Urban Forest Hurricane Recovery Program

http://treesandhurricanes.ifas.ufl.edu
Developing a preventive pruning program in your community:

Mature trees

Dr. Ed Gilman and Amanda Bisson
Inaction can cause structural problems

Young trees are easier to fix

Codominant stems with bark inclusions

Older trees are more challenging to treat
Poor structure such as codominant stems often cause branch failure in storms
Pruning can reduce damage

A recent study at UF showed that pruning reduces canopy movement when trees are exposed to high winds.
Your goal

Single trunk

Better management

Poor management

Multiple trunks
Common mature tree problems

codominant stems

included bark

dead branch

water sprouts

broken branch

dead branch

sucker

decay
Preventive Pruning: *mature trees*

- **Set objectives**
- Determine pruning cycle and dose
- Execute pruning plan
  - make good cuts
  - prioritize trees with high risk structural issues
  - choose appropriate pruning type
Pruning objectives:

• Reduce risk of failure – minimize storm damage
• Promote human safety
• Allow for safe passage
• Increase sun penetration to the ground
• Maintain health
Objective: Reduce risk of failure

- Identify risks
  - Bark inclusions
  - Cracks
  - Over-extended limbs
  - Leaning trees
  - Root decay
  - Girdling roots
- Reduce conditions that could lead to catastrophic branch or tree loss.
Strong union without a bark inclusion

Collar
Failure due to bark inclusion
Cracks are evident and indicate weakness
Reduce branch with crack

Horizontal crack
Broken branch
Reduction could have prevented this
Before pruning a leaning tree

After pruning
Severed and decayed root systems
Stem girdling roots may cause trees to topple

Location of girdling roots. Notice that there are few supporting roots on this side of the tree.
Stem girdling roots

- Roots that circle around the base of the trunk
After removing girdling roots
Objective: **Promote human safety**

- Avoid expensive damage

Broken branch pruned away to free the car
Objective: Allow for safe passage

Notice the large limbs located close to the ground – these will eventually have to be removed for clearance.
Objective: Reduce shade

Before thinning

After thinning

More light here
Objective: Maintain tree health
Preventive Pruning: mature trees

- Set objectives
- **Determine pruning cycle and dose**
- Execute pruning plan
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Pruning cycle

- Pruning cycle is the time period between pruning episodes
- Pruning every 2 years results in trees better prepared for storms than longer cycles
- The sooner you begin pruning the less you will need to remove at each pruning
Pruning dose

• Old trees can decline as a result of removing too much live tissue.
• Try not to remove more than 10% of the live foliage on a mature tree.
• Remove more than 10% only for a good reason such as a cracked live branch over a house.
Remove live foliage only for a good reason!

Excessive sprouting as a result of stress caused from over pruning.
Risks of removing too much tissue

• Forces use of energy by initiating defense mechanisms.
• Removes energy reserves.
• Can cause cracks.
• Can cause sprouting.
• Can cause branch death.
• Can cause tree mortality.
• Reduces energy storage space.
Preventive Pruning: mature trees

- Set objectives
- Determine pruning cycle and dose
- **Execute pruning plan**
  - make good cuts
  - prioritize trees with high risk structural issues
  - choose appropriate pruning type
Types of pruning cuts:

Reduction cut shortens the length of a stem by pruning back to a smaller limb.

Removal cut prunes a branch back to the trunk or parent branch.
Make good pruning cuts

**Step 1**
Make an undercut about 12 inches from the trunk.

**Step 2**
Make a top cut farther out on the limb.

**Step 3**
Remove the stub with final cut, being careful not to cut flush against the trunk. Leave the collar intact.
Collar: swollen area at the base of the branch where it joins the trunk. The tissue is rich in energy reserves and chemicals that hinder the spread of decay. Good pruning cuts avoid cutting into the collar.
Pruning cut

imaginary line

No collar visible

Angle ‘A’ should equal angle ‘B’
Bad cut- called a flush cut

Woundwood does not develop evenly
Pruning guidelines for mature and overmature trees

