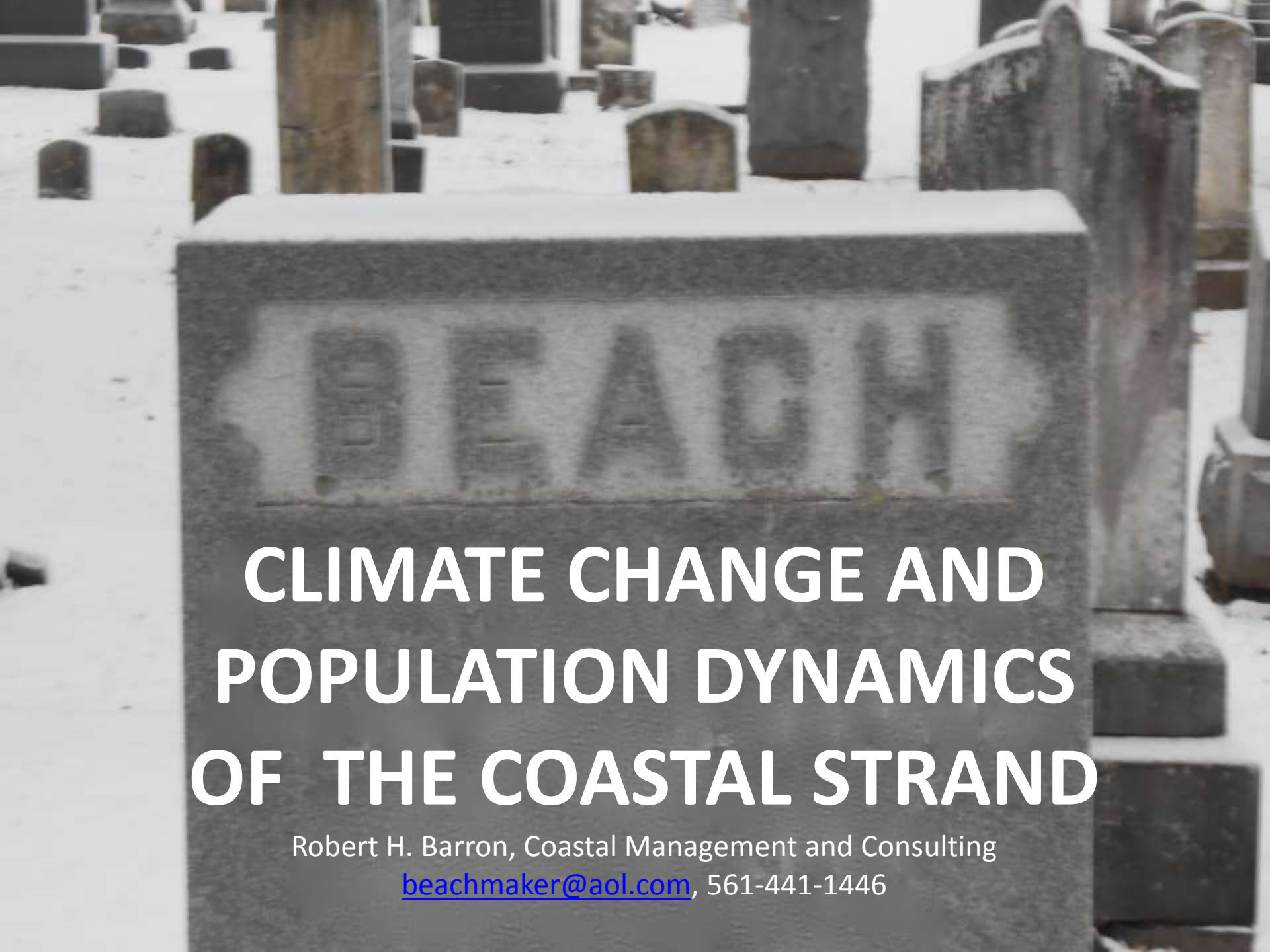

CLIMATE CHANGE AND POPULATION DYNAMICS OF THE COASTAL STRAND

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- I’ll be talking about

- THE NATURAL CHARACTER OF THE STRAND
- CONTROLS WITHIN THE CLIMATIC ENVELOPE
- HUMAN INFLUENCES AND ECOSYSTEM RESPONSE
- CASE STUDIES AND ILLUSTRATIONS
- MANAGEMENT METHODS
- THE COST OF FAILURE

The Coastal Strand ecosystem is all but wiped out in Florida, due mostly to development, but the few remaining patches are under increasing human generated threat. What was Strand like and how can we preserve what is left?

UNDEVELOPED BOCA RATON IN THE TWENTIES..

