

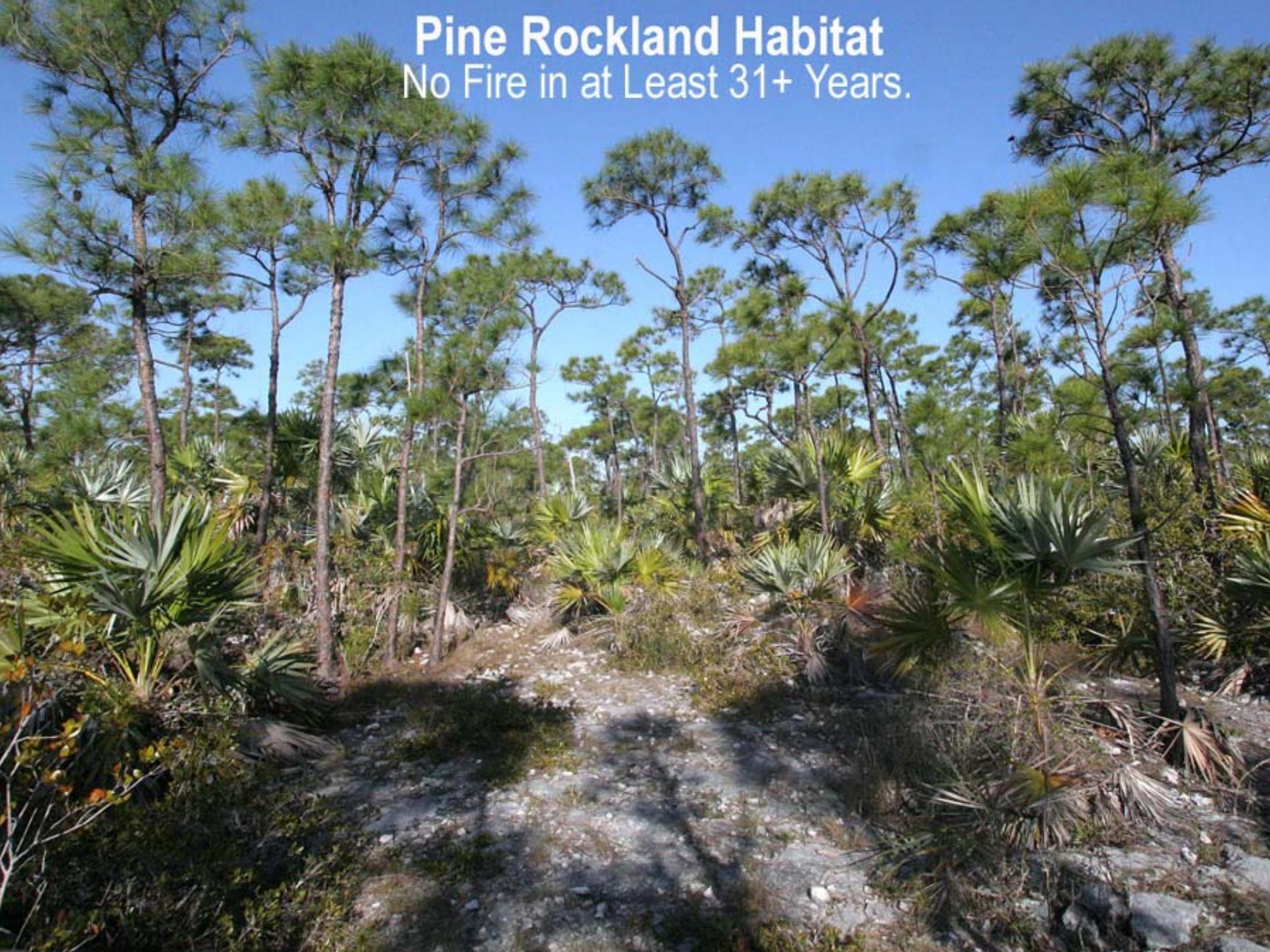
**Part 1 Effects of
Prescribed Burning
on Pine Rockland Habitats
in the Lower Keys.**

**Part 2 Effects of
hurricane Wilma. A series
of Photos from specific
locations documenting
on going changes.**

This study is ongoing and self-funded
Photo Documentation Study
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Pine Rockland Habitat

No Fire in at Least 31+ Years.



4/15/04

Damage from an old prescribed burn N. end BPK



Before Wilma

What makes our Pine Rockland unique from the mainland?

- #1 Our elevation is lower than Pine Rockland on the mainland.
- #2 Our regeneration is much slower.
- #3 Annual rainfall is far less.
- #4 Lightning is far less frequent.
- #5 Frequency of natural fire caused by lightning is far less.
- #6 We are much closer to the sea exposed to wind and salt.
- #7 We experience more frequent effects from hurricanes and storm surge.
- #8 Our Pinelands lack a soil layer, roots grow on the rock surface.
- #9 Pine Rocklands in the Keys are a mixed mosaic of hardwood hammock areas scattered among the pinelands.



In the Keys Pine
Rocklands there is
no soil layer. Pines
and other plants grow
right on the caprock.
Roots are exposed and vulnerable
to the elements.

