



COMMON BUCKTHORN

Rhamnus cathartica

This Best Management Practice (BMP) document provides guidance for managing Common Buckthorn in the Oak Openings Region of Northwest Ohio and Southeast Michigan. This BMP was developed by the Green Ribbon Initiative and its partners and uses available research and local experience to recommend environmentally safe control practices.

INTRODUCTION AND IMPACTS— Common or European Buckthorn (*Rhamnus cathartica*) is native to Eurasia and was first brought to North America in the 1800s as an ornamental. It has been regularly used for fencerows and wildlife habitat. Although its commercial sale is now banned in many places, Common Buckthorn (or “C. Buckthorn”) is already widely distributed in North America and is found throughout OH and MI.

The Midwest Invasive Species Information Network (MISIN) has over 170 reports of Common Buckthorn (black dots) in or within 5 miles of the Oak Openings Region (OOR, green line). It has been documented in 5 of the OOR’s 7 counties and is currently present in most natural areas. However, C. Buckthorn has demonstrated the ability to establish and spread in both healthy and disturbed habitats of the OOR. (see further details in the habitat section)



Common Buckthorn has many characteristics that contribute to its classification as an invasive, pest species. It produces abundant fruit and spreads rapidly. C. Buckthorn limits the light and alters nutrient cycling, changing soil environments for native species.

Through its inhibition of native plants, C. Buckthorn severely degrades the quality of the habitats in which it becomes established. It also alters ecosystem nitrogen cycling, to the detriment of (beneficial) soil fungi and the plants that depend on them. Birds nesting in C. Buckthorn experience higher predation rates than those nesting in native shrubs. Exuded chemicals from the plant may have a negative impact on amphibians as well. Further, C. Buckthorn hosts several agricultural pathogens. Livestock can be poisoned by grazing it in sufficient quantity.

SIMILAR SPECIES—Common Buckthorn is similar in appearance and habit to Dahurian buckthorn (*Rhamnus divurica*), another invasive buckthorn in the OOR. Dahurian buckthorn leaves are slightly longer, typically 2.5-5” in length. Treatment is the same as C. Buckthorn.

Common Buckthorn resembles Alder-leaved Buckthorn (*Rhamnus alnifolia*, a native). Alder-leaved does not exceed 3’ tall, has leaves with rounded teeth, and has petal-less flowers with 5 sepals. The leaves of *R. alnifolia* are regularly alternate instead of sub-opposite.

In the OOR, native dogwoods (*Cornus* spp.), plums/cherries (*Prunus* spp.), serviceberries (*Amelanchier* spp.) and nannyberry (*Viburnum lentago*) may be mistaken for C. Buckthorn but none of these species have its characteristic yellow sapwood. Also, these species have white flowers, not greenish-yellow.

HABITAT—C. Buckthorn prefers part-sun and neutral to alkaline soils but can grow in a wide range of conditions. It tolerates well-

drained sand to poorly-drained clay soils, and full sun to full shade. C. Buckthorn invades upland habitats including open woods, woodland edges, old fields, and roadsides. It can survive in flatwoods, fens and other wet habitats, but is less frequent (see Glossy Buckthorn). In the OOR, C. Buckthorn has been found on sand dunes, upland and swamp forests, within and at the edges of floodplains and streams, near vernal pools and ponds, and along roads-and ditches.

IDENTIFICATION—**Habit:** Deciduous multi-stemmed shrub, becoming a single-trunked tree with age. Typically reaches heights of 10-25’, and DBH ~4”, but has been recorded in MI at a height of 61’! DBH has also been recorded as high as ~10”!



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Leaves: Simple, with toothed margins. Oval and 1-2.5” long with pointed tips. Leaf veins are prominent, paired (3-5 pairs), and curve close to the leaf tip. **Sub-opposite arrangement.** Hairless. Dark green on top, lighter green below. Pale yellow in the fall.

Stems: Young bark is brown and shiny **with prominent lenticels.** Becomes gray and scaly, to peeling with age. Branches have light, vertical, raised marks. Slender, smooth twigs, often with a 0.2-0.9” **thorn** at the tip. Yellow sapwood and pink-orange heartwood.

Flowers: Small (1/4”), with four petals. Greenish yellow and clustered in the leaf axils. Fragrant. Dioecious.



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Fruits: Small and round, 1/4” in diameter. Ripen from green to purplish-black. Unripe fruits contain a laxative called emodin. Each contains 1-5 seeds which have a deep, narrow groove on back.

Seeds: 4-5 mm long and narrowly grooved. High germination rates. 15,000-54,000 seeds produced per plant per year.

Roots: Shallow and fibrous. Extent can vary. A mature C. Buckthorn in North Dakota had roots 18.5’ long, but 99% were in the top 3’.

