

## Natural Area Weeds: Carrotwood (*Cupaniopsis anacardioides*)<sup>1</sup>

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### Introduction

Plants provide us with food and fiber, decorate our yards and gardens, and provide habitat for wildlife. But when plants grow where they are not wanted, we call them weeds. To home owners, weeds may be unwanted plants in lawns and gardens. To farmers, weeds are plants that interfere with raising crops or livestock. To biologists who manage natural areas, weeds are plants that interfere with the functions of natural communities.

Natural area weeds are often exotic plant species (plants whose natural range does not include Florida and were brought here after European contact, about 1500 AD) that have become naturalized (capable of reproducing outside of cultivation). Invasive exotic plants are weeds that alter the functions and value of natural areas by displacing native species (plants whose natural range included Florida at the time of European contact) and disrupting natural processes such as fire and water flow. Natural area managers must remove invasive exotic plant species to maintain the integrity of natural areas.

Some invasive exotic plants were brought here for landscape uses and escaped into natural areas by natural dispersal of seeds or when yard waste was dumped in natural areas. Property owners can help protect natural areas by removing invasive exotic species from their land, and thus preventing the spread.

Carrotwood (*Cupaniopsis anacardioides*) is an invasive plant species in Florida that should be removed from public and private properties to help protect the state's natural areas. **Carrotwood has been listed by the Florida Exotic Pest Plant Council as one of Florida's most invasive plant species since 1995 and was added to the Florida Noxious Weed List (5b-57.007 FAC) by the Florida Department of Agriculture and Consumer Services in 1999. Plants on the Florida Noxious Weed List may not be introduced, possessed, moved, or released without a permit.**

### Impacts

Carrotwood freely seeds from plantings (Menninger 1964). Seeds are eaten by birds and

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dispersed away from parent plants (Lockhart et al. 1999, Coile 1997). Consumption by fish crows (Figure 1) is particularly important because seeds are carried from inland feeding sites to coastal islands where they are deposited and germinate (Lockhart et al. 1999).



**Figure 1.** Fish crows eat carrotwood seeds and disperse them to coastal habitats where they germinate and are invasive.

Habitats that have been invaded by carrotwood include spoil islands, beach dunes, marshes, tropical hammocks, pinelands, mangrove and cypress swamps, scrub habitats, and coastal strands (Lockhart et al. 1999). Carrotwood is especially a problem in low moist areas, is salt tolerant, and has become a pest to mangrove ecosystems (Coile 1997). Mangrove habitats are recognized as extremely important coastal habitats and are already heavily impacted by coastal development and invasion by other exotic plants. Natural areas of 14 coastal counties in central and south Florida have been impacted by carrotwood (Langeland and Burks 1998).

### Distribution

Carrotwood is native to Australia, where it occurs on the north and east coasts on rocky beaches, sand dunes, hilly scrub, and riverine and monsoon forests (Reynolds 1985). The earliest record of carrotwood in Florida is 1955 from a cultivated plant in St. Lucie County, but it was not introduced commercially until 1968 (Coile 1997). By 1990, seedlings were found established in various habitats, disturbed and undisturbed, on both Florida coasts (Oliver 1990). It is found in private and commercial landscapes and naturalized in coastal counties from

Brevard and Hillsborough south to Miami-Dade and Collier (Langeland and Burks 1998).

### How to Recognize Carrotwood

Carrotwood is an evergreen tree (Figure 2) that is usually single-trunked and grows to 35 feet tall. The outer bark is dark grey. The tree is called carrotwood because it often has an orange colored inner bark. Carrotwood leaves are compound, alternate, and usually even-pinnate (a compound leaf whose terminal leaflets are a pair) (Figure 3). Petioles (leaf stalks) are swollen at the base. Leaflets are 4-12, stalked, oblong, leathery, shiny yellowish-green, to 8 inches long and 3 inches wide, with untoothed margins, and tips rounded or slightly indented. Numerous white to greenish yellow flowers (Figure 3) occur in branched clusters to 14 inches long in January and February. Fruit are the most striking identifying characteristic, being a short-stalked woody capsule to 1 inch across, with 3 distinctly ridged segments, yellow orange when ripe (April/May), drying to brown and splitting open to expose 3 shiny oval black seeds covered by a yellow-red crust (Figure 4).



**Figure 2.** Carrotwood planted as shade tree at Lake Wyman Park, Boca Raton, Florida. Credits: Chris Lockhart

### Remove Carrotwood From Your Property to Protect Florida's Natural Areas

Property owners wishing to protect Florida's natural areas from carrotwood invasion should cut their trees down or have a professional tree service remove them and treat the stumps with an approved herbicide (Table 1) to prevent regrowth (referred to



