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**Department of Environmental Protection
Environmental and Geographic Information Center
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Invasive Plant Information Sheet



Buckthorn

Common Buckthorn (*Rhamnus cathartica*)

European Buckthorn (*Rhamnus frangula* = *Frangula alnus*)

Buckthorn Family (*Rhamnaceae*)

Ecological Impact: Common and European buckthorn grow rapidly and form dense, even-aged thickets that shade out native tree seedlings, low shrubs, and herbs. Both species are prolific seed producers. Fruits are eaten by birds and mice, which subsequently disperse the seeds. Laxative properties of the fruits encourage dispersal and can lead to energy loss in birds.

Control Methods: The most effective control method for buckthorns is to prevent establishment by manually removing seedlings. Underplanting disturbed woods with tolerant native woody species may prevent establishment if planting density is adequate and plants are regularly maintained. Underplants of sugar maple (*Acer saccharum*) have met with some success. Large plants can be controlled by cutting or girdling. Herbicide treatment in combination with cutting is also effective. Prescribed burning can be successful, but may also encourage infestation.

Mechanical Control: Seedlings or small plants should be hand pulled or removed with a hoe when the soil is moist. Mowing can also be used to prevent seedlings from establishing in open areas. Larger plants can be pulled out with a weed wrench or heavy equipment, however, this method disturbs the roots of adjacent plants and creates open soil readily colonized by new seedlings. Excavating large plants should be done only where buckthorn density is low or along roadsides, trails, and woodland edges. Disturbed soil should be tamped down and the area monitored for seedling development.

Large plants can also be cut or girdled. Since repeated cuttings reduce plant vigor, two cuts a season for two or three consecutive years is recommended. Make the first cut in late spring after leaf out, the second in late August or September. Follow the second cutting with a cut stump treatment to reduce or prevent sprouting.

Girdling stems and cutting resprouted growth slowly starves the tree and does not disrupt the soil or affect sensitive wetlands. Manually cut away bark and cambial tissue in a 2-3 cm wide ring around the trunk. Girdle trees with an ordinary axe in the winter or spring. For stems less than 4.5 cm in diameter, a five second flame torch application around the stem will kill the cambium. If sprouts appear, follow-up with a foliar spray or cut and treat stumps with herbicide. Prescribed burns in early spring or fall will kill seedlings and top kill mature plants. Resprouting usually follows top kill, especially in wetlands where moisture protects the base of the tree. Burning is appropriate only in fire-adapted communities and should be conducted annually or biannually for 5-6 years to exhaust the seed bank. Since groundcover and litter is often sparse under buckthorn stands, prescribed burns may not be suitable.

Chemical Control: Herbicide treatment is most effective if done in the fall, when most native plants are dormant and buckthorns are still actively growing.

1) Foliar Spray: This method is best used for stump sprouts or in areas with large numbers of seedlings. Spraying should be done in the fall, well before leaves have begun to drop and when temperatures are likely to remain above freezing for several days. Use a systemic herbicide like glyphosate or a bud inhibitor like fosamine (Krenite™). Glyphosate is a non-selective herbicide that will kill all vegetation. Fosamine is a non-selective bud inhibitor for woody plants. Managers should be cautious not to spray so heavily that herbicide drips off the leaves. Check herbicide labels for accurate dilution rates.

2) Cut Stump Treatment: This method is most effective if done from late summer to early winter (late August-January). Cut stems 2-4 inches from the ground and treat with a 20% solution of glyphosate (Roundup™ or Rodeo™) and water or a 25% solution of water-soluble triclopyr (Garlon 3ATM). A 25% solution of oil-soluble triclopyr (Garlon 4TM) is also effective. Apply the herbicide with a sponge or paint brush or spray with a spray bottle or backpack sprayer. To ensure uptake before the plant seals off the cut, apply herbicide immediately after cutting, within 5-15 minutes. Stump sprouts should be cut and the stumps treated, or, if left uncut, treated with a foliar spray.

3) Basal Bark Treatment: This method is generally used for stems between 2 and 3 inches in diameter. Use a 1:16 dilution of oil-soluble triclopyr (Garlon 4TM). With a handheld or backpack sprayer, apply the mixture in a 12-inch wide band around the tree, making sure to not miss any areas. Follow-up with cut stump treatments or a foliar spray if stump sprouts appear.

Biological Control: Currently, there are no known biological control methods. Host specific European insects were evaluated for possible Canadian introduction. Current studies focus on pests of Common buckthorn, since this species leads to greater agricultural damage and has less ornamental value. Fungal pathogens of European buckthorn are known from England. Research using fungal inoculation was begun in Wisconsin. Results are not yet available.

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