FLORIDA URBAN FORESTRY COUNCIL

The Council Quarterly

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ADAPTIVE URBAN FOREST MANAGEMENT AND CATASTROPHIC WEATHER EVENTS: A CASE STUDY FROM EUGENE, OREGON

Submitted by Scott Altenhoff and Eric Cariaga, City of Eugene, Oregon

It seems our "new normal" is far from normal; it's time to expect the unexpected and to do our best in preparing for an uncertain future.

Background:

Eugene, Oregon is a medium-sized community situated about 100 miles south of Portland, OR. Historically, extreme high wind events have been rather infrequent (once a decade). Severe cold spells and heavy snow/ice storms have been rare. However, many of our longstanding weather patterns are no longer standing the test of time. Climatic conditions are shifting. Since 2014, Eugene has had two FEMA-declared weather disasters, one in February of 2014 and one in December of 2016. Both events involved catastrophic ice storms that contributed to an estimated loss of about 2% of its urban tree canopy (UTC). This translates to tens of thousands of trees damaged or destroyed throughout the city.

There is, however, an upside to this story. We have learned how to better address catastrophic events. We use to plan and base our work by looking back at past models and tendencies. Now we practice a forward-looking approach. This new direction is based on Adaptive Management (AM) principles that emphasize the need to stay flexible and change with current environmental trends. We continuously learn from current data and experimentation, as opposed to stubbornly clinging onto the past. The preeminent Ecologist, C.S. Holling, an Emeritus Professor at the University of Florida and early proponent of Adaptive Management, once defined AM as *"natural resource management conducted in a manner that purposely and explicitly aims at increasing knowledge and reducing uncertainty"* (Holling 1978). In a nutshell, the AM approach involves: increased understanding of complex situations; being highly proactive instead of reactive; a commitment to structured experimentation; and improvements through the frequent feedback. In the lines to follow, we'll briefly share the story of how Eugene made the shift towards AM and how this shift made a positive difference in both our storm response and our overall operations. We'll then provide some "how-to" recommendations when adopting a similar AM approach.

Our 2014 Ice Storm:

In terms of their impact and severity, Eugene's two recent ice storms were very similar. Completely different, however, was our agency's response between the two. The first event caught us completely off-guard and unprepared. We didn't have a solid plan or system in place for prioritizing work, especially on such a large scale. Our

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INSIDE:

PRESIDENT'S MESSAGE

Hello FUFC members!

On September 10th and 11th, Hurricane Irma blew through Florida, leaving a path of destruction throughout the state. My thoughts and prayers go out to our Florida families and friends who suffered loss due to the storm.

Though it took less than 2 days for the hurricane to travel across our state, storm preparations started weeks earlier and the cleanup will continue months after the storm. Irma's tree work was swift, but incomplete. She left behind heaps of debris for us to clean up. Counties and municipalities set in motion debris management contracts to deal with the cleanup - some for the first time ever. Prioritizing, coordinating, and keeping trucks and crews operating became a routine exercise for stewards of the urban forests. Utility foresters were busy restoring power and managing out-of-state crews. Fielding calls, addressing complaints, and keeping the public informed about the progress was also a vital, daily task. Though we prepare for hurricanes in advance, there are always unforeseen issues and hidden hurdles that must be overcome.

To all who have worked those long hours to open roads, to restore power, to remove debris, and to inform and aid customers, I thank you with all my heart. The job is not easy and the challenges many, but I know our state has the best urban foresters, utility arborists, and tree-minded people needed to get the job done.

FUFC will be hosting the 2018 Urban Forest Institute on February 5–7 in Wimauma at the Gulf Coast Research and Education Center. This year's theme is very appropriate, 'Natural Disaster Preparation and Response Conference.' *What a great opportunity to discuss the challenges you encountered and to share stories of success and achievement with your peers and colleagues. You can find more information on this great event on our website (*FUFC.org*) or Facebook page. We look forward to you attending the conference!*

Yours Truly,

Linda Seufert

Linda Seufert
2017 FUFC President

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work was largely driven by service request and calls from the public (more or less in the order they were received) instead of following a structured system based on Best Management Practices (BMPs). Field crews were coordinated and dispatched directly through our Emergency Command Center (ECC). This proved to be a significant bottle neck. Just fielding and sorting through the thousands of service calls was overwhelming. Much of the information received was incomplete, inaccurate, duplicated, and outdated. Some job sites were visited multiple times, even after the work had been completed. Conversely, some sites with serious tree hazards went unresolved for months. The status of each situation could only be determined by sending staff out to check in person. Although our Urban Forestry team is part of the Eugene Parks and Open Space Division, which is in turn part of the larger Eugene Public Works Department, our team was largely left on its own for the first few weeks. Other PW work units weren't adequately trained, or equipped to deal with technical and advanced tree problems. We had a serious shortage of inspectors and field crews to help. Cleanup efforts dragged on for months.

