

# STATUS, TRENDS, IMMIGRATION AND HABITAT USE OF AMERICAN FLAMINGOS (PHOENICOPTERUS RUBER) IN SOUTHERN FLORIDA.

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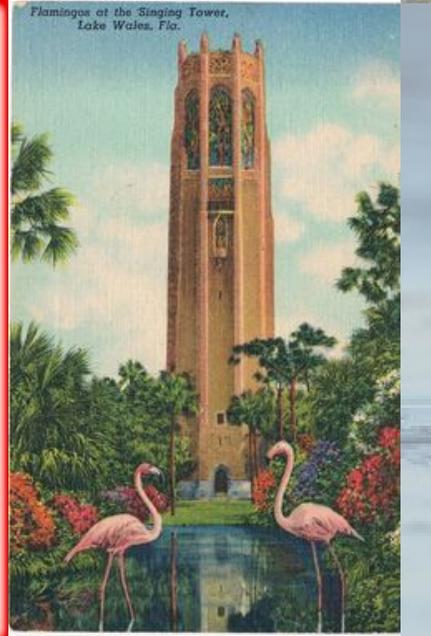
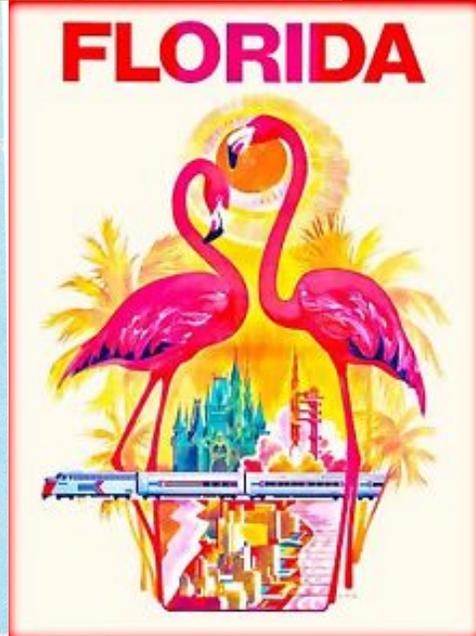
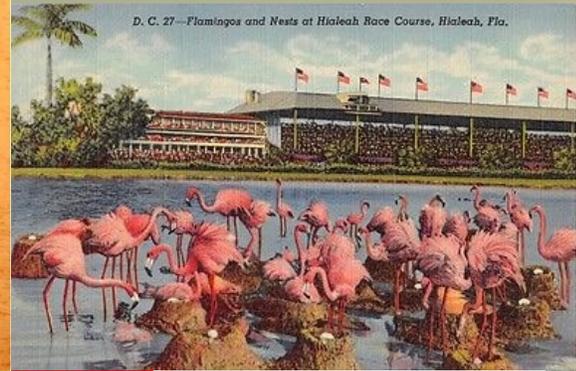
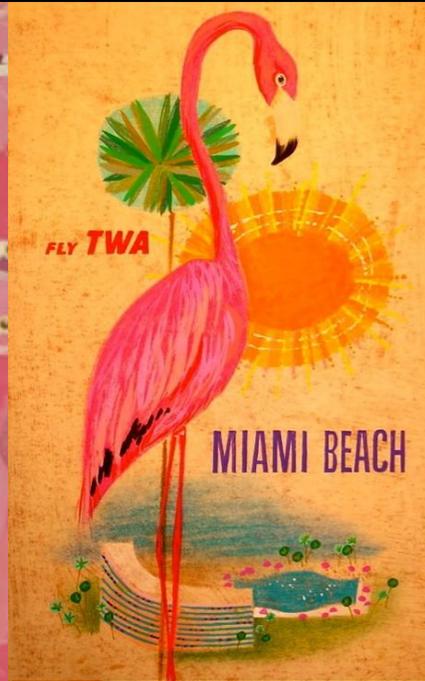
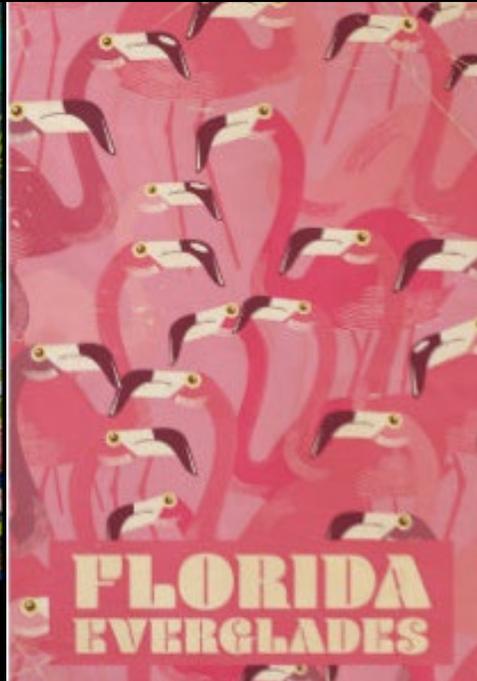
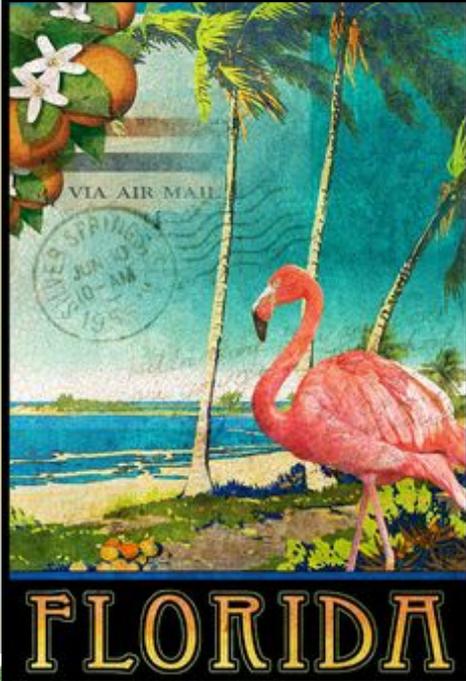
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<sup>5</sup> Big Cypress National Preserve, Ochopee, Florida

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# Florida's Most Iconic Bird?





# Flamingo sighted in Florida Keys – A newsworthy event?



ROB O'NEAL/The Citizen

Servicemen and women at NAS Key West are accustomed to wildlife on and around the airfield on Boca Chica Key, but were surprised to see several flamingos over the past few weeks including this one seen feeding in front of a visiting German Air Force cargo plane.

## Rare flamingo sighting at Boca Chica Field

BY ADAM LINHARDT

They were less common in the

It is even more rare to spot the

# Capture SUCCESSFUL – Named “Conchy”



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## Nonnatives - Greater Flamingo

### Species Profiles

### Managed Species

### Imperiled Species

### Nonnative Species

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### Greater Flamingo - *Phoenicopterus ruber*

[Florida's Nonnative Wildlife. Species detail.](#)

**First year:** 1930's

**Extirpated year:**

**Established status:** Species have populations whose status is unknown.

**Estimated Florida range:** 8 counties Not reported breeding

**Statewide trend:** Unknown status

**Threats to natives:** Unknown

**Species Account:** This species occurs naturally in Florida as a vagrant from the West Indies, Cuba, and the Bahamas. It was formerly abundant in extreme South Florida. However, captive flocks were established in South Florida in the 1930s, and these feral, semi-domestic birds are confused with birds arriving into Florida naturally.

**Habitats:** Estuarine community

County	First Year	Extirpated Year	Breeding status	Notes
Brevard	1992		Not reported breeding	Merritt Island NWR
			Not	

# Historic Accounts of Flamingos in Florida (1827-1902)

Year	Location	Region	Number	Reference
1827	Anclothe Keys	Tampa Bay	3	McCall 1968
1832	Indain Key	Florida Keys	Large Flock	Audubon 1938
1832	Key West	Florida Keys	"a great number"	Audubon 1938
1857	Key West	Florida Keys	>500	Wudermann 1860
1880	Marco Island	Everglades-10,000 Islands	"tens of thousands " mixed flock with Roseate Spoonbills	Ward 1914
1886	Marco Island	Everglades-10,000 Islands	5	Ward 1914
1885	Upper Cross Bank	Florida Bay	2 large flocks	Pierce 1962
Winter 1884-85	Caxambus Bay	Everglades-10,000 Islands	7	Ingraham 1893
Winter 1884-85	East of Cape Sable	Florida Bay	31	Ingraham 1893
Winter 1884-85	Garfield or Snake Bights	Florida Bay	>2500	Ingraham 1893
Winter 1885-86	Garfield or Snake Bights	Florida Bay	1000	Ingraham 1893
Winter 1886-87*	Garfield or Snake Bights	Florida Bay	No Estimate	Ingraham 1893
1890	Garfield or Snake Bights	Florida Bay	>1000 (50 juv)	Scott 1890
1902	Garfield or Snake Bights	Florida Bay	500-1000	Howe 1902

Single feathers were used or the whole back skin of the bird with its valuable breeding plumes were fashioned into hats.



