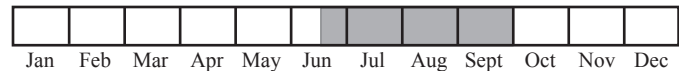


Best Survey Period



**Status:** State special concern

**Global and state rank:** G5/S3

**Other common names:** Eastern wahoo

**Family:** Celastraceae (bittersweet family)

**Synonym:** *Euonymus atropurpureus* Jacq.

**Taxonomy:** This species includes the widespread typical var. *atropurpureus* and the restricted var. *cheatumii* which is reportedly known from a single site in Texas (NatureServe 2006).

**Range:** Primarily a species of eastern North America, wahoo at the northern edge of its range occurs from Maine and New York west to Montana in the Great Plains, principally occurring from the Upper Midwest and the Northeast to Louisiana and Florida in the main portion of its range. It is considered rare in Alabama, Delaware, Florida, Georgia, Louisiana, Mississippi, North Carolina, North Dakota, Ontario, and South Carolina (NatureServe 2006).

**State distribution:** Approximately 20 occurrences are currently known, though this species is likely overlooked and thus somewhat underreported, occurring

in southern Lower Michigan with the majority of the localities documented in Washtenaw, Wayne, and Lenawee counties.

**Recognition:** *Euonymus atropurpurea* is a small to medium shrub or small tree arising from rhizomes, typically ranging to about 4 m in height in Michigan (Barnes and Wagner 1980). The relatively slender, somewhat delicate twigs are **green and often faintly lined, but lack corky wings**. The twigs bear opposite, thin, elliptic leaves that are finely toothed and have a pointed (short-acuminate) tip. The leaves are a somewhat dull green color above and **finely hairy beneath**, turning a bright scarlet color in the fall. The flowers, produced in stalked, more or less loose clusters from the leaf axils (bases), are **purplish**, four-petaled and insect-pollinated. When mature, the four-lobed fruit (which is a capsule) is pink, containing seeds that develop a **bright, scarlet aril** (a covering or accessory appendage). As the fruit dries and opens, the combination of the pink capsule with the bright red seeds is an indication of ripeness to birds, the primary consumer and disperser.

*E. atropurpurea* is most likely to be confused with the non-native *E. europaea*, which in addition to its invasiveness (and thus lack of fidelity to floodplain environments) can be distinguished from wahoo by its



leaves, which are smaller and smooth beneath, as well as by its yellowish-green flowers and fruits that have seeds bearing orange arils.

**Best survey time/phenology:** Although best identified and located for surveys when in fruit, this species can be reliably determined in vegetative condition by experienced botanists. It can thus be sought from approximately mid-June through September and likely longer depending on leaf drop and the persistence of fruits.

**Habitat:** Wahoo is a wetland species almost exclusively occurring in Michigan in or near floodplain forests, although it will occasionally grow in southern swamp forests or southern mesic forests. In floodplain forests, this species may occur both near and on riverbanks (e.g. levees) or in any successive river bottoms or terraces away from the water's edge and up into adjacent upland forests. The soils are typically silt loams in riparian areas. Common associates include such characteristic overstory trees as *Acer saccharinum* (silver maple), *Populus deltoides* (Eastern cottonwood), *Celtis occidentalis* (common hackberry), *Acer negundo* (box elder), *A. nigrum* (black maple), *Gymnocladus dioica* (Kentucky coffeetree), *Ulmus americana* (American elm), *Fraxinus pennsylvanica* (red ash), *Platanus occidentalis* (Eastern sycamore), *Quercus macrocarpa* (bur oak), and *Q. bicolor* (swamp white oak).