In addition to a lack of internal support, it was difficult to solicit private contractors during such a large scale event - and for so long a duration. One of our greatest frustrations was the loss of many precious hours trying to coordinate with our local utility company, when dealing with potential electrical hazards regarding down power lines.

The significant damage and the complexity of work was certainly challenging and depressing. Most demoralizing though, was a lack of organization, significant inefficiencies, and lack of good information for planning. We vowed to use this painful experience to learn, to improve, and to utilize information to our advantage rather than being overwhelmed by it. Our staff spent dozens of hours debriefing, processing feedback and observations, and absorbing the many lessons. We then crafted flexible and adjustable plans that could be applied to information updates and rapidly changing conditions.

Our 2016 Ice Storm:

When the second ice storm hit in 2016, thanks to the AM initiative, we were in much better shape to deal with the challenge. A primary difference was our organization's general attitude and our overall expectations. We had learned that we could get through an event like this, but that

it was going to be a protracted effort. We needed to stay flexible and seek out internal and external support wherever we could. We would have to temper our expectations and pace ourselves for a marathon--not a sprint. This time we had an Emergency Storm Response contract in place. Now we had a national line-clearance-contractor available within 72 hours of a request for assistance. Additionally, in this second disaster, all our Public Works teams pulled together to create an "all hands on deck" expectation from beginning to end. Another important development was that we now had several new urban forestry plans in place: an operational plan, a maintenance plan, and a storm response plan. We established a system for dividing the city into smaller management units when organizing our work. We developed a hybrid grid system that accommodated public infrastructure, neighborhoods, and road classifications. We now have a prioritization system with precise descriptions and criteria for each different category. Priorities range from highest to lowest based on location and hazard potential. We adopted a geographic/zonal approach to our work rather than just jumping from service request to service request. Advance winter storm response training, for all Public Works personnel to ensure that their skills were sharp and their equipment was ready, paid off. We instituted a Storm Scouts program to help train office and technical staff how to identify, document, and mitigate tree hazards. We worked to develop and refine field protocols to reduce inefficiencies and communication breakdowns. We created a utility company liaison that coordinates closely with Eugene Water and Electric Board. Moving forward, field crews now use mobile tablets to run a GIS-based tree inventory/work management app that tracks tree sites, personnel, equipment and work activities. This provides staff with a big picture view and detailed contextual information. Teams can now communicate and coordinate much more effectively and are able to decentralize

operations. Our GIS tools greatly enhance the ability to prioritize situations, document work, and coordinate with other agencies. Digital queries can pin down timeframes, budgets, and staffing/equipment needs. The 2016 storm was still grueling, but our spirits were lifted because many of the old hurdles were gone. We still have kinks to work out, but we can now adapt on the fly, rather than waiting till after the event was over. Essentially, we are smarter and more nimble as an organization, especially in terms of our information management. Surprisingly, this is more than half the battle.

Summary of our Recent Adaptations:

- Proactive and less reactive; greater control of work through diligent planning and advance preparation/training.
- Increased collaboration and interconnected agency (internally and externally).
- Increased learning potential, and adaptability on the fly; increased institutional intelligence and flexibility/nimbleness.
- Increased innovation and experimentation; willingness to endure small mistakes and missteps that lead to future success.
- Improved communication and information management. This is the foundation for everything else.
- Improved safety, efficiency, effectiveness, and faster response time.

Main Recommendations for Other Agencies:

1) **Compose basic plans** to include: to identify smaller, workable management units; how to prioritize situations; the who, what, when, where, and why of work assignments. Chances are that much of this information already resides in various staff members' heads, but it is imperative to document it in writing. This is a critical element for organizational learning/growth to occur. It is also a critical component of FEMA reimbursement (establishing and following Standard Operating Procedures). These plans don't have to be complicated, fancy, or expensive. They just need to cover the important details. This can all be accomplished in a hybrid "operational plan" document of roughly 30 pages which covers pertinent elements of an urban forest management plan, a maintenance plan, and a storm response plan. These plans should be a "living" document - dynamic and constantly evolving.

2) **Establish a storm response contract** with a private, large-scale, tree company who can provide assistance in the event of a catastrophic storm. Establish a commit when providing the right equipment, personnel, and training. Secure deployment timelines and "locked in" pricing. Note: FEMA regulations require unit-pricing rather than time and materials (T&M) pricing. This can be extremely challenging but not impossible to pin down.