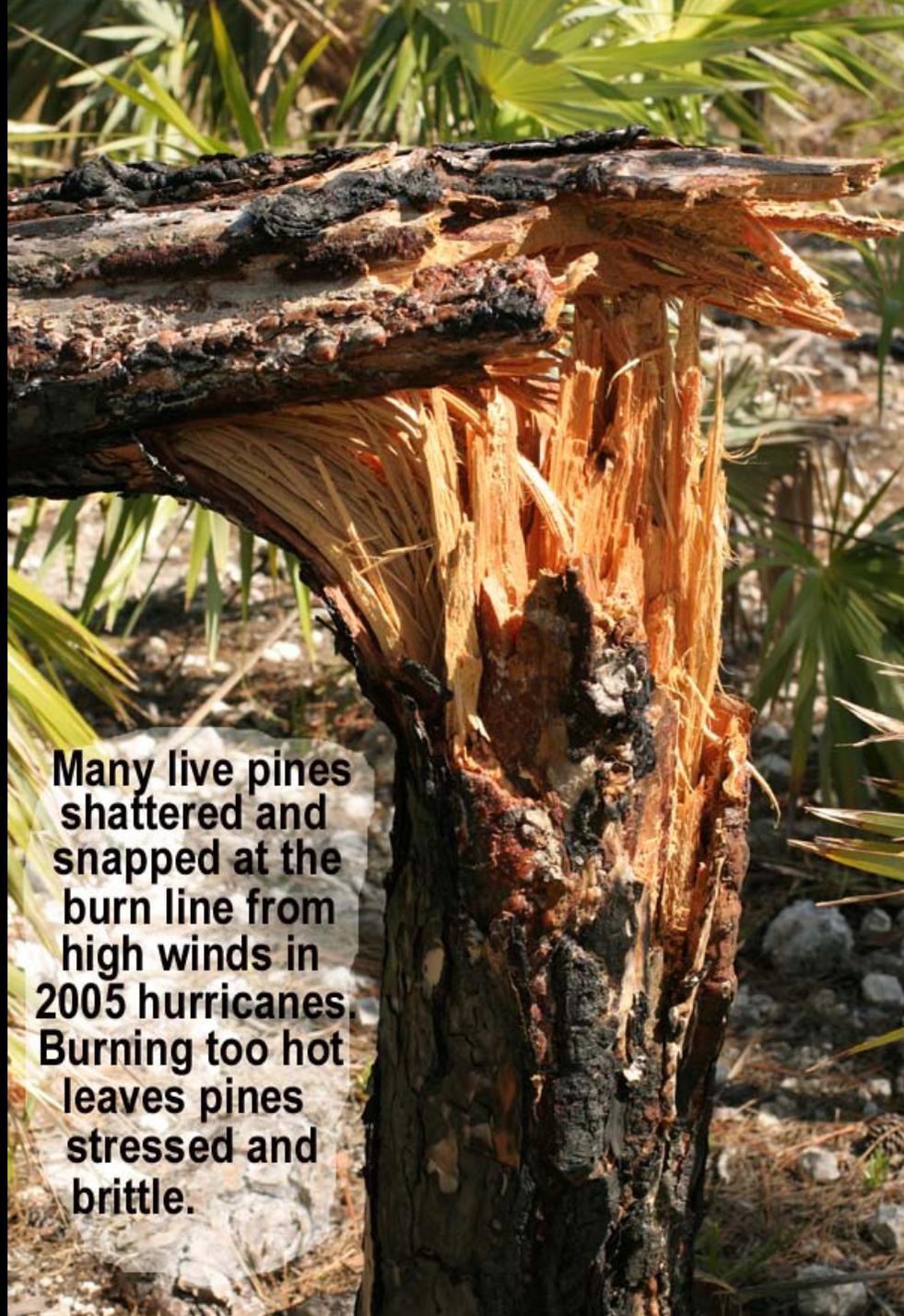
A photograph of a tree in a forest. The tree's trunk is dark and charred, and its roots are exposed and also charred. The ground is covered with dry pine needles and small rocks. In the background, there are other trees and palm-like plants. The text is overlaid on the left side of the image.

Exposed roots
burn in fires.
Severe stress
from burning
too hot
results in
very high
mortality.



Much of a pine trees root system is on the surface of the caprock. When the rock gets too hot the roots burn. Many old pines can be seen lying on the ground dead with roots burned like this one.

Before Wilma
Taken 4 15 05 (Burn of 2003) Big Pine Key
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**Many live pines
shattered and
snapped at the
burn line from
high winds in
2005 hurricanes.
Burning too hot
leaves pines
stressed and
brittle.**



Cudjoe
Before Wilma

Taken 11/08/04

Cudjoe burn 2004, This giant died when all it's exposed surface roots growing on the cap rock literally cooked to death. All the mature cone producing trees are vanishing quickly.
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Taken 12/08/04

Cudjoe burn 2004 pines still die months later.
This old tree was so large you could barely put your arms
around it.

