Conservation of Diamondback Terrapins in the Southeastern United States

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John D. Willson

Shannon Pittman

Kristen Cecala

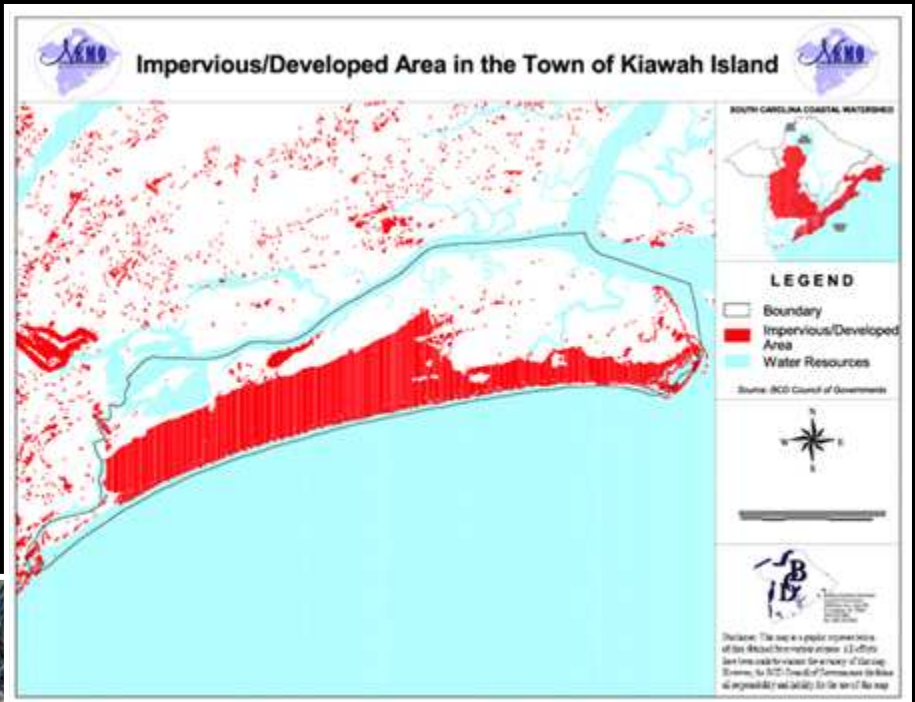
Charleston
Harbor
Kiawah Island

Terrapin Studies at Kiawah Island, S.C.

Sampling over a
25-year period
(1983 - Present)

Kiawah Island

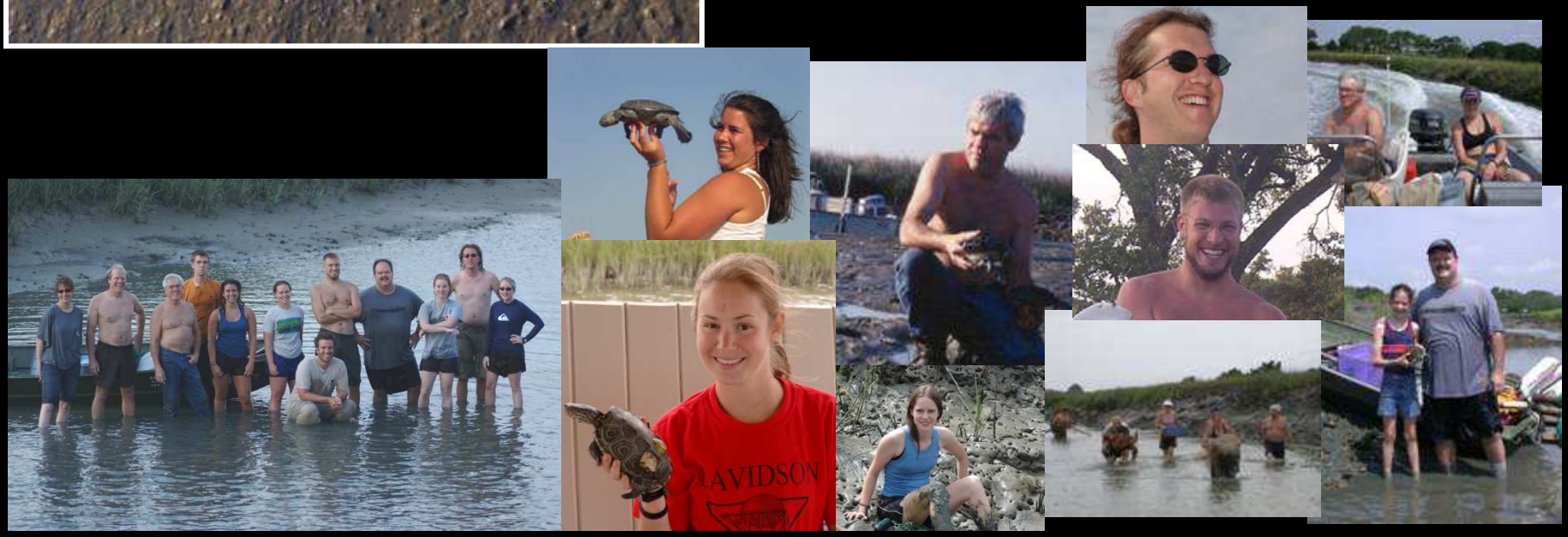
Rapidly developing region



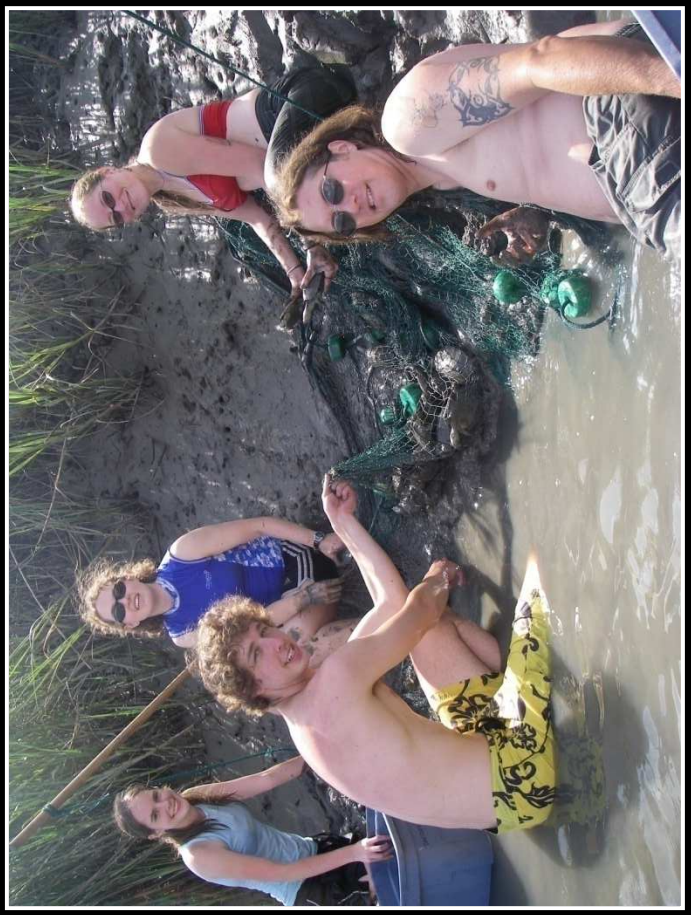
Terrapin Studies at Kiawah Island, S.C.