1904 American ladies hats



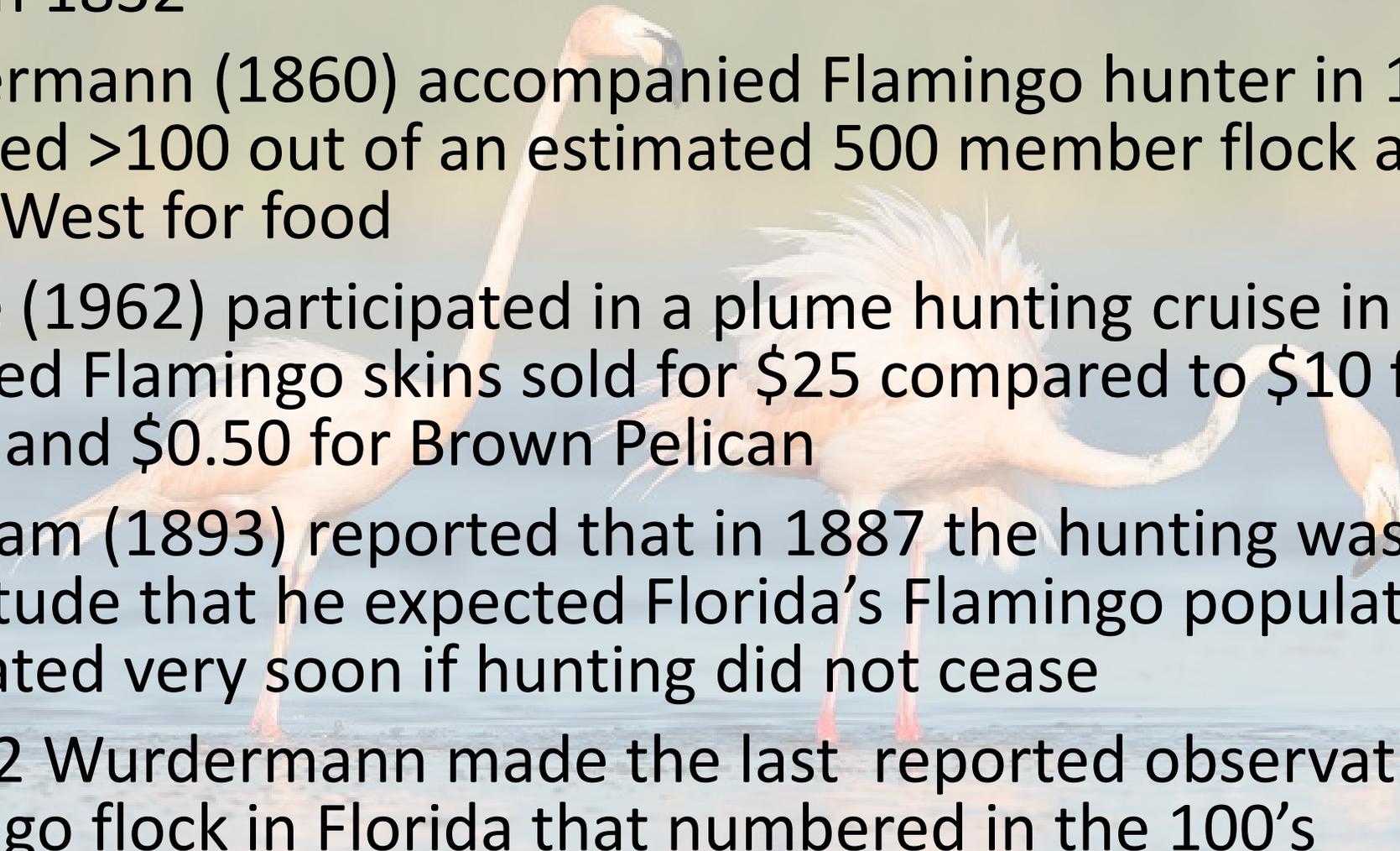
1910 hat



Snowy Egret back skin and plumes

# Hunted to Extirpation in Florida

- Audubon (1839) stated that they were hunted for food by locals in Key West in 1832
- Wurdermann (1860) accompanied Flamingo hunter in 1857 who collected >100 out of an estimated 500 member flock and sold them in Key West for food
- Pearce (1962) participated in a plume hunting cruise in 1885 and reported Flamingo skins sold for \$25 compared to \$10 for Great White Heron and \$0.50 for Brown Pelican
- Ingraham (1893) reported that in 1887 the hunting was of such a magnitude that he expected Florida's Flamingo population to be extirpated very soon if hunting did not cease
- In 1902 Wurdermann made the last reported observation of a Flamingo flock in Florida that numbered in the 100's



# Historic Accounts of Flamingos in Florida (1905-1939)

Year	Location	Region	Number	Reference
1905	Lake Worth	Everglades -East Coast	1	Ryman 1908
1906	Upper Matecumbe Key	Florida Keys	1	Broadhead 1910
1923	Flamingo Bank	Florida Bay	3	Holt 1924
1927	Wakulla County	Panhandle	1	Stoddard 1928
1930	Tamiami Trail-Miami	Everglades	2	Howell 1932
1931	Card Sound Bridge	Florida Bay	14	Howell 1932
1932	Clive Key	Florida Bay	1	Holt 1933
1932	Buzzard Key	Everglades-10,000 Islands	4	Holt 1933
1936	Hobe Sound	Evevrglades East Coast	1	Howell 1937
1936	Upper Keys	Florida Keys	1 (4 times)	Sprunt 1937
1938	Tavernier	Florida Keys	1	Sprunt 1939
1938	Bottle Key	Florida Bay	1	Sprunt 1939
1938	Boca Chica	Florida Keys	4	Sprunt 1939
1938	West Lake	Florida Bay	2	Stimson 1939
1939*	West Lake	Florida Bay	1	Stimson 1939

\*Stimson reported that the other bird observed in 1938 had been shot by a hunter

# Museum Specimens – Physical Evidence for Presence

Specimen Number	Collector	Date
ANSP 6116	ND	ND
USNM 8693†	Gustavus Wurdemann	06 August 1857
USNM 8694†	Gustavus Wurdemann	06 August 1857
USNM 8695†	Gustavus Wurdemann	06 August 1857
USNM 8696†	Gustavus Wurdemann	06 August 1857
USNM 8698	Gustavus Wurdemann	06 August 1857
UMMZ 20587	Gustavus Wurdemann	06 August 1857
MCZ 2746	J.E. Mills	06 March 1858
MCZ 2747	J.E. Mills	06 March 1858
MCZ 100685	Charles J. Maynard	01 May 1870
USNM 202641	Pierre Louis Jouy	1874
USNM 84693	J. Scholl	Summer 1874
MCZ 229360	William E. D. Scott	25 February 1890
MCZ 229361	William E. D. Scott	25 February 1890
FMNH 47680	ND	Before 1893
MCZ 301212	O. Tollin	01 March 1898
MCZ 315289	“Howe-Shattuck Collection”	26 March 1902
UF 19297	John Thomas	October 1904
ISM 600369	ND	Before 1918*



- \*Last entry (1918) date is only an estimate
- We found no other museum specimens after the estimated 1918 date until 1948
- Four other museum specimens since 1948 in 1973, 2 in 1974 and one in 2011

# Evidence of Reproduction in Florida



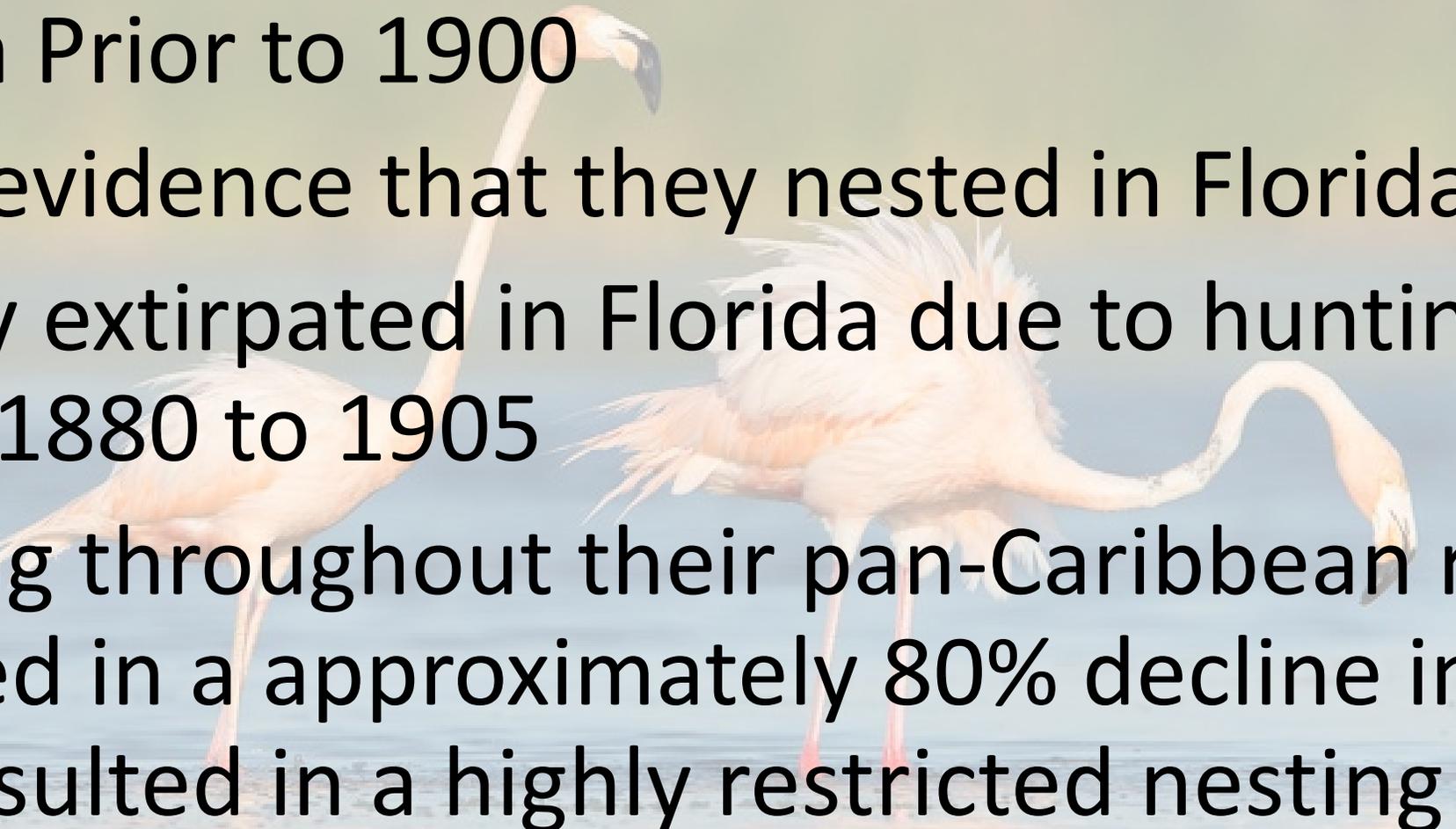
- We found four egg specimens in museums attributed with being collected in Florida
  - On one the date of collection was not listed the others were collected in 1884, 1886, 1887
- Sprunt (1937) reported a credible but controversial account of 40 to 50 nests on Sugarloaf Key in the Lower Keys in 1901
- Scott (1890) reported that ovaries from 3 females taken near Cape Sable were estimated 4 or 5 weeks from laying

American Flamingo. *YPM 149176*  
A. O. U. No. 182. *Phoenicopterus ruber*.  
Florida Keys. *June 15 - 1884*  
No. of Eggs in Set. 1 or 2  
Loaned by *E. Wilkinson*.

