Good evening! My name is Katherine Booth. Thank you for inviting me to speak about our native trees tonight.

I represent a new non-profit conservation organization, Let's Be a Good Neighbor to the Indian River Lagoon.

Biography:
A little abut me: I'm a retired nurse practitioner. My children and grandchildren are Florida natives. Since 2019, I've served on the City of Vero Beach Tree and Beautification Commission. Most recently, I led the effort to revise the City's Landscape and Tree Protection ordinances to prevent pollution of air, drinking water and the Lagoon. Today, I will share with you about my journey to protect native oaks and other native plants, because of their connection to human health and the health of the Lagoon.

NATIVE PLANT LANDSCAPING TO PROTECT THE LAGOON:

ORGANIC TREE CARE

Organic care of native trees allows them to perform their critical purpose of helping solve the health crisis of the Lagoon while saving money on tree maintenance, a win-win!

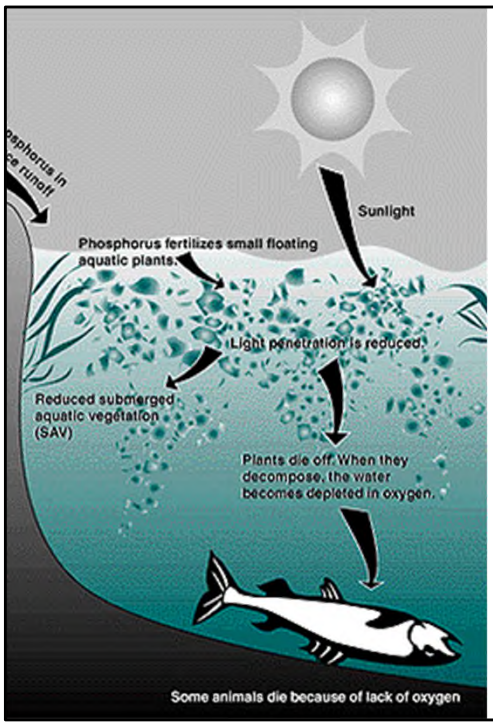
The shallow Indian River Lagoon stretches 156 miles or about 40 percent of the East Coast of the State of Florida. The Lagoon contributes nearly $8 Billion to the Florida economy and is an important attraction for visitors and people wishing to reside here.

I talked with a commercial fisherman in Sebastian. He said he had been fishing in the lagoon for 25 years. In years past he could clearly see to the sandy bottom of the Lagoon and catch his days' quota of fish in 2 hours. This is no longer the case.

Every week in the news we are informed that the Lagoon is in crisis. We know this because of the diseases and deaths of plants and animals that live in it. Seagrass beds have died, manatees have starved because of lack of seagrass, dolphins are dying from respiratory diseases, turtles die from tumors, and there are frequent fish kills. Commercial fishing is also nearly dead and the FDEP warns against eating fish from the Lagoon.

What is causing this crisis and what can you do to reverse it?

While we go through this presentation keep in mind why you buy organic food.



What has happened to the Lagoon?

The Eutrophication Process

- Normally, wind and waves oxygenate the Lagoon
- Algae in water bodies are a normal finding and essential for the smallest creatures to feed on, as the basis of the food web
- Nutrients from landscape fertilizers run off by irrigation and stormwater into the Lagoon
- Abnormal overproduction of algae and non-native invasive aquatic plants occurs
- Overgrowth of both beneficial and harmful plants prevents oxygen and sunlight from penetrating into deeper water (seagrass must have sunlight for photosynthesis)
- Overgrowth is sprayed with toxic aquatic pesticide equivalents of round-up
- Beneficial and non-native invasive aquatic plants are killed and decompose
- Decomposition of the plants requires oxygen, which is taken from the water
- Suffocation of plants and animals occurs from lack of dissolved oxygen
- Muck, composed of toxic synthetic chemicals is now transformed into more poisonous substances, along with dead animal and plant debris, covering the normal sandy floor of the Lagoon, and resulting in dead zones near inhabited coastlines

What has happened to the Lagoon is eutrophication.