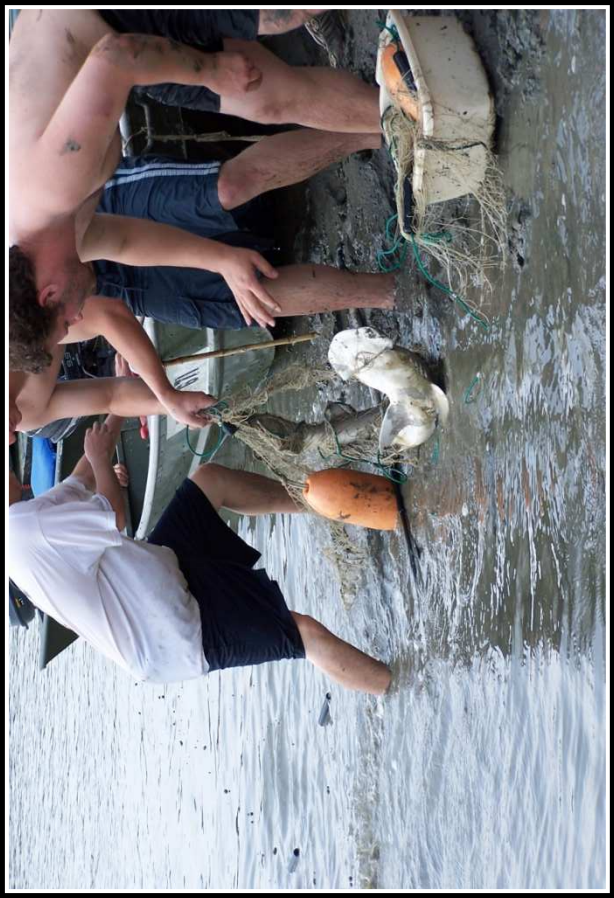
> 1450 individual terrapins marked

> 2800 captures/ recaptures

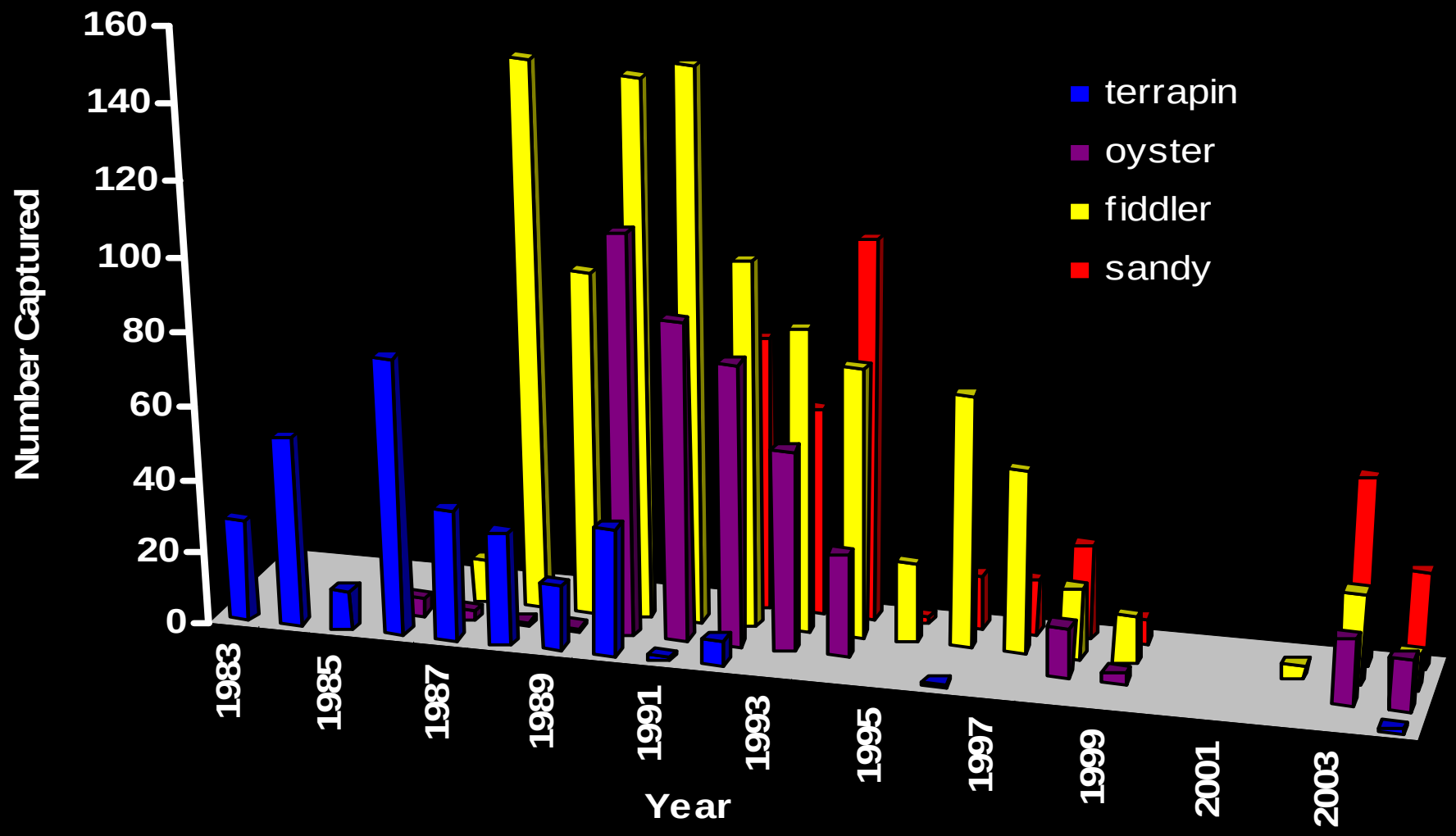


Kiawah River and Associated Tidal Creeks

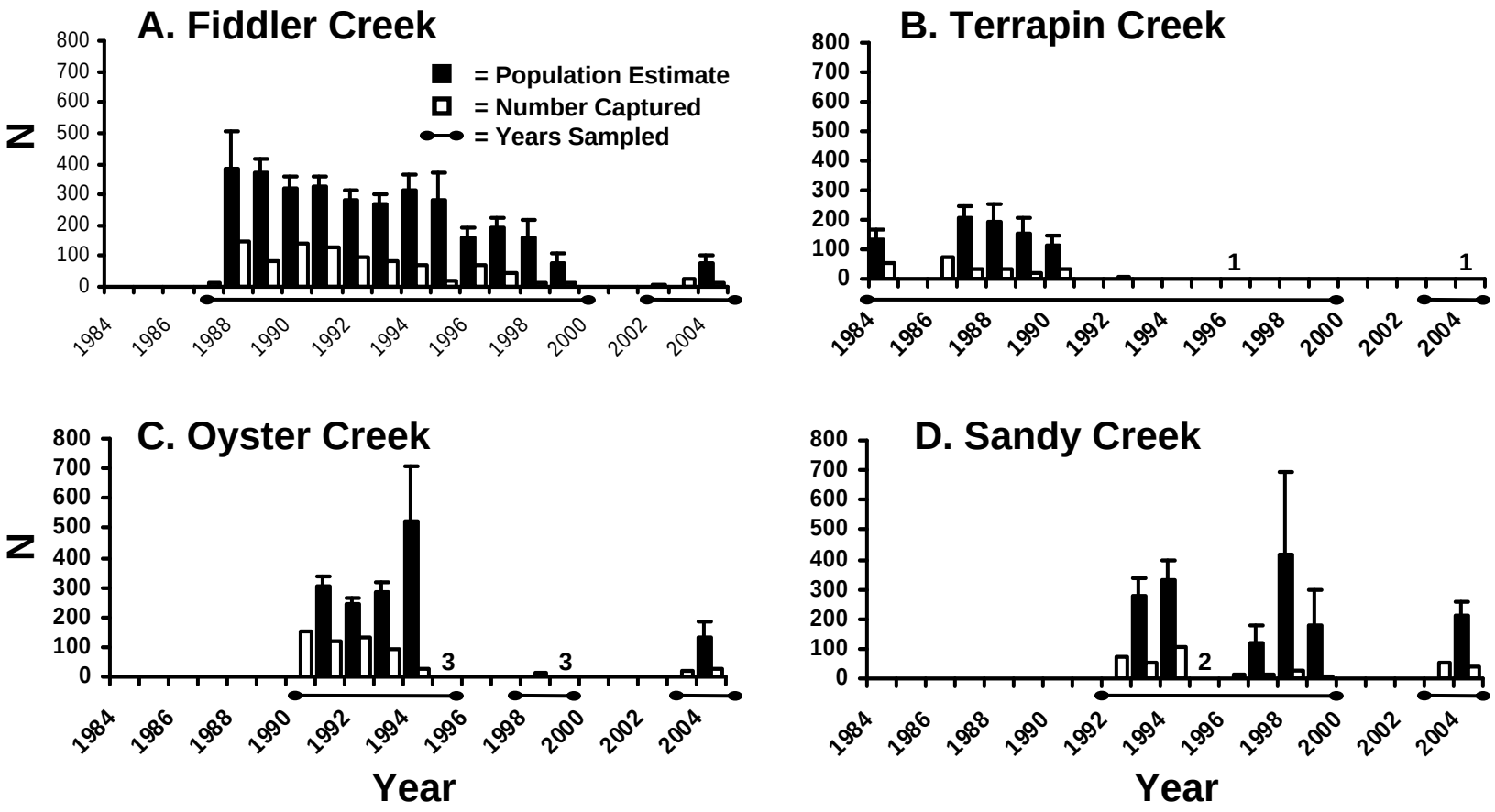




Number of Terrapins Captured in Creeks Over Time



Population Estimates



State First Lady Recipes

MARYLAND

By MRS. J. MILLARD TAWES
Wife of Gov. Tawes

Terrapin Soup

3 terrapins (or, 2 cans of terrapin meat)
1 stick butter
1 tablespoon flour
1 pint milk
Pinch of pepper
6 eggs, hard boiled
½ pint heavy cream
Sherry wine (optional)
Pinch salt