C. Buckthorn Timeline	J	F	M	A	M	J	J	A	S	O	N	D
Life History	Dormant		Germination/ Leaf Out		Flowering		Fruit Ripens			Leaves Persist	Dormant, Fruit Persists	
Cut and Spray	Cut					Spray before leaves change color			Cut			
Foliar Spray						Spray before leaves change color						
Stump Cut/Basal Bark/Drill+Fill/Injection	Treat		Treat									
Prescribed Fire	Burn											

REPRODUCTION AND DISPERSAL—Reproduction of Common Buckthorn is entirely by seed, though it can resprout from roots and stumps. C. Buckthorn is dioecious, but female plants far outnumber male plants and bear large quantities of fruit starting at 2-4 years old. Fruit is dispersed short distances by gravity, and long distances by birds, deer, and mice. Seeds will not germinate until the fruit’s flesh has been removed, and can remain viable for 2-6 years. Beneath mature C. Buckthorn, 500-1,000 seeds/meter may reside in the top few inches of soil. **Thoroughly cleaning equipment is a critical prevention measure for C. Buckthorn. Land managers should consider incorporating pre- and post-project equipment cleaning into contracts.**

REPORTING—Identified for Control in the OOR. Reporting Common Buckthorn is essential for its control. C. Buckthorn is easiest to identify in the spring or fall when leaves of native vegetation are absent. Report C. Buckthorn at www.misin.msu.edu and to the county or local CWMA or CISMA.

CONTROL—The best control is integrated control. Management plans should focus on prevention of fruiting followed by chemical damage to the roots where conditions permit the use of herbicides. Annual follow-up is essential in the treatment of C. Buckthorn, and monitoring should include at least 20’ surrounding the original patch.

Chemical: The following recommendations have been compiled from groups working in MI, OH, MO, PA, NH and Canada. It is the responsibility of the applicator to ensure compliance with herbicide labels and regulations when planning chemical treatment. Follow-up treatments should take place six weeks after cutting or initial application.

Foliar Spraying—Best for large, dense populations of C. Buckthorn that is short in height or as follow-up after cutting. Herbicides should be used with 0.5-1% of an appropriate non-ionic surfactant (e.g. Cygnat Plus®, LI-700, etc.) or oil-based adjuvant (e.g. SprayTech® Oil).

Stump Cut—Cut stem 2” above ground and immediately apply herbicide to the cross-section of the stump.

Drill and Fill—On larger C. Buckthorn, drill holes into the tree at a downward angle and fill them with a measured amount of

Herbicide	Trade Names	Concentration
Glyphosate	Aquamaster®, Rodeo®, Aqua Neat®, Round-up®, Razor®, Accord®, Glypro®	Spray—2-8% Stump—10-50%
Triclopyr	Garlon 3A® or 4 Ultra®, Pathfinder®, Renovate®	Foliar—2-3% Basal—22-30% Injection—27% Stump—31-44%
Triclopyr + Metsulfuron	Metsulfuron: Escort®	
Triclopyr + Imazapyr	Imazapyr: Arsenal®, Stalker®	Stump—15-18% Tric. + 3% Imaz.
Also Picloram (Pathway®), 2,4-D+MCCP+Dicamba (Trimec®), and Krenite®		

concentrated herbicide. One hole for each inch of diameter.

Stem Injection—Inject liquid herbicide or herbicide pellets at 3-4” intervals around the stem at any height. Best for large stems, small patches, remote sites, sensitive areas, or where spraying is prohibited.

Basal Bark—Apply triclopyr with a penetrating oil (e.g. AX-IT®) to a band of bark around the stem extending 18” up from the ground. Most effective on younger stems with thin bark. Do not use when snow or water prevent application at ground level.

Mechanical: Hand pulling can be applied to Common Buckthorn seedlings only. Cutting or mowing C. Buckthorn is only effective when followed with herbicide, as C. Buckthorn resprouts vigorously. In all mechanical removal scenarios, ensure you clean your equipment and dispose of all plant material appropriately (see Disposal below).

Biological: Researchers are investigating the use of Buckthorn Phytoplasma, a disease affecting buckthorns, for biological control. Grazing on C. Buckthorn has resulted in livestock poisoning.

Prescribed Fire: Burning stimulates resprouting in mature plants and encourages germination of C. Buckthorn seeds, but will kill seedlings and help exhaust the seed bank. Fire should be used in conjunction with other control methods. Best in early spring. May require annual burning for 5-6 years.

Flooding: In places where flooding is possible, raising the water level can kill C. Buckthorn.

DISPOSAL—

- If no fruit is present: cut brush can be left in place. Pulled seedlings can be left on site if roots are not in contact with the soil. C. Buckthorn wood is fairly resistant to degradation, so it may take a long time to decompose if not burned.
- If fruit is present: fruit should be incinerated, or sealed in plastic bags and disposed of in a landfill.
- Due to C. Buckthorn’s prolific-nature and potency in the seed-bank, do not remove soil from the site unless it is being disposed of in a landfill.



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