3) **Develop advance training programs for internal staff and contractors.** Although there never seems to be a good time to conduct trainings, these can make a huge difference for safety, team preparedness, and morale.

4) **Establish cooperative agreements and joint training programs with other departments and outside agencies.**

5) **Purchase and/or develop mobile device-based GPS/GIS tools** that staff, contractors, and partner agencies can use to coordinate efforts, document work, and keep track of trees, public infrastructure, people, equipment, and work activities.

Conclusion:

If you want to set your agency up for success when confronting unknown challenges and extreme weather events, you need to be proactive, not passive. You need to be the driver of technological and procedural advancement. Policy and technology can't continue to happen to us. Adaptive Management is not just a shift in organizational strategy, it is a shift in organizational culture.

References: Holling, C. S. 1978. Adaptive Environmental Assessment and Management. Chichester, UK: John Wiley and Sons.

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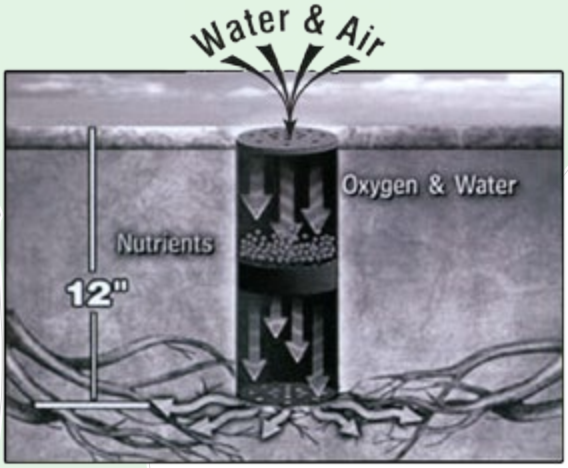

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HURRICANE IRMA CULLS THE URBAN FORESTS OF FLORIDA

Submitted by John Harris, President –Earth Advisors, Inc.

During the storm recovery period after Hurricane Irma, we observed the need to remove many trees. We were constantly asked, "What caused my tree to fail?"

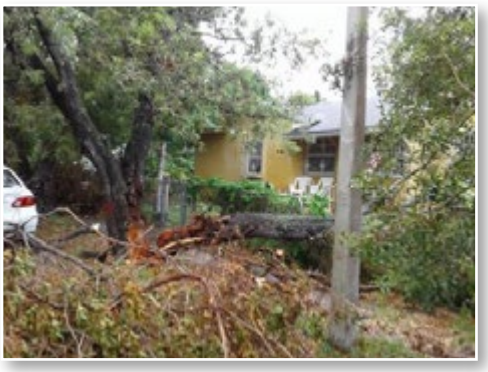
The easy answers many people say and hear are:

1. The winds were strong enough to uproot the tree (the roots were too damaged to reset it).
2. The winds came through and tore up leaders and branches destroying the tree.
3. The constant tropical storm and hurricane level winds, over 1-2 days, dried out and tore off too many leaves and branches for the tree to recover.

Those generalizations are often misleading about tree hazards and why trees fail during storms. There is a strong correlation between tree failures during the storm and the lack of proper tree care (history/maintenance) before a storm's arrival. Trees with poor maintenance histories were the majority of uprooted or severely damaged trees in Hurricane Irma. Poorly placed, poorly maintained, and unmaintained trees are more susceptible to failure.

Hurricane Irma culled our urban forests of weaker trees. I have inspected thousands of trees across Florida from the Keys through to central Florida since Hurricane Irma's wind receded. I also have interviewed many professional foresters, arborists, landscape inspectors, landscape contractors, and others, to learn from their observations of why trees failed. Green industry meetings are happening month by month, in different regions of Florida, and sharing observations of what happened across our landscapes and inside our urban forests. Discussions are being held to find out how we are doing with storm recovery and cleanup; and to explore how we can improve our practices and reduce the loss of trees and landscape plants in future storms.

Ficus growing in +/- 5' wide street swale, with road rock base across greenspace under root system. Winds uprooted tree due to lack of soil needed for root growth and anchor depth.



Mahogany tree with internal decay, and close angled main stems, damaged the house. Also, a Ficus seedling had started growing in the decay area, causing more outward pressure. These are the reasons this tree failed in the winds; not just that there was wind.

Why do I say the storm culled our urban forests? Culling is the removal or separation of weaker individuals from a population. It is a forestry management practice used to improve the growth and quality of trees within a stand. The term cull is also used in the Florida Grades & Standards as the lowest quality for a plant being graded--"Cull quality." Generally, due to their poor structure and non-saleable condition, cull quality plants would be chipped, or composted, to provide the recycled nutrients for plants that meet the quality standards for sale.