# Range-wide declines due to hunting

- Allen (1956) estimated that a minimum of 95,000 Flamingos nested at 28 population units throughout the Pan-Caribbean region historically (prior to wide-spread hunting between 1880 and 1903)
- Based on estimate that Allen (1956) did himself or commissioned to be done he concluded that in 1955 there was a total of 21,500 Flamingos nesting at 4 locations throughout the Caribbean range
- 77% decline in numbers and 85% decline in nesting populations
- He indicated that the 4 remaining nesting populations were under protection from hunting in varying degrees and that the population was stable with some indication that it was increasing with high nesting success rates

## Conclusions from Historical Investigation

- Flamingos naturally occurred in large numbers in Florida Prior to 1900
  - Some evidence that they nested in Florida
  - Largely extirpated in Florida due to hunting from about 1880 to 1905
  - Hunting throughout their pan-Caribbean range resulted in a approximately 80% decline in numbers and resulted in a highly restricted nesting range compared to historical estimates
- 
- A photograph of two pink flamingos standing in shallow, rippling water. The flamingo on the left is facing right with its long neck extended upwards. The flamingo on the right is facing left with its neck curved downwards. The background is a soft, out-of-focus blue and white, suggesting a bright, open environment.



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## Nonnatives - Greater Flamingo

Species Profiles

Greater Flamingo - *Phoenicopterus ruber*

# Then why considered a non-native species in Florida?

### Invasive Species

### What Can I Do To Help

### Links

### Mammals

### Birds

- Abdims Stork
- Abyssinian Ground-Hornbill
- African Gray Hornbill
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# Hialeah Race Track

- In January 1931 20-30 American Flamingos were imported from Cuba and released. They were not pinioned and left the site the day after introduction.
- Additional Flamingos were imported, pinioned and began breeding in 1937 fledging about 65 chicks per year from 1942 into the early 1950's
- In 1956 Allen estimated 750 Flamingos, 150 fully flighted
- Currently there are about 300 Flamingos that are all fully flighted and have been observed at various locations near the race track

# Escapes from Captive Colonies

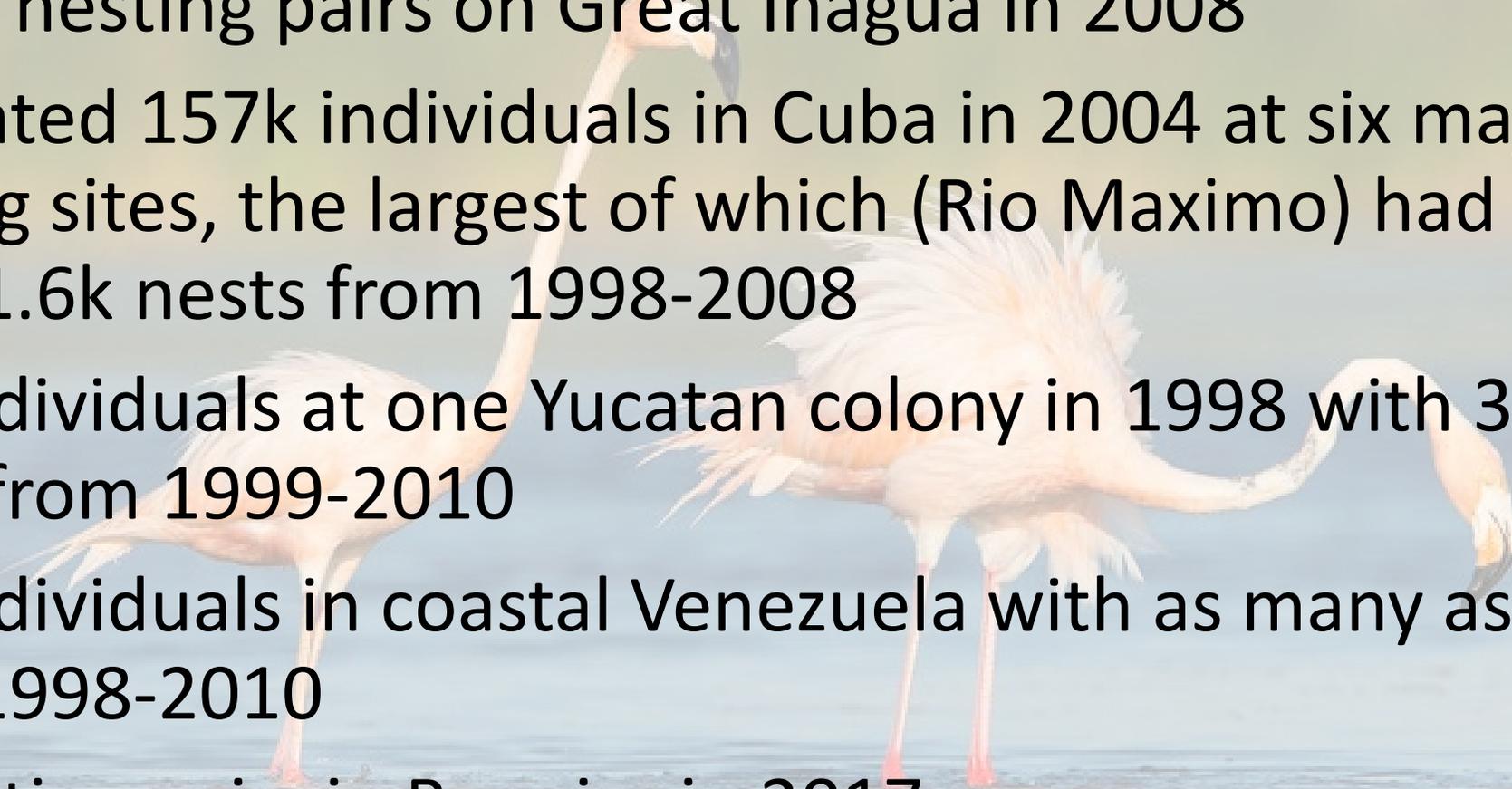
- At least 40 American, Chilean and Greater Flamingos were released at Bok Tower Gardens (Lake Wales, FL) between 1925 and 1940.
- At Least one escaped in December 1927 indicating that at least some of the Flamingos were not pinioned
- Bailey (1928) reported that a single Flamingo observed in Wakulla County (Florida Panhandle) was an escapee from Bok Tower Gardens
- The Bok Tower Flamingos suffered high mortality from cold weather and predation and the last one died on site in 1944

# Non-Native Status Imbedded in the Scientific Lexicon

- Allen (1956) concluded that individuals or pairs of Flamingos infrequently observed in the 1940's and 1950's were ALL escapees based on:
  - the absence of observations of Flamingos in Florida from 1930-1940
  - The coincidence of them reappearing at the same time as Bok Tower, Hialeah Race Track and 12 additional captive populations were established in Florida
  - The low numbers of the remaining Flamingos at nearby nesting locations of Abaco and Cuba
  - The long distance to the larger remaining nesting populations on Inagua and the Yucatan
- Reinforced through time as Allen's conclusion was recited.

# Range-wide Recovery

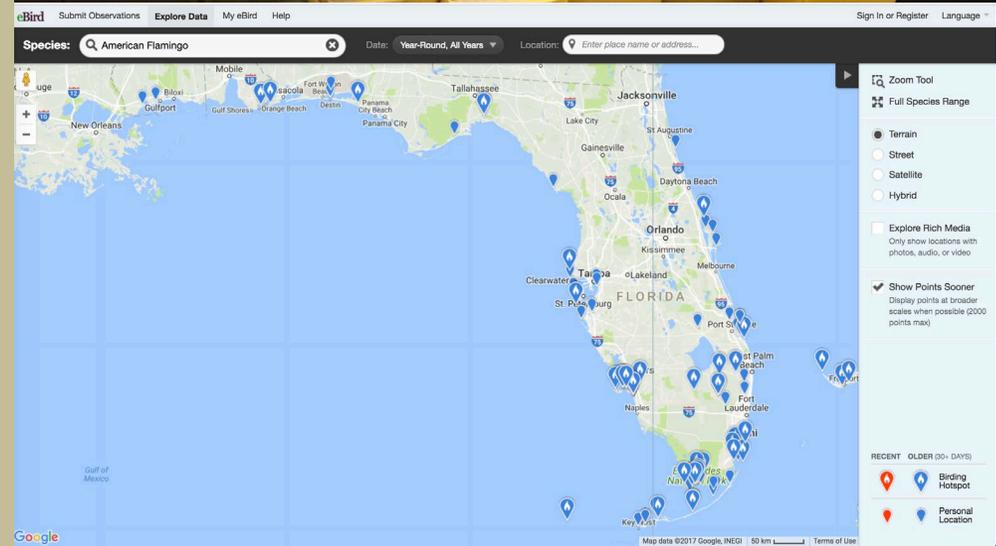
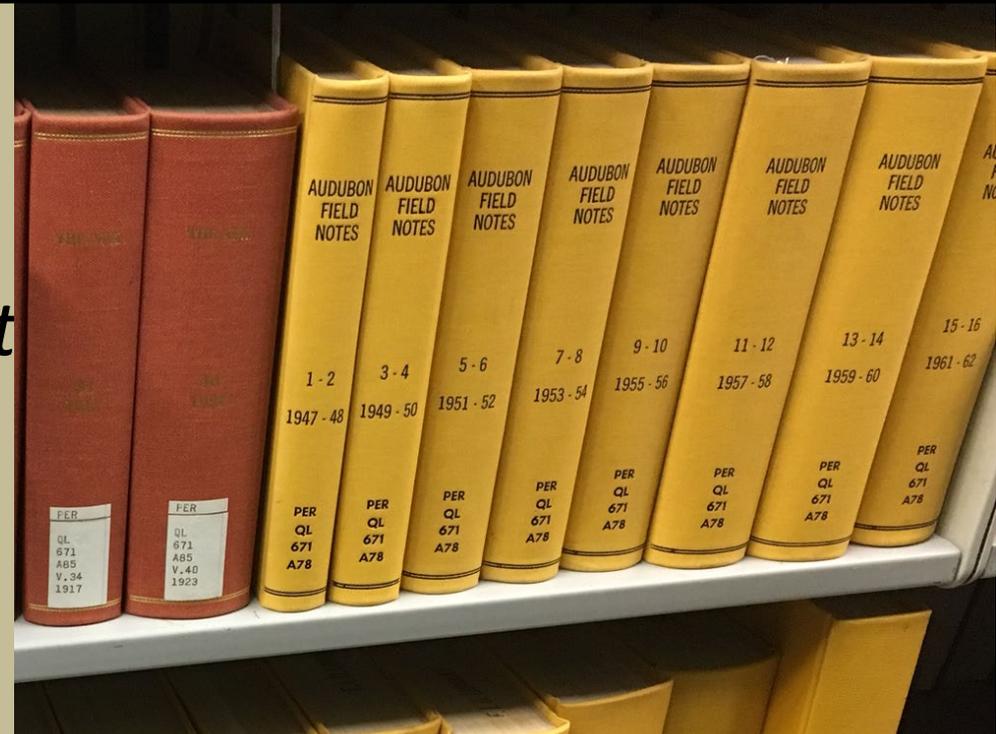
- Bird Life International estimated 260k to 330k individuals in 2016
- >8000 nesting pairs on Great Inagua in 2008
- Estimated 157k individuals in Cuba in 2004 at six major wetland nesting sites, the largest of which (Rio Maximo) had between 22k and 51.6k nests from 1998-2008
- 27k individuals at one Yucatan colony in 1998 with 3.5K to 12.5k nests from 1999-2010
- 37k individuals in coastal Venezuela with as many as 11k nests from 1998-2010
- 7k nesting pairs in Bonaire in 2017