Pollution of the Lagoon is caused by chemicals we put on lawn grass and non-native plants. Fertilizers are composed of nitrogen and phosphorus which are nutrients that make plants grow. After these are applied to non-native lawn grass, flowers and shrubs, through the effect of wind, or during rain or irrigation, these synthetic chemicals are carried by air and water runoff into the Lagoon. Plant food nutrients cause the normal algae in water to superbloom. The resulting cover of algae inhibits sunlight and oxygen from penetrating deeper into the Lagoon, killing seagrass and suffocating fish.

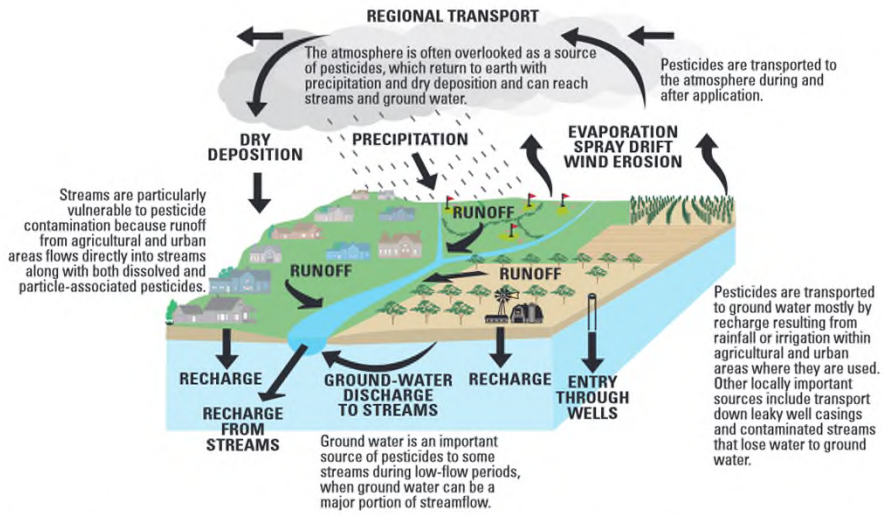


Figure 2–4. Pesticides are transported to streams and ground water primarily by runoff and recharge. Nonpoint sources of pesticides originating from areas where they were applied—rather than point sources such as wastewater discharges—are the most widespread causes of pesticide occurrence in streams and ground water. (Modified from Majewski and Capel, 1995.)

Pesticides in groundwater (potential drinking water) is primarily due to non-point sources such as lawns, golf courses, and agriculture

Here I just want to show you that synthetic chemicals applied on our lawns and ornamental non-native plants, not only run off into the Lagoon, but are carried up into the atmosphere and rain back down on us indiscriminately--leaching into ground water, onto food sources and onto our body surfaces and into us. Scary!

Implications from Survey Results

- None want an increase in monthly assessments
- But 50% would approve an increase in the cost of landscape maintenance and 50% would not
- All respondents enjoy bunnies and squirrels on campus yet did not connect wildlife with needing safe and non-toxic habitat for resting, nesting, and plentiful food sources
- All are concerned about their health to such a degree that they buy organic food that has not been grown or processed with pesticides or hormones and is higher priced than the same food that is not organic. Yet in contradiction, respondents unanimously were not concerned about toxins in their air or drinking water or in the IR Lagoon, which all respondents located as being on our eastern border
- All care about children but did not connect clean air and water as essential for children to have a future

GOVERNOR RON DESANTIS 2019-2020 BUDGET — BOLD VISION FOR A BRIGHTER FUTURE

- Floridians recently spent $1,800,000,000 billion to "protect" our environment. $25,000,000 million was for projects to meet scientific nutrient reduction goals (Total Maximum Daily Loads). This funding supported projects identified by the DEP and the Blue-Green Algae Task Force and its partners to reduce nutrient pollution and harmful algal blooms in our treasured waterways, including the Indian River Lagoon. The State budget additionally included more than $49,000,000 million for specific projects, including septic conversions, to assist local governments in improving water quality and conservation in their respective communities.

I presented some of this material in a landscape workshop in my COA and in conjunction with that conducted a survey, the results you see here. As residents of Florida, we have voted to approve vast sums of money for conservation or have elected officials who do so. We apparently want the government to fix the pollution problem with 1.8 billion dollars and ignore that we have any personal responsibility.