You may think the quality of the trees and past maintenance may not make much difference for locations that experienced the strongest winds, the highest tidal surges, and/or prolonged flooding. I say quality and maintenance did still make a difference, even in these locations. Certainly, where tornados speed through, where downdrafts and hurricane force winds bear down, where 4-8' of salt water surges in, trees, plants, vehicles, and buildings will receive an increase in the level of damages. Even in the areas hit hardest by Hurricane Irma, the trees that were better rooted, consistent aspect ratios (proportional relationship between a tree's height & width), tapered limbs throughout their canopies, and were species known to be more wind resistant, experienced less damage -- contributing less to the destruction and debris piles.

There are many wind factors and site conditions that influence the level of damages for a particular location. Discussing them is for another longer article that includes discussing and summarizing from research projects that study hurricanes and urban forests. University of Florida research projects, up through Hurricane Wilma, are well summarized in the bulletin *"Assessing Damage and Restoring Trees after a Hurricane,"* University of Florida/IFAS Extension,

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Java Plum trees that show previous hatracking (stub cutting of most or all main leaders), shown by the darker bark below old stub cuts (+/- 10 years ago) and the lighter gray bark and multiple sprouts growing above old stub cuts. All the trees in this median were stable for main trunk and root system, but the sprouts broke apart severely in winds. This is why hatracking is a violation of many city codes and industry standards---it is an abuse that causes trees to be structurally weaker and more prone to branch failure in wind storms.

Bulletin ENH1036. This bulletin is part of the larger Urban Forest Hurricane Recovery Program, and more information can be read at http://collier.ifas.ufl.edu.

Preventative maintenance is an investment strategy that applies to almost everything we see around us. Most people understand that maintenance is needed for many parts of our urban environment. Roads or pavement, as it ages, can break up with potholes that become larger if left unrepaired. Aging roofs begin to have leaks that continue to get worse until repaired. Cars need regular maintenance (changing the oil every 5,000 miles or so, changing tires before they wear down past the treads, etc.) to keep them operating. With regular maintenance, aging trees can provide greater benefits, fewer risks, and are healthier.

Here are some of the more visible and maintainable examples of why trees failed and were culled out of our urban forests by Hurricane Irma:

1. Girdling roots at the location where a tree trunk snapped and failed.
2. Circling roots around the outside of a root mass (root balls). Trees did not develop the spreading roots needed to increase soil volume to anchoring roots. Uprooted trees often displayed the entire root systems. A system of stunted roots that could have fit back into the same size nursery containers they were in when first planted.
3. Restricted rooting space that hampered the growth and extent of root masses, leaving large trees without enough ballast in the ground to stay in place during high winds. Trees fell showing the restricted root growth in the uprooted root masses.
4. Shallow soil conditions, as observed in development sites where road rock base for pavement and foundations is not removed from greenspace areas. Trees mainly grew surface roots and shallow anchoring roots. Trees uprooted with a "pancake" of roots exposed.
5. Old stub cuts, or "hatrack," along a leader or main limb where branches tore or broke off.
6. Tight angled branch junctures (or trunk junctures) with included bark and/or signs of pressure between the trunks or branches that tore apart when winds blew through the canopy.
7. Trees with most or all live canopy in the upper 1/3 or ¼ of the tree height, without the anchoring and support of lower limbs and having less tapering of leaders and limbs. The winds whipped the high canopies and tore the limbs and leaders out of them.

Cutting all the live foliage and secondary branches out of your tree, IS TREE ABUSE; IS HATRACKING. Here you see a large hat rack; instead of the canopy tree that used to exist. Now, we have a tree needing code enforcement, removal, and replacement instead of restoration pruning and preservation.

Each of these examples is a defect or deficiency that can be identified during the life of a tree. Each can be corrected by preventative maintenance and proper tree care practices or by culling the tree before it is placed in the landscape. One consistent theme comes from the workshops and seminars and meetings and discussions I have attended since Hurricane Irma: "We need to get the word out. Maintained trees survive storms better, trees require maintenance, and tree damage can be prevented."

Help the Florida Urban Forestry Council get the word out about proper tree care. Well-maintained trees will provide greater benefits. A resilient tree canopy will buffer communities during storms by protecting homes, businesses, and properties from damage. Read more about trees and hurricanes from the great research that has been done and is being planned to continue after Hurricane Irma. Use the research to update your municipal and county tree protection and landscape codes. Lastly, share your hurricane and disaster experiences when attending upcoming meetings, seminars, and workshops. What did you see regarding tree survival and tree failure? What do you know about standing and/or uprooting trees? Your observations can help to generate new standards, new codes, and new practices that will improve our shared environment.