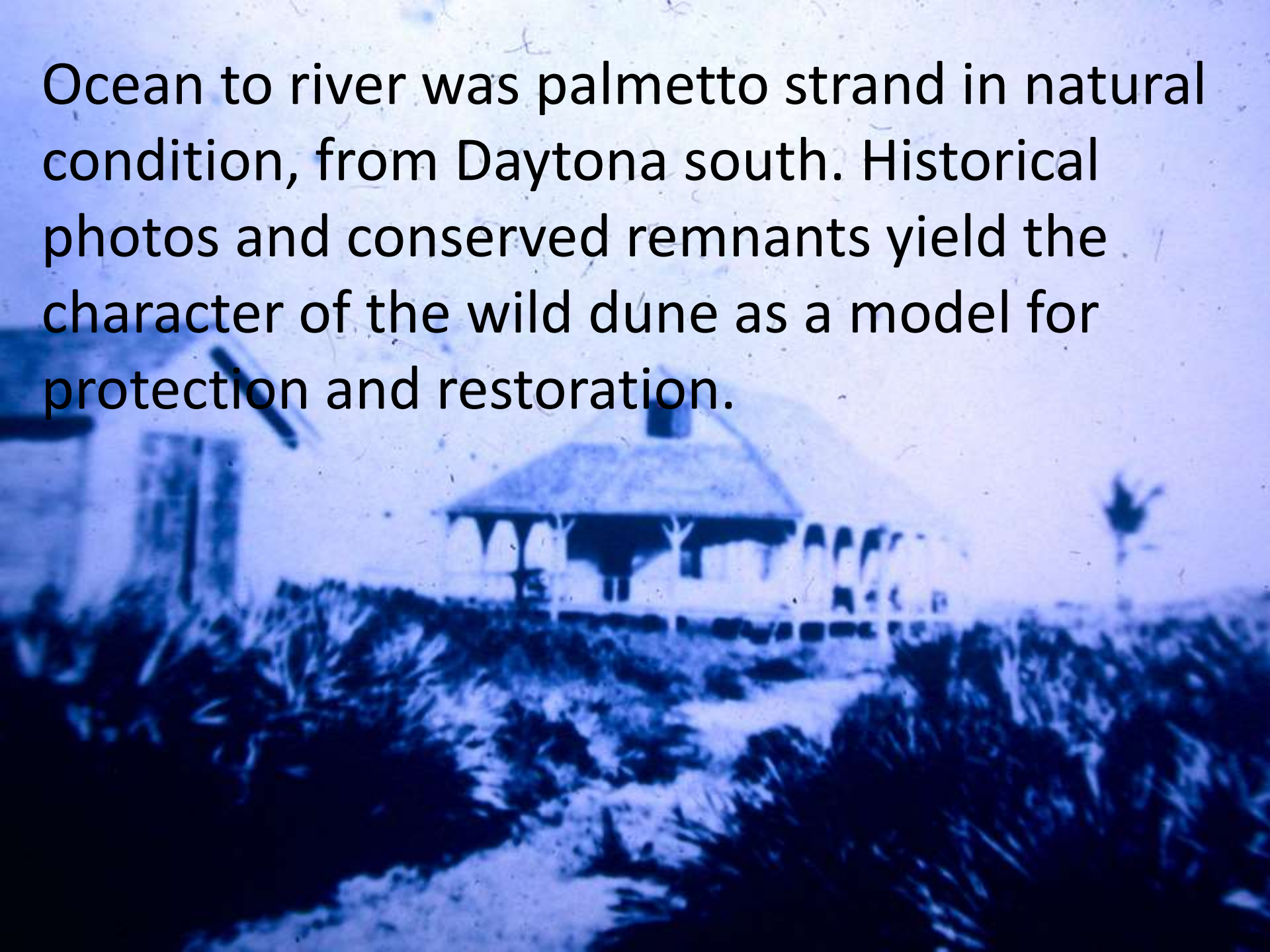
palmetto dominated strand..no trees

EARLY COASTAL PALM BCH. COUNTY BEACHFRONT HOMESTEAD..no trees.


DELRAY BEACH CLUB SITE
CA 1950
NO TREES
Scrub species and palmetto

DELRAY BEACH

1951



Ocean to river was palmetto strand in natural condition, from Daytona south. Historical photos and conserved remnants yield the character of the wild dune as a model for protection and restoration.

