

# HISTORY AND STATUS OF COASTAL DUNE MANAGEMENT AT DELRAY BEACH, FLORIDA

What is working well, .. and not so much

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Presented to Delray Beach City Commission and Beach Property Owners Assn,  
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updated for FSBPA 2021

HOW TO IGNORE SCIENCE  
and



WASTE WADS OF  
MONEY

Ocean to river was palmetto strand in natural condition. Historical photos yield character of the wild dune.



**DELRAY BEACH CLUB SITE  
CA 1950**



**NO TREES  
Scrub species and palmetto**



SEAGATE..1951


## CANAVERAL NATIONAL SEASHORE

One of the few remaining complete natural barrier island ecosystems.. 26 miles with minimal human impact.



**EXISTING COASTAL STRAND IN NATURAL CONDITION  
is the model for our dune restoration program**





Seagrape was historically  
surpressed by occasional  
freezing temperatures

1991 freeze at  
Atlantic dunes



1920's



# Beach Management History

Mid 1950's




1964



Critical erosion in fifties and sixties due to sand starvation caused by new inlets.

**700 N. OCEAN  
IN 1969**

An aerial photograph of a beach showing significant erosion. A long, narrow, and irregularly shaped rocky structure, possibly a breakwater or a natural rock formation, runs parallel to the shoreline. The beach is wide and sandy, with several people visible in the distance. The ocean is visible on the left side of the image.

SAM GREEN

**THE WAY WE WERE**

1969



Special to Neighborhood Post

**Quiet corner**

DELRAY BEACH — Where are all the people? The cars? The city hasn't seen this kind of emptiness since . . . well, at least 1969 when this picture was taken of the intersection at Atlantic Avenue and the beach by the Seacrest Hotel, now a Marriott.

1772



Photo courtesy Florida Photographic Collection

## All washed out

DELRAY BEACH — This 1972 shot shows a section of A1A that was washed out during a storm.

“Hard solution” failed within one year.



1972

1973

First Nourishment





# ELEMENTS OF A COMPREHENSIVE DUNE MAINTENANCE PLAN

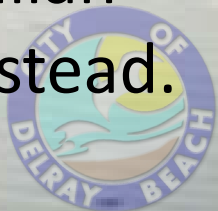
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1. LIGHT POLLUTION CONTROL
2. EXOTIC PLANT ERADICATION
3. PIONEER ZONE ENHANCEMENT
4. SEAGRAPE CONTROL PRUNING
5. COMPREHENSIVE SPECIES RESTORATION

# “NO HAYFIELD ON DELRAY BEACH”

With new sand  
burying the street,  
City rejects sea oat  
plan and installs  
exotic Hawaiian  
Seagrape instead.

1973



# **“NO HAYFIELD ON DELRAY BEACH”**

City rejects Engineers recommendation to plant sea oats to control windblown sand.



Class I pest species grows to 6 feet in a few years, blocks view.

1982



Non native Hawaiian seagrape and sand fenced installed in late 70's to keep sand from blowing into the street.

1982, no dune yet, only  
the scaevola hedge along  
the street and sand fence



ALL SEAGRAPE on Delray Beach started from this size in 1980.



10 x 15 foot groupings at the accessways meant to stop sand from blowing into the street.



1980 Sand still flows to street at access pathways..exotic hedge grows.



Thanksgiving 1984.. 3 day Northeaster erodes most of the nourished beach almost back to the sidewalk.



Thanksgiving 1984 storm  
caused 90 ft. recession  
of high water line in 3  
days.



Notice the size of seagrass clusters



1985 dune planting installed sea oats in a 6 to 12 foot wide Strip just to seaward of the exotic Hawaiian seagrape



again, notice the size of the seagrape clusters

The initial contracted installation failed, but CDB Parks staff used the contract retainage to purchase plants and finish the job with better than 95 per cent survival. No other dune grasses have been added.



New plants immediately capture windblown sand



**SEA OATS ROOTS**

**Sea oats march seaward, capturing \$ millions of sand and advancing dune line 120-130 feet. Front ridge gains 5 -7 feet elevation.**



Seagrapes planted in 1980 did not begin to thrive until after sea oats foredune was established in 1985..then grew to 25 ft. in the next 16 years. By then, fences had captured 3 feet of sand and become safety hazard.