Thanks to everyone for your efforts during our Hurricane Irma Storm Recovery time together. Continue to work smart and be safe. Let people know trees saved more homes than they damaged. The urban forest provides a level of storm protection for our communities. We look forward to working with you for a better shared environment.

- John A. Harris, FUFC President; MS, MBA, BS, AAS; Landscape Economist; Tree and Landscape Appraiser; Certified Forester; Registered Consulting Arborist; Certified Arborist; Certified Landscape Inspector; Tree Grader; Registered Professional Mangrove Trimmer; and Qualified Tree Risk Assessor

STUMP THE FORESTER

QUESTION: What impact will storm flooding have on street trees?

ANSWER: Though flooding will have an impact on our urban trees, the beneficial impact trees will have against the detrimental impacts of excessive storm water cannot be over-emphasized. Storm-related flooding accounts for the majority of polluted runoff to surface water, property damages, and storm hazards to public safety. Trees, and a resilient urban tree canopy, will ultimately play an important role toward a greener storm water solution, and a viable action plan.

Street trees may be able to withstand temporary periods of stress caused by storm flooding, but flood waters can deplete the soil of oxygen and create the anaerobic conditions that suffocate roots – halting the biological functions of photosynthesis, transpiration, and plant respiration. When talking about trees, leaves and photosynthesis get a lot of attention. Respiration is often overlooked. Respiration is the process by which stored carbohydrates, produced through photosynthesis, are used by the tree. Trees are incapable of respiration in the absence of free oxygen to roots. If flooding depletes the soil of oxygen for long periods of time, roots will decline, or die. Flood waters can also dilute essential elements and build up mineral toxicities within the soil. This is especially true if the flooding involves brackish, or salt water.

Flood-stressed trees may turn brown, or drop leaves prematurely. This does not mean that a tree is dead. If the cambium layer- just under the bark – is green and alive, the tree will likely recover.

Though storm flooding is often a temporary condition, the detrimental impacts on a tree's anchoring system can be significant and immediate. Evidence reveals a direct correlation between increased soil saturation and tree-related power outages associated with hurricanes and severe storms. Soil moisture data from NASA's Soil Moisture Active Passive (SMAP) satellite maps have been used to forecast tree-related power outages with a surprisingly high degree of accuracy. This is no surprise to what we've seen on the ground. Increased soil saturation, caused by flooding, will decrease the holding capacity between roots and soil. The results can impact the anchoring system for weeks, or perhaps months after the storm. The structural integrity of the root system should not be overlooked when inspecting trees that survived flooding.

Answer provided by Joe Anderson, Utility Forester with JEA

If you would like to 'stump the forester,' see page 15 for information on submitting your question!

Tree of the Quarter

RED MANGROVE
(Rhizophora mangle)

Submitted by Andrew Koeser, Melissa Friedman, and Gitta Hasing – UF/IFAS Gulf Coast Research and Education Center

Red mangrove *(Rhizophora mangle)* is native to Florida and naturally occurs from north Florida southward. Like black *(Avicennia germinans)* and white *(Laguncularia racemose)* mangrove, red mangrove naturally occurs in low-energy coastal areas. However, red mangrove has a lower salt tolerance than black and white mangrove and tends to inhabit the lower portions of regularly flooded intertidal zones.

The Nation's champion red mangrove, located in Lee County is 64' tall and 43" wide, but most specimens are much smaller at approximately 20-30' in height and width. As one of the state's three native mangrove species, red mangrove is protected by various local/county regulations or Florida's Mangrove Trimming and Preservation Act--depending on the location of the trees in question. These regulations govern both removal and pruning and should be referenced by all professionals working in coastal areas.

Habitat: Red mangrove is found across the Caribbean, Mexico, Central America, and South America. In Florida, the species is generally limited to USDA Hardiness Zones 10 and 11, tolerating occasional winter lows right around freezing (30 to 35 degrees F.). That said, red mangrove persists beyond this range given the protection offered by its coastal habitat. The species is found in full sun and moist to wet soil. It has a low drought tolerance, and high aerosol and soil salt tolerance.

Leaves: Red mangrove leaves are 1½ to 6" long, simple, opposite, elliptic, and with entire margins. Leaves are thick, leathery, smooth, dark to medium green on top, and paler green to yellow underneath. Leaf undersides have tiny black dots that may require a magnifying glass or hand lens to view. The species is evergreen.

Bark: The bark is reddish brown and smooth, becoming gray and slightly fissured with age. One of the more notable features of the species are the many prop roots which arc outward from the stems like buttresses.