Many people give to charities that aid children around the world. What they may not realize is that when we pollute water bodies here with toxic lawn chemicals, whether running off into the Lagoon or leaching down through the soil into the aquifer, every drop of water is recycled and used again someplace else. Water molecules in oceans and water molecules in air are contaminated with pollutants that travel all over the world. Children in countries that cannot purify their water for drinking and hygiene, are unavoidably exposed to toxins that cause harmful health effects. **If we love our neighbor as we love ourselves, we will want to amend our behaviors of unnecessary and completely preventable harmful landscaping practices that cause suffering to our neighbor**.

DO YOU WANT BETTER QUALITY OF LIFE?

- Willingness to question the consensus is how you learn
- Willingness to learn allows you to know what should be changed
- You must be willing to be open to new information
- You must be willing to change your concept of beauty
- Are you willing to decrease time and effort maintaining your landscape?
- Budget constraints may propel you to seek high value, low-cost solutions
- You can transition by changing your landscape gradually as opportunities present

Are you willing to implement what you learn today to personally help protect and restore the Lagoon?

Now I'm asking you, do you want better quality of life for yourself and your neighbor? I hope you will implement what you learn today to personally help protect and restore the Lagoon and Ocean.

Homeowners: PREVENTABLE Pollution

Lack of Native Plants	Pruning of Native Trees	Applying Fertilizer, Herbicides and Pesticides	Excessive Irrigation	Mis-Management of Storm Water Retention Ponds
Little planting of native species of trees, shrubs, and groundcovers that do not need chemicals to survive and thrive	Poor landscaping practices include excessive pruning of trees and shrubs	on lawns and shrubs and in stormwater ponds	resulting in chemical runoff into the Lagoon	and Waterfront

Homeowners have control over 5 landscaping sources of preventable pollution. First, we must define what we mean by native plants.

Native plants are defined as plants here when Europeans first arrived. Because these plants thrived before human intervention, they don't require fertilizers or pesticides or herbicides to survive. They do not need these chemicals to grow, and once established they do not need irrigation. This helps keep water in the Lagoon clear by avoiding irrigation water flowing off our yards taking pollutants with it into the Lagoon.

We must change our perception of beauty and accept the plants that are designed to live here, embracing the natural beauty of Florida's native plants. When we do that, we will restore the health of the Lagoon, and improve our own health.

You may not realize the variety of native plants available to you because it's rare to see a yard planted with native plants. I have not seen any association entrance have a native plant landscape. When you embrace native plants instead of showy non-natives, which are mostly from Asia, you can expect birds and butterflies to beautify your yard.

Consider --

THIS (Florida Friendly)

Recommend maintain turf at highest height 3.5-4.5
Less frequent mowing
= less $
= less fossil fuel used
= less carbon footprint

OR BETTER

PERFORM A TRIAL of replacing turf area bounded by man made structures with a native ground cover mix

OR BEST (Lagoon Friendly)

GRADUALLY replace turf grass with native groundcovers and beds of native shrubs shrinking size of turf, to decrease water usage and cost of manpower and fuel to maintain, thereby decreasing pollution and carbon release