Terrapins are North American turtles commonly found in the salt water marshes of Maryland. Boil terrapins (5 to 7 inches long) and pick out meat, or use canned meat. Melt butter in good size saucepan. Remove from fire, add heaping tablespoon flour, blend, add milk, salt and pepper to taste. Hard boil six eggs, chop up whites, add to milk, flour and butter mixture. Add terrapin meat. Mash yolks of eggs and add. Return to stove and simmer until thickened. Last, add heavy cream and, if desired, sherry wine.

(Women's News Service)

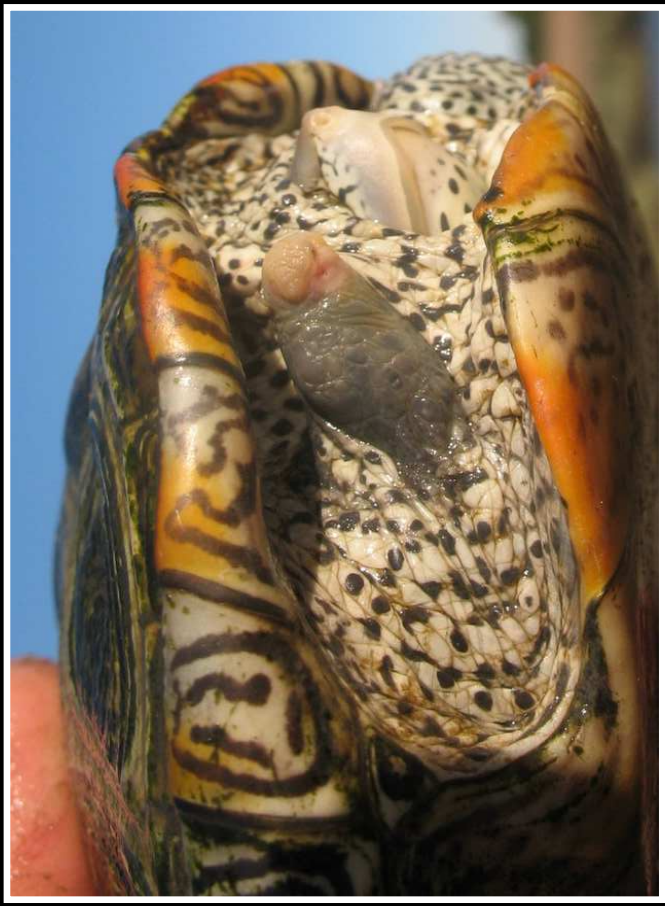
Anthropogenic Impacts on Kiawah Terrapins

