Invasive Species Profile: Autumn Olive (*Elaeagnus umbellata*)

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Native Range: Japan, China, and Korea
U.S. Introduction: 1830s as an ornamental shrub
Life Cycle: perennial shrub
Means of Spreading: berries, eaten by birds, which pass the seeds
Commercially Available: yes, with a shrinking market: some states ban or prohibit autumn olive sales
Control Method: hand-pull seedlings and saplings. Mature bushes may require mechanical tools, such as a Weed Wrench. Cut down large shrubs leaving two feet of defoliated branches; continue manually removing new growth until the plant dies (takes approximately two years).
Good Alternative Species: spicebush (*Lindera benzoin*), flowering dogwood (*Cornus florida*), eastern baccharis or groundsel tree (*Baccharis halimifolia*).

Comments: The case of autumn olive illustrates how introducing a non-native species with good intentions can go bad. First brought to America from Asia in the 1830s, it was promoted to control erosion and act as a wind break. Adding to the appeal, this tall shrub grows fast in many soil types and moisture levels, even fixing atmospheric nitrogen thanks to the relationship its roots have with bacteria from the genus *Frankia*. Some people found *Elaeagnus*' metallic green leaves with silvery scales attractive while others enjoyed the potent, sickeningly sweet aroma from the cream-colored springtime blossoms. As recently as the 1970s, its fruits, ripening in September and October, were thought to help birds and wildlife advocates encouraged planting autumn olive. Other folks harvested the drupes to make food items like jams and pie fillings.

So far, this plant sounds like a miracle bush! Unfortunately, autumn olive has no serious North American parasites, diseases, or predators to keep it in check. Only aphids significantly attack it, which draw ladybugs, but that micro-ecosystem has no major contribution to the broader habitat. Without a natural control, autumn olive forms vast, dense thickets that blocks out sunlight so native plants cannot grow. Furthermore, it is allelopathic, meaning that the olive secretes chemicals into the soil thereby inhibiting the growth of other plants. Whereas the berries feed some adult animals, the lack of insect biodiversity hosted by the olive means that the arthropod-eating birds and many chicks starting life eating bugs have

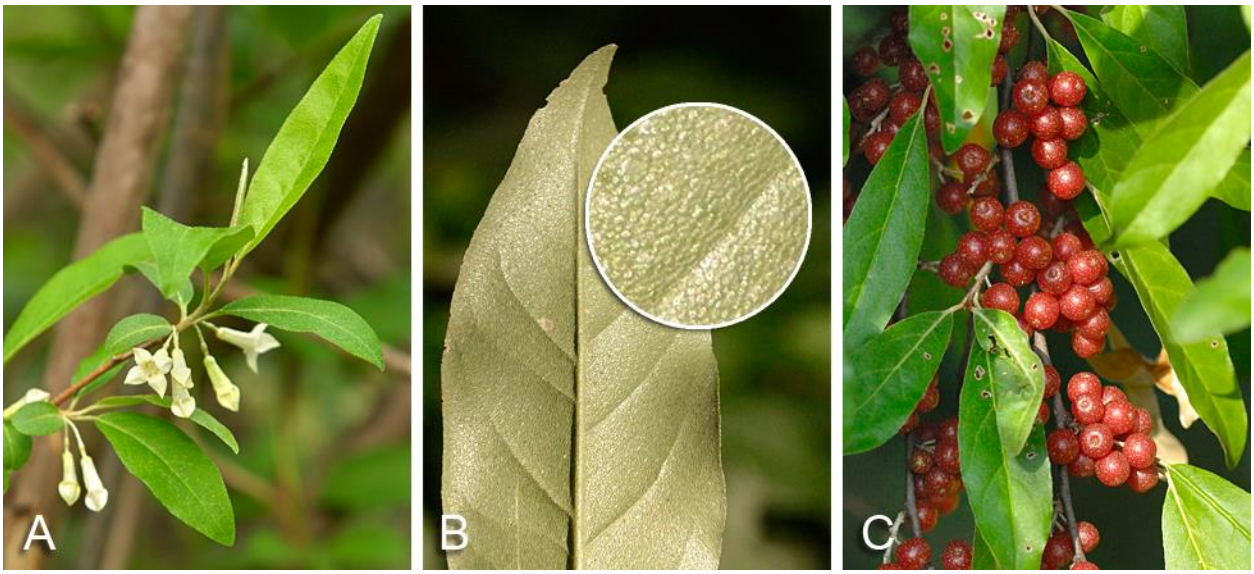

Figure 1. Autumn olive's pungent, sweet-smelling, cream flowers (A) bloom as the leaves develop. Some silvery scales speckle the foliage tops; the leaf underside (B) is lighter in color with more prevalent scales (magnified inset). In the fall, berries, which also display scaly flecks, weigh down the branches (C). One mature bush can produce up to 200,000 fruits.

reduced meal options near autumn olive groves. Those few adult bird species that gulp the fruits end up dispersing the seeds; those seeds germinate and quickly grow into new berry factories within several years. Clearly, autumn olive's dark side overshadows any benefit.