EXISTING COASTAL STRAND IN NATURAL CONDITION


CLIFTON S. PERRY
BEACH
OPERATED BY THE MARTIN COUNTY
BOARD OF COUNTY COMMISSIONERS


Spessard Holland Beach, Brevard County 1987

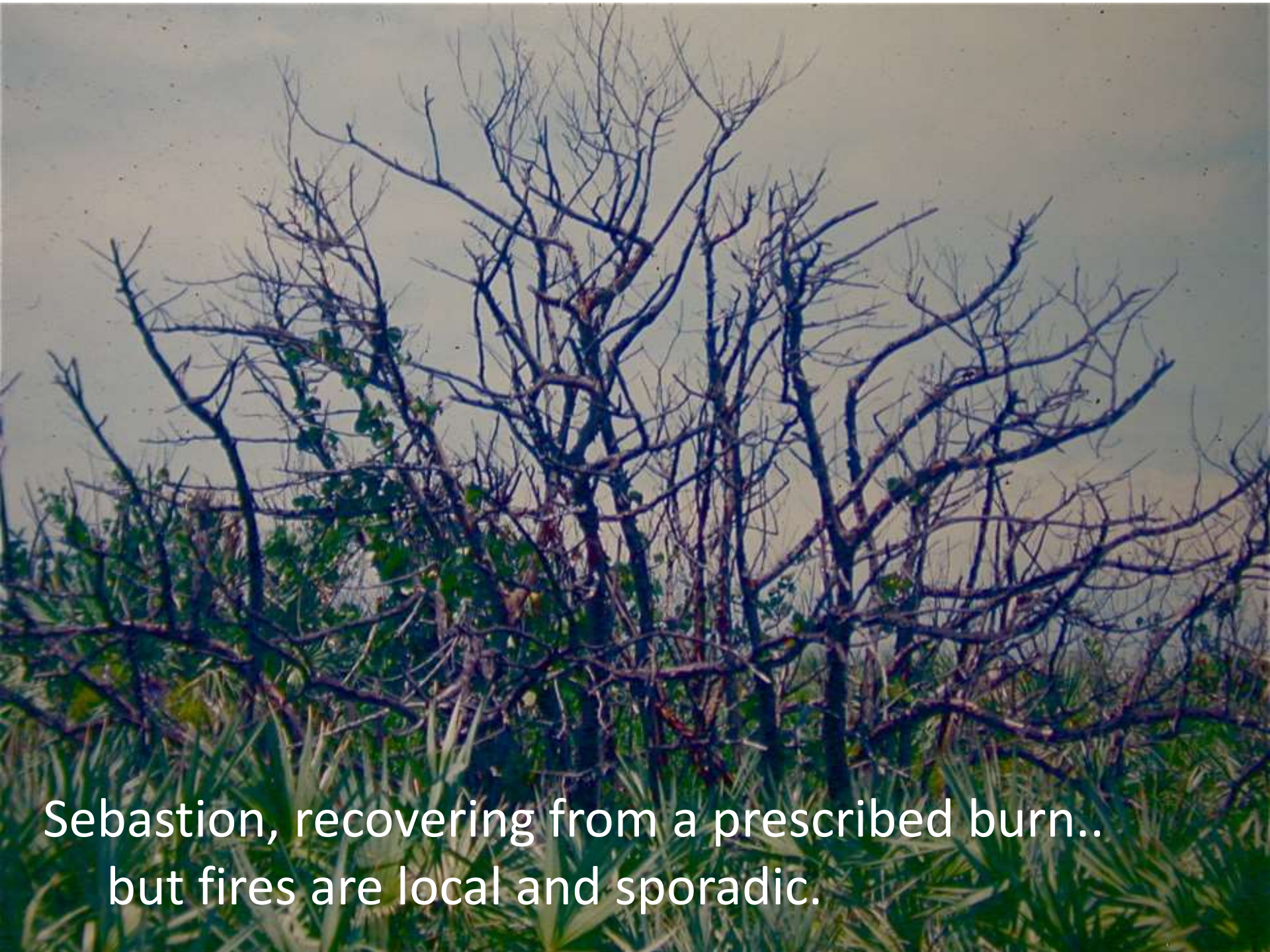

CANAVERAL NATIONAL SEASHORE..1988
WHAT SHAPED THIS SYSTEM SO UNIFORMLY THROUGHOUT THE SOUTHEAST COAST OF FLORIDA?