Flowers: Flowers are small, white and emerge in clusters of 2-3 from leaf axils. They appear in early to mid-summer, though sporadic flowering can occur year round.

Fruit: Initially, fruits develop as 1-2" long, brown, egg-shaped structures. Over time they evolve into a pencil-shaped propagule that emerge at the fruit base and extend up to 11" long. This extension varies from light green, dark green, to reddish-brown in color. Red mangrove fruits in late summer to early fall.

Special notes: Red mangrove has a unique root system of prop roots, which generally extend outward in an arc from the lower portion of the trunk. The prop roots assist with gas exchange in oxygen-poor soils, provide stability to the tree, and prevent coastal erosion. Mangroves provide critical roosting, breeding, and nursing habitat for a variety of wading birds, fish, and other wildlife. Subsequently, mangroves play a vital role in the sustainability and success of Florida's recreational and commercial fishing industries, as well as Florida's ecotourism industry.

See this species (and other coastal trees) for yourself at the Urban Forestry Institute's pre-conference mangrove kayaking tour! Space will be limited.

AVOID THE CRASH

Submitted by Dave Conser, Senior Forester, Florida Forest Service

CRASH! She was sure a car had run into her house and went rushing outside to find, not a car, but a huge tree branch, splayed across the roof. With all the soaking rains a large, dead branch had finally given into gravity. Why hadn't someone seen that ahead of time and done something about it?

When Hurricane season is upon us, some homeowners turn their attention to the condition of their trees. Others are blissfully unaware of the hazard that may be lurking above. Should we turn our yards into treeless pastures, or throw our hands up in resignation of ignorance? Neither extreme is necessary or appropriate.

There are tried and true principles when assessing the hazards a particular tree may possess. Granted, there are few guarantees regarding what this natural world may or may not throw our way. But the following are some principles I have gleaned through years of advising homeowners regarding the condition of their trees.

Sick, stressed or compromised trees often show signs to the discerning eye. Not in every case, but often enough if we pay attention. A tree with a full, luxurious canopy of leaves is almost always more healthy than one with a thinning top. Foresters and arborists call the live top of a tree its "crown." Crown decline refers to a condition when a tree has a significant number of leafless twigs scattered throughout the top of the tree. It signals that the tree is declining, often due to root injury and/or the steady progression of one or more root diseases. A tree with compromised roots is more likely to topple over, possibly onto something important.

The trunk and branching structure of a tree is important. One common example of poor structure leading to hazardous conditions is a sharp "V" crotch--where two large trunks or branches join tightly together in a "V-like" configuration. This means the tree probably has an internal bark-to-bark connection (a structural defect referred to as "included bark), which is really no connection at all. One or more of these competing trunks or branches may fail, splitting away. On the other hand, branches that grow out from the trunk in a horizontal direction are likely to form a stronger bond. Generally, "U-shaped" crotches are stronger than "V" crotches. This problem can be resolved with proper pruning, and the earlier the better. Live oak *(Quercus virginiana)* is a conundrum in this case. It has a tendency to form a lot of "V" crotches; but it is a great tree, with ultra-strong wood. It may be fine with a modest size "V," but fail with the large V-joint. No doubt it is best to prune Live oaks early in order to promote horizontal branching and strong branch unions.

Obviously, we should survey our trees for dead branches, or recognize a tree if it's entirely dead. With a dead tree especially, there is another important observation, or consideration. Is there a target? In other words, what's the worst thing that can happen if the tree or branch falls? Is it likely to strike everything? If it can't hit anything important, it has no significant target. Dead trees are actually vitally important to many cavity nesters, such as woodpeckers, owls, other birds, flying squirrels, and many additional critters. Consider leaving a dead tree standing if you can safely do so. Even after it falls on the ground, dead wood is a valuable resource for an assortment of animals. In some instances, dead wood can create an entire habitat.

Here are some other, less common hazards. Does a tree have a large rotten, decayed area? Are their mushroom-like growths forming in decayed areas. Rotten areas never heal. The tree will fight to keep the decay from progressing further into good, sound wood. If the tree is healthy, it will triumph for quite some time. If the tree is unhealthy or stressed, the decay may gain the upper hand. Is the rotten area large enough and in a position to cause the failure of the tree or limb? To assist your tree, in a fight against decay, prevent any-and-all injury to the bark of a tree. The bark is the tree's natural defensive barrier against decay. Lawnmowers and weed eaters are big-time culprits in this regard. Improper

pruning of branches also exacerbates injuries and decay.

Cankers are sunken, misshapen areas, usually on the trunk of the tree. About 30% of pine trees have cankers from a disease called fusiform rust. A canker can cause a tree to be hazardous if it extends too far around, or into, the trunk of the tree. If it is more than half way through the tree's trunk, there are increased concerns.

