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VEGETATION MANAGEMENT GUIDELINE
Exotic Buckthorns

Common buckthorn (*Rhamnus cathartica* L.)
Other names: European buckthorn, Hart's thorn, waythorn, rhineberry

Glossy buckthorn (*Rhamnus frangula* L.)
Other names: Columnar buckthorn, European buckthorn

Dahurian buckthorn (*Rhamnus davurica* Pall.)

Photos by Kenneth R. Robertson, INHS

SPECIES CHARACTER

Description

Common Buckthorn: This shrub or small tree reaches heights of 25 feet (7.6 meters); trunk diameter is up to 10 inches (25 cm); crown is spreading and irregular. Bark is gray to brown, showing a rough texture when mature. Twigs often are tipped with a spine. Leaves and bud scars are nearly opposite to opposite. Small black fruits up to 1/4 inch (0.6 cm) diameter and containing 3-4 seeds are typical. Leaves are broadly elliptic, rounded

to pointed at the tip, and toothed. Both upper and lower
leaf surfaces are smooth. Leaves stay green late into fall.
Dahurian Buckthorn: Similar to common buckthorn, however leaves, on average, are longer than 2.5 inches (6.4 cm) and are more lance to elliptic in shape. Leaves are brown in fall.
Glossy Buckthorn: This shrub or small tree reaches heights up to 20 feet (6.1 meters). No spine is present on the ends of hairy twigs. Leaves are alternately arranged and not toothed. The upper leaf surface is shiny, whereas, the bottom leaf surface is hairy. Leaves range from 1/2 to 3 inches (1.3 to 7.6 cm) and are more or less obtuse in shape. The fruit is red when young and turns black as it matures. Flower stalks are hairless or nearly so. Buds are long, with no bud scales. Leaves stay green late into fall.

Similar Species
Three native buckthorns are found in Illinois. Carolina buckthorn (*Rhamnus caroliniana*) is native to the southern one-fifth of Illinois and looks similar to glossy bucthorn. However, Carolina buckthorn grows to a larger size and its leaves are finely toothed and smooth on both sides. Alder buckthorn (*Rhamnus alnifolia*), found in northern Illinois, is a small shrub less than 3 feet (0.9 meters) in height. The twigs of this native buckthorn are hairless and have dark scales on the buds in winter. Lance-leaved buckthorn (*Rhamnus lanceolata*), a shrub up to 6 feet high (1.8 meters) that occurs in fens and on river bluffs, has 2-6 inch lance-shaped leaves, alternately arranged on the twig. This buckthorn has bud scales in winter. Common, glossy, and Dahurian buckthorn should be accurately identified before attempting any control measures. If identification of the species is in doubt, the plant's identity should be confirmed by a knowledgeable individual and/or by consulting appropriate books.

Distribution
All exotic buckthorns mentioned are endemics of Eurasia that were introduced to North America as ornamental shrubs. While these species have spread into the northern half of Illinois, the most serious problems occur in northeastern Illinois in several biotic communities. Dahurian buckthorn has only recently been found in natural areas around the Morton Arboretum in DuPage County (Swink & Wilhelm, 1979).

Habitat
Common buckthorn and dahurian buckthorn inhabit woodlands and savanna. Common buckthorn apparently is more sun-tolerant than dahurian buckthorn, as it is found in prairies and abandoned fields. Glossy buckthorn is found most frequently in wetland communities. However, glossy buckthorn invades mesic upland sites, including roadsides and old fields.

Life History
All exotic buckthorns produce a fruit that is readily eaten by birds. The severe laxative effect of these fruits readily distributes seeds. These shrubs readily resprout from cut or damaged stems.

Effects Upon Natural Areas
Common and glossy buckthorn readily invade natural communities. Once established, exotic buckthorns crowd or shade out native shrubs and herbs. Common buckthorn invades woodlands, savannas, and prairies. Glossy buckthorn invades fen, bog and sedge meadow communities, as well as mesic upland sites, such as prairies. Dahurian buckthorn invades woodlands and savannas, but is not as widespread as the other exotic buckthorns.

Current Status
Exotic buckthorns are sold as ornamentals by several nurseries, and are used as hedges in many urban areas. There are no current legal restrictions on the sale or propagation of these plants.

CONTROL RECOMMENDATIONS

RECOMMENDED PRACTICES IN NATURAL COMMUNITIES OF HIGH QUALITY

As with all management, control efforts must balance improvement of the biotic community with damage caused by the management. It is always best to take the least damaging approach that will affect the desired control of an exotic. The following are effective control measures for exotic buckthorns.

