GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Celastrus orbiculatus***

Celastrus orbiculatus 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Celastrales	Celastraceae

Common name tsuru-ume-mo-doki (Japanese), Asian bittersweet (English), climbing spindleberry (English), Japanese bittersweet (English), Asiatic bittersweet (English), oriental bittersweet (English), Rundblättriger Baumwürger (German)

Synonym *Celastrus orbiculata* , Thunb.
Celastrus articulatus , Thunb.

Similar species *Celastrus scandens*

Summary Celastrus orbiculatus is a deciduous, dioecious round-leaved vine that makes use of the 'sit and wait' invasion strategy. This species establishes under closed canopy forest conditions and persists indefinitely until it is released by a disturbance that creates conditions optimal for rapid growth. It invades forested land but has also been known to persist on coasts and may possibly disrupt dune formations. C. orbiculatus can overtop and girdle native trees and shrubs along roads, in clearings and in forest gaps. Identifying and eradicating populations before it they are released by an opening in the canopy is the easiest method of control.

view this species on IUCN Red List

Species Description
Celastrus orbiculatus is described as a deciduous, woody, perennial vine from the staff-tree family (Celastraceae), which sometimes occurs as a trailing shrub. Also known as round-leaved and oriental bittersweet, stems of older plants sometimes grow to 10cm (4 inches) in diameter. Leaves of oriental bittersweet are glossy, rounded, finely toothed and arranged alternately along the stem. Clusters of small greenish flowers emerge from leaf axils, allowing each plant to produce large numbers of seeds. Dreyer (2003) recognises the following identification characterisitics of *C. orbiculatus*: Axillary buds are 1-3mm long, rounded, with outer scales sometimes becoming spine-like. Leaves are glabrous, alternate in arrangement and extremely variable in size and shape, from broadly oblong-obovate to suborbicular, 2 -12cm long and 1.5 to 8cm wide. Leaf margins are crenate-serrate and leaf base cuneate to obtuse, tip acute to rounded. Petioles are 1-3cm long. Inflorescences are axillary cymes, usually containing 3 - 7 flowers. However inflorescences are sometimes terminal in male plants. Flowers are small, greenish-yellow, and usually become unisexual by abortion or reduction of male or female parts, thus the plants are usually dioecious. Occasional vines develop both unisexual and perfect flowers and are then termed polygamo-dioecious. Another reported variation is occasional monoecious plants, i.e. with both male and female flowers on the same vine. The flowers have 5 sepals and 5 petals. Male flowers contain 5 stamens which are about as long as the petals and inserted at the edge of a cup-shaped disk around a vestigial pistil. Female flowers have vestigial stamens, a 3-lobed stigma, columnar style and well a developed superior ovary, sometimes embedded in the disk. The fruit are globose, loculicidal capsules, 6 to 8mm in diameter, which change in colour from green to bright yellow as they mature. The capsules are three valved with each valve (locule) containing one or two brown seeds completely enclosed in a fleshy red aril. Upon ripening, the yellow outer covering splits open to reveal the red aril, thus presenting a brightly bicoloured \"dispersal flag\".

Lifecycle Stages
McNab and Loftis (2002) recorded in their study that, \" *C. orbiculatus* vines emerged from winter dormancy and began stem elongation several weeks before the arborescent overstory. We observed that many *C. orbiculatus* seedlings from 0.2 to 0.5m height had experienced periodic dieback of the stem terminal followed by resprouting. Paterson (1975) reported that tip ends of *C. orbiculatus* stems are typically killed by onset of freezing temperatures in the fall and although not reported, susceptibility of seedlings to cold damage could be influenced by their location in relation to canopy gaps.\" Silveri *et al.* (2001) state that, \"In the absence of disturbance, *C. orbiculatus* invades forested habitat using a strategy similar to the 'advance regeneration' of some canopy trees. Like these shade tolerant species (Philips and Shure 1990; White 1991), *C. orbiculatus* seedlings may persist for long periods on the forest floor but require creation of a gap to reach the canopy and reproduce sexually.\"

Uses
Celastrus orbiculatus favourable ornamental qualities, particularly its colourful and abundant fruit, make it an attractive ornamental species.