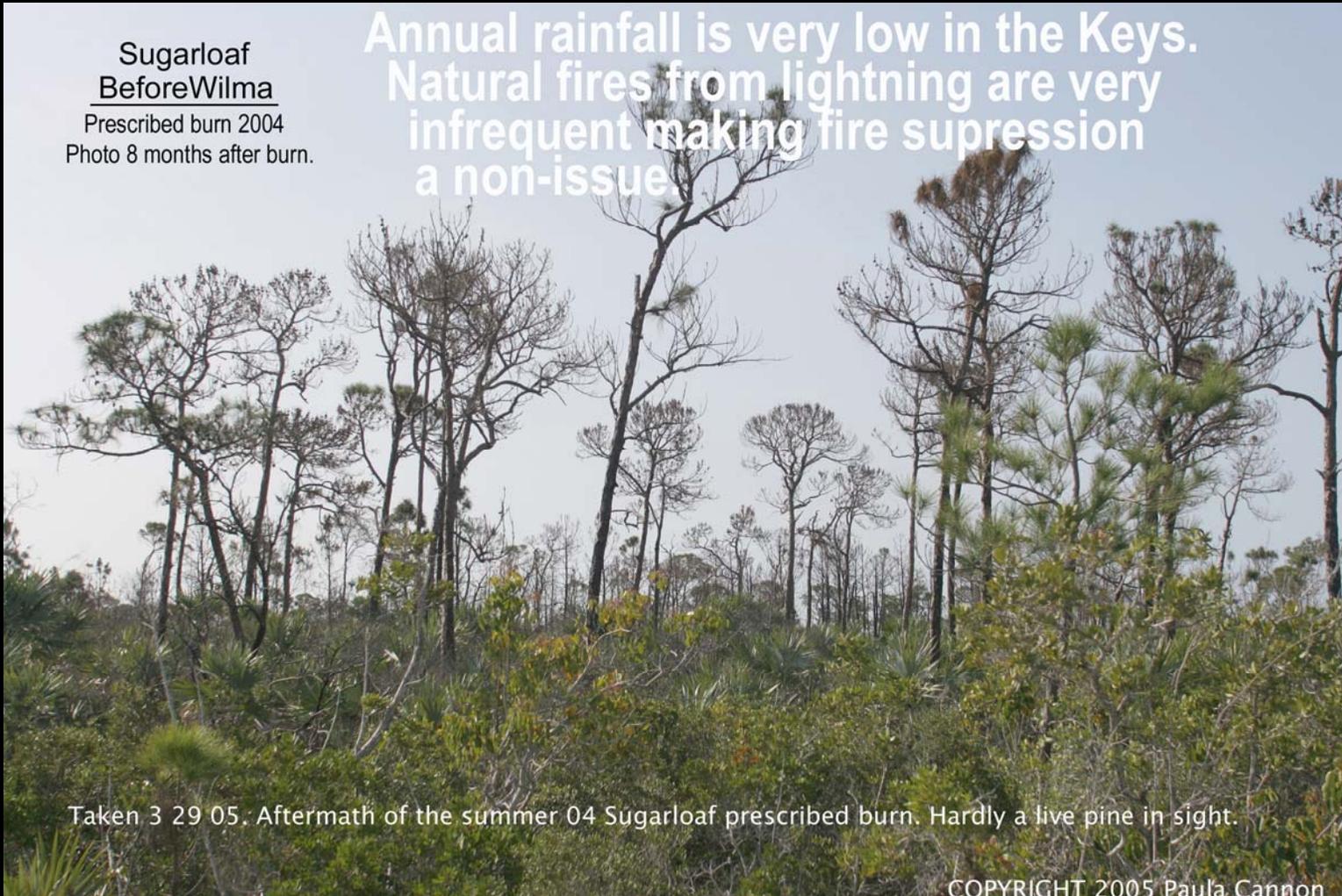
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Sugarloaf
BeforeWilma
Prescribed burn 2004
Photo 8 months after burn.

Annual rainfall is very low in the Keys.
Natural fires from lightning are very
infrequent making fire supression
a non-issue.

Taken 3 29 05. Aftermath of the summer 04 Sugarloaf prescribed burn. Hardly a live pine in sight.

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One year after the 2003 burn North end Big Pine Key



Big Pine Key
Before Wilma

Two years after the BPK north end burn trees continue to die, many acres of Pines died in this burn
Taken 6-01-05 (burn of 2003) COPYRIGHT 2005 Paula Cannon



Big Pine Key
Taken 4/15/05
(2003 burn)
Before Wilma

Regeneration in the Keys is much slower
than on the mainland.

Taken near bone yard fire road

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Taken 7/30/04

One year after burn on BPK north end trees
continue to die and bracken thrives.

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Big Pine Key
Before Wilma

Taken 7/30/04 end of Pine Ave. off of Big Pine St.
One year after the 2003 burn on Big Pine Key. Bracken coming in heavy shading other plants out.

Before Wilma

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Highly disturbed areas
promote invasives like
Brazilian Pepper.





Sugarloaf
Before Wilma

Dead Byrsonima-Important host plant to the endemic Florida Duskywing butterfly and good food source for migrating birds especially Wht. CrownPigeons
Taken 3 29 05. Large trees many years old were killed or reduced to small clumps of sprouting vegetation at the base of their once great trunk. These trees will not produce flower or seed for many years and as a result they will not produce important food for wildlife such as butterflies insects and birds. Deer heavily graze these ground sprouting dead trees often finishing them off.

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Islands of the Lower Keys
have a very low occurrence
of natural fires from lightning.