A deep crack through the bark of the tree, into the wood, may indicate the tree is already failing. It's natural for bark to look like it has minute cracks all over the place. A long, deep crack that appears to go all the way through is a serious warning sign.

So which trees hold up best in hurricanes? The latest research suggests Live oak *(Quercus virginiana)* and sabal palm *(Sabal palmetto)* are the real champs. Southern Magnolia *(Magnolia grandiflora),* sand live oak *(Quercus geminata)*, dogwood *(Cornus florida)*, pecan *(Carya illinoinensis)* (sheltered in a non-orchard setting), and bald cypress *(Taxodium distichum)* are also real "stand-up" performers. Some of the worst include laurel oak, water oak, sand pine, Carolina laurelcherry *(Prunus caroliniana)*, red maple (Acer rubrum), and turkey oak *(Quercus cerris*). Sweetgum *(Liquidambar styraciflua)* and red cedar *(Juniperus virginiana)* have a tendency to break in hurricane winds. Don't panic though, scientific surveys show that only 1-2% of trees that failed during hurricanes caused damage to property.

"Don't panic though, scientific surveys show that only 1-2% of trees that failed during hurricanes caused damage to property."

Do your trees have crown decline, V-crotches, dead branches, large areas of decay, cankers, or deep cracks? These are some of the tell-tale signs of tree defects that homeowners should look for. Does the hazardous tree have a target? If so, tree work, and perhaps removal, is probably warranted. A qualified arborist is a great resource for a more in-depth analysis.

Planting trees correctly and planting "the right tree in the right place" can get a tree off to a great start. Proper pruning of young trees is worthwhile. Pruning older trees can be extremely beneficial. Detrimental pruning techniques as "topping" and "lion tailing" should be avoided. Research indicates that the practice of crown thinning to mitigate wind damage from hurricanes is actually harmful. Avoid disturbing a tree's root system--most of the absorbing roots of a tree are at a shallow depth of only 3 to 12 inches in the soil. Avoid the CRASH by promoting the health of your tree(s). Identifying tree issues ahead of time and doing something about it depends on you.

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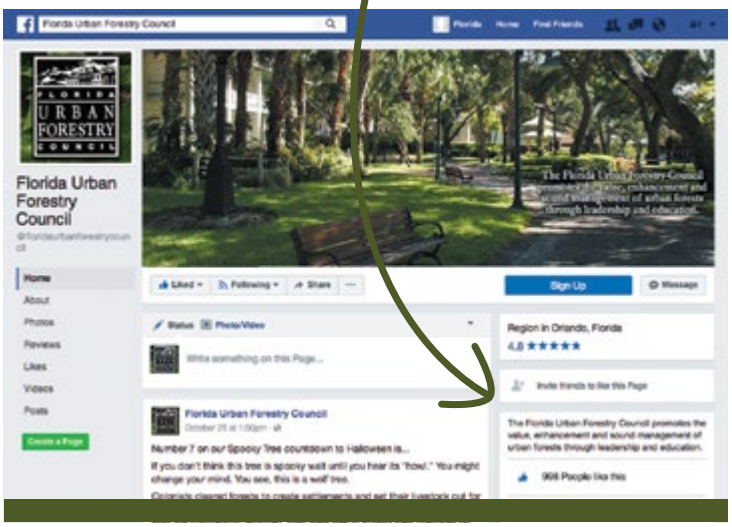


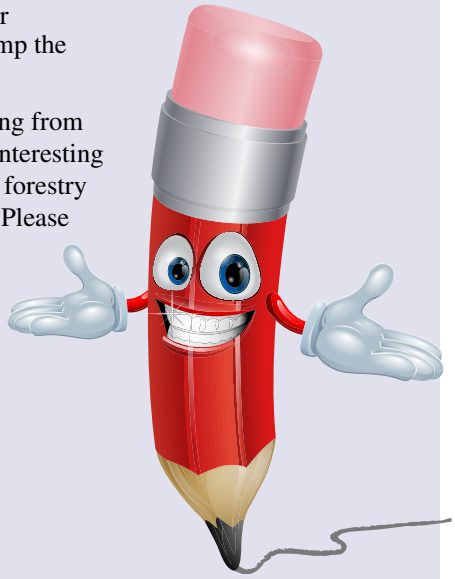
REQUEST FOR ARTICLES

Please let us know what urban forestry projects you have going on in your neck of the woods. The Florida Urban Forestry Council would greatly appreciate the opportunity to share your information in our newsletter. These articles can include:

- New trends in the industry
- News about tree advocacy groups
- Volunteer projects
- City tree programs
- Letters to the Editor
- Questions for "Stump the Forester"

We look forward to hearing from you on this or any other interesting topic related to the urban forestry industry and profession. Please send any articles or ideas to Joe Anderson, FUFC newsletter editor, at andejs@jea.com.