Two other species of *Elaeagnus* plague the D.C. metropolitan area: the thorny olive (*E. pungens*) and the Russian olive (*E. angustifolia*). Easy ways to tell these *Elaeagnus* apart are summarized in Table 1. Russian olives received a great deal of press lately because this little tree is a huge problem in the western states, especially invasive around waterways and lower canyon regions. North America has only one native *Elaeagnus* representative, the American silverberry (*E. commutata*), but it is does not naturally occur in Virginia. All *Elaeagnus* members are unrelated to the familiar food item, European olives (*Olea europaea*).

Table 1. Several key characteristics help distinguish the three *Elaeagnus* species found in Fairfax (from Weakley, et al. 2012).

Characteristic	Autumn Olive	Thorny Olive	Russian Olive
Bloom Time	Spring	Autumn	Around early summer
Fruits Ripen	Late summer to autumn	Early spring	Late summer
Berry Color	Red	Red	Yellow to brown
Berry Size	0.8 cm	1.5 cm	1.0 cm
Leaf Length x Width	3.0-8.0 x 1.0-3.0 cm	3.0-10.0 x 1.5-3.5 cm (evergreen)	3.0-10.0 x 0.4-3.2 cm
Leaf Scale Coloration	Silver	Silver with some bronze on undersides	Silver

For several years, Invasive Management Area (IMA) volunteers worked towards controlling autumn olive, and 2016's site leader increase at Royal Lake enabled more aggressive olive targeting. Killing autumn olive and its relatives is easiest done when the shrubs are young and can be hand-pulled. A Weed Wrench extracts larger specimens. If the tree is too large to be uprooted, they cut back the olive to completely defoliate the branches and prevent it from it from fruiting while leaving the main trunk standing. Volunteers return to the stump and remove new growth and suckers once every several months or so. Starving the plant through persistent defoliation kills it in a couple of years.

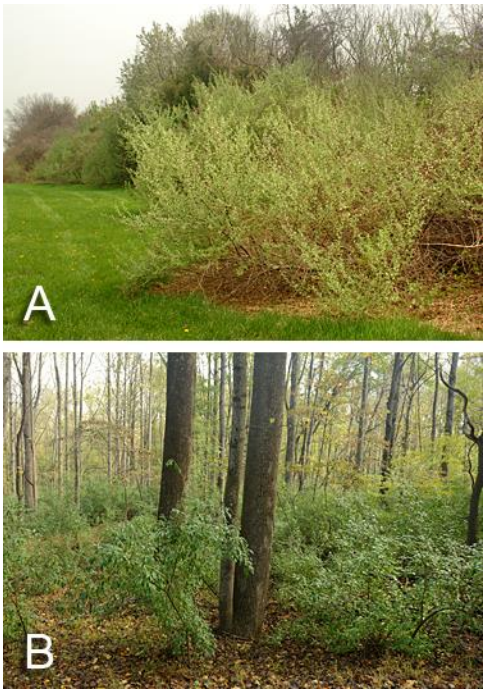

Figure 2. Autumn olive infestations can dominate open areas (A, seen in spring at Monticello Park in Burke) and woodland understories (B, at Hemlock Overlook in Clifton last fall).

For more information on autumn olive:

https://mnfi.anr.msu.edu/invasive-species/AutumnOliveBCP.pdf
http://www.invasiveplantatlas.org/subject.html?sub=3021
http://www.fs.fed.us/database/feis/plants/shrub/elaumb/all.html
http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/indiana/journeywithnature/autumn-olive.xml
https://www.techlinenews.com/articles/2018/managing-autumn-olive-ielaexagnus-umbellata-thunbi-in-natural-areas

Weakley, Alan S., J. Christopher Ludwig, and John F. Townsend. 2012. *Flora of Virginia*. BRIT Press, Fort Worth, TX. pp. 1554. floraofvirginia.org

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