Unnatural fires started by way
of arson, foul play or accident
make up the majority of
supressed fires.

Our natural burn cycle is the only
thing that should be considered
when determining a schedule
for prescribed burning.

There is not enough Pine Rockland
left for more mistakes to be made.

**Sugarloaf 8 months after 05 prescribed burn.
Dead tree line can be seen in the distance to the right.**

2004 Prescribed Burn



3 29 05 Sugarloaf



Sugarloaf
Before Wilma

Taken 3/29/05. Heavy pine mortality Sugarloaf 2004 prescribed burn.
Notice heavy fuelload created by this prescribed burn.

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Sugarloaf
Before Wilma

Taken 3/25/05. Damage still evident over 8 months after the Sugarloaf prescribed burn. Notice heavy fuel load of dead trees and fallen branches created by this fire. Very few pines survived.





Taken 3/29/05
Before Wilma

A Row of rare Joewood dead from prescribed burn on Sugarloaf 2004

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4/15/04

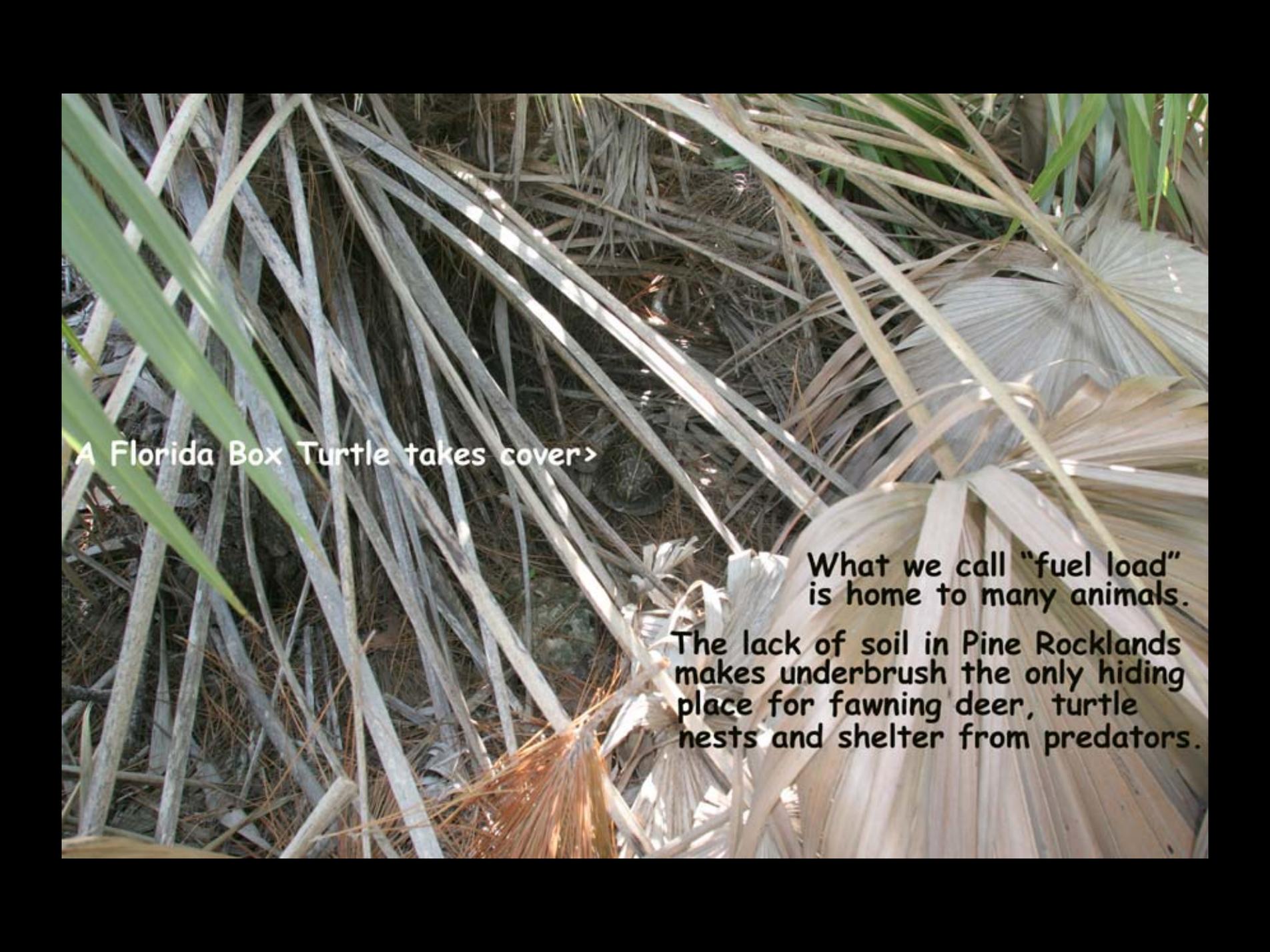
Damage from an old prescribed burn
N. end BPK



Before Wilma



4/15/05 N. End KDB
2003 burn
Almost 2 years later

A photograph showing a Florida Box Turtle hidden within a dense thicket of dry, tangled vegetation. The turtle is partially obscured by the dry, light-colored leaves and stems of the plants. The background is dark and filled with more of the same vegetation. The text is overlaid on the image in white and black.