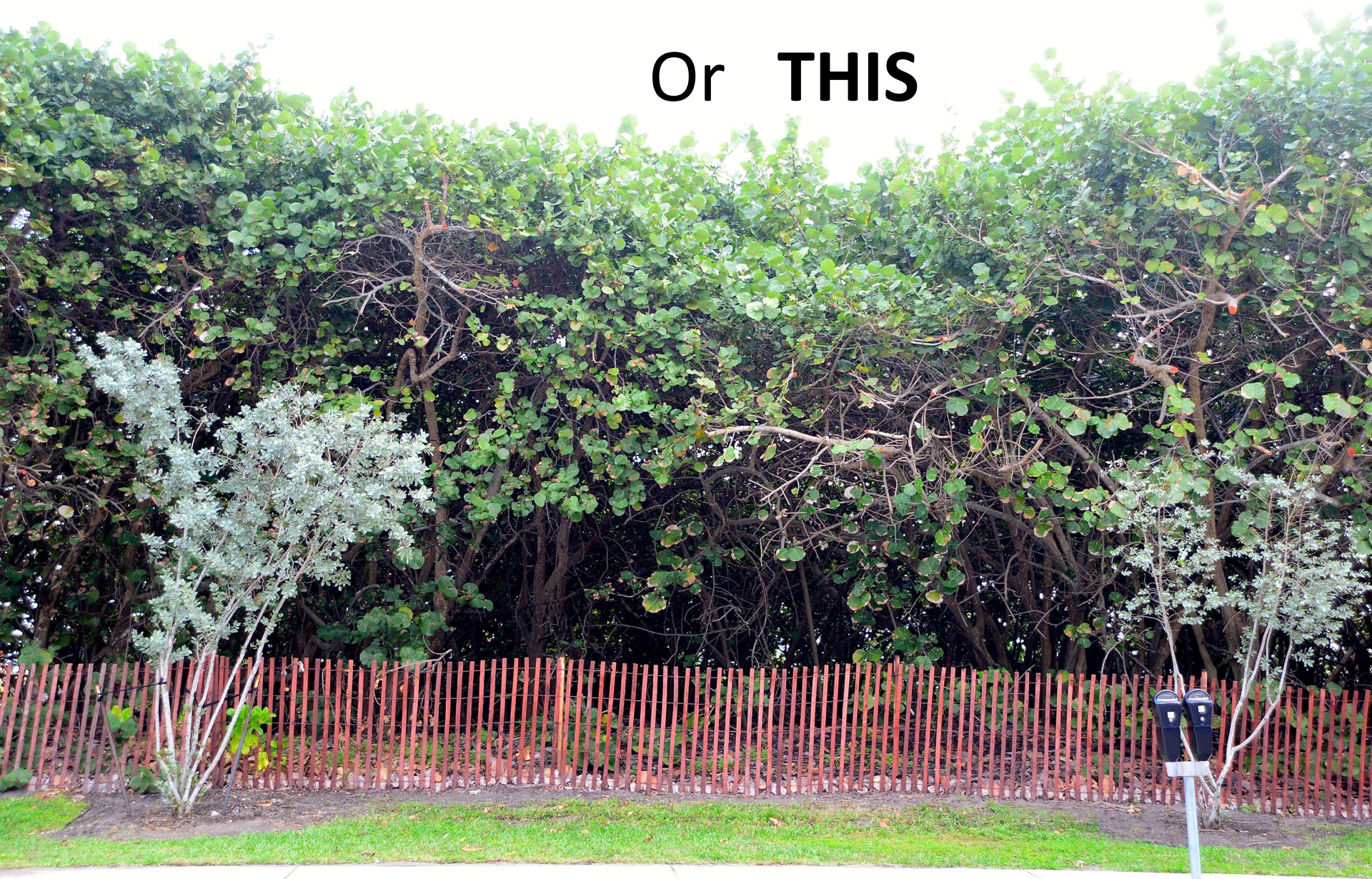
Between 1985 and 1997 the unmanaged dune grew.