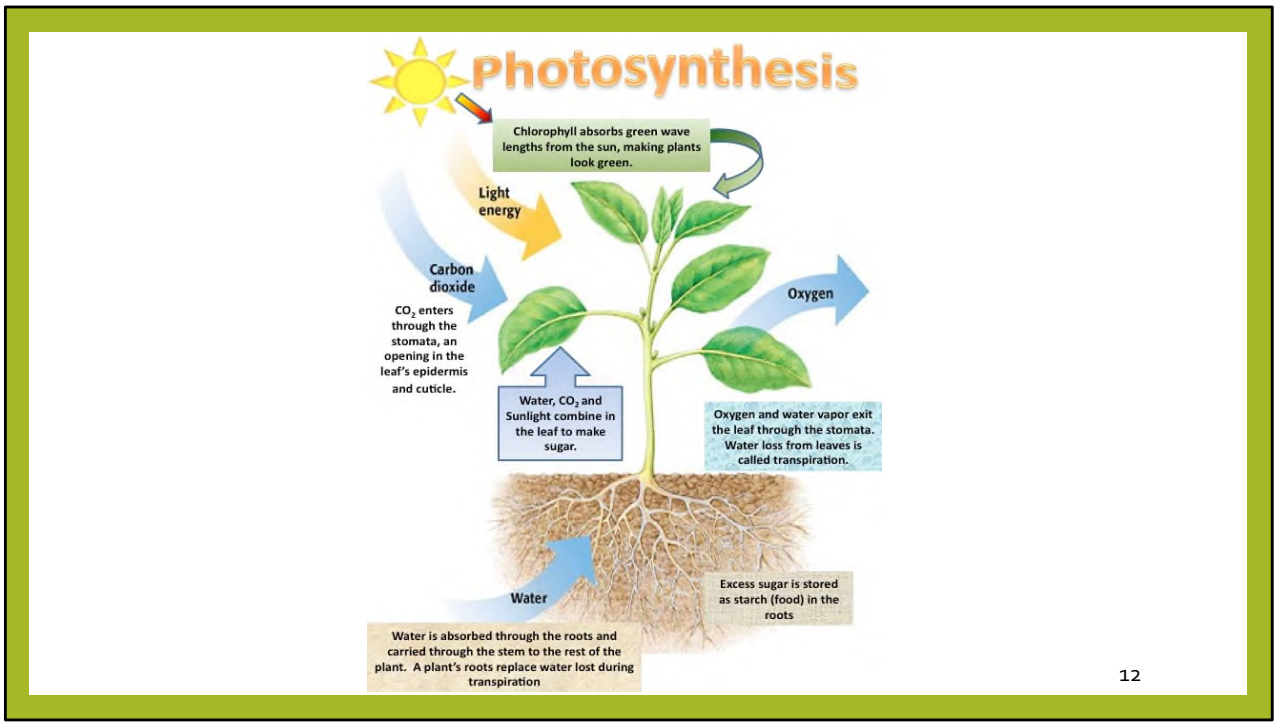
Did you know that the word “lawn” originated 100’s of years ago in England? Having grass lawns was a sign of status by wealthy British landowners who had servants to maintain them. We broke away from Britain long ago. It’s time for freedom lawns!

There is no turf grass lawn native to Florida. Because all turf grass is non-native, it requires synthetic chemicals to survive. These chemicals runoff into the Lagoon in irrigation water. So, it follows that it’s Lagoon Friendly to replace turf grass lawns with native groundcovers, larger beds of native shrubs and flowering plants, and more native trees!

NATIVE PLANTS

- Are low maintenance
- Don't require chemicals to thrive
- Don't require irrigation after establishment
- Encourage pollinators & beneficial insects
- Save homeowners time and money
- Beautiful and a natural fit into our ecosystem

In a cost comparison study in Florida, between two 60' x 180' plots, one non-native landscape with St. Augustine grass lawn and the other a native plant landscape, costs of maintenance per year were $1,680 for the lawn vs only $300 for the native landscape, a greater than 80% cost savings.



What is it about native plants that is so important to the health of the Lagoon?

For an explanation, let's start by going back to biology class.

All life depends on photosynthesis.

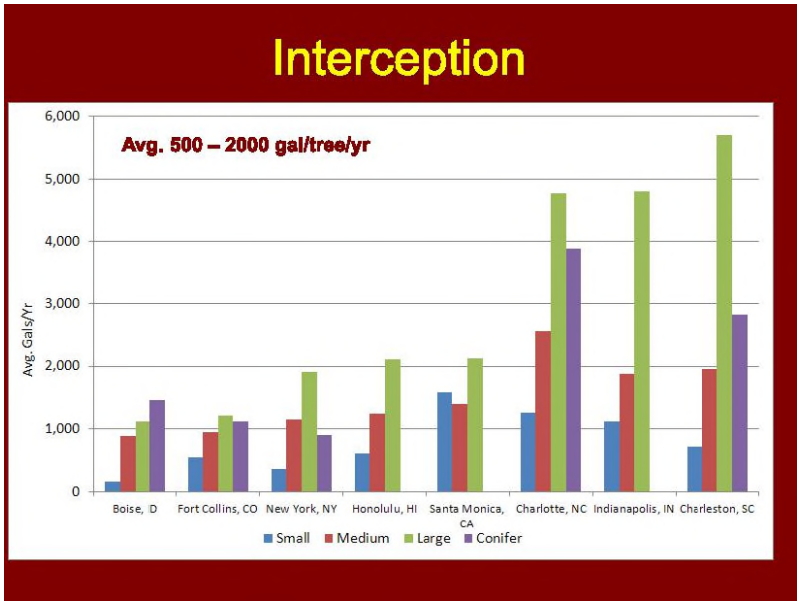
The *miraculous* process of photosynthesis in plant leaves, charges the air we breathe with oxygen, keeps rain and air clean by absorbing pollutants, and cools the air around us by water extruded by leaves into the atmosphere.