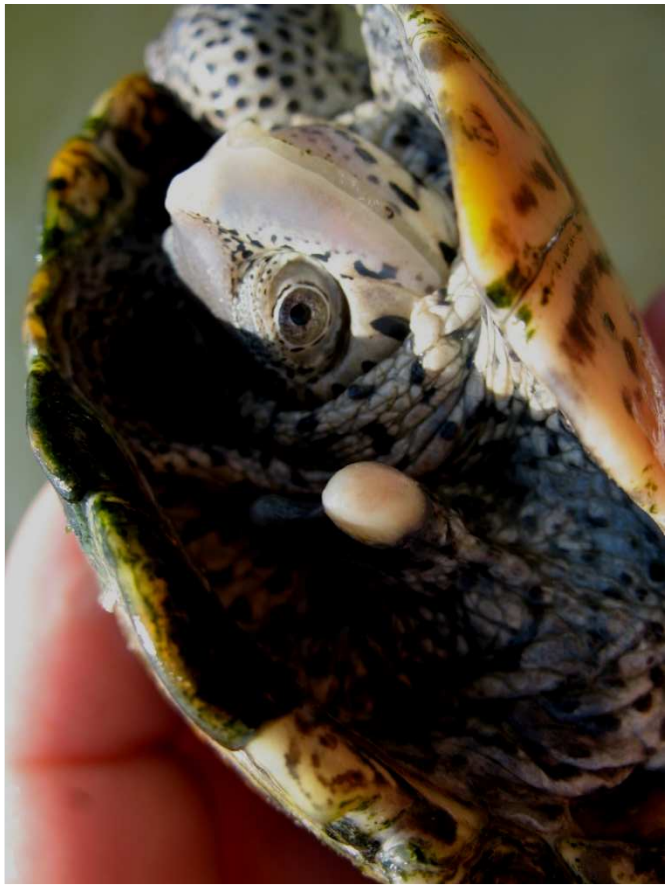
Habitat Loss and Degradation

Road Mortality

Anthropogenic Impacts on Kiawah Terrapins

Crab Traps





Cmpena-5

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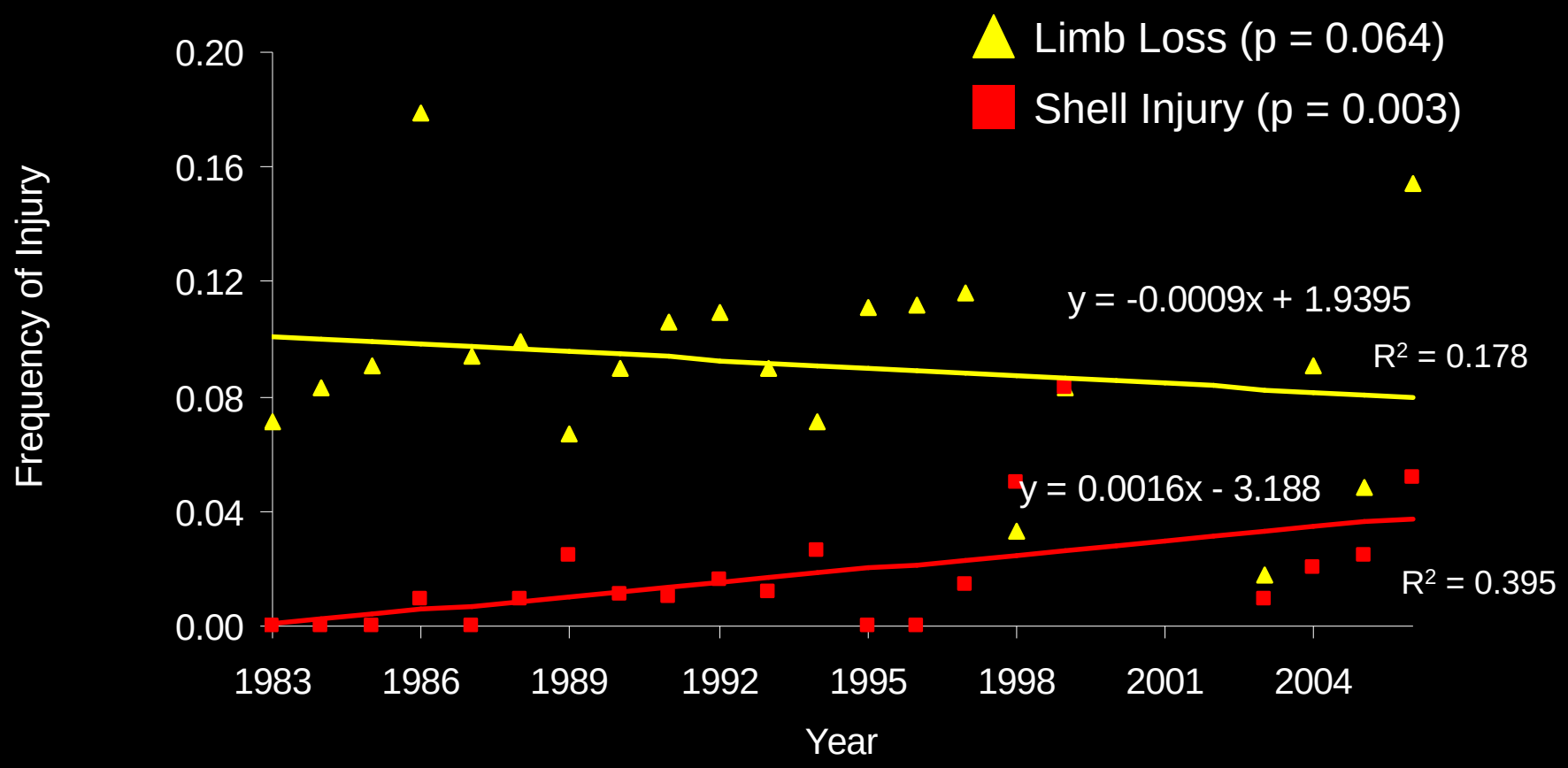
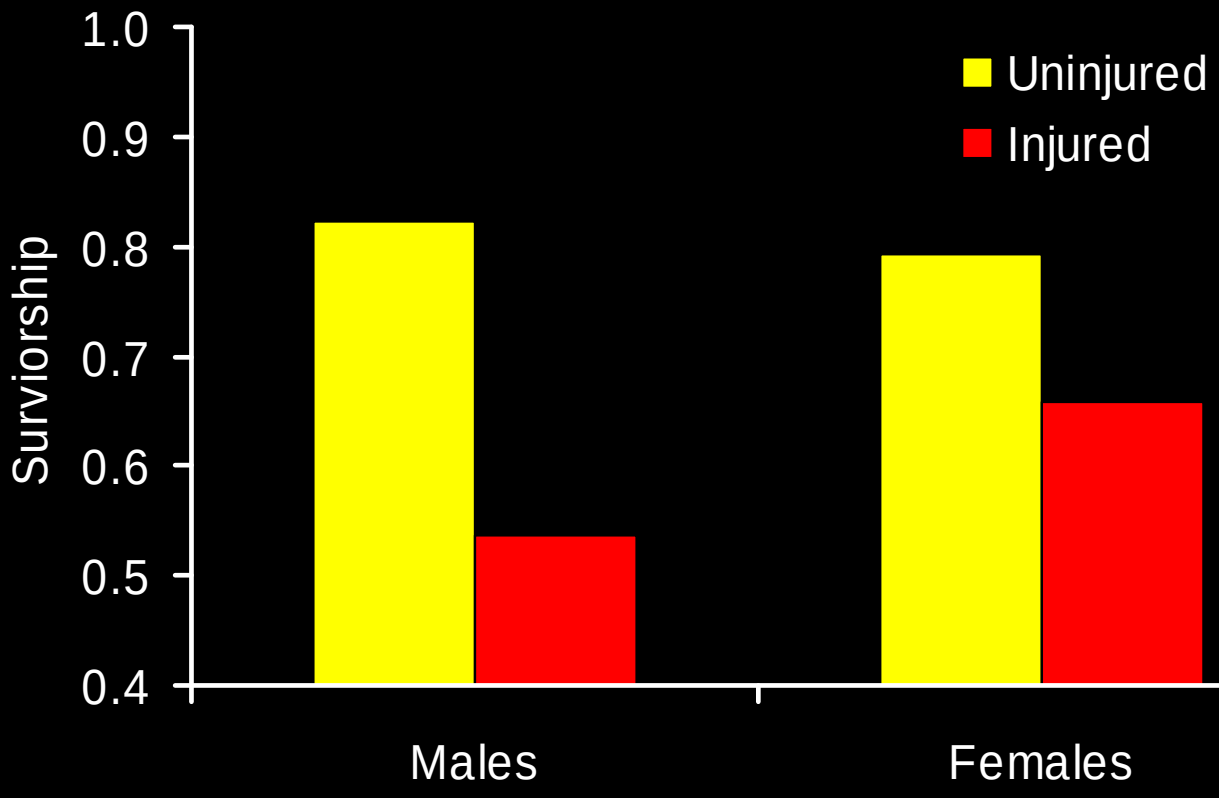
Results


Limb Loss (p = 0.064)
Shell Injury (p = 0.003)
Frequency of Injury
0.20
0.16
0.12
0.08
0.04
0.00
1983
1986
1989
1992
1995
1998
2001
2004
Year
y = -0.0009x + 1.9395
R2 = 0.178
y = 0.0016x - 3.188
R2 = 0.395