# Population Increases in Florida 1950-2015?

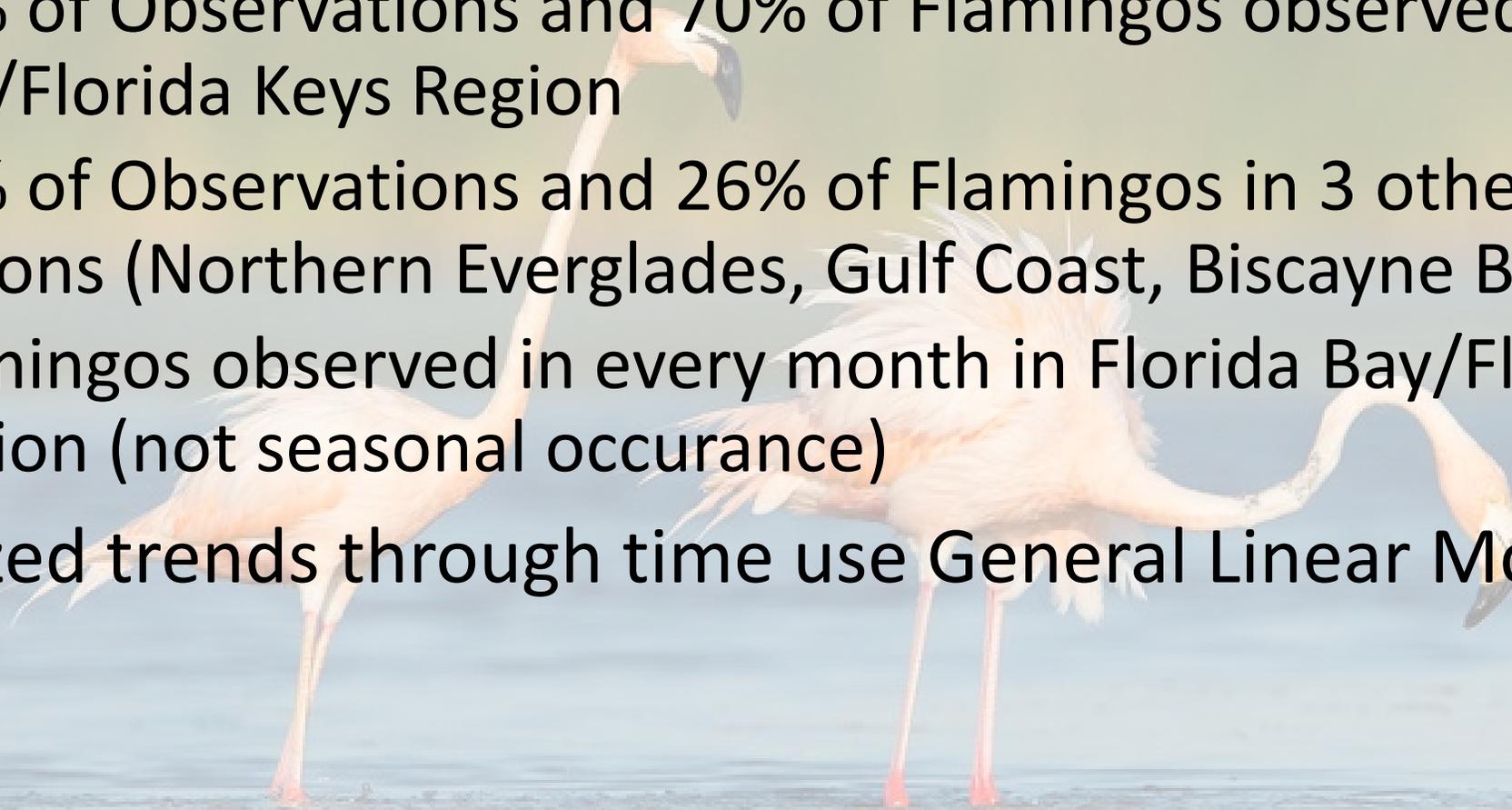
## Data Sources:

- Audubon's Christmas Bird Count
- *Audubon Field Naturalist*, *American Birds*, *Florida Naturalist* all report occasional rare bird reports
- eBird is an online portal
- EDDMapS is an online reporting system for Invasive species
- P. Frezza began documenting Flamingo sightings in Florida in 2000 from Pers. Obs, coworkers, collaborators and fishing guides



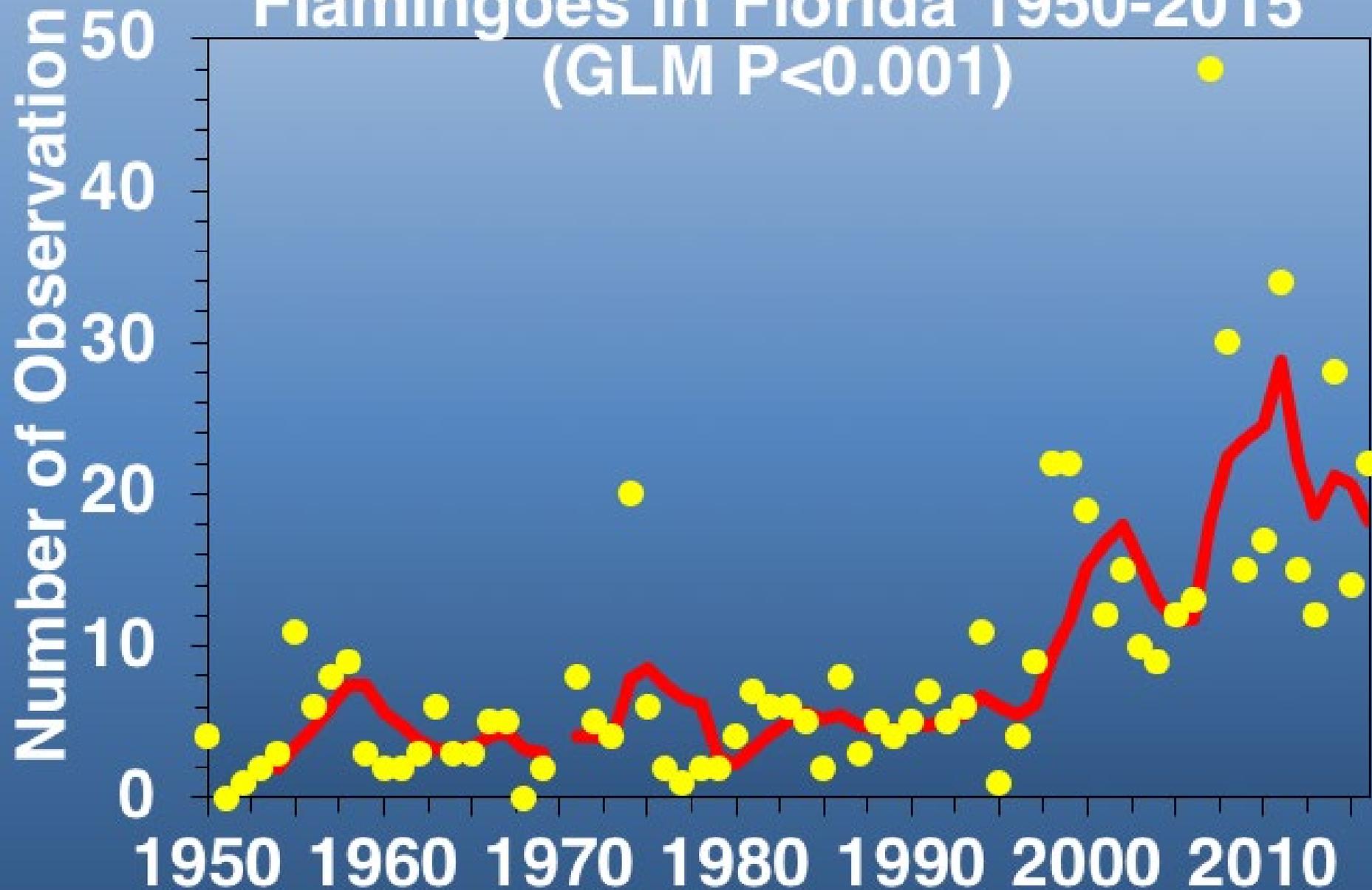
# Results of Data Search

- 495 observations of 3119 Flamingos
  - 60% of Observations and 70% of Flamingos observed in Florida Bay/Florida Keys Region
  - 26% of Observations and 26% of Flamingos in 3 other Everglades regions (Northern Everglades, Gulf Coast, Biscayne Bay)
  - Flamingos observed in every month in Florida Bay/Florida Keys Region (not seasonal occurrence)
- Analyzed trends through time use General Linear Models (GLM)