Trees, which are the plants with the most abundant leaves, have the greatest number of surfaces of any single plant to conduct photosynthesis. Obviously, mature trees photosynthesize more than young trees because of their larger size and more leaves.

Note small branches and abundant foliage of an organic canopy

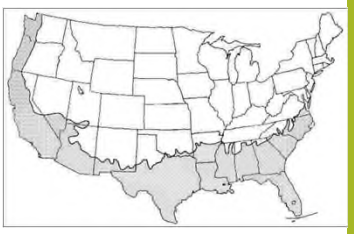
13

This SLIDE reveals the natural shape and structure of a mature oak.



1 inch of rainfall per acre is equal to 27,000 gallons of stormwater

Range of Live Oak



- Native plants are vital to water conservation and the *quality* of *that* water. In a study of cities across the US, South Carolina had the most large trees for interception of rain water.

- The most common hardwood tree in coastal South Carolina are live oaks. This chart indicated that large oaks, meaning mature oak trees, have the most interception of stormwater of any city surveyed.

- Florida's most abundant native tree is also oak. All parts of the oak intercept rainfall, interrupting its flow, so that it is not shed off the tree flowing unimpeded as stormwater runoff into the Lagoon. In this study, one mature oak absorbs 2,000 gallons of rainfall annually.

- Both Indian River County and the city of Sebastian require 1 inch of rainfall to be kept onsite of a property. A couple of leafy mature oaks will significantly help with that goal, as nothing else can. As the tree directs rainfall downward and into the soil, instead of it running off, more rain infiltrates the ground to help recharge our drinking water aquifer.

Plants' Awareness

- Plants differentiate between red, blue, far-red and UV light and respond accordingly
- Plants respond to minute quantities of aromatic compounds wafting in the air
- Plants know when they are being touched and can distinguish different touches
- **Plants' DNA causes them to grow according to the species shape. Thus, plants know where their branches are oriented in space and position successive branches to achieve that design**
- Plants are aware of gravity and align their shape to ensure that shoots grow up and roots grown down
- Plants are aware of their past: they remember past infections and the conditions they've weathered and then modify their current physiology based on these memories and share their knowledge with other plants!

15

Just like our DNA determines everything *about u*s, the same with plants.

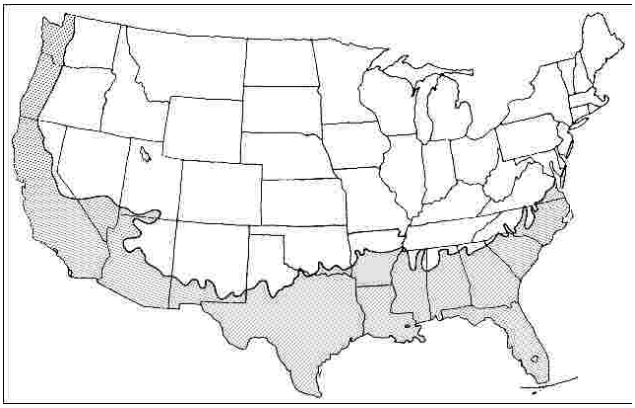
Because all plants, including trees, have a particular shape according to their DNA, they know at the cellular level where their branches are supposed to be oriented in space and position successive branches to achieve proper posture according to their designed shape. What does pruning do? Fundamentally, pruning interferes with the tree's balance as well as its structural integrity, while also removing the leaves it needs to survive by photosynthesis.