Results



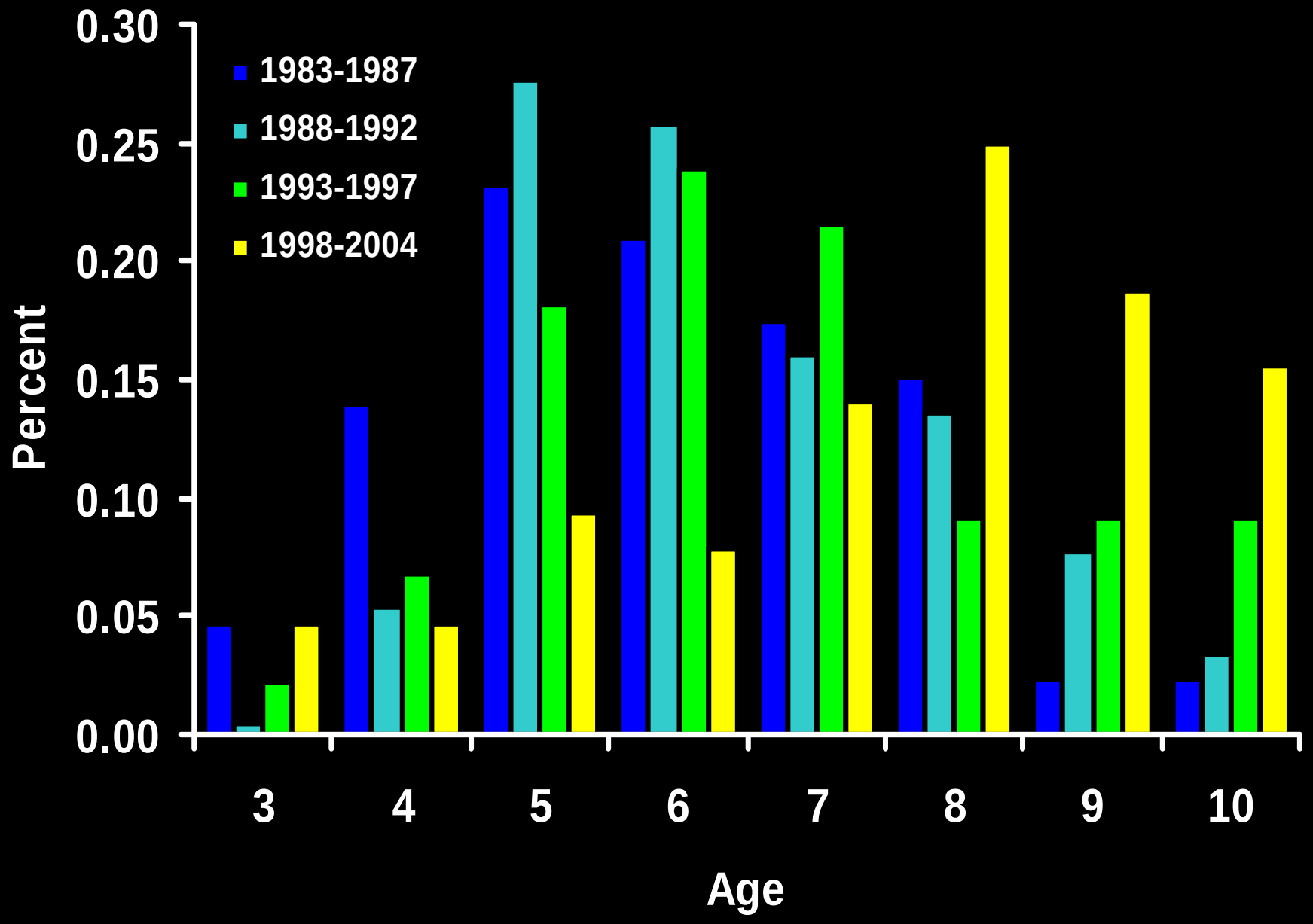
Program MARK –
Φ(group,time)p(time) for males and females separately.
(White and Burnham 1999)

Conclusions

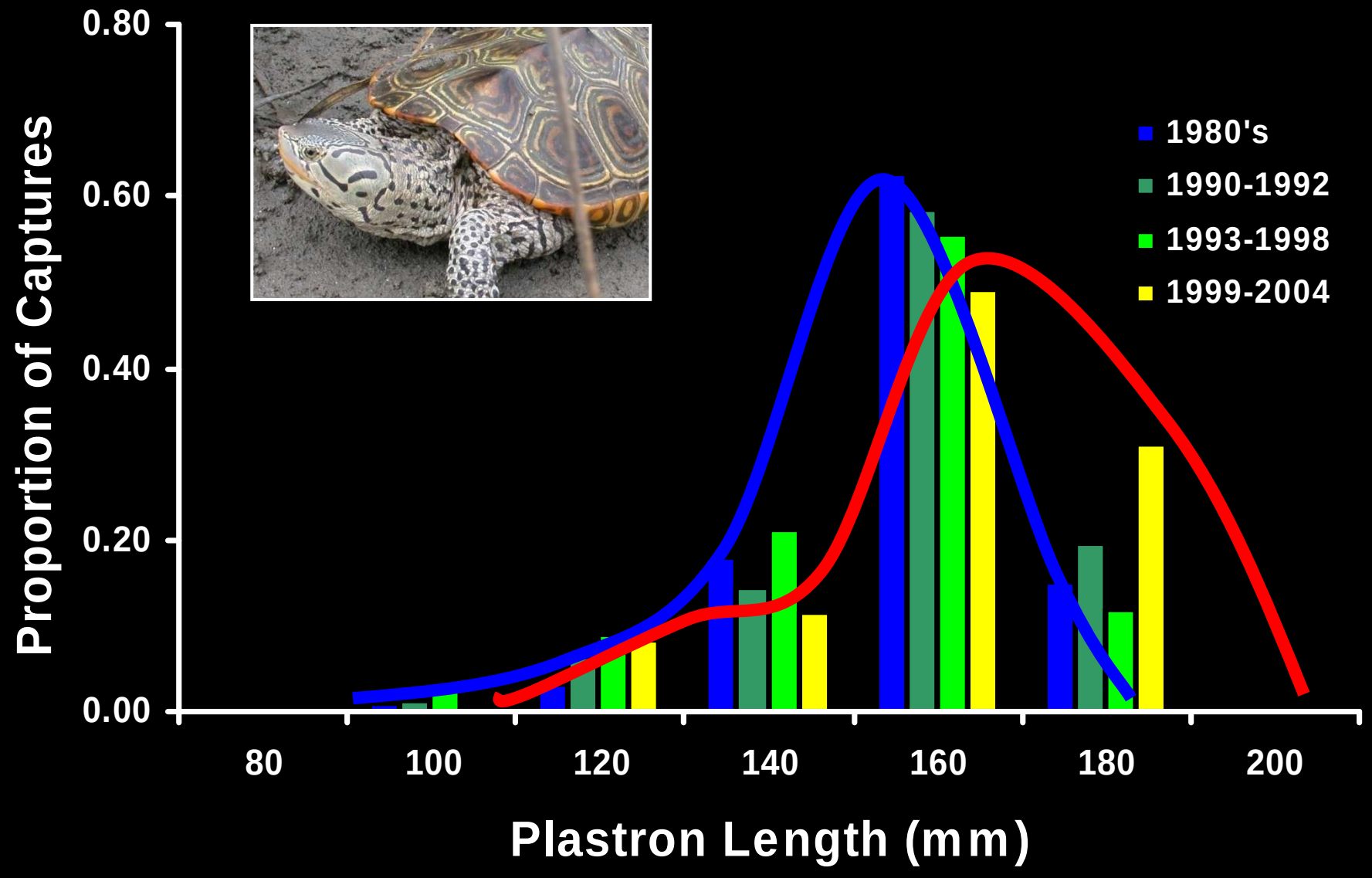
- Limb loss a result of aquatic predators