A Florida Box Turtle takes cover >

What we call "fuel load" is home to many animals.

The lack of soil in Pine Rocklands makes underbrush the only hiding place for fawning deer, turtle nests and shelter from predators.

Photo taken 7/21/04 COPYRIGHT 2004 Paula Cannon

CUDJOE KEY PRESCRIBED BURN 2004

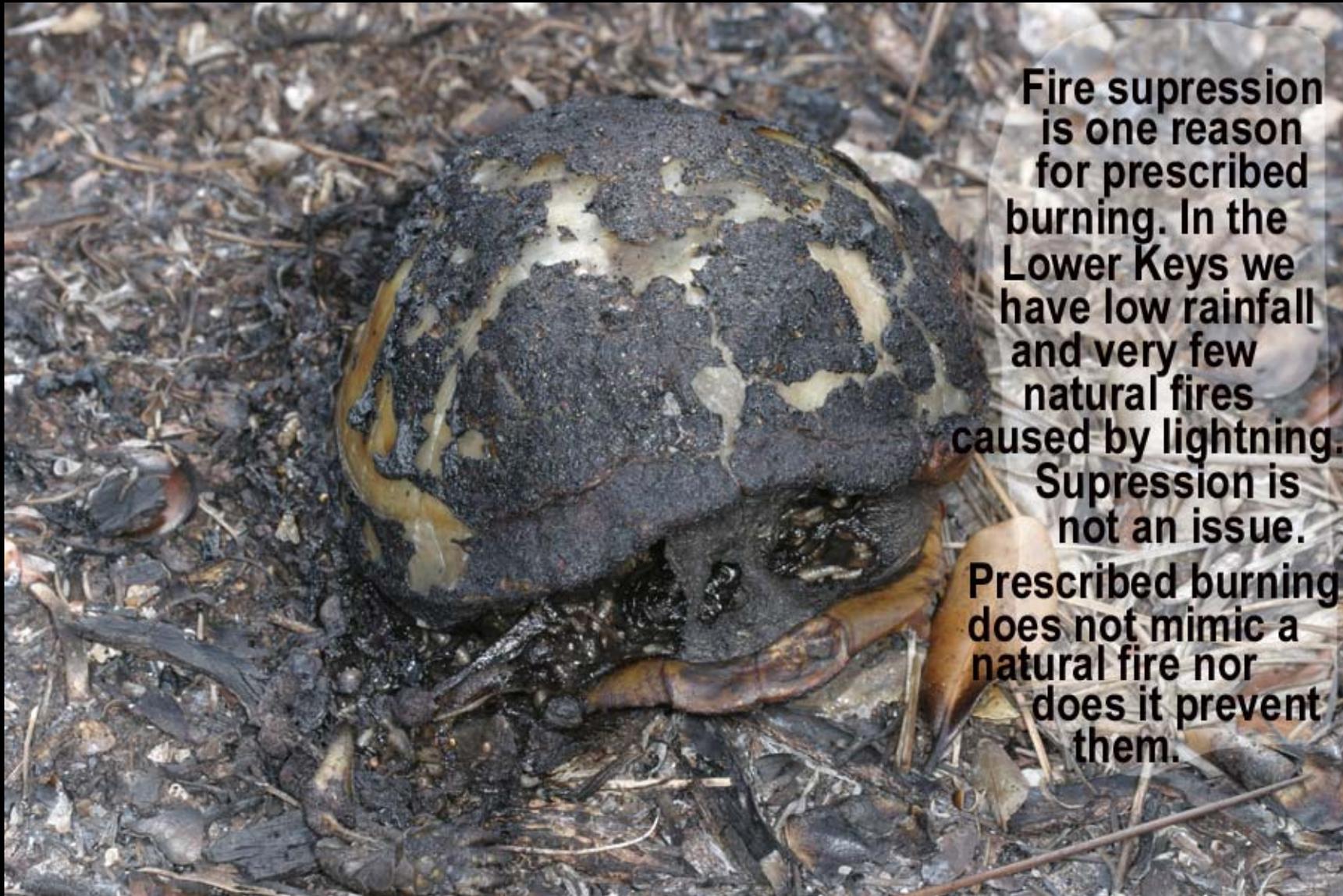
A Florida Box Turtle Burns to death



Methods used for burning included dropping fuel filled balls from aircraft. This practice gives wildlife no chance of escape from the extreme heat.

Many dead turtles were found near or in solution holes trying to escape. Even their safe places were scorched.





Fire suppression is one reason for prescribed burning. In the Lower Keys we have low rainfall and very few natural fires caused by lightning. Suppression is not an issue. Prescribed burning does not mimic a natural fire nor does it prevent them.



**All elements
play an
important
role in a
healthy
ecosystem.**

**Nature decides
when to burn
when to water
and has done
so for
thousands of
years without
the help of
man.**



Cerion Snails die in the burn



A female Box Turtle had her shell burned and her back feet burned off. She is egg laden and unable to dig a nest. With help, she deposited her eggs in a man made burrow.



A male box turtle
with both back feet
burned off.