View from the street was **this** ..



Or **THIS**



Comprehensive Dune Management Plan was written in 1997, to include pruning, replanting.

## Section 17 Seagrape expansion since 1985

Red line is approximate footprint of seagrape clusters as installed to trap sand at access points 1982; about 300 sq ft.

Yellow is footprint at time of 2001 FDEP pruning permit; about 4,500 sq.ft.

White line is seagrape footprint at 2015 FDEP exotic removal permit; about 10,500 sq. ft.

35X increase since planting, 2.3X increase since pruning began. 7% /year, expansion since pruning began.

N26.4636°

**Expanded to 35x installed footprint**

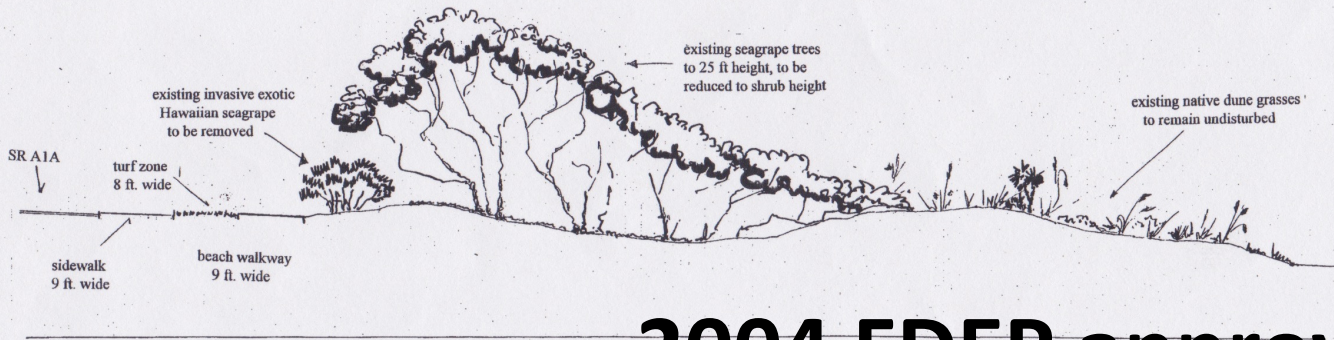


phototropic habit of coccoloba  
leaves large areas under canopy  
unrooted and vulnerable

02.28.2017 14:34

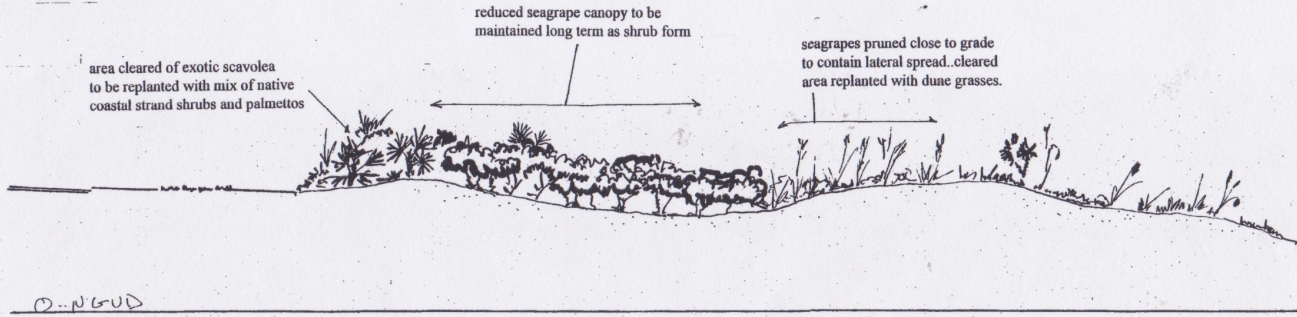
This is an actual surveyed, scaled transect, taken at FLDEP monument 06-G-06-B. The purpose of this drawing is to clearly define the proposed initial modifications and long term maintenance plans for this section of the dune between access walkways, and by reference, for the other sections of the dune at the Delray Public Beach, an area which reaches approximately from survey monument R-177 at the North end, to monument R-183 at the South end of the Public Beach.