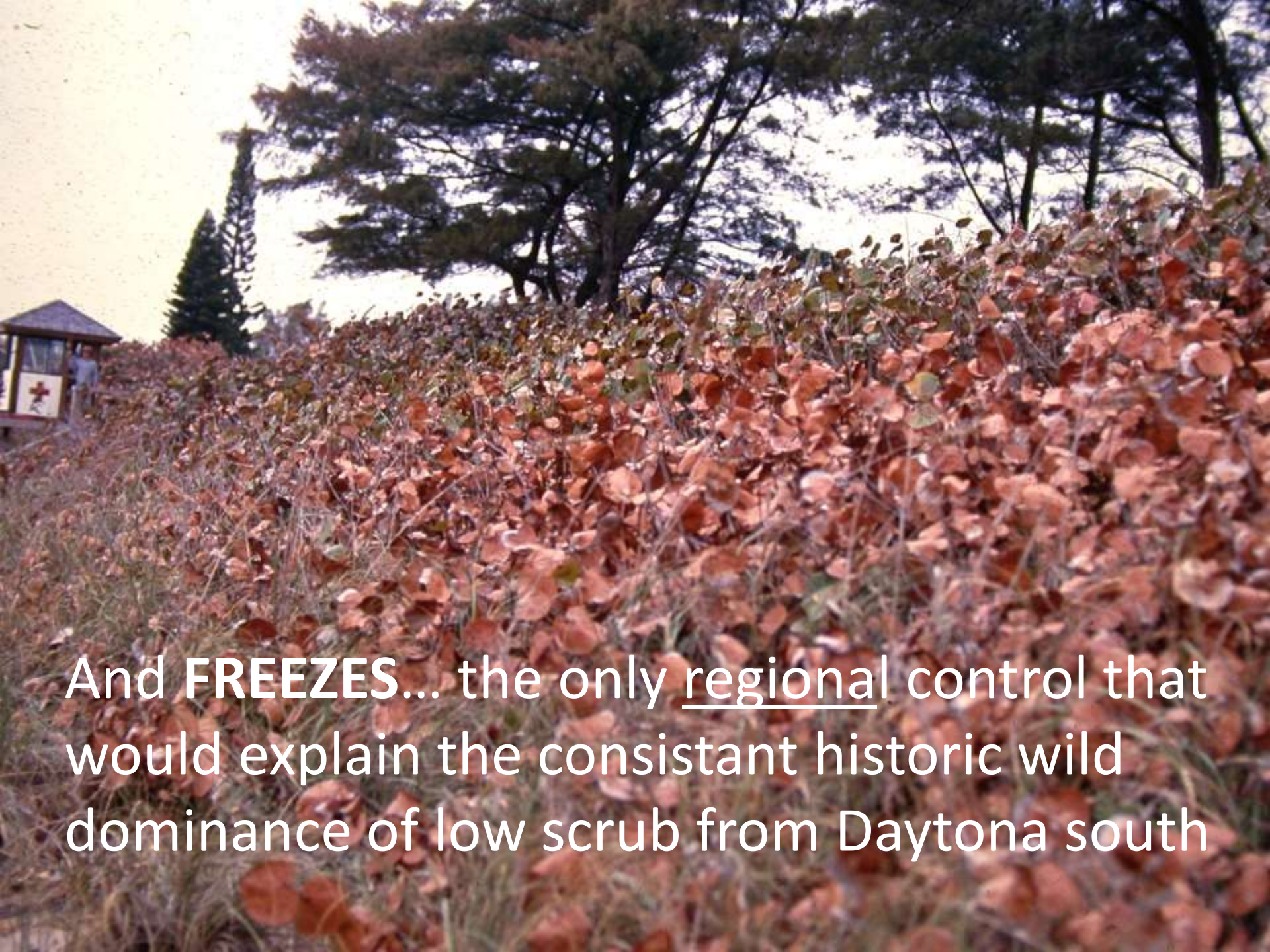
Canaveral today..not much change.

HURRICANES ?..catastrophic but local, since most storms are cross shore


WILDFIRE.. effective controller of
woody species, fast growing herbs


Selects out seagrapes and taller shrubs,
promoting fire resistant palmettos


Sebastion, recovering from a prescribed burn..
but fires are local and sporadic.