Thanks for contributing!



MEMBERSHIP APPLICATION

(Dues are effective for the calendar year of January 1 - December 31)

Make check or money order payable to FUFC and mail to:
Post Office Box 547993, Orlando, FL 32854-7993

Categories (please check one):

❑ Professional @ $25.00
(Professional membership is open to anyone who is actively working in the profession of Urban Forestry or any related profession.)

❑ Tree Advocate @ $20.00
(Tree Advocate membership is granted to those volunteers who are members of a tree board, beautification committee or other Urban Forestry volunteer group.)

❑ Supporting @ $200.00
(Supporting membership is granted to those individuals, groups or other entities expressing a desire for a strong supportive role in the Council. Membership will be granted for up to five individuals of an organization or business.)

❑ Government/Non-Profit Agency @ $100.00
(Government/Non-Profit Agency membership is granted to those individuals, groups or other entities actively working in the profession of Urban Forestry or any related profession. Membership will be granted for up to five individuals within the agency.)

❑ Student @ $10.00
(Student membership is granted to anyone who is actively enrolled as a full-time student and who is considering pursuing a career in Urban Forestry.)

Name: _____

Title: _____

Firm: _____

Address: _____

City: _____

State: _____ Zip: _____

Telephone: (_____)_____

FAX: (_____)_____

E-mail: _____

Amount Enclosed: _____ Date: _____/_____/_____

Would you be interested in further information regarding serving on a Council subcommittee? ☐ Yes ☐ No

Area of interest: _____

Clip and Mail Today!

FLORIDA URBAN FORESTRY COUNCIL
Post Office Box 547993
Orlando, FL 32854-7993

For more information or change of address, please contact the FUFC:
Phone: (407) 872-1738
Fax: (407) 872-6868
E-Mail: info@fufc.org
Website: www.fufc.org

CHANGE SERVICE REQUESTED

Address Update:

❑ Please change my address as noted on the right.
❑ I receive duplicates. Please delete my name at right.
❑ Please remove my name from your mailing list.

2017 FUFC EXECUTIVE COMMITTEE MEMBERS

OFFICERS:

Linda Seufert
President
Appointed Position
Advisory Member
City of St. Petersburg

John Harris
President Elect
Acting Treasurer
Appointed Position
FNGLA
Earth Advisors, Inc.

Joe Anderson
Vice President
Elected Position
Member-at-Large
JEA

Erin Givens
Acting Secretary
Appointed Position
Advisory Member
Orlando Utilities Commission

Justin Freedman
Immediate Past President
Elected Position
Private Arborist
E Sciences Inc.

COMMITTEE MEMBERS:

Alexis Alvey, *Appointed Position*
ASLA/FL Chapter
Keith and Schnars

Kathy Beck, *Appointed Position*
Advisory Member
City of Tampa

Kathleen Brennan, *Appointed Position*
Florida League of Cities

Greg Brown, *Appointed Position*
FL Recreation and Park Association
City of Largo

Jody Buyas, *Elected Position*
Member-at-Large
Keep Orlando Beautiful

Jim Davis, *Appointed Position*
Cooperative Extension Service
Sumter County

Steve Edgar, *Appointed Position*
Society of American Foresters
Long Leaf Forest Service, Inc.

Elizabeth Harkey, *Elected Position*
City Arborist
City of Sanford

Julie Iooss, *Appointed Position*
FL Chapter ISA
Retired – City of Orlando

Ian Jurgensen, *Elected Position*
Member-at-Large
City of Orlando

Andrew Koeser, *Appointed Position*
Member-at-Large
City of Vero Beach

Gayle Lafferty, *Elected Position*
Member-at-Large
City of Vero Beach

Mark Miller, *Appointed Position*
Advisory Member
City of Apopka

Daisy Morales, *Appointed Position*
Advisory Member
Orange County Soil and Water Conservation District

Guy Murtonen, *Appointed Position*
Florida Department of Transportation
Florida's Turnpike Enterprise

John Springer, *Elected Position*
Tree Advocacy
Enchanted Walkabouts

David Watford, *Elected Position*
Utility Forester
SECO Energy

Mark Williams, *Elected Position*
Member-at-Large
City of Fort Lauderdale

Vacancy - Advisory Member

Lou Shepherd, *Liaison*
Florida Forest Service

Sandy Temple
FUFC Executive Director