EXISTING CONDITION



# 2004 FDEP approved permit plan

PROPOSED MODIFICATIONS



PRUNING METHODS

1. This project is intended to reduce the height of tree form seagrapes by a heavy crown reduction pruning to 24 to 36 inches above grade, to allow for the reestablishment of a branching sub structure in the first season after the pruning, and then to maintain the seagrapes at roughly 36 to 48 inches height as shrubs long term, by stem and leaf pruning, which is a permit exempt activity.
2. The perimeter of existing seagrape masses will be controlled by lateral pruning, at or slightly above grade, where stems are spreading across the ground but not rooted into the ground. This is to contain the aggressive spread of seagrapes and preserve the diversity of other dune shrub species and palmettos.
3. The prescribed pruning heights may be initially lower, where weak lateral light seeking growth has resulted in long branches which grow low against the grade. Common horticultural sense will prevail.
4. All unvegetated areas exposed by pruning will be replanted according to the specifications of the Project Management Notes for each dune section.

APPROVED  
DEP/BCS  
#8018009 PB

1/2  
5/7

REVISIONS	BY

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DELRAY PUBLIC BEACH  
DUNE ENHANCEMENT PLAN  
TYPICAL TRANSVERSE SECTION

DRAWN	
CHECKED	
DATE	5/10/04
SCALE	1" = 10'
JOB NO.	
SHEET	1
OF	2 SHEETS

Work in progress under 2001 FDEP  
permit.. exotics removed..



But wait !

**Migrant center programs  
face financial crisis**

PAGE 4C

# LOCAL NEWS

## Trimming of Delray sea grapes under fire

**By Howie Paul Hartnett**  
*Palm Beach Post Staff Writer*

DELRAY BEACH — When city workers planted sea grapes along North Ocean Boulevard back in the 1950s, the city administration, they said, had no time to keep the

But after more than a decade of major storm damage, the trees grown as high as 20 feet

So, earlier this month, city workers trimmed them down to 8 feet

It's too stark a change, says Mark Taynton, a state Department of Environmental Protection

"He (city consultant) just way over his permit," he said. "He took some large trees and cut them down to 8 feet. It appears to be a violation."

Barron said he will appear again at the permit hearing.

*The intent was never to allow those sea grapes to establish themselves as trees. They were*

"Anything larger than 3 inches in diameter obviously shouldn't be cut down to 3 feet tall," Taynton said. "I personally think it's a violation, but at the same time, it's a violation."

to allow those sea grapes to establish themselves as trees. They were supposed to be maintained as a hedge.

The intent, Barron said, is "to create a complete dune ecosystem that's as



## Official faults Delray for trimming sea grapes

Dune caretaker cut trees to room for playground

said Mark Taynton, a field engineer for the DEP. plants in the city's 6,480-foot beach

### Trim Delray's attitude

**BY NEIL SANTANIELLO**  
STAFF WRITER

DELRAY BEACH — A state permit hearing on whether the city is going to recommend that he be cited for violating state law for trimming sea grapes back to 8 feet

Whether Delray Beach accepts the violation, and a fine levied by DEP supervisors at the state Department of Environmental Protection

Governments and homeowners were halted after Palm Beach County's beach coordinator, Bob Clinger, saw the trees and asked, "Who in the world is going on here?" Mr. Barron said there's no proof that the cutting endangers sea turtles or contributes to erosion, and the city should remove the plants that Richard Moyroud of Mesquite Landscape says "natural" sea-grape stands appear to be the result of human activity. "Occasional fires that would keep them from growing tall enough to crowd out other species. But that doesn't lessen the value of the trees in blocking lights that

streets. Barron has argued the dune itself will sufficiently block light and that sea grapes aren't normal dune-line plants in the first place.

As part of a possible penalty, Barron said the state may require him to plant more sea grapes along another part of the beach.

When the matter is resolved, Barron said the DEP will allow him to go ahead next week and plant new vegetation, such as saw palmetto, that was the dominant on dunes decades ago.