1 Primary - do not remove
2 Secondary - almost never remove
3 Tertiary - carefully consider removal
4 Quaternary – could remove some
5 Quinary - could remove several
Types of preventive pruning: Mature Trees

Structural pruning
Cleaning
Thinning
Raising
Reducing
Balancing
Root pruning
Palm pruning
Pruning to restore
Structural pruning shortens or thins certain stems and branches.
Preventive structural pruning

Before pruning

3 years later

After pruning
Three years later

Showing three cuts
First cut
3.5 inch stem removed
Before pruning

After pruning
Pruning to: **Clean**

- Removal of dead, broken, rubbing, or diseased branches, and foreign objects.
- Reduces the risk of branches falling from the tree
Cleaning takes care of these broken branches.
Pruning to: Thin

- The selective removal of small live branches to reduce crown density.
- Increases light and air penetration.
- Reduces the risk of storm damage.

Inappropriate thinning

Appropriate thinning

Removes branches from edge of canopy

Removes interior branches
How to thin a canopy
Dense canopy
Thinning removes entire branches back well into the canopy
Inappropriate thinning

Lions-tailing: trees with foliage concentrated at the tips of branches because inner branches were removed.

- More susceptible to hurricane damage
- Difficult to restore
HELP!
Two years later
Pruning to: **Reduce**

- The selective removal of branches and stems to decrease the height and/or spread of a tree
Reduction

• May be necessary to direct growth
• A better option is to plant a smaller tree

Think right tree right place!
Lateral branch assumes dominance

Reduction cut
Proper canopy reduction

Reduction cut
Reduction

Pruning under utility wires

Growth

Excessive sprouting

Branches grow mostly around wires

Topping

Branches quickly grow back into wires
Reduction Pruning

Proper vs. Improper (Topping)

Proper reduction
- reduces size while maintaining form
- minimizes re-growth
- cuts barely noticeable
- branch tips visible in outer canopy

Improper reduction
- drastic form change
- sprouting
- cuts very noticeable
- branch tips not visible in outer canopy
- compromises structure
- promotes defects and decay
Sprouts

Topping trees promotes bad structure!
Not all tree species can be reduced

- Consider species and plant health before reducing the canopy
- More decay can enter the tree following reduction than following removal cuts
Pruning to: *Raise*

- The selective removal of branches to provide vertical clearance
- Best done over a period of years, not all at once
Over-lifting causes stress resulting in sprouting
Sprouts

Large lower branch removed

After lifting the canopy

Two years later

Sprouts
Big cuts can result in decay and cracks.
Sprouts develop from large pruning cuts
Clearance can be achieved by shortening low branches rather than removing them.
Raising: a stepwise process

- Thin/reduce/remove the largest branches in the lower part of the tree.
- Leave smaller branches intact for one year.
- If necessary remove branches back to trunk one to several years later.
- Do not forget to correct any structural pruning needs.
Don’t forget structural pruning!
Pruning to: Balance

- Removes live branches to redistribute wind and gravity loads in the canopy.
Unbalanced canopy

Reduce this side of the canopy
Balance the right side of the canopy by reducing the large limb.
Excessive end weight

before

Large pruning cut

after
Clumped trees can fall over without treatment

Yikes!!
One side of this clumped tree broke off at the base.
Poor root distribution on clumped trees

No roots present here
Balance canopies of clumped trees to prevent them from falling over

Reduce branched indicated with dotted lines
Pruning to: Correct root problems
Airspades show you what’s underground and may help uncover girdling roots.
Pruning to: **Restore**

*Storm damaged tree*
Palm Pruning

• Retain all green fronds
Coconut palms
Remember your goals and objectives…

Produce a structurally sound tree

- Reduce risk of failure
- Promote human safety
- Allow for safe passage
- Reduce shade and wind resistance
- Maintain tree health and vigor
With dedication to a management plan, your community can become a model for others.