Windstorms and Tree Damage[1]

Windstorms in Florida have taken a toll not only on building structures, but also the urban forest. Preliminary data analysis and observations[2] on trees in urban areas following eight hurricanes reveals that high wind speeds, tree characteristics, cultural practices, soil and rooting space characteristics, and construction practices are all factors contributing to tree loss or damage.

More specifically, the following can all contribute to tree loss or failure: trees with one leader (main trunk) did best, whereas trees with codominant leaders and inclusions often failed; preventive (with some exceptions) and structural pruning works; large, improper, pruning cuts lead to decay; trees that fail once often fail again; apparently healthy trees can be hollow; trees in large groups are more wind resistant—edge trees take the fall; larger trees are more prone to failing than smaller trees; some species are more wind resistant than others (see Tables 1 and 2 on next page, keeping in mind that *no* tree is absolutely wind resistant, and that these are preliminary lists); planting issues—too deep and settling, soil over root ball, or bags, wires and straps left on the tree after planting; girdling and circling roots; rooting space characteristics; nearby construction, even years ago; deflected roots; recently planted trees; soggy soil or shallow roots in many coastal landscapes, etc..

What can you do to help? Some things to do include: analyze the planting site; use sustainable parking lot design; place pavers over uncompacted soil; re-route walks around trees; possibly use new soil mixes; place trees on "lawn" side of sidewalk instead of between sidewalk and road; choose the appropriate species for the specific location; select quality trees using *Grades and Standards* as a guide; plant correctly; follow good cultural practices or hire someone who does.

In general, a healthy urban forest needs: wind resistant species; a wide range of species age and diversity; good cultural practices; good rooting space and soil properties; informed planning, design and construction professionals; and an informed public. Keep in mind that data collection and analysis is ongoing and that some trees are still being observed to determine long-term effects of windstorms.

References and Resources:

Florida Chapter International Society of Arboriculture. http://www.floridaisa.org/

Florida Division of Plant Industry, *Florida Grades & Standards* manual is available through the Division of Plant Industry, Bureau of Plant Inspection. The tree standards are printable at http://doacs.state.fl.us/pi/plantinsp/publications.html

Florida Exotic Pest Plant Council, *2005 List of Invasive Species*. http://www.fleppc.org/list/list05web.pdf

Florida Native Plant Society http://www.fnps.org

Florida Urban Forestry Council. http://www.fufc.org/

Institute for Systemic Botany, Atlas of Vascular Plants. http://www.plantatlas.usf.edu/

United States Department of Agriculture, National Resources Conservation Service. Plants Database. http://plants.usda.gov/

University of Florida, Department of Environmental Horticulture. Fact sheets, searchable by plant family, common name, or scientific name on 680 trees can be found at http://hort.ifas.ufl.edu/trees/; more information on trees can be found at http://hort.ifas.ufl.edu/woody/

University of Florida, Institute of Food and Agricultural Sciences (IFAS). List of County Extension Offices (with maps) plus other information. http://www.ifas.ufl.edu; Numerous IFAS publications available on line and a bookstore link http://www.ifas.ufl.edu/pubs.html

Don't know where to go for an answer to a specific question?

Contact: Building A Safer Florida, Inc. 1-850-222-2772 or www.buildingasaferflorida.org

This document was developed jointly by Building a Safer Florida and the University of Florida's Program for Resource Efficient Communities (www.energy.ufl.edu).

[2] Preliminary information from Dr. Mary Duryea, Ms. Eliana Kampf, Dr. Ramon Littell and Dr. Ed Gilman (University of Florida) along with County Extension faculty and certified arborists.

June 2005 R

***NOTE*: Information in tables subject to change based on final results of study.**

Table 1. Coastal Plain Trees – *Preliminary* List

Greatest Wind Resistance	Intermediate Wind Resistance	Least Wind Resistance
Live* and sand oaks	Wax myrtle	Sand, loblolly and spruce pines
Sabal palm	Silver maple	Laurel and water* oaks
Southern magnolia	Pindo palm	Southern red oak*
Bald cypress	Longleaf and slash pines	Southern red cedar*
Florida scrub hickory	Washington fan palm	Carolina laurelcherry
American holly	Dahoon holly	Black cherry*
Crape myrtle	Turkey oak	Loquat
Dogwood	Pignut hickory	Pecan*
Sweet gum*		Sycamore
		Tulip poplar
		Bradford pear
		Red maple*

Table 2. Tropical / Subtropical Trees – *Preliminary* List

Greatest Wind Resistance	Intermediate Wind Resistance	Least Wind Resistance
Dicots	**Dicots**	**Dicots**
Live oak*	Wax myrtle	Citrus spp
Sand live oak	Mahogany	Southern red cedar
Southern magnolia	Laurel oak*	Black olive
Boxleaf stopper	Dahoon holly	Avocado
Florida scrub hickory*	Sea grape	Sycamore*
American holly	Mango	Hong Kong orchid
Crape myrtle	White cedar	Bottlebrush
Dogwood	Strangler fig*	Weeping fig
Gumbo limbo	Tropical almond	Caribbean trumpet tree
Conifers	**Conifers**	Red maple*
Bald cypress	South Florida slash pine	**Conifers**
Palms	Longleaf pine*	Sand pine
Sabal palm	**Palms**	Norfolk Island pine*
Christmas palm	Washington fan palm	**Palms**
Pygmy date palm	Coconut palm	Queen palm
Areca palm	Royal palm	

* Lose a lot of branches

Tables courtesy of: Duryea, Kampf and Littlel, University of Florida