beyond wetlands, buckthorn is known to invade the understory of upland forest. In southern Michigan buckthorn has successfully invaded oak forest, conifer plantation, floodplain forest, and other communities. In forested situations, studies have found a reduction in native tree seedlings beneath the buckthorn shrub layer. This reduced layer of native tree seedlings experiences further selection of shade tolerant species and can have a long lasting impact of the successional trajectory of invaded systems.

### Autumn Olive (*Elaeagnus umbellata*) continued

#### Biological and Mechanical Control

Effective control options for autumn olive are limited. Burning and mowing are ineffective because the plants re-sprout readily. Hand removal of young plants and seedlings can be productive in small infestations if the root system is completely removed, but this method is unsuitable for larger populations. Biological control options are not currently available, but may be included for future consideration.

#### Chemical Control

Selective chemical treatments to autumn olive using appropriate herbicides and application methods have proven to be more effective than most other control options. Whenever using pesticides, be sure to follow label directions and obtain all necessary state or local permits and approvals prior to treatment.

#### Cut-stump Treatment

The most common chemical control for autumn olive is cut-stump treatment using a 20–25% active ingredient solution of a glyphosate-based chemical (Aqua Neat, Rodeo, Glypro, etc.). The solution is applied with a sponge applicator or backpack sprayer immediately after cutting. This treatment may be performed in late summer (July – September) or during the dormant period (December – February).

#### Basal Bark Treatment

Basal bark treatments with 12% triclopyr (Garlon 4, Pathfinder, etc.) solution are also effective. This herbicide is oil-based, and typically requires a methylated seed oil or other oil-based carrier. The solution is applied to the lower 10–15 inches of bark, down to the root crown. Basal bark applications are completed during the dormant season to avoid damage to non-target vegetation.

#### Foliar Treatment

Foliar treatments using 2% glyphosate during the growing season are effective; however, this method is unselective, and should only be utilized in areas that contain no desirable vegetation. Late summer is the recommended timeframe for foliar spraying of autumn olive.

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Autumn Olive



## *Rhamnus frangula* (glossy buckthorn) *continued...*

Similarly, buckthorn has been found to impact native fauna as well. The berries of this species contain an emodin chemical that is not palatable to generalist consumers. The inability of generalist insects to utilize this source of food will in turn reduce the available food for insectivorous birds. To meet nutritional requirements they will need to establish larger territories. Phenologically, glossy buckthorn leafs out early and maintains leaves longer and later, than native shrubs. It is hypothesized that this early leaf out will attract early migrants and because of a lack of resources will also decrease recruitment of these species to other life stages (e.g. nestling survival). When the fruit ripens it is at this time most dispersal occurs.

### Managing *Rhamnus frangula*

There are several options when dealing with the control/eradication of glossy buckthorn. This article will deal only with those techniques that could be used by anyone in any situation.

The starting point for any quality invasive species program is an early detection/rapid response program. Early detection focuses on addressing colonization before it becomes problematic, potentially saving the land manager and/or landowner a financial burden and irrevocable changes to fundamental ecosystem processes. Land managers can be proactive and lessen their work load by identifying potential sites for invasion (e.g. proximity to disturbed areas). Following detection of the target species, land managers should treat the area within a reasonable time frame. I recommend using an aquatic rated glyphosate product. This will allow land managers to move from uplands and wetlands without the worry of using their herbicide in a manner inconsistent with its label.

Buckthorn can be treated at any time of the year by cutting the stem and applying herbicide to the cut surface. The cut stump and herbicide method is most common, though other more expedient methods are currently being researched (i.e. single stem herbicide application). Typically—and I highly recommend this – land managers will wait for mild weather if treating buckthorn in the winter months. Herbicide concentrations used during this period are also typically much higher than during the active growing season, approximately 50 to 10%, respectively. Land managers have also found glyphosate to be effective at a concentration of 2.5–3% during the active season. It is suggested that land managers make some trial runs before deciding on which concentration to use. Effectiveness will vary with such factors as site conditions and weather. During the rest of the year treatment is fairly straight forward. However, unlike winter treatment, land managers will have to be keenly aware of native plants, especially those in the understory, to reduce non-target impact and preserve site biodiversity.

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## Invasive Plant Species Control and Management Autumn Olive (*Elaeagnus umbellata*)

By Jennifer Lemler, Ecological Resource Specialist, JFNew



### Background

Autumn olive is an invasive shrub that originated in Asia. Introduced to the United States as an ornamental plant in the mid-1800s, autumn olive has been planted extensively for wildlife use and soil stabilization. It has since escaped cultivation to colonize disturbed and degraded landscapes through much of the eastern United States. Because it prefers open, dry habitat, it is not typically prevalent in dense woods or wetland areas; however, it does spread into moist transitional areas between uplands and wetlands. Its aggressive growth habit and propensity for invading natural areas has resulted in the species being banned as a noxious weed in several states. As a nitrogen-fixing plant, autumn olive exhibits a tolerance for poor soils, and has the potential to impact native plant communities that rely on infertile soil. It is adaptable to various site and soil conditions, giving it an edge over more sensitive native vegetation.

The leaves of autumn olive are distinctive, with silvery-white undersides. The bark has tiny, coppery spots, and the branches are frequently thorny. Autumn olive grows up to 20 feet in height and bears red fruits, which are consumed by birds and small mammals. It is easily visible when the leaves emerge in early spring, well before most native shrubs break dormancy. Autumn olive spreads almost entirely by seed, and has the advantage of high seed production and germination rates. Seed dispersal occurs primarily through birds and by fruits dropping from the shrub.

Management options are typically categorized into **Biological**, **Mechanical**, and **Chemical**. Most often, the ideal treatment strategy utilizes more than one of these techniques in an **IVM**, or **Integrated Vegetation Management** approach.

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- Facilitate the exchange of information concerning management, control, inventory, and monitoring of invasive plants.
- Provide a forum for all interested parties to discuss issues relating to invasive plants.
- Serve as an educational, advisory, and technical support council for all aspects of invasive plants and related issues.
- Prevent future introductions of new invasive plants.
- Adopt guiding principles set forth in the management plan by the National Invasive Species Council Executive Order 13112 February 3, 1999.

MIPC's website: [www.invasiveplantsmi.org](http://www.invasiveplantsmi.org)

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Editor: **Heidi Gray**  
Layout and Design: **Rick Willey**