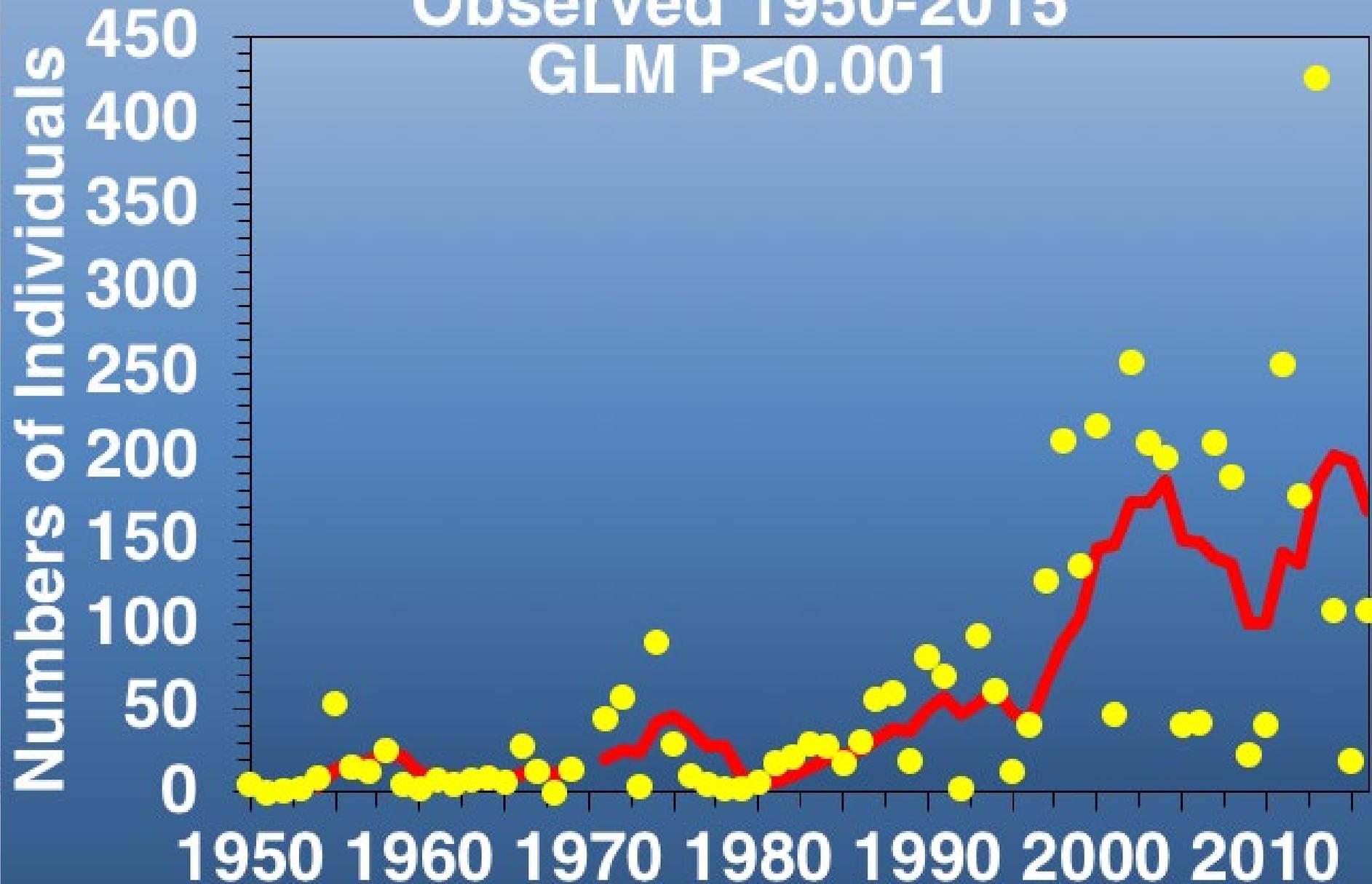


# Number of Observations of Flamingoes in Florida 1950-2015

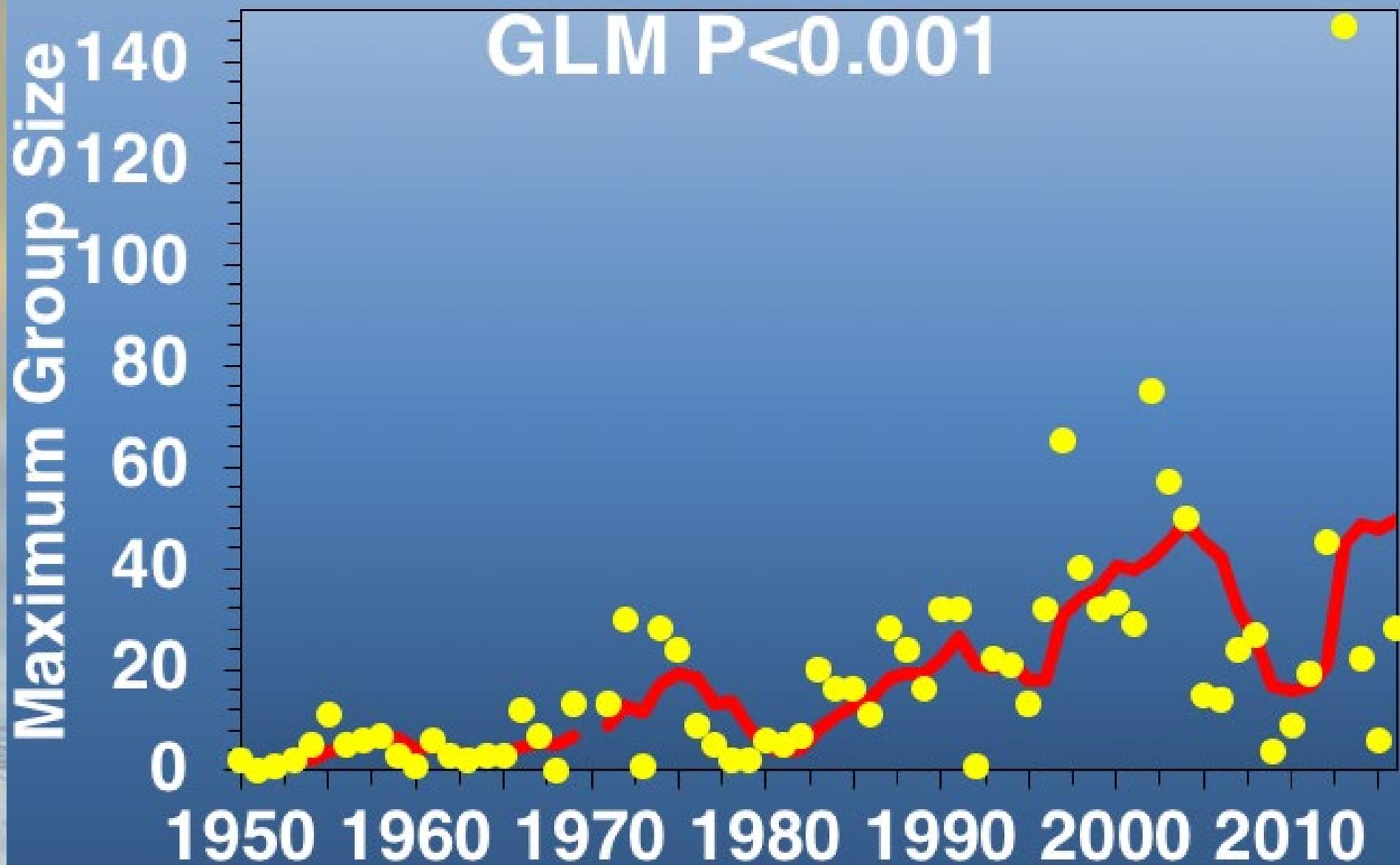
(GLM  $P < 0.001$ )



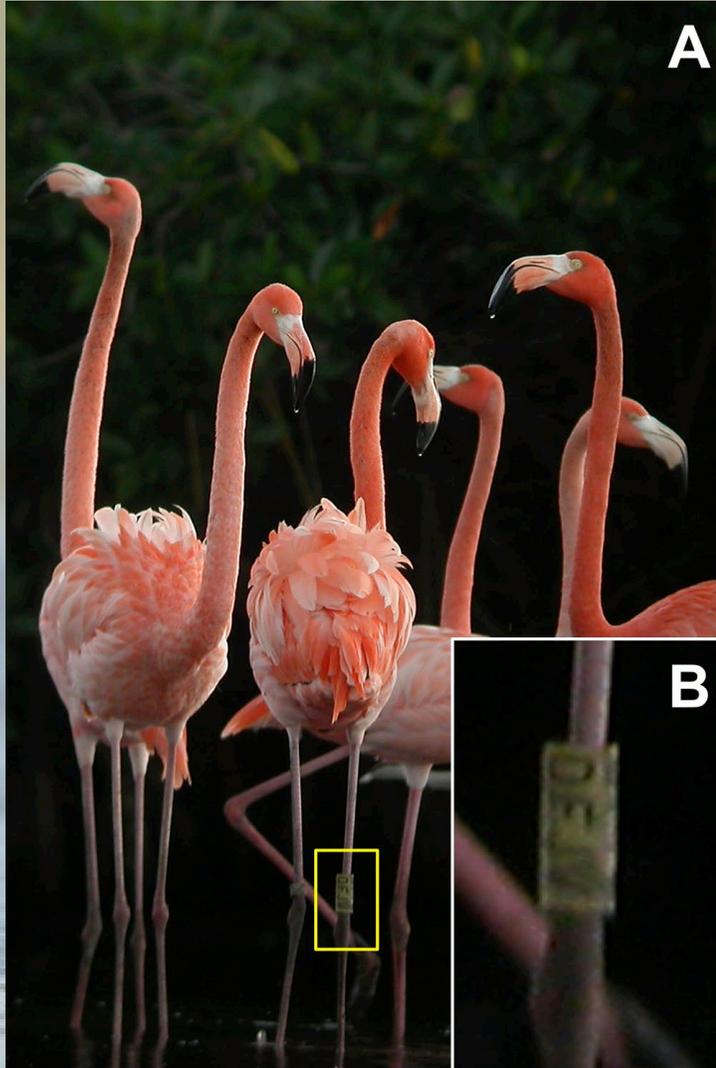
# Total Number of Flamingos Observed 1950-2015