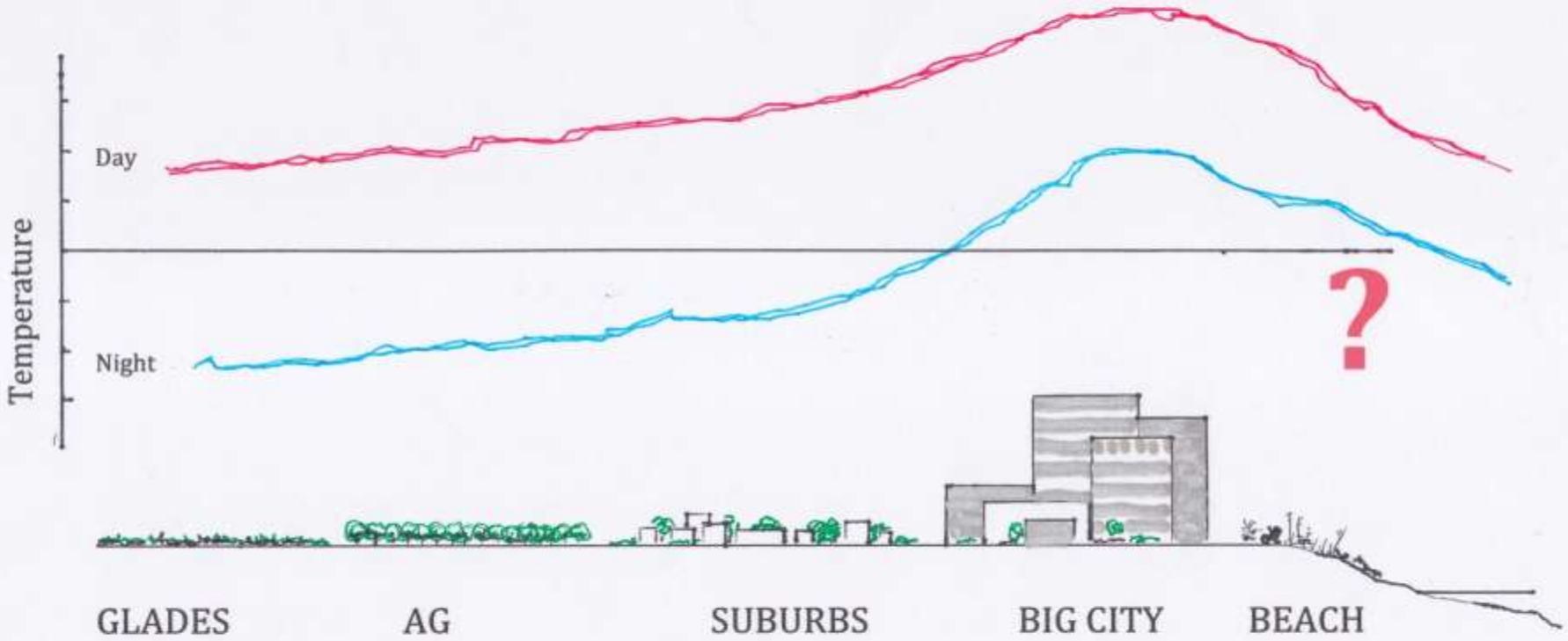

And **FREEZES**… the only regional control that would explain the consistant historic wild dominance of low scrub from Daytona south


1990 FREEZE, DELRAY BEACH
Saw palmetto, yucca, inkberry, pioneer species not impacted..
Seagrape and cocoplum frozen to the root crown.

2010 NOAA Data Center correspondence…

"the frequency of freezing temeratures along the coast (and all of SE Florida) has decreased since 1940, compared to the 1890 to 1940 period. **The time period between freezes has approximately doubled"**

URBAN HEAT ISLAND EFFECT



"...air temperature of a city of one million or more can be 1-3°C higher than its surroundings. In the evening, the difference can be as high as 12°C." (U.S. E.P.A.)

Buildings and pavement capture heat during the day and release it at night. Even a one degree change can mean **no freeze this time.**

RESULTS OF HUMAN INFLUENCE

- Invasive plant behavior
- Accelerated succession
- Degredation and loss of strand


Dalberghia ecastophylum, 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.

Offshore hurricane winds from Frances, Jeannie, and Wilma resulted in spike of floating seed distribution.

OCEAN VILLAGE, FT. PIERCE

Three years after first observed during annual sea oat seed collection..35 coin vine clusters as big as 500 square yards.


Vine species respond to warmth and increased CO2 better than slow growing woody species.
Rapid stem elongation speeds up overshadowing.

Hand cutting and removal required 24 man days labor and filled seven 20 yard dumpsters

Massive vine clusters lead back to central tap rooted lead. No rooting below the vines.

2 plants..3 years..500 sq.yds. $2,500 fix.

TOTAL REPAIR PROJECT COST..**$7K**


Hollywood Beach
coin vine infestation
$4,000.00 to remove and dispose
$7,200.00 to replant..$11K cost

ANNA MARIA. County park bayside shore half covered with invasive monoculture

ANNA MARIA ISLAND, BAYFRONT PARK

Most other native species have been overshdowed and killed.

Coin vine devouring recent seagrape planting at Patrick AFB

MIAMI BEACH

CAUGHT IN TIME..Dune Management Plan will include inspections and seedling control.. HUGE SAVINGS

Several years of neglect result in exotic removal costs above $40K, not counting replanting cost.


Replanting will cost minimum of
$4/square yard.