Boat Traffic

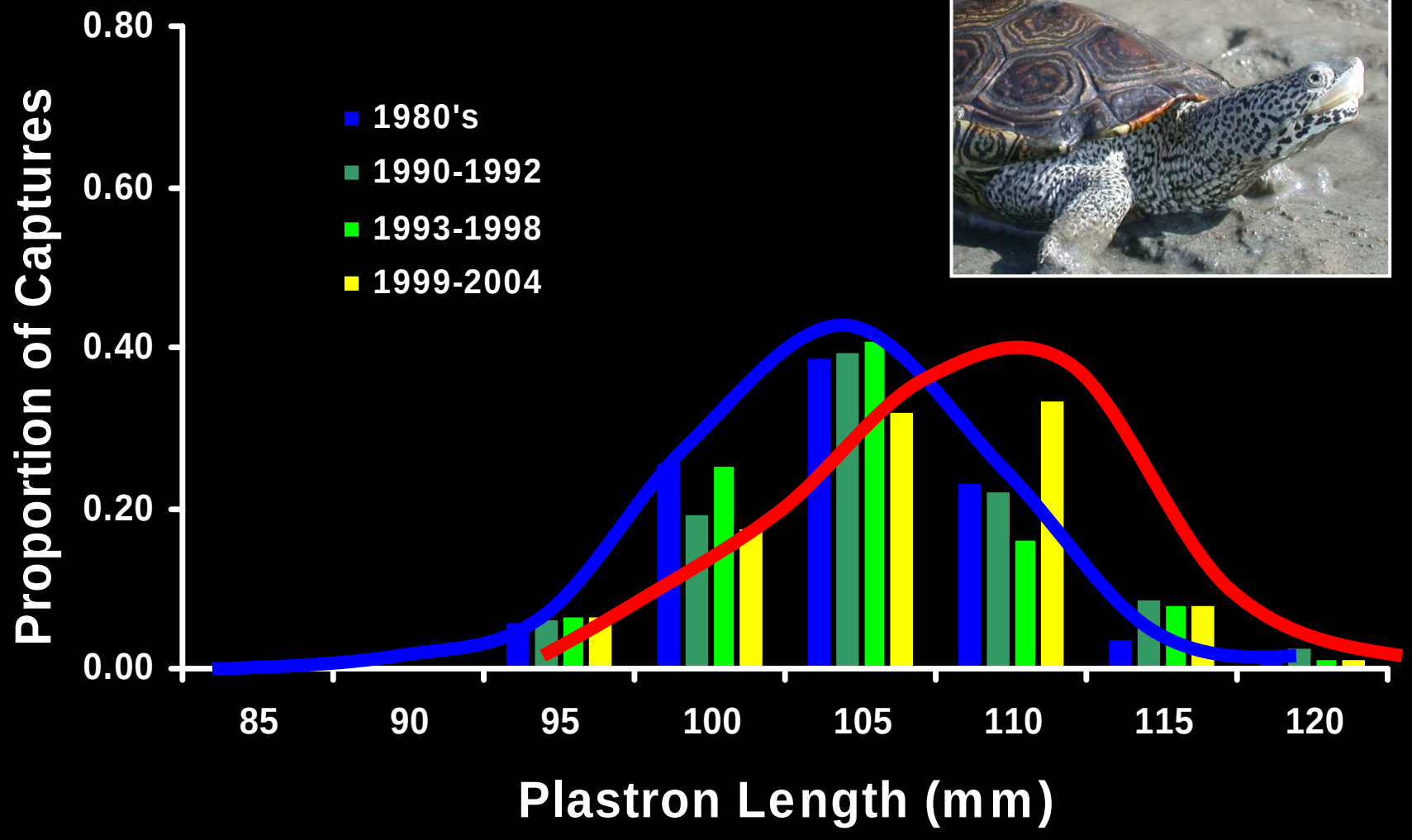
Changes in Age Structure Over Time



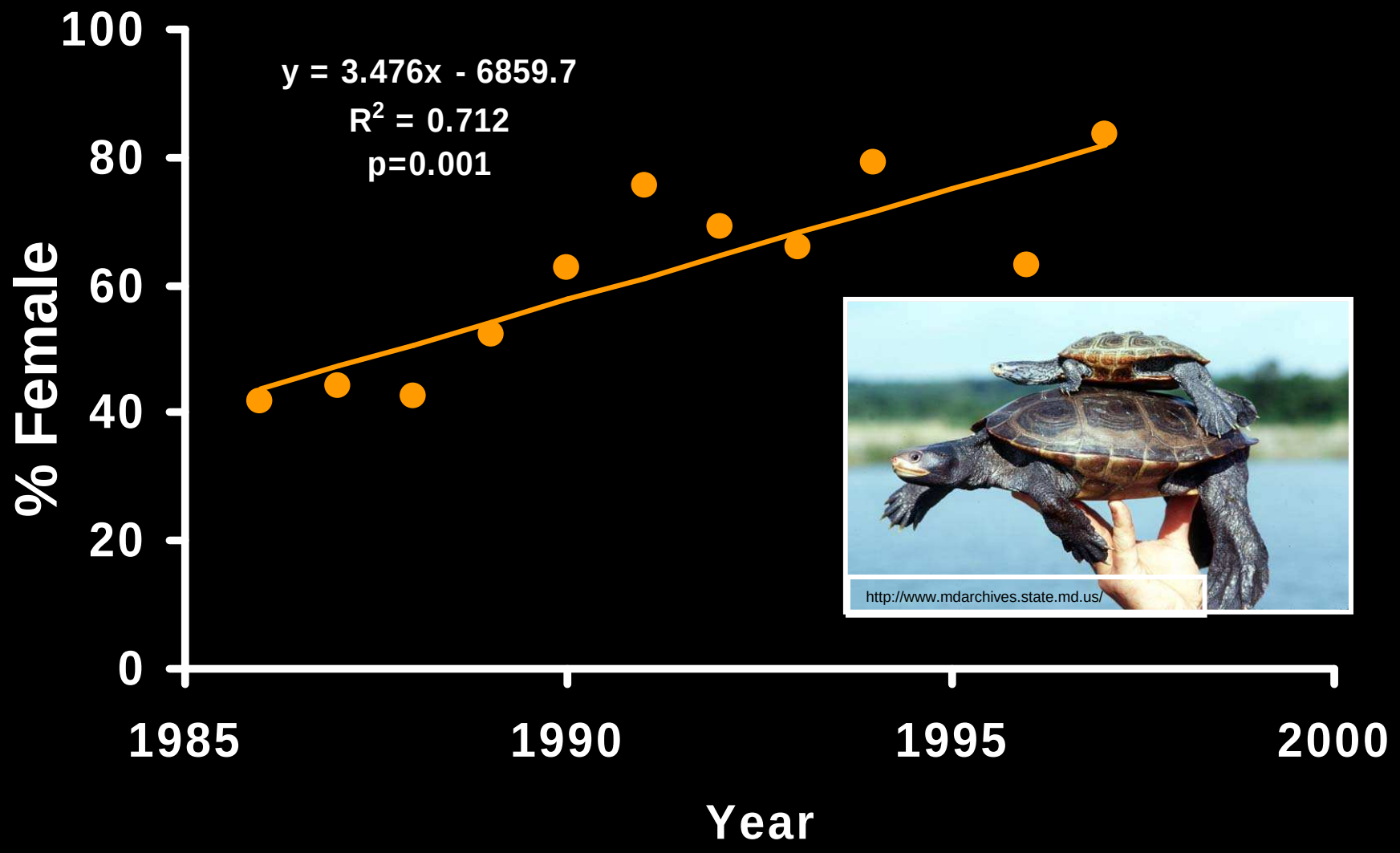
Changes in Size Over Time - Females



Changes in Size Over Time – Males



Changes in Sex Ratio Over Time



A.M. Grosse
unpubl. data

Conclusions

- Increased boat traffic results in increased shell damage – reduces survivorship.
- Major factor – crab trapping

What's Needed?