**The future of our Pine Rockland
is not in our hands.**

**We cannot control hurricanes,
floods, sea level rise, drought,
or fire.....**



**the responsibility of being
prepared is.**

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The prescribed burning
of 2003 and 2004
resulted in large areas
of stressed Pine Rockland
habitat on Sugarloaf,
Cudjoe and Big Pine Key.
Many acres of Pines
died in these burns.

And then there was Rita,
Katrina, Dennis, and
Wilma.....

October 25, 2005 The surge from hurricane Wilma covered our islands with salt water.



After Wilma a heavy layer of salt penetrated our pinelands. Pines and other trees will die for many years to come as this salt is taken up. This was very evident in 1998 and years after Georges.



Taken 5/11/2006 Seven months after Wilma and almost no rain, salt still covers the cap rock on Big Pine Key.

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1/2/06

Photo -Sugarloaf

During Wilma, A storm surge
of 8 feet inundated the islands.
Seaweed line in trees can be
seen over my head.

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1/2/06 Sugarloaf



1/2/06 Sugarloaf



A Key Deer is thirsty and hungry during the 6th month of drought following Wilma.

4/26/06

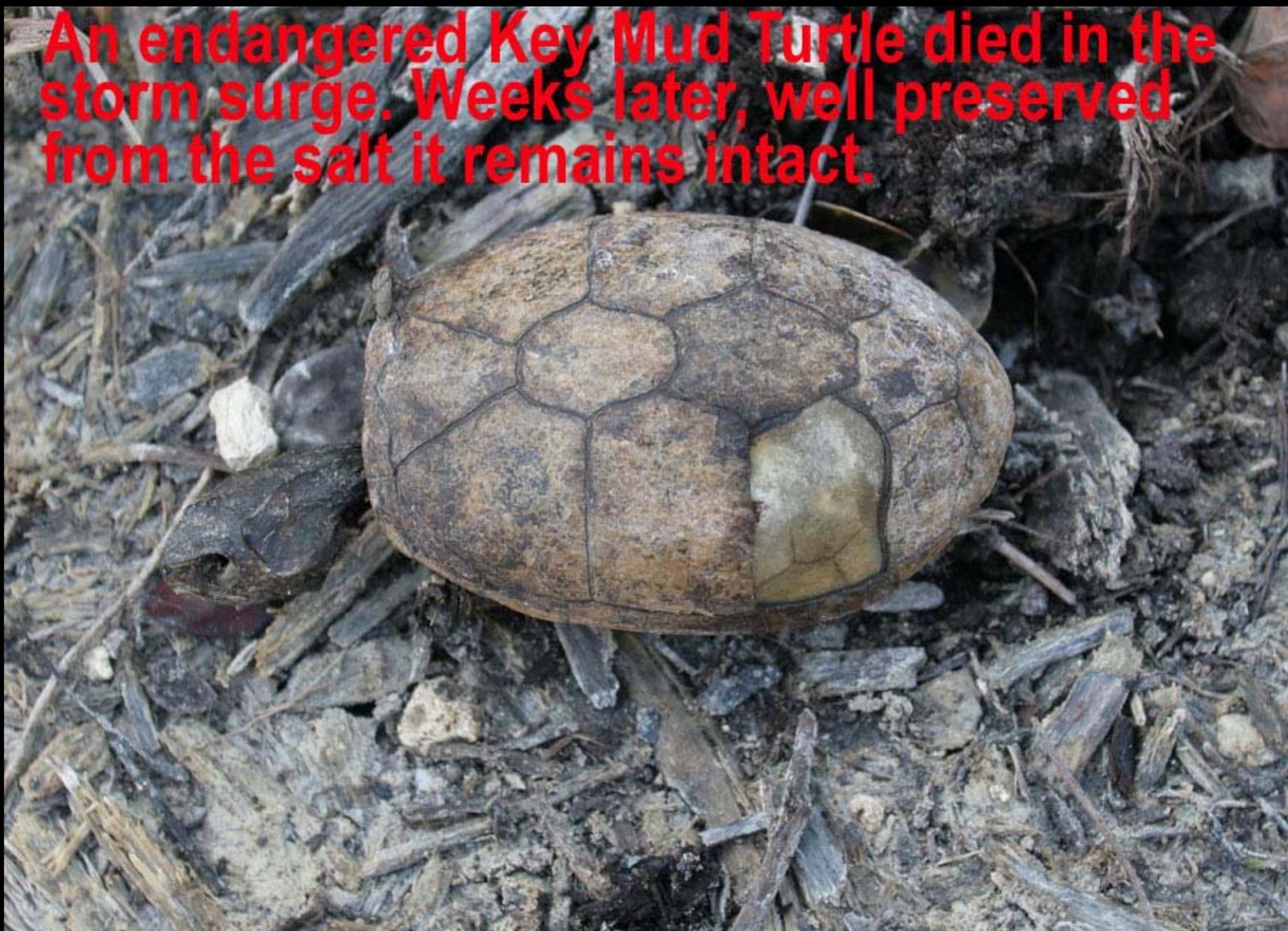


During the many months of drought many animals died. There was no fresh water after the storm surge. This Doe died trying to give birth.

This Box Turtle shows the scars of surviving a fire but sadly died in the storm surge.