How Do Native Trees Help the Lagoon? **LEAVES**

- Improved water quality – natural filtering
- Better air quality – 40 trees can remove 80 lbs of pollutants annually
- Lower energy costs – Leafy shade trees cool the air naturally
- Higher real estate values
- Customers are drawn to businesses with shade trees

Florida Urban Forestry Council

Almost all benefits of native trees are at the LEAF level. Pruning in which only a few branches remain, results in few leaves and essentially no benefits to us!



LIVE OAKS ARE FOUND IN HURRICANE PRONE COASTAL REGIONS. WE MUST ASK, WHY ARE THEY FOUND THERE? THEY ARE IDEALLY SUITED TO WITHSTANDING HIGH WINDS ***BECAUSE*** THEIR NATURAL SHAPE WITH LOW SPREADING BRANCHES AND ABUNDANT FOLIAGE KEEPS THEIR CENTER OF GRAVITY CLOSE TO THE GROUND, PREVENTING THEM FROM BEING UPROOTED. SMALL INTERIOR BRANCHES AND LEAVES CUSHION LARGE LIMBS SWAYING IN HIGH WIND.

UF/IFAS: Range of Live Oak

17

Live Oaks are only found in hurricane prone coastal regions. They are ideally suited to withstanding high winds ***because*** their natural shape, low spreading branches and abundant foliage keeps their center of gravity close to the ground, preventing them from being uprooted. After category 5 Hurricane Andrew in 1992, a survey of trees revealed that southern lives oaks *and* laurel oaks had a greater than 95% chance of surviving intact.

Harm from Pruning

- Removes benefits to us and environment
- Diverts energy production to wound healing
- Depletes tree energy reserves
- Bark splitting, potential disease
- Increases risk of failure in wind event

Besides wasting money unnecessarily, pruning makes trees susceptible to infection, decay and death sustained from pruning wounds, limb breakage, sun scald, wind burn, sprouting, starvation and uprooting.

The only legitimate reason for pruning is to provide clearance over a man made structure when a tree has been planted too close without sufficient room to grow to its mature size, or to remove damage from natural causes.

Due to limited time, I have not gone into the many egregious methods of pruning, such as topping, thinning, over-lifting, raising, hat-racking, lion's tailing, olli-popping, or limbing up, generally allowed by ordinance although without scientific basis. Remember that native trees thrived for centuries before the "get rich quick" scheme of the pruning craze began in the 1980s.

From: Gregory Dahle [mailto:Gregory.Dahle@mail.wvu.edu]
Sent: Friday, August 31, 2018 10:09 AM
To: Mark, Katherine Booth Rademacher
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19

An expert on the pruning of hardwood trees, Dr. Gregory Dahle, performed a meta-analysis of the literature and this is his conclusion...

MYTHS VS. TRUTH

Florida oaks were here long before Europeans arrived and have thrived for centuries **WITHOUT** pruning!

- It's necessary to strip the oak tree by pruning to prevent it from uprooting in high winds or from dropping branches: **NOT PROVEN** scientifically. What is true is that small branches buffer large branches and the low branches, relatively short trunk and extensive roots keep the unpruned tree rooted in wind.
- Pruning the branches to allow air to flow through the tree prevents it from uprooting in high winds: how can this be? **The tree PRODUCES air!** More leaves = more oxygen.
- It's necessary to prune the branches to allow sunlight into it for a healthier tree. What the arborist is really saying is now you'll be able to grow a lawn underneath the tree. Pruning **defeats the purpose of the tree—shade,** and causes remaining branches to droop due to loss of structural integrity.
- Laurel oaks don't live more than 50 years: **NOT PROVEN** scientifically. **The opposite has been proven:** A database of laurel oak ages proves these trees age well. Biodiversity is important to natural ecosystems. Why do laurel oaks and southern live oaks co-exist if only one oak is needed?

20

BECAUSE OF MYTHS, NOT SCIENCE. You may have heard that it is necessary to prune an oak to prevent it from failure in high winds, but this is a myth. What is true is …

It's a myth that pruning the branches to allow air to flow through the tree prevents failure in high winds. The tree produces air! More leaves = more clean air and oxygen for you and me.