Range-wide Information

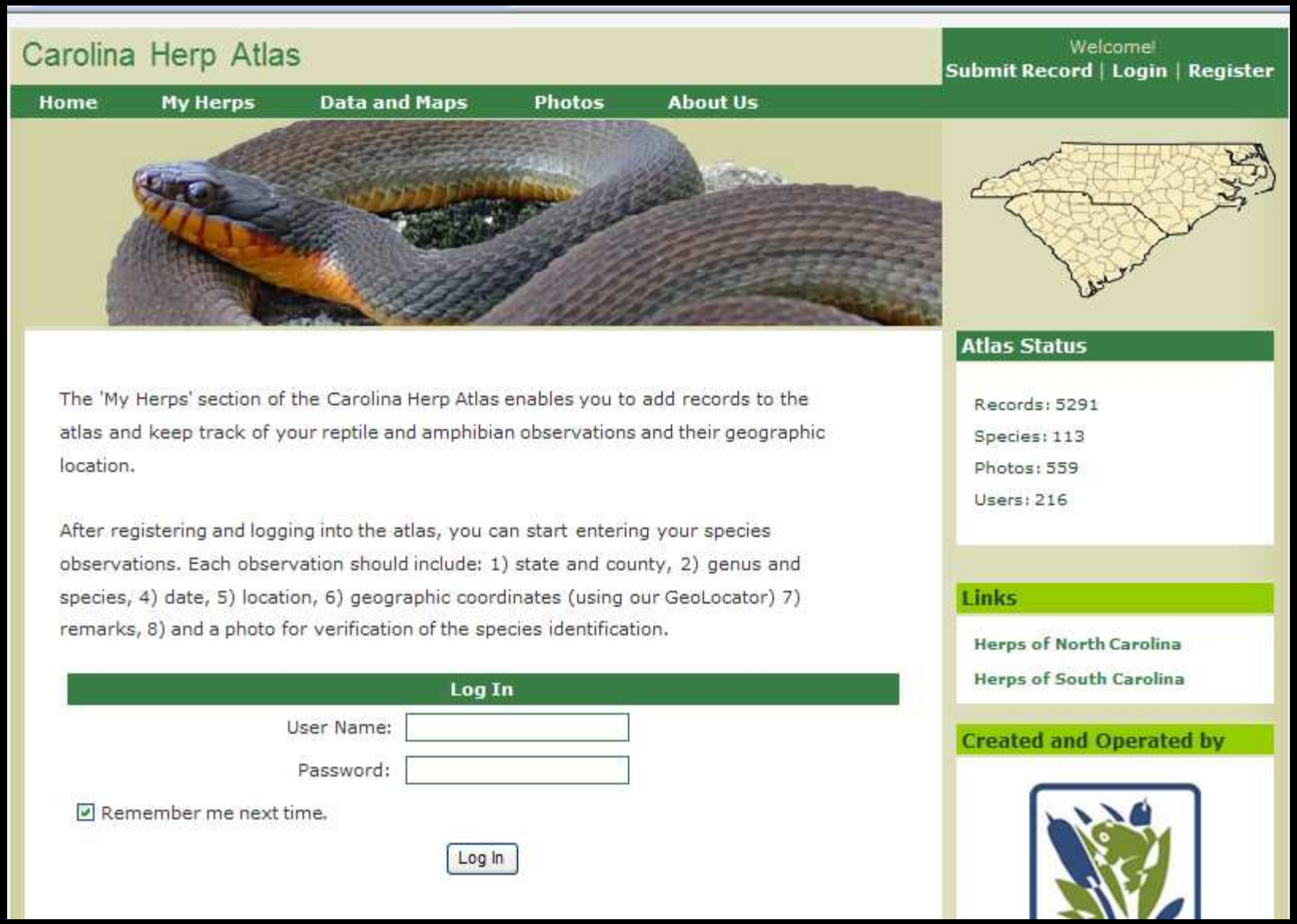
Carolina Herp Atlas

- Operated by Davidson College Herpetology Lab
- Supported by:
  - NCWRC
  - SCDNR

6461 records
128 species
318 users
Since March 2007

www.carolinaherpatlas.org

My Herps



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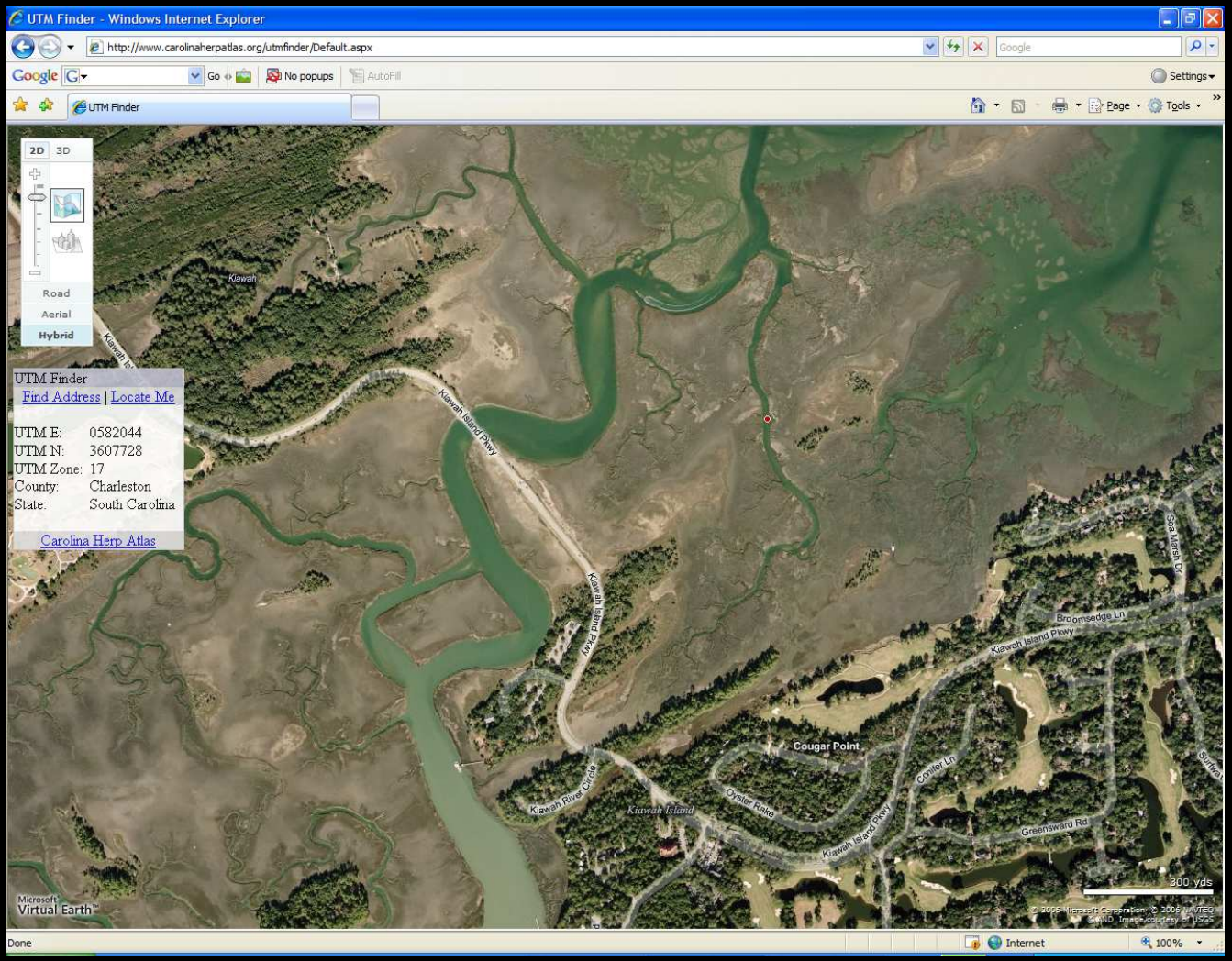
Geolocator – pinpointing your observation