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**Sudden turmoil (similar to today's facebook freakouts) halts work as FDEP takes a closer look.**

## **BUT THE SCIENCE HOLDS UP UNDER SCRUTINY**



After thorough scientific review, FDEP again approves and 50% funds the comprehensive Delray Beach Dune Management program.



March 2017, FDEP permitted  
Coppicing, exotic removal,  
species enhancements to  
Society for Ecological Restoration  
guidelines.

Acknowledged as 5 Star project by SER.

02.28.2017 14:36



# Delray Beach Dune, Comprehensive Habitat Restoration

A photograph showing a coastal dune area. In the foreground, there is a dense field of green and yellowish plants, likely beach grasses and other dune vegetation. In the middle ground, several wooden lifeguard stands with thatched roofs are visible, each with a set of stairs leading down to the beach. The beach is sandy and crowded with people, many of whom are using blue beach umbrellas. The ocean is visible in the background under a clear blue sky.


A 35 year project

**120 of possible 196 native plant species, including all threatened and endangered State and Federal species, several rescued from at risk locations.**



**OBJECTIVE: Restore the natural plant complex.**

**Swale formed as dune captured \$ millions  
and as much as 11 verticle feet of sand.**

An aerial photograph showing a coastal residential area. On the left, the ocean meets a wide, sandy beach. The beach is bordered by a line of dunes and sparse vegetation. To the right of the dunes, there is a dense residential neighborhood with numerous houses, some with swimming pools, and green lawns. The overall scene depicts a typical coastal community with a clear boundary between the natural beach/dune area and the developed residential zone.

Private efforts beginning 1987

80 % of private owners in DB have invested in dune conservation.

Looking to the south from the Seagate Beach Club in 1987, at the first of the private dune restorations.



Twenty four of twenty six private property owners in the renourished mile of shoreline south of Delray Public Beach, have invested in dune restoration and conservation.



269 ft



2011

© 2015 Google  
Image Landsat  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

Imagery Date: 1/18/2014 26°26'53.41" N 80°03'22.38" W elev -12 ft eye alt 616 ft

**Resulting sand capture, stabilization and dune function mean dramatically reduced need for public renourishment cost.**



Rare plant species  
rescued to all areas

Low profile walkways  
designed, installed



**Aggressive enforcement of lighting codes and compliance with FWC lighting consultation yield disorientation rates comparable to wild dunes, and no hatchling loss attributable to lights. Even in commercial areas**