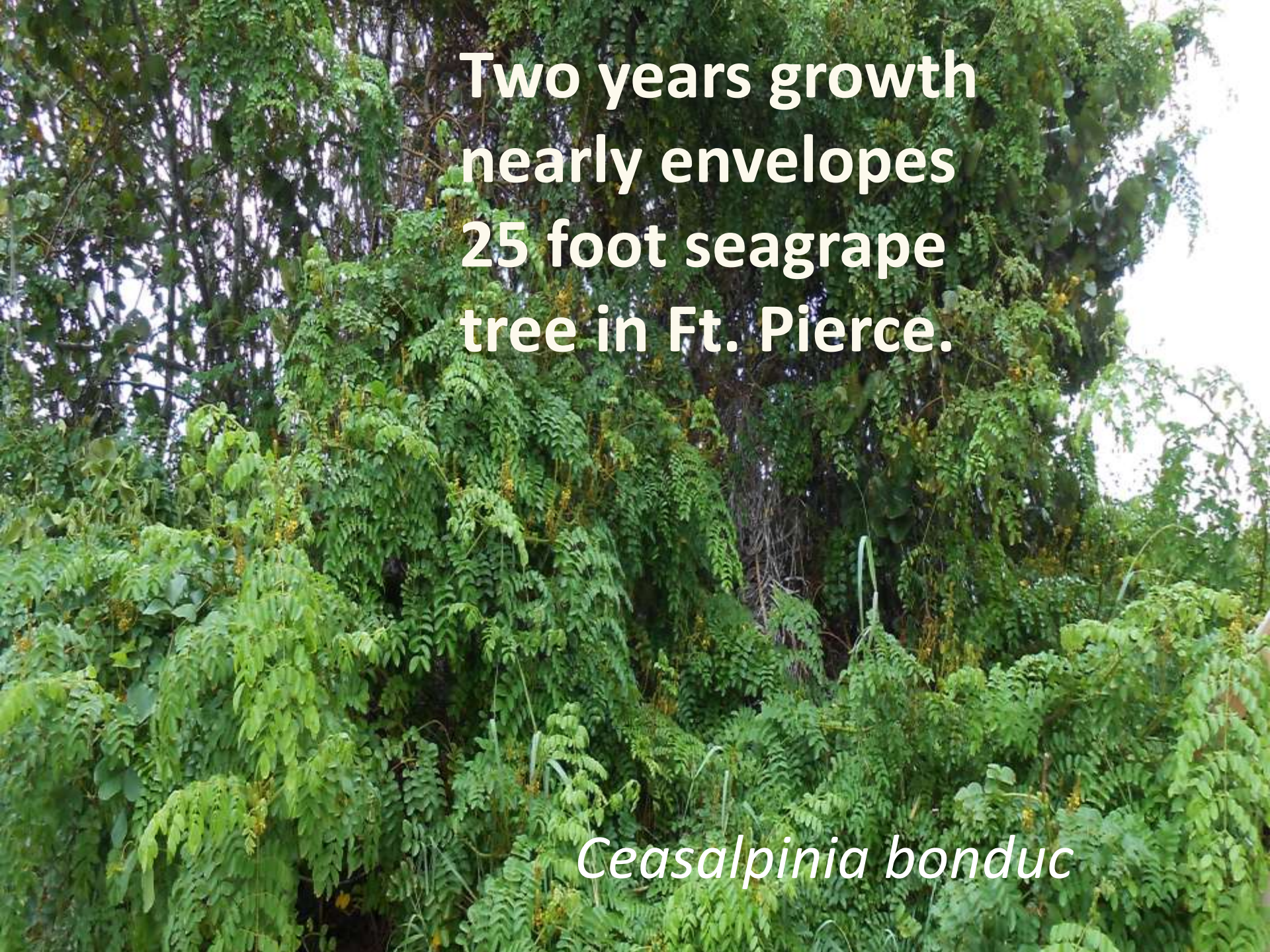

Coin vine engulfing twenty foot tall seagrape trees at a Palm Beach County Park… maybe we should call it
BEACH KUDZU

$2,450 to remove and dispose, $5,000 TO replant

since then.. Ignore/neglect,etc..next KA'JING SCHEDULED?

Cost of annual prevention program?..less than 1 truckload of sand.

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


Two years growth
nearly envelopes
25 foot seagrape
tree in Ft. Pierce.
Ceasalpinia bonduc

Nickerbean engulfing and killing seagrape at Sebastion Inlet State Park

HOW DO WE MANAGE THE PROBLEM, SHORT TERM AND LONG TERM ?

SEMI-ANNUAL INSPECTIONS. Worker on foot with shovel, 1 mile/day. Cost to remove a seedling by hand.. Maybe $1.50. No need for costly replanting or biomass removal.

But if not controlled as seedlings..

MECHANIZED REMOVAL?, SELECTIVE HERBICIDE?