Fire is very effective in controlling buckthorns and is the preferred method whenever feasible. Regular prescribed fire will kill seedlings and shrubs of these species in fire-adapted upland and wetland (e.g. fens, sedge meadows, marshes) sites. Some control usually will be evident after the first burn. However, for complete control in established stands of buckthorn, burning yearly or every other year may be required for 5-6 years or more. Fire should not be used to control these species if the community will be affected adversely (e.g. some bog communities). To conduct prescribed burns, open burning permits must be obtained from the Illinois Environmental Protection Agency and often the appropriate local agency also. Burns should be conducted by persons trained or experienced in conducting prescribed burns, and proper safety precautions should be followed.

In wetlands, where the water table has been artificially lowered, restoration of water levels often will kill glossy buckthorn. Care should be taken not to flood sensitive communities by raising water levels higher than occurred historically.

When burning is not feasible, larger trees can be cut or girdled and resprouts clipped as they occur. When using chainsaws and other power equipment, proper safety equipment and precautions need to be used. For safety recommendations refer to your chainsaw owner's manual. For girdling to be effective, use an ax or saw to make 2 parallel cuts 4-5 inches apart, cutting through the bark slightly deeper than the cambium. The bark is then either knocked off, using a blunt object like an ax head, or peeled away, using a blunt ax blade. Phloem should be removed without damaging the xylem. Girdles should be checked after a few weeks to make sure that bark does not develop over the cut area. Girdled trees take time to die and the results may not be seen until a year later. Basically, the tree is slowly starving to death. All suckers should be cut.

In upland areas where burning is not feasible, cut stumps can be treated with Trimec (a formulation of 2,4-D, MCCP and Dicamba) or Roundup (formulation of glyphosate) to prevent resprouting. Trimec, an herbicide specific for broadleaf plants, should be diluted with an equal portion of water and applied according to label instructions. Roundup is non-specific and kills all photosynthetically active vegetation. Although the Roundup label recommends a rate of 50-100% for cut-stump treatment, a 50% solution has proven effective. In wetland areas, Rodeo (a formulation of glyphosate approved for use in wetlands) can be used for cut-stump treatment. As with Roundup, Rodeo is non-specific and is effective when applied as a 50% solution. Autumn is the preferred time to cut and stump-treat buckthorn, because 1) buckthorns retain green leaves late into the fall, making it easy to find all plants and 2) most native vegetation is dormant, minimizing the potential harm to non-target plants. To be effective, the herbicides mentioned above must be applied immediately after cutting. Consult appropriate herbicide label(s) for specific application directions. These chemicals can be applied either by spraying individual cut stumps with a low pressure hand sprayer or else by wiping the herbicide on each cut stump with a sponge applicator (sponge-type paint applicators can be used). Care should be taken to avoid herbicide contact with nontarget plants. Native nontarget plants will be important in recolonizing the site after buckthorn is eliminated. By law, herbicides only may be applied according to label directions and by licensed herbicide applicators or operators when working on public properties.

RECOMMENDED PRACTICES ON BUFFER AND SEVERELY DISTURBED SITES

Same as given above for high-quality areas, with the following additions.

In addition to the cut-stump treatments recommended above, Garlon 3A (a formulation of triclopyr) is a selective translocated herbicide that can also be applied on cut stumps. A 50% Garlon solution diluted

with water can be sprayed, using a hand sprayer, to the cut stump. Application should be within a few hours of cutting. Cut-surface application can be made during any season of the year, but application during the dormant season reduces the potential for drift injury.
Dormant season basal-bark treatment using GARLON 4 herbicide is effective on trees and resprouts less than 6 inches in diameter, however, this treatment is not labelled for use in wetlands. Two to 2 1/2 oz. of Garlon 4 is added to one gallon of diesel fuel. Spray this mixture, using a hand sprayer, to the basal portion of the trunk. Spray to a height of 12-15 inches (30.5-38.1 cm). A thorough spraying is necessary. **This treatment should not be used in high quality natural areas because the diesel fuel may kill vegetation around the tree.**
Use of Triclopyr is best done in the dormant season to lessen damage to nontarget species. Great care should be exercised to avoid getting any of the mixtures on the ground near the target plant since some nontarget species may be harmed. Avoid using Triclopyr if rain is forecast for the following 1-4 days; otherwise runoff will harm nontarget species.
In wetland areas, buckthorn can be cut or girdled and the cut stumps treated with Rodeo as described above. Any resprouts should be cut and stump-treated again, or else hand sprayed with a 1.5% foliar spray of Rodeo herbicide. Care should be taken to avoid herbicide contact with nontarget plants. As with most exotic plant control projects, follow-up treatments may be needed.

FAILED OR INEFFECTIVE PRACTICES

No effective biological controls that are feasible in natural areas are known.

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PERSONAL COMMUNICATION

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