**Tens of thousands invested in lighting upgrades.**

06.26.2016 05:46



## DELRAY BEACH SHORELINE LIGHT CONTAMINATION

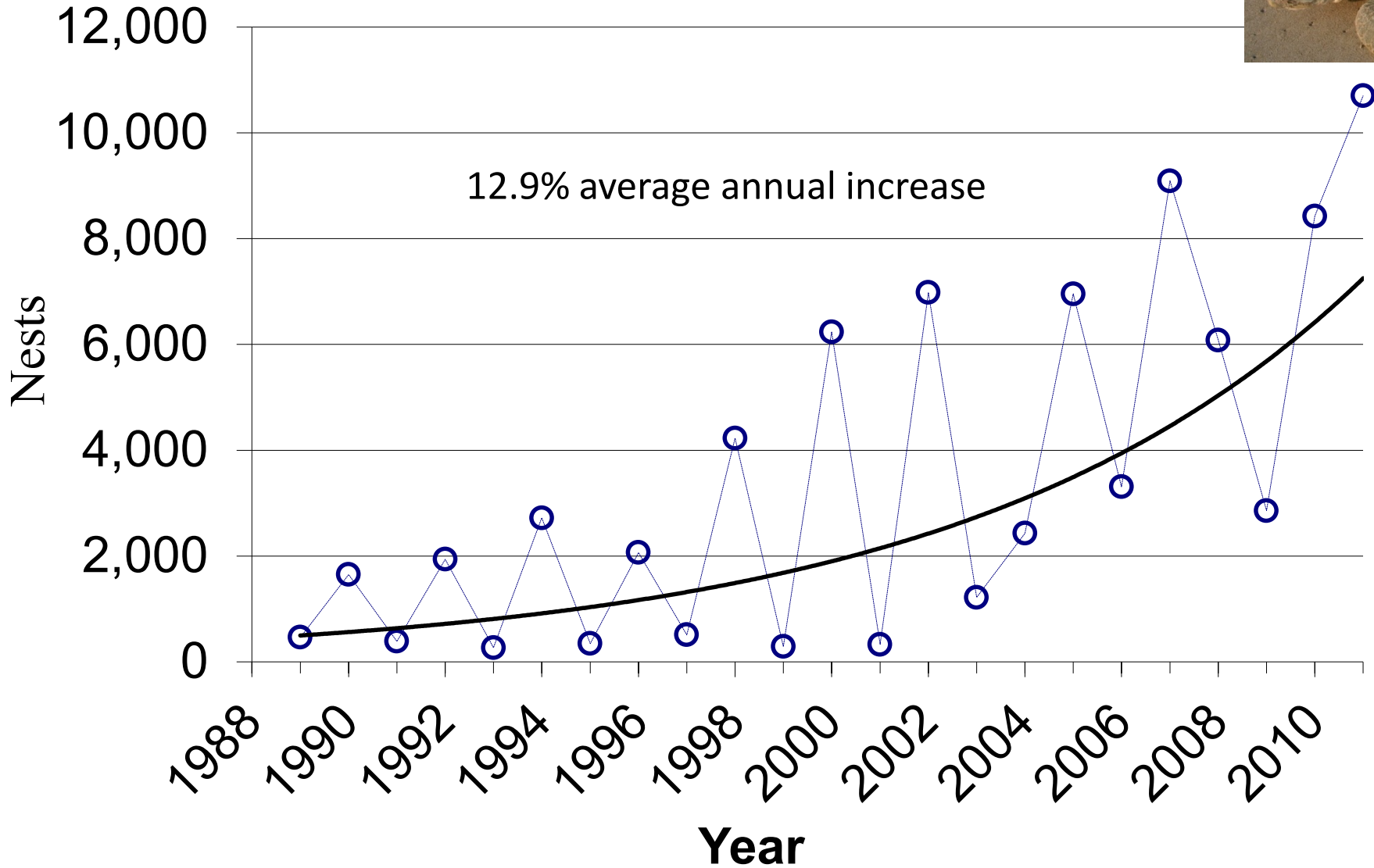
Photo #	DSC_0181
Camera	Nikon D3000
Date/time	September 13, 2016, 6:26 AM
GPS location	N 26,27.24, W 80.03.32
Compass heading	179
Focal length	55 mm
Shutter speed	.8s
ISO	1600
Aperture	6.3
SQML	NA
Type of light	Headlights from ATV
Address	Seagate Beach Club

This minefield of chairs would not be permitted by FDEP or FWC. They should be stored much farther back on the beach.



Photo witness Robert Barron  
561-441-1446, <beachmaker@aol.com>

# Green turtle nests on Florida core index beaches



Turtles benefit..

**But exotic plant control  
is neglected.**



12/3/14 INSPECTION 3 year old invasive exotic *Casuarina* and several 2 to 3 year old *Scaevola*, not removed as \$20K contract effort stalled at mid beach.



12/3/14 INSPECTION

Cost to remove a seedling by hand.. Maybe \$1.50



12/3/14 INSPECTION

Cost to remove 400 square yards after 3 years neglect..\$750



The revised permit does not address the grey nickerbean infestation which continues to damage rare plants in sections just to the north of the flagpole. No one on the team is aware. Money and plants lost.



12/3/14 INSPECTION 500 FT. NORTH END Invasive exotic *Scaevola taccada*, 2 to 3 year old cluster. Cost to remove \$350.

*Dalbergia ecastophyllum*, coinvine”  
..single 3 year old plant with 36 leads  
to 30 feet long



If not controlled while small, this invasive native species can overwhelm large areas of healthy dune in just a few seasons..but provides little stabilizing rootmass.



Chain and beach cleaning tractor yanks 46 foot section of 3 year old 400 square yard cover invasive coin vine in about 4 minutes setup and reset time.