Cost to remove 400 square yards after 3 years neglect..$400-$700. Does not include replanting cost of $4/square yard.


Invasive plant
removal tool
Patent pending……. OK maybe not…..go ahead, make your own.

Bada..

-BING

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

COSTS OF FAILURE TO MANAGE THE SYSTEM ?

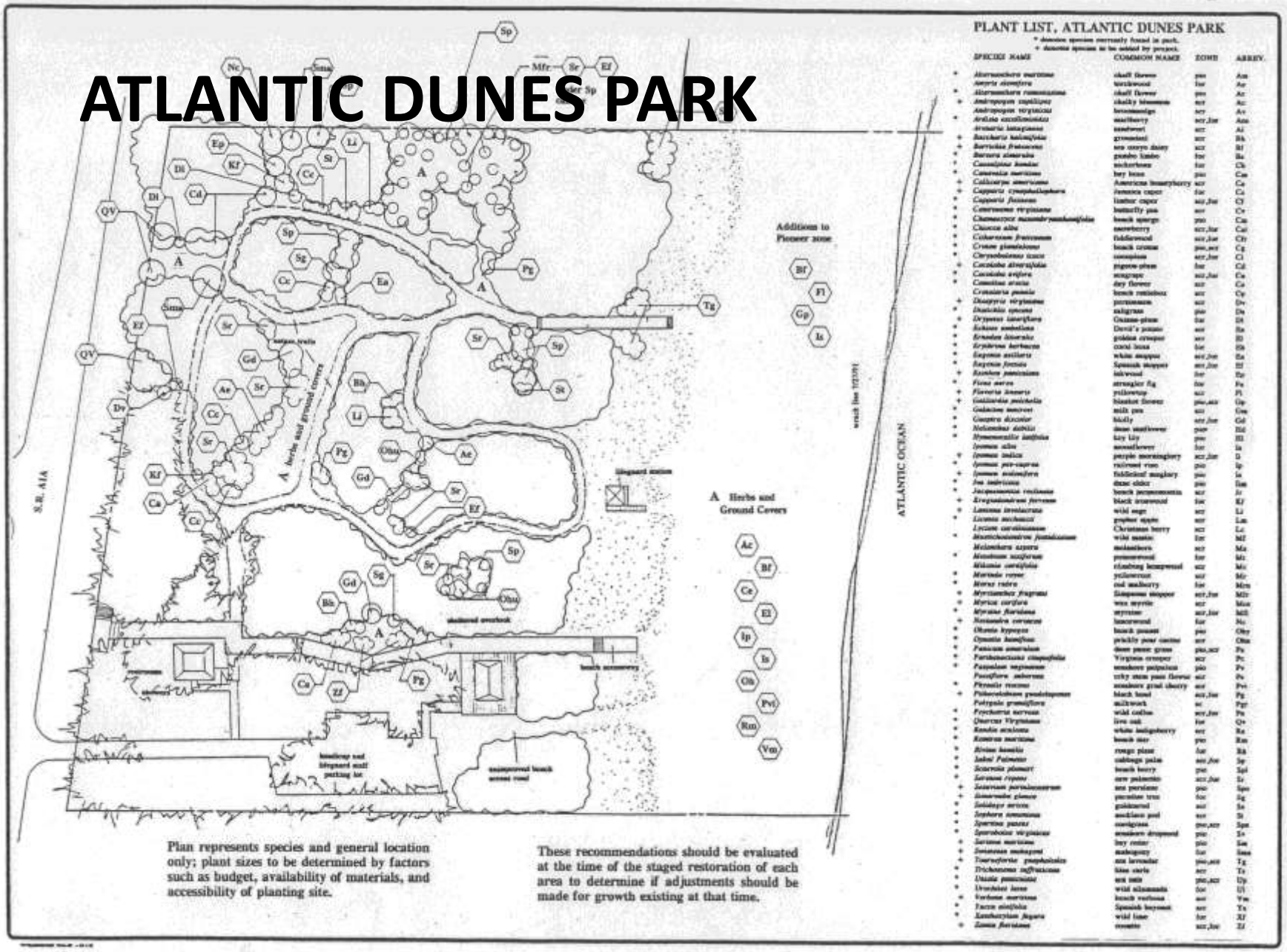
- Loss of habitat function.
- Loss of genetic and species diversity
- Reduced erosion resistance.
- Increased maintenance burden.
- **LOSS OF THE NATURAL HERITAGE OF OUR WILD SHORELINE**

“CLIMAXOPHILIA”