It's a myth that a tree needs sunlight into it. Wind moving branches and leaves exposes every leaf to sunlight. What the arborist…

It's a myth that laurel oaks don't live more than 50 years. A database…

Bottom Line: Follow the Money

In Florida, **NO TRAINING** is required for anyone wanting to prune trees

- Tree pruners calling themselves "arborists" are **NOT LICENSED** as professionals by the State of Florida
- Tree pruners pay a business tax to Indian River County, which is not a license, and there is no penalty for not paying the tax nor non-renewal
- Only minimal requirements are needed to advertise as a "certified arborist" by the International Society of Arboriculture [ISA] or other similar organizations *
- There is **ZERO ACCOUNTABILITY** for tree pruners in Florida
- Unlicensed, untrained tree pruners have enormous earning power and use myths and unproved reasons to persuade municipalities, homeowners and HOA's to prune native trees year after year
- Due to high demand for unskilled labor, arboriculture is one of the top ten **AT-RISK** industries for **human trafficking, slave labor and illegal immigration**

When I followed the money I discovered these facts, all of which you can verify for yourself.

*After 3rd bullet: An ISA certified arborist has 3 years of experience of pruning, which we have proven is not based on science, has passed a one-time written examination, and has minimal continuing education with payment of annual dues. One local "arborist" admitted he did not have a high school education and tree pruning was a business he could start right out of prison with a truck and a chainsaw. Pruners want to argue with you that the tree has "inclusions" or some other poor structure and will fail prematurely. You know what, the tree will thrive all the same without pruning. Trees are designed to succeed.

Care for your sabal palms organically too. ***Don't prune!***

Sabal palms need the brown fronds for its daily vitamin, the squirrels eat the fruit, and the bats sleep in the boots under the fronds. A colony of bats may eat upwards of 1 million insects per night, including mosquitoes.

Pruning the brown fronds means you have to spend $ to fertilize the tree and these granules inevitably wash off into the Lagoon! Fertilize it the organic way by leaving the fronds on! The brown fronds are a critical source of daily potassium for the tree. Brown fronds absorb stormwater too!

Leave your native oaks and sabals alone and the environment and your wallet will thank you!

Benefits of Organic Tree Care (NOT Pruning)

- Saves $ for homeowners, HOAs, municipalities
- Stormwater storage by all parts of the tree
- More leaves = more O_2, less CO_2
- Native trees are healthy and beautiful
- Organic trees continue to host abundant and diverse plant and animal life
- Natural purification of air and water
- Organic canopy reduces Summer heat, energy costs
- Offsets human carbon impact

HOA's save thousands of dollars annually by organic care of native hardwoods.

It's so important in Florida to have shade trees in the yard to cool the air around our homes.

So how is native plant landscaping and leaving your oaks and sabals unpruned, "solutions to stop pollution" of the lagoon? Full leafy canopies of mature oaks and unpruned sabals absorb thousands of gallons of water per year keeping rain on your property and percolating through your native groundcover, filtering it as it drains to the aquifer, instead of contributing to stormwater runoff which carries all kinds of pollution to the Lagoon and the ocean.

Benefits of Walking in Treed Areas

- Reduces stress, sadness, anger
- Increases feeling of vigor and liveliness
- Physical benefits: lower cortisol, blood pressure and pulse rate
- The aroma of trees is associated with improved immunity, reduced anxiety and increased pain threshold
- The aroma of evergreen trees contains a natural air disinfectant
- Being among trees generally requires some exercise, which itself reduces depression, anxiety and obesity/metabolic syndrome

Other benefits found from walking in forests are reduced stress, increased vitality, and these physical benefits….

Even the aroma of trees has psychological and physical health benefits! We should plant more pine and cypress!

Landscaping impacts our $ and our health

- Are you willing to question the consensus of how your landscape has historically been maintained?
- High value, no to low-cost solutions have been offered
- Problem solutions based on science can change how your landscape is maintained
- The transition can be gradual as opportunities present
- Are you willing to use what you've learned today to propel yourself and your community in a better and healthier direction?

NATURAL FLORIDA BEAUTY