# Maximum Flock Size 1950-2015



# Two American Flamingos Banded in Yucatan Mexico Photographed in Florida Bay



DFJV, Dec 2002



HRTJ, Sept 2010



# Science informs policy (and has impact, sometimes)



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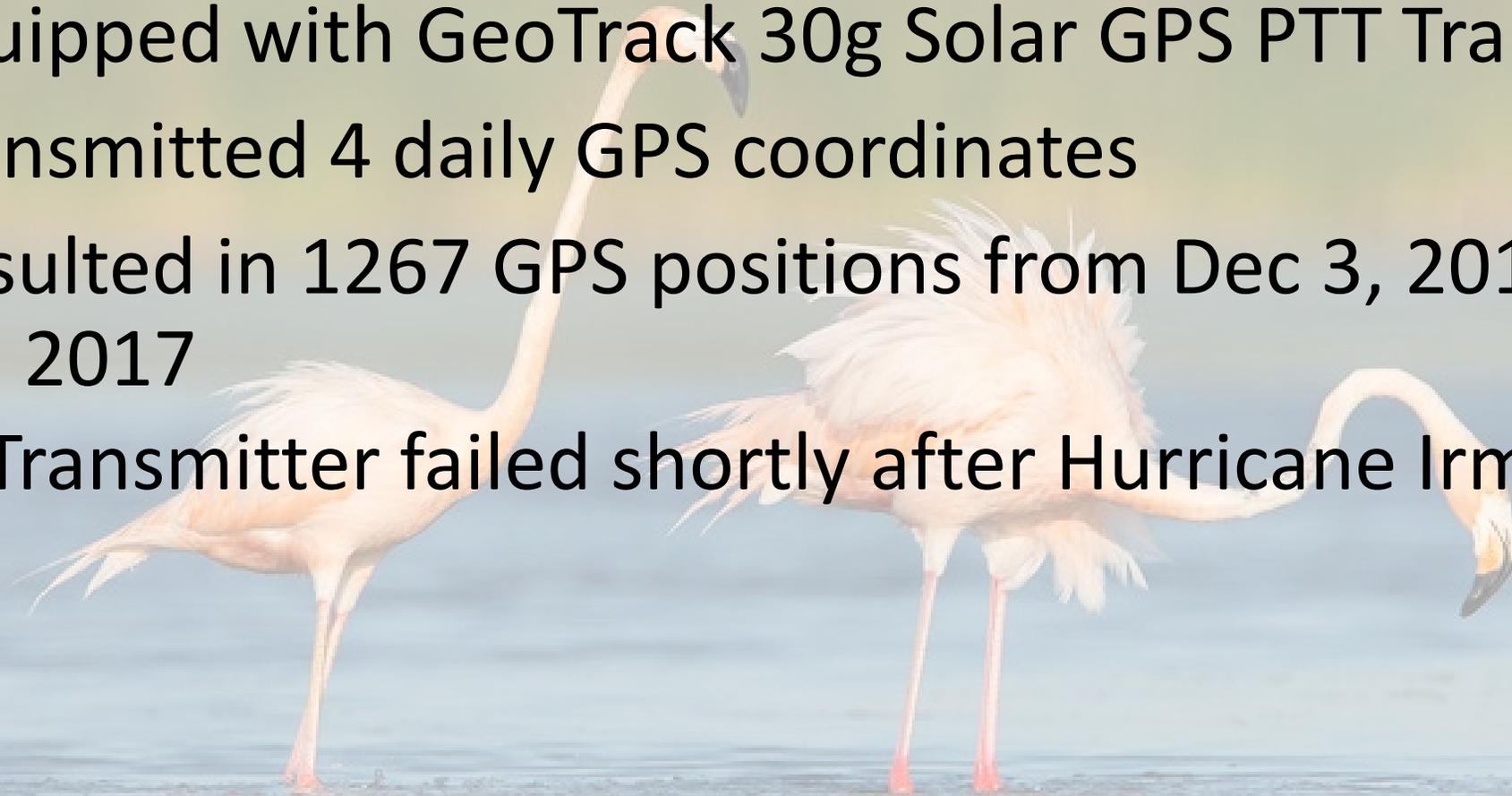
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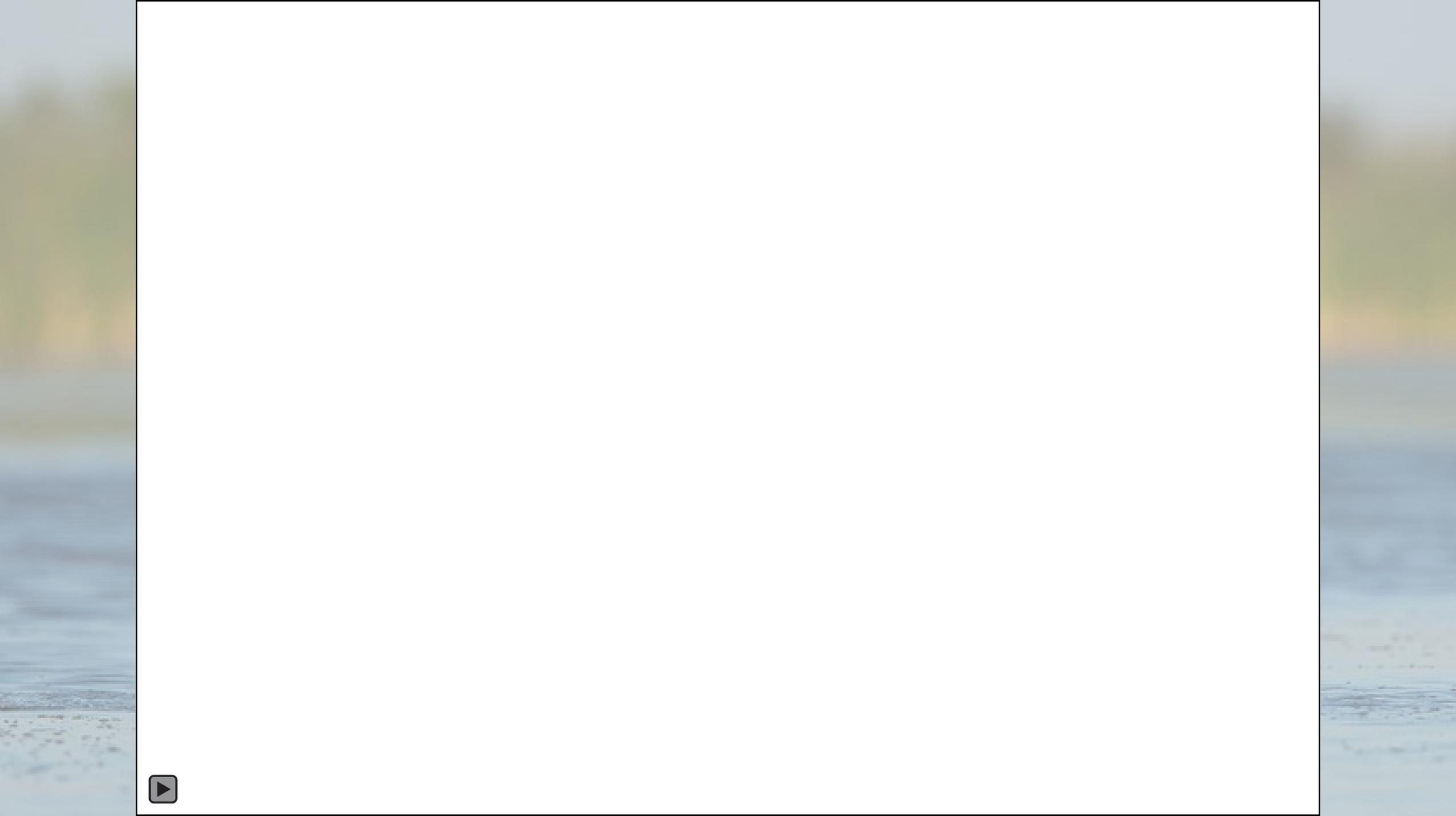
- [Alligators](#)