Habitat Description
Oriental bittersweet dominates gap and edge environments, but may also colonise undisturbed forest (Ellsworth *et al.* 2004b). Dreyer (2003) states, \"Its North American habitat preferences have been stated as wide. It is variously described as occupying open woods and thickets, roadsides, fence-rows, and thickets, alluvial woods, roadsides and thickets\".

Reproduction
McNab and Loftis (2002) state that, \"Seeds are believed to be disseminated primarily by birds (Stoll *et al.* 1980 and Dreyer, 1994) that consume the leathery capsule consisting of three to five seeds, which ripens in the fall.\"

General Impacts
McNab and Loftis (2002) observe that, *C. orbiculatus* characteristics of shade tolerance, rapid growth response upon release from shading, prolific and consistent annual seed production with high viability and germination, and, adaptation to a wide range of suitable environments make it highly competitive with native vegetation and potentially difficult to manage in forests that are subject to recurrent natural or managed disturbance. Ellsworth *et al.* (2004) state, \"Once established, *C. orbiculatus* can overtop and girdle native trees and shrubs along roads, in clearings and in forest gaps\". The success of *C. orbiculatus* may be due to frequent natural and human-caused disturbances in the eastern U.S. (Robertson *et al.* 1994 ; Luken *et al.* 1997 ; McDonnell *et al.* 1997 ; McNab and Loftis, 2002). Disturbances can lead to plant invasions through an increase in the availability of resources such as germination sites, light and water (Hobbs and Huenneke, 1992 ; Greenberg *et al.* 2001). However, it has also been suggested that *C. orbiculatus* seedlings can become established and survive in intact forest understory (Paterson, 1974 , 1975 ; Greenberg *et al.* 2001). This ability has important implications for forest management because disturbances that result in increases in light may release *C. orbiculatus* already established in the understory. Silveri *et al.* (2001) state that, \"The annual growth rate of *C. orbiculatus* may exceed 3m (Paterson 1974), allowing plants in open-light habitats to climb a canopy-sized tree in 3-4 growing seasons. Twining vines are generally limited to small-diameter supports (Teramura *et al.* 1991), but *C. orbiculatus* is able to climb tree trunks with a wide variety of diameters, aided by spiny projections around its bud and leaf scars that lodge in the host's bark. *C. orbiculatus* kills other vegetation through blanketing and constrictive twining, and halts the succession of young deciduous forests (McNab and Meeker 1987; Dreyer 1994).\" Ellsworth *et al.* (2004) also suggest that failure to control it would result in severe forest degradation and considerably higher future costs associated with forest restoration.

Management Info
For details on preventative measures, chemical, physical, biological control options, please see *management information*.

Pathway
McNab and Loftis (2002) state that oriental bittersweet was introduced as an ornamental to the USA.

Principal source: Dreyer, 2003. *Element Stewardship Abstract For Celastrus orbiculatus Thunb. (C. articulatus)*
McNab and Loftis, 2002. Probability of occurrence and habitat features for oriental bittersweet in an oak forest in the southern Appalachian mountains, USA.

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ALIEN RANGE

[2] CANADA
[1] PANAMA
[1] SWEDEN
[6] NEW ZEALAND
[1] POLAND
[25] UNITED STATES

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Summary: A study into the spread of this invasive species. It describes in detail the invasive pathway of this species and its impacts on the environment. The authors also include management suggestions.
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Summary: The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction (i.e. those listed as Critically Endangered, Endangered and Vulnerable). The IUCN Red List also includes information on taxa that are categorized as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e. are Data Deficient); and on taxa that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme (i.e. are Near Threatened).
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Summary: A study that investigates methods of rapidly surveying land for species. The authors also make note of certain control methods that are available to combat the species, and also certain methods that do now work.
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