**Figure 3.** Carrotwood flowers and leaves.



**Figure 4.** Carrotwood fruits. Credits: Chris Lockhart

as cut stump herbicide application). The herbicide can be poured directly from the container onto the freshly cut stump or applied with a paint brush. Brush-B-Gon and Roundup Super Concentrate are effective and available in retail stores in quantities as small as pints. Both of these herbicides are applied without diluting. Property owners with large numbers of trees can use Garlon 3A, which has the same active ingredient as Brush-B-Gon but is more concentrated and is diluted to 10% with water. Garlon 3A is only available from certain farm supply stores. Alternatively, carrotwood trees can be controlled without being cut down by applying certain herbicides to the bark at the base of the tree (referred to as basal bark application). Trees can be removed when dead or left in place to decay, a

low-impact option sometimes used by natural area managers. Pathfinder II, which is ready-to-use, or Garlon 4 diluted to 10%-20% with special penetrating oil, can be used for basal bark applications. Pathfinder II, Garlon 4, and penetrating oils are only available at certain farm supply stores. Herbicides should always be applied according to the instructions on the label. The Cooperative Extension Service Office in your county can provide information on herbicide availability and application training.

Dispose of any debris that contains carrotwood seed in such a way that seeds will not be introduced to new areas. For example, dispose of on site where seeds can be monitored for germination and seedlings pulled and destroyed or in a landfill where they will be incinerated.

### **Replace with Non-invasive Species**

Carrotwood trees can be replaced with noninvasive species that will provide the same functions, such as shade and wildlife attraction. Table 2 lists some landscape plants that are appropriate for replacing carrotwood trees. Fact sheets that provide additional information on landscape plants can be viewed at <http://hort.ifas.ufl.edu/trees/index.htm>. For information on the availability of native landscape plant species contact the Association of Florida Native Nurseries (877/353-2366 or <http://www.afnn.org>). The Cooperative Extension Service Office in your county can help you identify plants appropriate to your property conditions, the ecosystems on and near your site, and your aesthetic desires.

### **Additional Information About Invasive Plant Species**

Center for Aquatic and Invasive Plants Web site  
<http://plants.ifas.ufl.edu>.

Florida Exotic Pest Plant Council Web site  
<http://fleppc.org>.

Identification and Biology of Non-Native Plants in Floridas Natural Areas. K.A. Langeland and K. Craddock Burks. 165 pp. 1998. IFAS Publication SP 257.

Control of Non-Native Plants in Natural Areas of Florida. K.A. Langeland and R.K. Stocker. 34 pp. 2001. IFAS Publication SP 242.

Help Protect Floridas Natural Areas from Non-Native Invasive Plants. K.A. Langeland. 1999. IFAS Circular 1204.

### **Literature Sited**

Coile, N. C. 1997. Risk Assessment for Carrotwood. Memorandum to Connie Riherd, Assistant Director, Division of Plant Industry.

Langeland, K. A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Floridas Natural Areas, IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.

Lockhart, C. S., D. F. Austin, W. E. Jones, and L. A. Downey. 1999. Invasion of Carrotwood (*Cupaniopsis anacardioides*) in Florida Natural Areas (USA). *Natural Areas Journal* 19:254-262.

Menninger, E. A. 1964. *Seaside Plants of the World*. New York: Hearthsides Press Inc. 303 pp.

Oliver, J. D. 1992. Carrotwood: a review of the literature. Tech. Report. Tallahassee: Florida Department of Environmental Protection, Bureau of Aquatic Plant Management. 10 pp.

Reynolds, S. T. 1985. Sapindaceae, p. 4-163. In: George, A. S., ed. *Flora of Australia*, Volume 25, Melianthaceae to Simaroubaceae. Australian Government Publishing Service, Canberra.

**Table 1.** Herbicides that can be used to control Carrotwood trees.

Herbicide	Application	Dilution	Availability
Brush-B-Gon	Cut stump	Undiluted	Retail stores
Roundup Super Concentrate Weed and Grass Killer	Cut stump	Undiluted	Retail stores
Garlon 3A	Cut stump	10%-20% with water	Farm supply stores
Pathfinder II	Basal bark Cut stump	Undiluted	Farm supply stores
Garlon 4	Basal bark Cut stump	10%-20% with penetrating oil	Farm supply stores
Vine-X	Basal bark Cut stump	Undiluted	World Wide Web

**Table 2.** Some landscape plants for replacing Carrotwood trees after removal.

Botanical name	Common name	USDA Cold Hardiness Zones
<i>Bursera simaruba</i>	Gumbo limbo	10B-11
<i>Chrysophyllum oliviforme</i>	Satin leaf	10B-11
<i>Coccoloba diversifolia</i>	Pigeon plum	10B-11
<i>Conocarpus erectus</i>	Buttonwood	10B-11
<i>Cordia sabastena</i>	Geiger tree	10B-11
<i>Eugenia confusa</i>	Red stopper	10B-11
<i>Ilex cassine</i>	Dahoon holly	7-11
<i>Ilex vomitoria</i>	Yaupon holly	7-9
<i>Myrcianthes fragrans</i>	Simpson's Stopper	10-11
<i>Persea borbonia</i>	Sweetbay	7B-11
<i>Sapindus saponaria</i>	Florida soapberry	10-11
<i>Simarouba glauca</i>	Paradise tree	10B-11
<i>Sweitenia mahagoni</i>	Mahogany	10B-11
<i>Tabebuia</i> spp. (exotic)	Tabebuia	10-11