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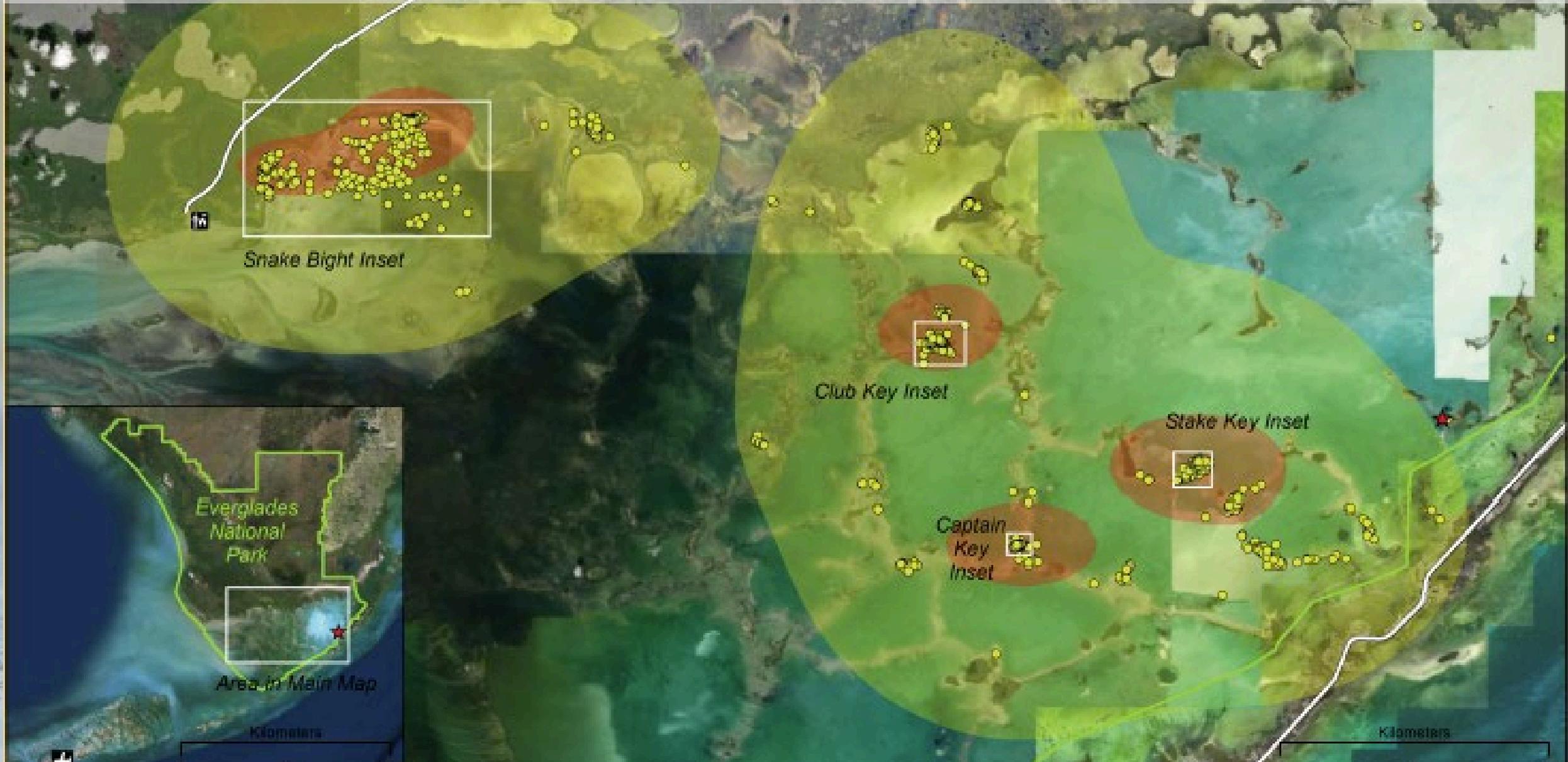
# Satellite Tracking

- Conchy released Dec 3, 2015
- Equipped with GeoTrack 30g Solar GPS PTT Transmitter
- Transmitted 4 daily GPS coordinates
- Resulted in 1267 GPS positions from Dec 3, 2015 to Sep 12, 2017
  - Transmitter failed shortly after Hurricane Irma

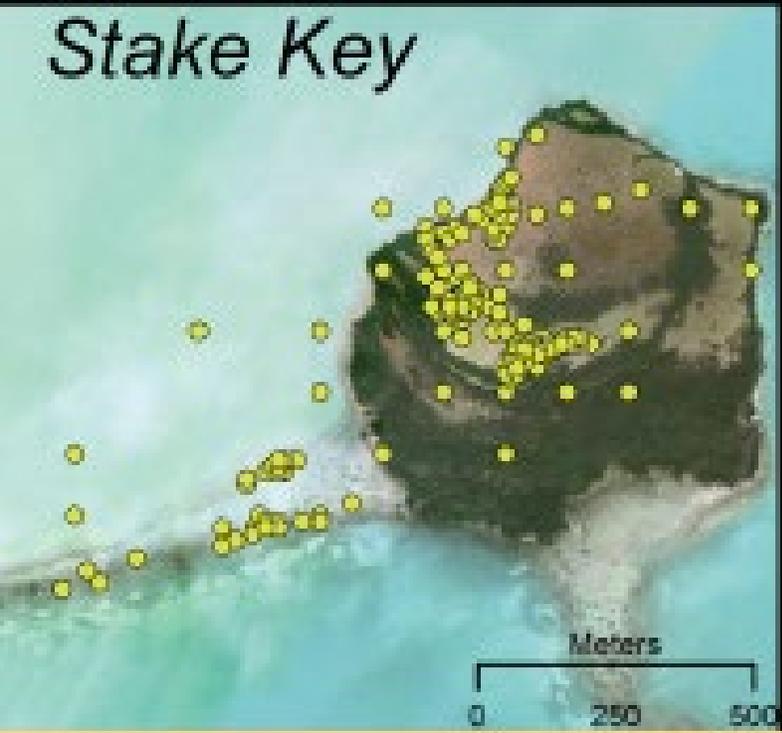




# Core Area Analyses: Relied on 4 major areas over 661 days



Stake Key



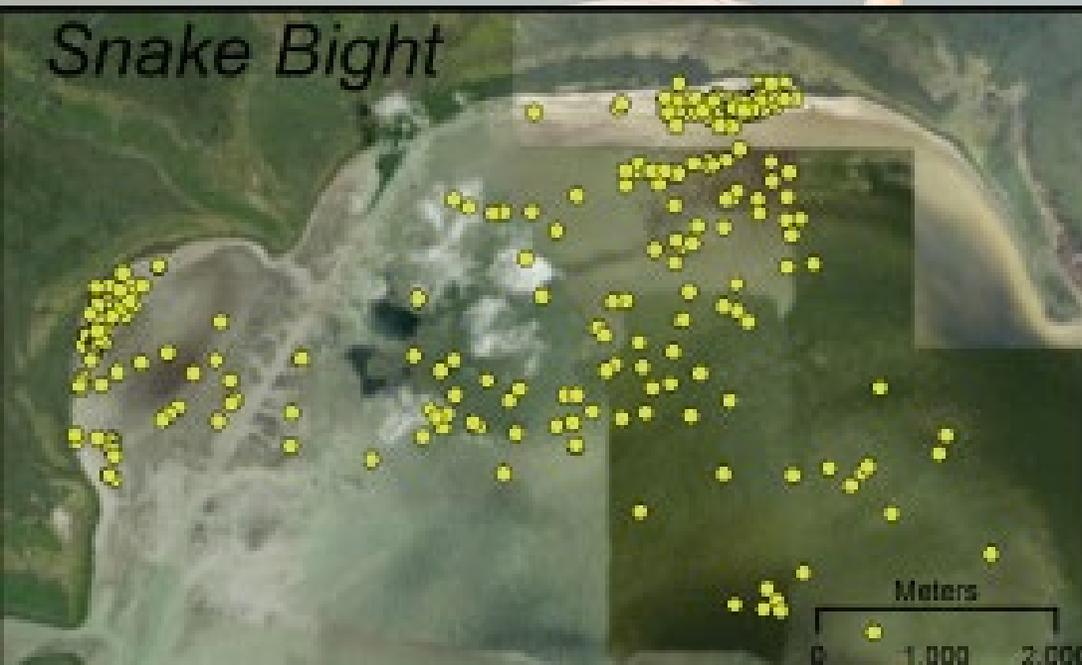
Club Key



Captain Key

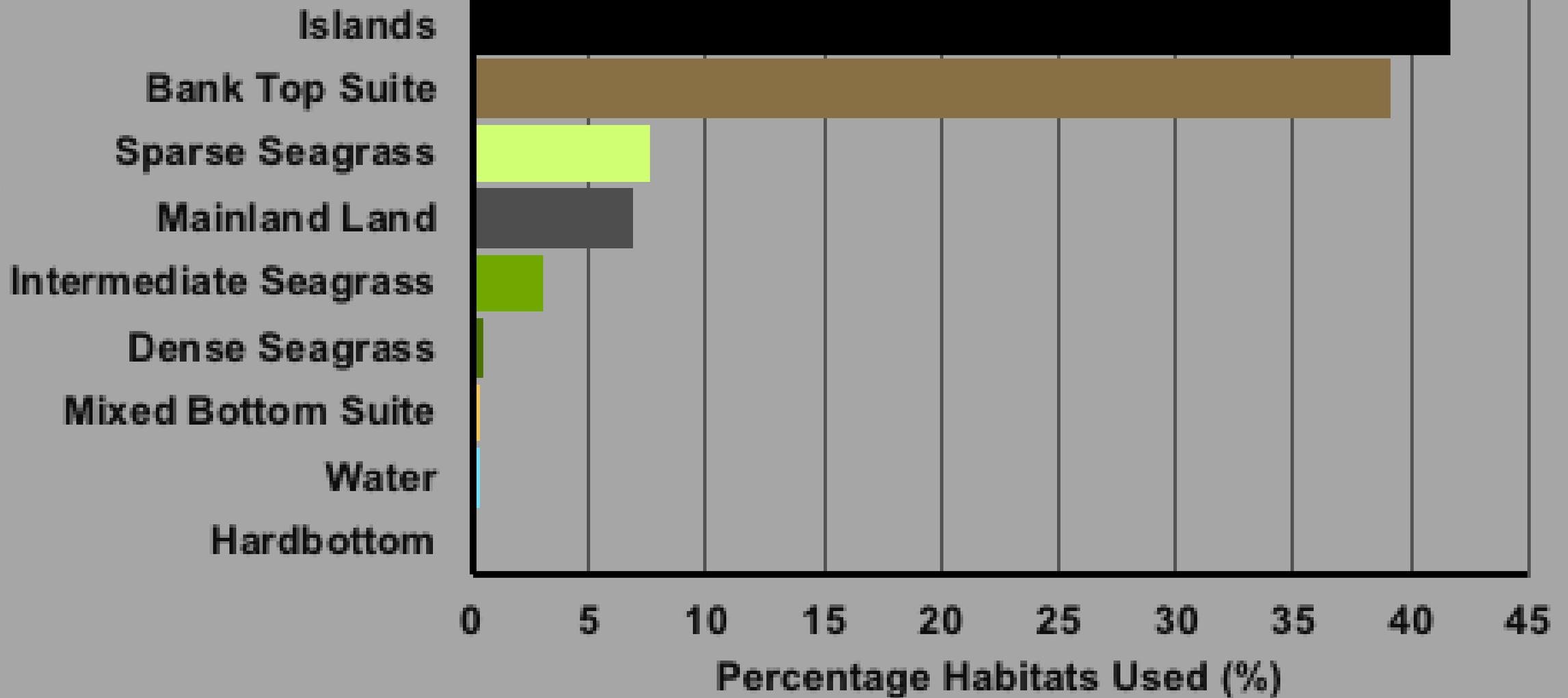


Snake Bight



Conchy used habitats where detection probability by humans was low. Flamingos were reported on ebird only 15 times in 661 d and 13 of 15 reports were from Snake Bight.