Typical understory associates are *Lindera benzoin* (spicebush), *Staphylea trifoliata* (bladdernut), *Carpinus caroliniana* (musclewood or blue-beech), *Asimina triloba* (pawpaw), *Cercis canadensis* (redbud), *Cornus alternifolia* (alternate-leaved dogwood), *Cornus foemina* (gray dogwood), *Zanthoxylum americanum* (prickly-ash), and *Viburnum lentago* (nannyberry), whereas common groundcover plants would include such typical species as *Boehmeria cylindrica* (false nettle), *Asarum canadense* (wild ginger), *Toxicodendron radicans* (poison ivy), *Arisaema dracontium* (green dragon), *Verbesina alternifolia* (wingstem), *Eupatorium rugosum* (white snakeroot), *Rudbeckia laciniata* (cut-leaved coneflower), *Laportea canadensis* (wood nettle), *Hackelia virginiana* (beggar's lice), and many other taxa as part of a diverse groundcover flora. Noteworthy non-native species that commonly occur in floodplain forests include *Alliaria petiolata* (garlic mustard), *Lysimachia nummularia* (moneywort), *Rosa multiflora*

(multiflora rose), and *Hesperis matronalis* (dame's rocket). More detailed information on associated species, including a comprehensive listing of dominant, common, and also the many rare plant and animal taxa occurring in this habitat can be found in the MNFI abstract for floodplain forest.

**Biology:** There is little available information on the life history of this shrub, although wahoo has been included in some studies. Thompson and Willson (1979) incorporated *E. atropurpurea* into their studies of the evolution of temperate fruit/bird interactions, with a focus on fruiting phenology and migration patterns. In their study, they observed the major frugivores for selected plant species, and documented the migration patterns of frugivores and potential frugivores. They found that Illinois plants ripened during the peak of frugivore migrations, that fall and winter fruits ripened more synchronously than summer fruits, and fall fruiting species had the highest removal rates. Willson (1991) studied the relationship of mites and selected woody plant species, concluding that the specialized foliar shelters (known as "domatia") found in some plant taxa did not occur in *E. atropurpurea*, but suggested that mites could be hosted in alternative ways.

**Conservation/management:** Wahoo is best protected by maintaining the ecological integrity of the floodplain forest environment, which includes the maintenance of hydrological regime (e.g. seasonal flooding cycles), protection from pollution, and the control of the many competitive exotic species that tend to invade and establish in riparian communities. Floodplain forests are vulnerable communities because they are often highly fragmented. Thus conservation efforts that work toward maintaining and restoring connectivity and enhancing the size of forest tracts and buffers will be the most effective over the long-term. Other efforts that will help maintain floodplain forests include encouraging appropriate management on private tracts, such as avoiding excessive timber extraction and other activities that tend to degrade this community type.

**Research needs:** Other than more detailed field work to better document and delineate populations, the study of any aspect of life history (e.g. breeding system, population structure, genetic diversity, dispersal and establishment) would provide information that can be used for management and conservation.



**Related abstracts:** Floodplain forest, American beak-grass, Assiniboia sedge, large toothwort, pumpkin ash, showy orchis, goldenseal, ginseng, prairie trillium, Virginia snakeroot, Black rat snake, Blanding's turtle, Cooper's hawk, Eastern box turtle, prothonotary warbler, red-shouldered hawk, yellow-throated warbler,

**Selected references:**

Barnes, B. V. and W. H. Wagner, Jr. 1980. Michigan Trees. A Guide to the Trees of Michigan and the Great Lakes Region. Revised and enlarged edition of Charles Herbert Otis's *Michigan Trees*. University of Michigan Press, Ann Arbor. 383 pp.

NatureServe. 2006. NatureServe Explorer: an online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: December 15, 2006).

Thompson, J.N. and M.F. Willson. Evolution of temperate fruit/bird interactions: phonological strategies. *Evolution*. 33:973-982.

Willson, M.F. 1991. Foliar shelters for mites in the Eastern Deciduous Forest. *American Midland Naturalist*. 126:111-117.

**Abstract citation:**

Penskar, M.R. 2008. Special Plant Abstract for wahoo (*Euonymus atropurpurea*). Michigan Natural Features Inventory, Lansing, MI. 3 pp.

Copyright 2008 Michigan State University Board of Trustees.

Michigan State University Extension is an affirmative-action, equal-opportunity employer.

Funding for abstract provided by Michigan Department of Transportation.