Grey nickerbean. Invasive  
native shades out and kills  
other valuable strand zone  
species.



A photograph showing a dense thicket of green vines and leaves covering a tree trunk. The vines are thick and have small, yellowish flowers. The background is a bright, overcast sky. The text is overlaid in the center of the image.

**Two years growth nearly envelopes 20 foot seagrape tree.**



Invasive species had killed off large areas of native vegetation before 2016 exotic removal program. These areas have been replanted with beneficial species as part of the 2017 seagrape reduction.  
**BUT LOST AGAIN BY FAILURE TO MAINTAIN PRUNING PROGRAM**



12/3/14 INSPECTION OF NORTH 500 FT.

Homeless hotel.. would be discovered with regular inspections.

2018

PAVILION  
OPEN  
DAWN TO DUSK  
NO LITTERING  
NO LOITERING  
SEC 11A-70.01

**NEW CITY LEADERSHIP ARGUE SEAGRAPE TREES ARE "ICONIC"  
ABANDON LONG TERM SCIENCE BASED PERMITS AND PROGRAM.  
SEAGRAPES NOT PRUNED FOR TWO YEARS UNTIL RESOLVED**



## **NEW 2021 AREA WIDE PERMIT**

**11 feet spread to reach new 42 inch height**

Pointless height limits mean seagrape branches can travel many feet before reaching authorized pruning height. And nothing grew or will grow beneath the overhanging canopy.



## IN WHAT WORLD IS THIS REASONABLE HABITAT MANAGEMENT PRACTICE?


There is no science whatsoever to support arbitrary 36 inch, or 42 inch or any other number as pruning reference. The correct arboricultural method for reducing seagrape is coppicing, cutting the tree to just above grade, allowing a low shrub form recovery.



# 36 inches?...42 inches?...How does it matter?



Since the first of the field permits in 2000, FDEP agents confirmed on site that the frontal dune ridge was high enough to obscure line of sight from turtle nesting beach to well above pruning level. Arbitrary height limits, at the street in new permit, just make no difference.



BUT growth between trims  
overshadows and kills most  
other species below.

cycles between four  
and seven feet .....

# What are pruning costs, methods?



**Delray Beach, 6,840 feet, three machete cuts/yr, \$35K to \$40K annually, with staff labor.**

City crews pruned seagrass 3 times/year to comply with FDEP permits from 2002 to 2016. RECENT REMEDIAL PRUNING COST \$100,000. NOT COUNTING \$40K FOR UNECESSARY PERMIT.

**Back to chain saws after  
two year neglect**

**THE COST for single  
repair pruning..  
nearly \$100,000.00**



**Yet still no effort to contain seagrape spread so just  
gets more costly each year**

WHAT THE SYSTEM NEEDS..

# HOMEOSTASIS.

**A relatively stable equilibrium  
between interdependent elements,  
especially as maintained by  
physiological process.**

**LESS POLITICS, MORE SCIENCE**



*Jacquemontia reclinata*  
Listed Endangered U.S

COST TO CREATE A NEW POPULATION IS \$40K  
FOR 100 NEW PLANTS, UNDER FEDERAL PLAN

Functioning population was established near the sailboats, by Miami Fairchild Garden. Uncontrolled Seagrass expansion reduces this population.

*Croton punctatus* can now be grown from seed.



Beach ambrosia..almost extinct in Florida, but rescued and reestablished in the Delray dune.





Burrowing four o'clock  
*Okenia hypogaea*

(Endangered—Florida)





sea lavender  
*Argusia gnaphalodes*,  
Boy scout project


**Rare, Endangered plants benefit  
and help secure FDEP favor.**



Blanket Flower  
*Gallardia pulchella*

*Trichostema sufruticasom*





Listed coastal plants have no inherent weakness..but are suffering from habitat loss. Preserving them for future generations simply requires finding safe places to plant them. Delray Beach supports many. But all are at risk again if pruning policy is based on Politics rather than science.

Beach verbena grows well in semi-sheltered backdune areas.  
Threatened species in FL.

THANKS FOR LISTENING...

Please practice redundant contraception.