Habitat Type (SOFIA Florida  
Bay Bottom Type)

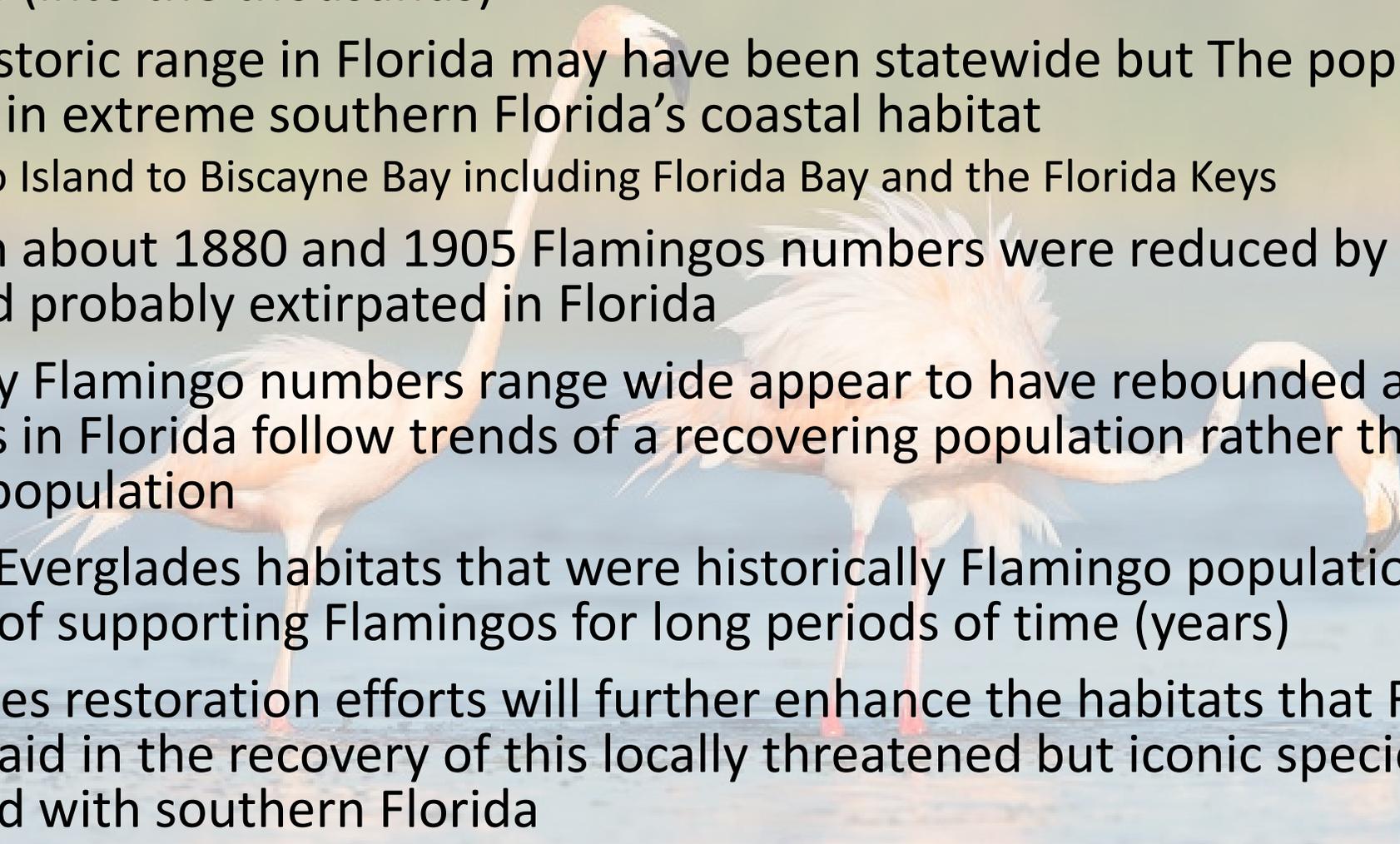


# Conclusions Based on GPS Tracking

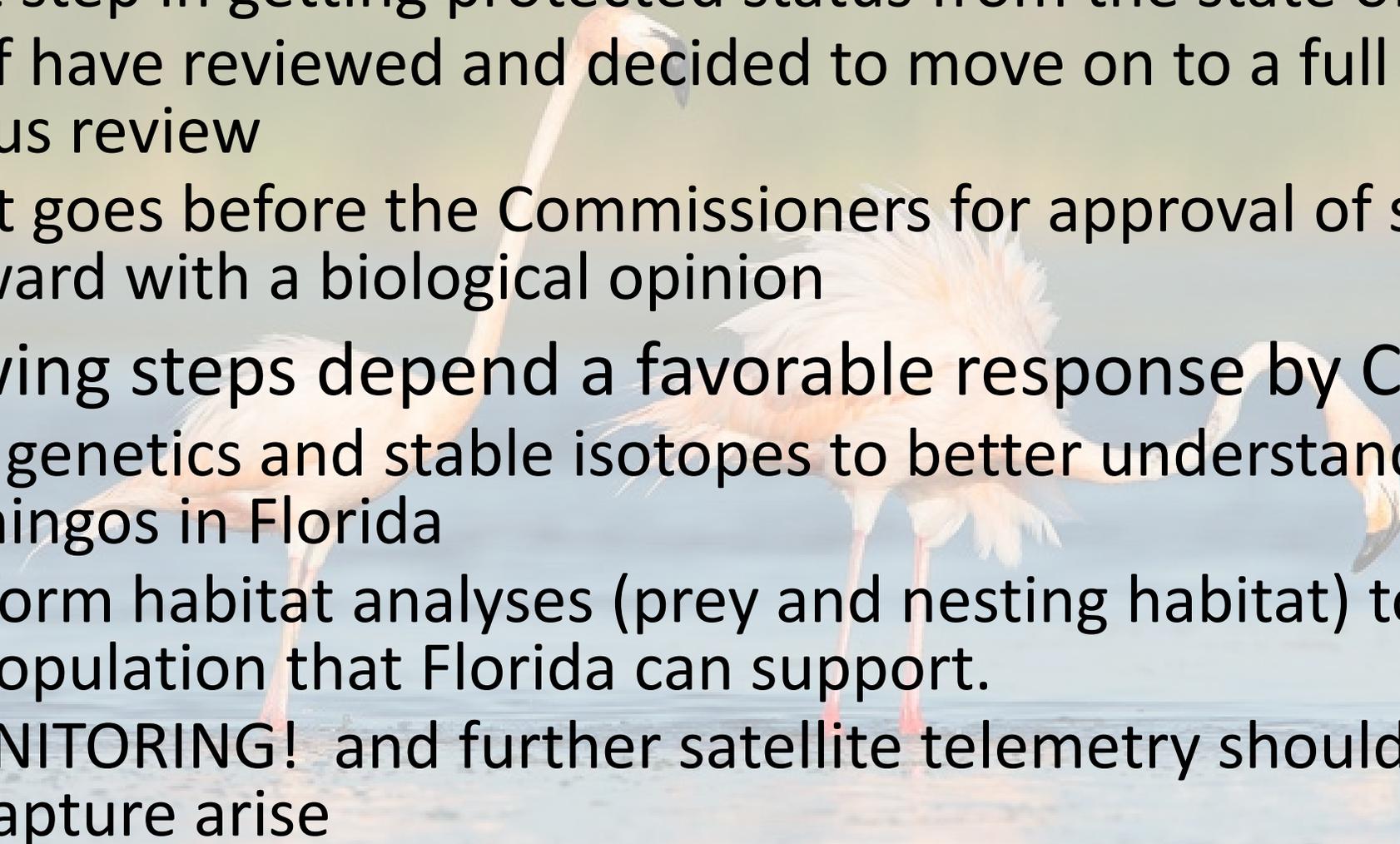
- Habitats within Florida Bay can support Flamingos for multiple years
  - At least 661 d
  - Maybe longer if Conchy is resighted again
  - Possibly photographed Nov 5, 2017 with 4 other flamingos in Snake Bight
- Habitat use made detection probability by humans surprisingly low for such a conspicuous species



# Conclusions

- American Flamingos were a natural member of Florida's avifauna and occurred in large numbers (into the thousands)
  - Their historic range in Florida may have been statewide but the population was greatest in extreme southern Florida's coastal habitat
    - Marco Island to Biscayne Bay including Florida Bay and the Florida Keys
  - Between about 1880 and 1905 Flamingo numbers were reduced by at least 80% range wide and probably extirpated in Florida
  - Currently Flamingo numbers range wide appear to have rebounded and population numbers in Florida follow trends of a recovering population rather than escapee from captive population
  - Current Everglades habitats that were historically Flamingo population center are capable of supporting Flamingos for long periods of time (years)
  - Everglades restoration efforts will further enhance the habitats that Flamingos rely on and will aid in the recovery of this locally threatened but iconic species that is clearly identified with southern Florida
- 
- A photograph of two American Flamingos standing in shallow, clear water. The bird on the left is facing right, with its long neck curved upwards. The bird on the right is facing left, with its neck curved downwards. Both birds have pinkish-orange plumage and long, thin legs. The background is a soft, out-of-focus landscape with a light blue sky and a sandy or silty ground.

# Next Steps

- Petition filed with FFWCC to evaluate species status
    - First step in getting protected status from the state of Florida
    - Staff have reviewed and decided to move on to a full biological status review
    - Next goes before the Commissioners for approval of staff to go forward with a biological opinion
  - Following steps depend a favorable response by Commission
    - Use genetics and stable isotopes to better understand the origins of flamingos in Florida
    - Perform habitat analyses (prey and nesting habitat) to estimate size of population that Florida can support.
    - **MONITORING!** and further satellite telemetry should opportunities to capture arise
- 
- A photograph of two pink flamingos standing in shallow, rippling water. The flamingo on the left is facing left, with its long neck extended upwards. The flamingo on the right is facing right, with its head lowered towards the water. The background is a soft, out-of-focus blue and white, suggesting a bright, open environment.

Thank You!

Questions?





