**Watch out for these two forest invaders**

By Nancy Olmstead
Maine Natural Areas Program, Maine Department of Agriculture, Conservation and Forestry

Invasive plants such as Japanese barberry and common buckthorn are a threat to forest regeneration, wildlife, and even human and animal health. Unfortunately, these two species could go undetected on your woodlot or town forest because they are shade-tolerant and will grow in the forest understory. You can help stop their spread in the Maine woods by identifying and removing them from your property. You can also map their locations using the online mapping tool, iMapInvasives – this helps us all understand the distribution of invasive plants across the state. Visit www.imapinvasives.org/meimi to request a free user account.

Japanese barberry

Long-planted in landscaping, Japanese barberry (*Berberis thunbergii*) has bird-dispersed fruits that allow it to "hop" around the landscape, spreading from hedgerows into the woods. This deciduous shrub can grow up to eight feet tall and wide, has vicious spines along the stems, and produces small (3/8-1/2"), oblong, red fruits. The small leaves (1/2-3/4" long) taper at the base and are found in alternate clusters along the stem. Leaves appear before those of native plants in the spring and remain active after native plants go dormant in the fall, giving barberry a competitive advantage. And once it is mature, deer won't eat it because of the spines.

Since Japanese barberry is shade-tolerant, resistant to herbivory, and reproduces well, it tends to create thickets of dense, thorny shrubs that outcompete native trees, shrubs, and wildflowers. The dense, thorny thickets are good habitat for mice, many of which host deer ticks, the carriers of Lyme disease. In a recent study, Japanese barberry thickets were found to have higher tick densities than surrounding areas with little to no barberry[1].

Luckily, if you find Japanese barberry in your woods, it is relatively easy to kill. Simply put on your thickest garden gloves and dig it out by the roots; getting as much root as you can. If it does not have fruits, hang it in the crook of a tree so there is no chance of re-rooting, or if it does have fruits, bag it for disposal off-site (never compost invasive plants with fruit). If you have a large infestation, consider a professional herbicide application.

Close-up of Japanese barberry stem showing red fruit, small leaves, and leaves turning reddish-purple color in fall. Photo courtesy of Maine Natural Areas Program.

Common buckthorn

Common buckthorn (*Rhamnus cathartica*) is a deciduous shrub or small tree (up to ~25' tall and 10" diameter) that invades open areas, upland forests, and wetland edges. It was also brought to North America for ornamental plantings. It has small "thorns" at the ends of the twig tips (look carefully between the end buds), but they are not painful like those of Japanese barberry. The leaves of common buckthorn occur *almost* opposite from each other, as opposed to directly opposite or alternate along the stem (botanists call this "subopposite"). Leaf edges are finely toothed and the leaf veins curve inward at the tip. Common buckthorn fruits ripen from green to purple-black.

In addition to impacting forests by competing with native plants, common buckthorn produces a metabolic by-product (emodin) that causes harmful effects when consumed by wildlife, including vomiting and diarrhea (for example, if birds feed on unripe fruits). If common buckthorn is present around amphibian breeding pools, emodin can contaminate them. Scientists found that amphibians developing in emodin-contaminated water suffered malformations or died[2]. This is of special concern since many amphibian species are already in decline.

If you find common buckthorn, there are several ways to get rid of it. Small plants can simply be pulled up (emodin is not known to be skin-active, but use gloves if you have sensitive skin). Hang in a branch as for barberry, or bag for disposal off-site (if there are fruits). Larger plants can be cut down, but they will re-sprout, so plan on follow-up. If you have a large infestation, consider hiring a licensed pesticide applicator.

*Maine Natural Areas Program's work on invasive plants is generously supported by the U.S. Environmental Protection Agency, the National Fish and Wildlife Foundation's Pulling Together Initiative, the Maine Outdoor Heritage Fund, and the Maine Department of Agriculture, Conservation and Forestry.*

Buckthorn branch ends showing ripe black fruit. Note the leaves with sub-opposite branching, arching leaf veins, and small teeth along the edges. Photo courtesy of Maine Natural Areas Program.

[1] Williams, S.C., Ward, J.S., Worthley, T.E., and K.C. Stafford. 2012. Managing Japanese barberry (Ranunculales: Berberidaceae) infestations reduces blacklegged tick (Acari: Ixodidae) abundance and infection prevalence with *Borrelia burgdorferi* (Spirochaetales: Spirochaetaceae). *Environmental Entomology* 38(4): 977-984.

[2] Sacerdote, A.B. and R.B. King. 2014. Direct effects of an invasive European buckthorn metabolite on embryo survival and development in *Xenopus laevis* and *Psedacris triseriata*. *Journal of Herpetology* 48(1): 51-58.