An endangered Key Mud Turtle died in the storm surge. Weeks later, well preserved from the salt it remains intact.





This young fawn rests on the sea floor after being washed away in the surge.

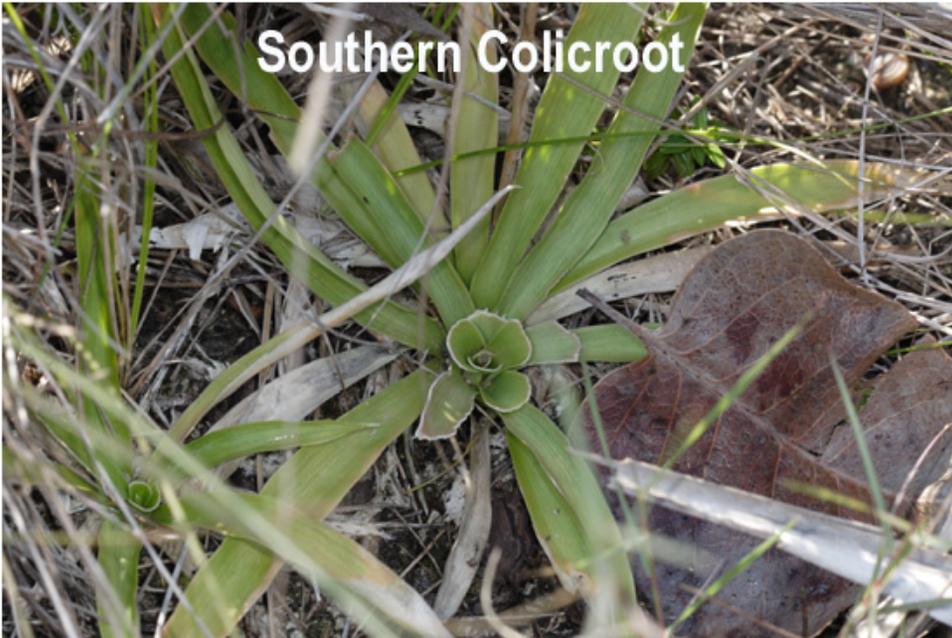
Since 2003 our Pine Rockland habitats have endured:

- *4 Large Prescribed Burns
- *Effects from hurricanes, including Dennis, Katrina, Rita and Wilma.
- *Storm surge covered most of the middle and lower Keys inundating them with salt water in 2005.
- *Almost eight months of drought following Wilma.

There are no longer Pine Rocklands on Sugarloaf and Cudjoe Key. Only a small fraction remains on Big Pine Key.

With little left for deer to eat,
native vegetation faces further
stress from over browsing by a
deer population well beyond habitat
capacity.



A close-up photograph of a Southern Colicroot plant. The plant has a central rosette of broad, green, lanceolate leaves. A small, green, tubular flower is visible in the center of the rosette. The plant is growing in a natural setting with dry grass and other vegetation.

Southern Colicroot

A photograph of a Saw Palmetto plant. The plant features several fan-shaped, green leaves radiating from a central point. The ground is covered with dry, brown pine needles and other forest debris.

Saw Palmetto

**A sample of plants
browsed by deer.**

When habitat shrinks and deer populations are over capacity the plant community is threatened. Airplants and orchids have been greatly impacted by browsing deer. Palms have also been browsed such as this Saw Palmetto top right.

A photograph of a Tillandsia plant, also known as an airplant. The plant has a cluster of long, narrow, green leaves. It is growing on a forest floor covered with dry leaves, twigs, and other organic matter.

Tillandsia

The only Key in which Pineland Croton can still be found is on Big Pine Key. Deer have been browsing this plant in some areas of Big Pine.

This is the host plant for the vanishing Florida Leafwing butterfly and the Bartram's Scrub Hairstreak butterfly.

There have been no Leafwing butterflies seen since hurricane Wilma and only a few Bartram's Hairstreaks.

Very rare

This tiny orchid was eaten to the ground shortly after this photo was taken.

Southern Ladies'-tresses orchid
Spiranthes torta

Pineland Croton



Sabal palmetto



More plants deer are impacting.

Green Antelopehorn is extremely rare, after many years of searching I only know of two. This plant is toxic to livestock yet, shortly after this photo was taken a deer ate this plant.



Green Antelopehorn
Asclepias viridis

Snowberry
Chiococca alba



Leather Fern



Our vanishing Flora and Fauna

**A brief look at the rare
and the endangered....**

**Endangered Stock Island Tree snails
*Orthalicus reses reses***



Key Ringneck Snake

Diadophis punctatus acricus



Ventral View

Penninsula Ribbon Snake



Key Mud Turtle
Endangered



Native Green Treefrog

Hyla cinerea



**Florida Leafwing
butterfly**

No sightings since hurricane Wilma

**Candidate for
endangered
listing.**



Nickerbean Blue
No sightings since hurricane Wilma



Host Plant: Acacia

Candidate for endangered listing



**Bartram's-scrub Hairstreak ovipositing
on Pineland Croton.**

COPYRIGHT 2004 Paula Cannon/ Bartram's Scrub Hairstreak

Miami Blue
nectaring on
host plant.