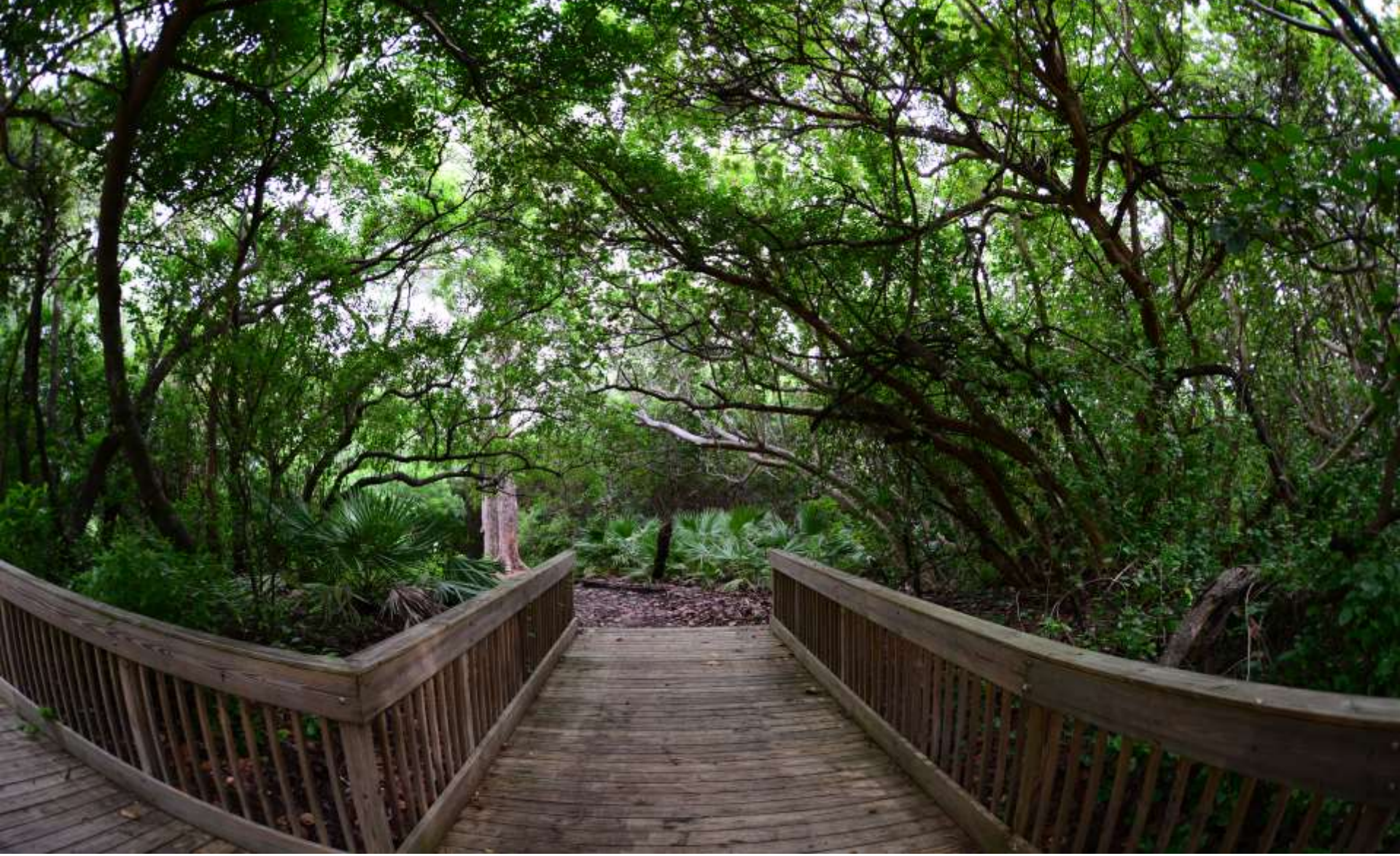
biased management of habitat for the benefit of apex species, at the expense of the overall ecosystem.

Beachfront parks have been actively managed for the benefit of seagrapes and turtles. Most of the strand species are lost in a single management generation.

ATLANTIC DUNES PARK



1991..58 wild native species found.. Today at least 15 lost.



Exotic infestation and accelerated succession has cost much of the biodiversity..listed species gone.

Shading by seagrape has killed most of the native strand species which occupied this park only 20 years ago. Rare and listed plant species are lost. This was a choice!


What remains is a near sterile monoculture.

Invasive native species can be more of a problem than exotics.

Absent natural controls, seagrape spreads to monoculture, even if pruned to shrub height.

These planted masses started as 30’ by 30’


We know that it is possible to repair and conserve
the coastal strand with focused commitment.

So.. The point of this presentation is..

We must !

Manage the the coastal ecosystem actively and wisely or we lose what remains within the next fifteen or twenty years.

THANKS TO:

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THANKS FOR LISTENING…and please
practice redundant contraception.
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