Host Plant: Blackhead



Evolvulus grisebachii

Florida Keys Sandmat
Chamaesyce deltoidea



Pine Pink
Bletia purpurea



Butterfly Orchid
Encyclia tampensis





Sand Flax
Linum arenicola

Big Pine Partridge Pea
Chamaecrista lineata



Small Butterwort
Pinguicula pumila



A small carnivorous plant



Black Torch
Erithalis fruticosa

A favorite food of
Key Deer and White-
Crowned Pigeons
Little is left on Big Pine Key

Part #2

Effects of hurricane Wilma

The following is part of an ongoing photographic documentation study which I began shortly after hurricane Wilma.

Locations were selected and photographed and then reshot several times periodically.

The changes are dramatic and all areas photographed continue to show a decline.

Here are a few samples of this work in progress.....

12/14/05 Pompano S.



12 14 05 Pompano toward watson hammock S.

3/9/07 Pompano S.



3 9 07 Pompano S.



12 14 05 Pompano toward section home A S.

12 14 05 Pompano S.



3 9 07 Pompano S.

3 9 07 Pompano S.

3/16/05 N. end KDB W. side before Watson Hammock



3/9/07





3/24/06 N. of Nature Trail KDB E.



3 24 06 Past nature trail KDB facing E.



3 16 07 past nature trail E. side KDB

3/24/06 N. of Nature Trail KDB E.



3 24 06 Post nature trail KDB facing E.

1 year later



11 10 05

16th St. facing N.

16th st



3 10 07

16th St. facing N. N.40.784 W.21.655



11 10 05 16th St. facing N.

16th st



3 10 07 16th St. facing N. N. 40.784 W. 21.655





7 4 06 KDB N. at Wildwood



3 16 07 KDB N at wildwood



7 4 06

3 16 07

KDB N. at Wildwood



3 16 07 KDB N at wildwood



3/21/05

Little Pine Key



2/22/07

Photo courtesy Anne Morkill

Facing E. from Nature Trail KDB 3/24/06



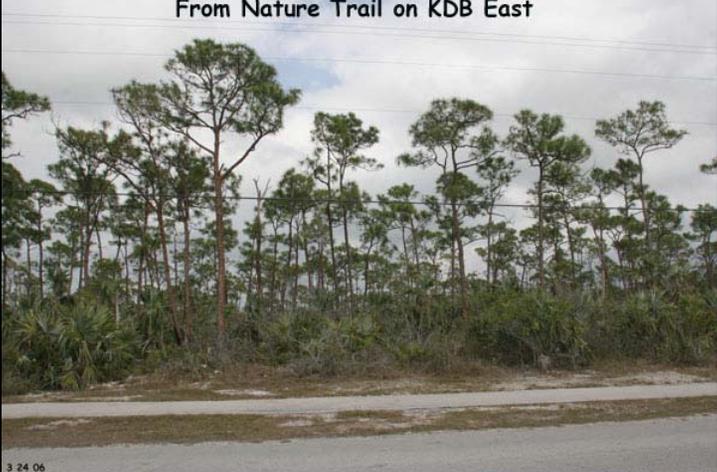
3 24 06



3 10 07 KDB standing between nature trail driveways facing E.

N.42.576
W.22.437

From Nature Trail on KDB East



3 24 06

3 months later



6 29 06 KDB standing between nature trail driveways facing E.

1 year later



3 10 07 KDB standing between nature trail driveways facing E.

N. 42.576
W. 22.437



11/10/05
lyttens way



3/10/07 Lyttons Way



11/10/05
lyttons way
7 4 06



3/10/07 Lyttons Way



lyttons way 11 10 05



3/10/07 Lyttons way

11/10/05



lyttens.wav.11.10.05

7/04/06



7.4.06

3/10/07



3/10/07 Lyttens.wav

11/11/05



11/11/05

N. end KDB E. side

2/8/06



3/9/07 N. end KDB E. side



11/11/05



2/8/06



6/25/06



3/9/07



11 10 05 NE corner watson



WATSON BLVD

National
Key Deer
Refuge

3 10 07 NE corner watson



11 10 05 NE corner watson



11/10/05

3 10 07 NE corner watson



3/10/07

4/5/06 Watson fire break S. end



Notice the breaking down of
dead vegetation. This will
make soil for the future.



3/2/07 Watson S. end

4/5/06 Watson fire break S. end



5 months after Wilma all of these pines are dead.

Notice the breaking down of dead vegetation. This will make soil for the future.



3/2/07 Watson S. end

There will be no more pine seeds produced. The future of the pine rockland habitat is lying on the ground. As more vegetation breaks down a soil layer will be created for these seeds to germinate in. Regeneration will be very slow.

4/5/06

5 months
after Wilma
a seedling
emerges.



Today, March 28, 2007

Almost a year and a half since
hurricane Wilma,
our pines continue to die.

Sequence photos taken since
Wilma document the evidence.

Pine Rocklands that once covered
many islands, are now reduced
to a small remainder here on
Big Pine Key.

Prescribed burning on a stressed,
declining habitat is the wrong
prescription.

It doesn't take a college degree
to figure out that
fire WILL NOT magically cure a
dying Pine Rockland habitat!

Thank you for listening.
The End



A rare Bartram's-scrub Hairstreak rests on it's host plant *Croton linearis*