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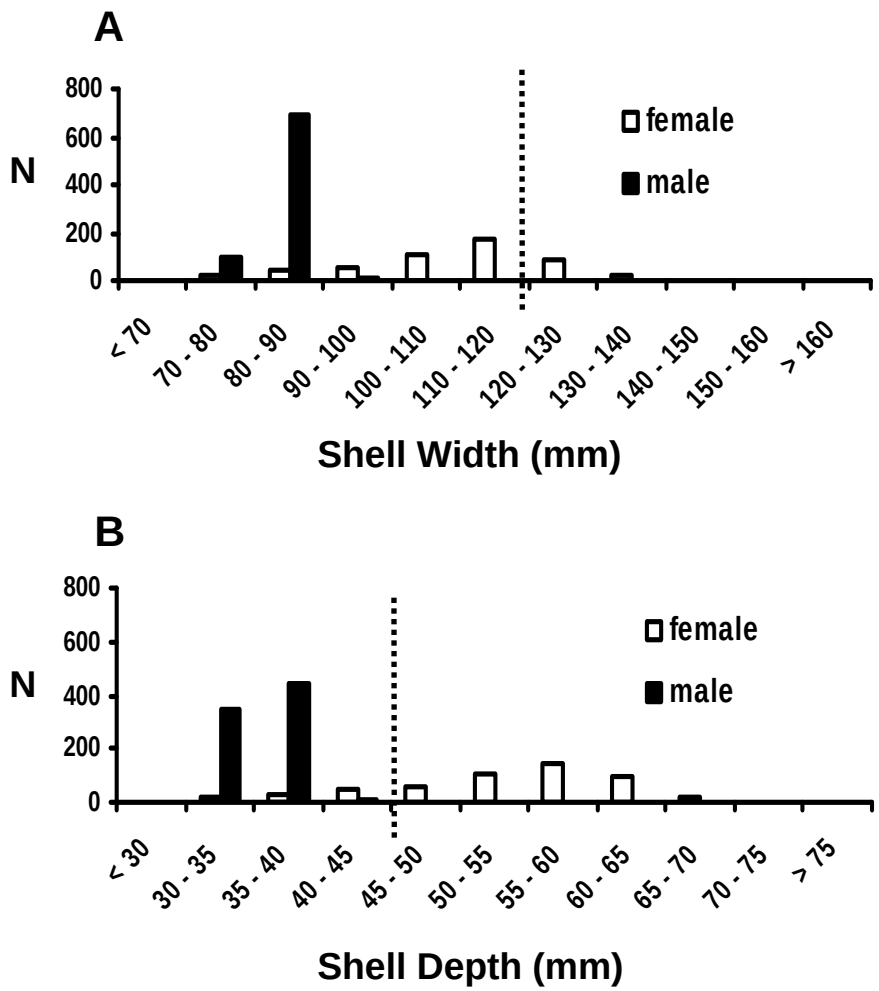
What's Needed?

Ghost Trap Removal

Bycatch Reduction Devices

Bycatch-Reduction Devices at Kiawah Island



No
Crabbing

Hypotheses

- If anthropogenic, we hypothesize that…
  - Females will have higher rates of limb loss.
  - Rates of injury will increase over time.

- Investigate spatial distribution of injuries.
- Determine the effects of injury on survivorship.

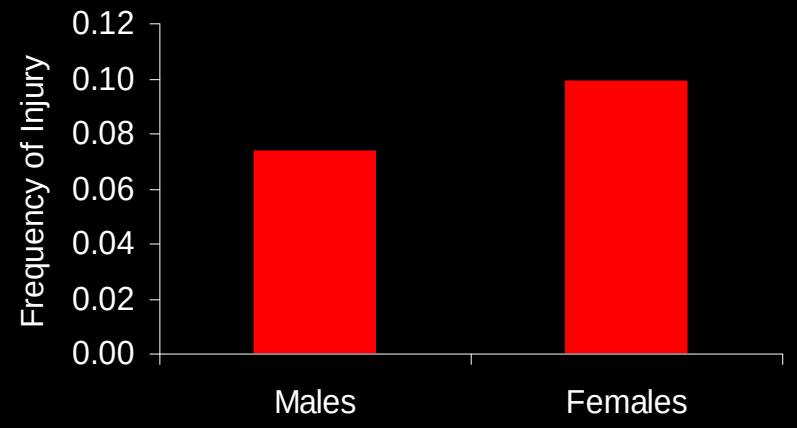
Kiawah River and Associated Tidal Creeks

Program MARK CJS results

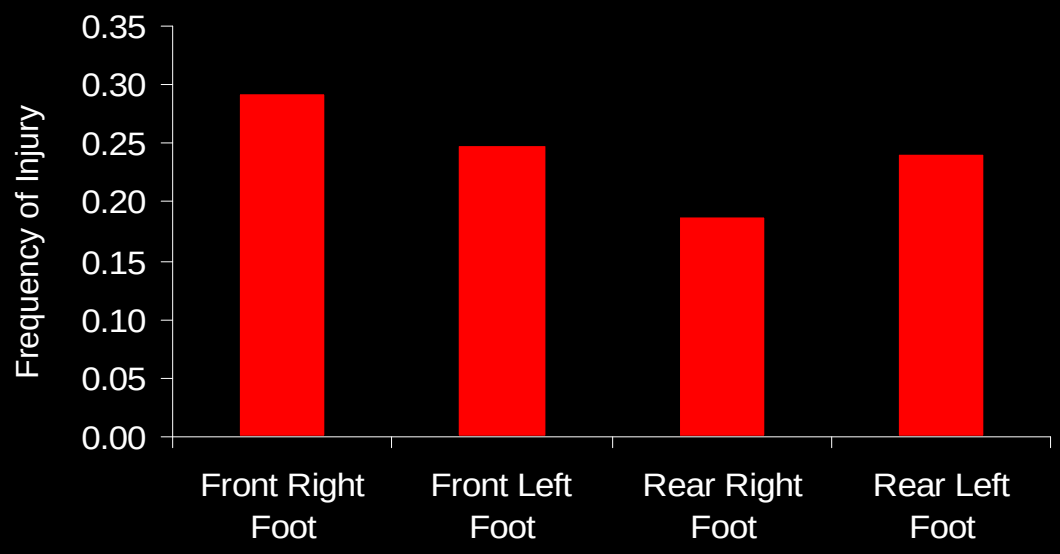
Model	# Parameters	QAIC	QAICc *w*
Males			
φ(group, time)p(time)	17	1541.83	0.99457
φ(constant)p(time)	16	1552.25	0.00542
φ(time)p(time)	29	1570.55	0.00000
Females			
φ(group, time)p(time)	18	741.91	0.57543
φ(constant)p(time)	17	742.52	0.42456
φ(time)p(time)	31	765.9	0.00000

Results

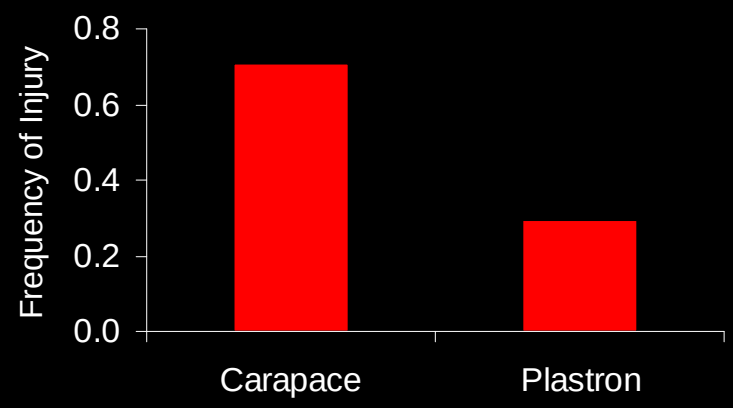
- 10.83% had a major injury.
- 8.06% were missing a limb.
    - 0.97% were missing multiple limbs.
- 2.78% had major shell damage.



Males and females have similar frequencies of major injuries (p = 0.553).

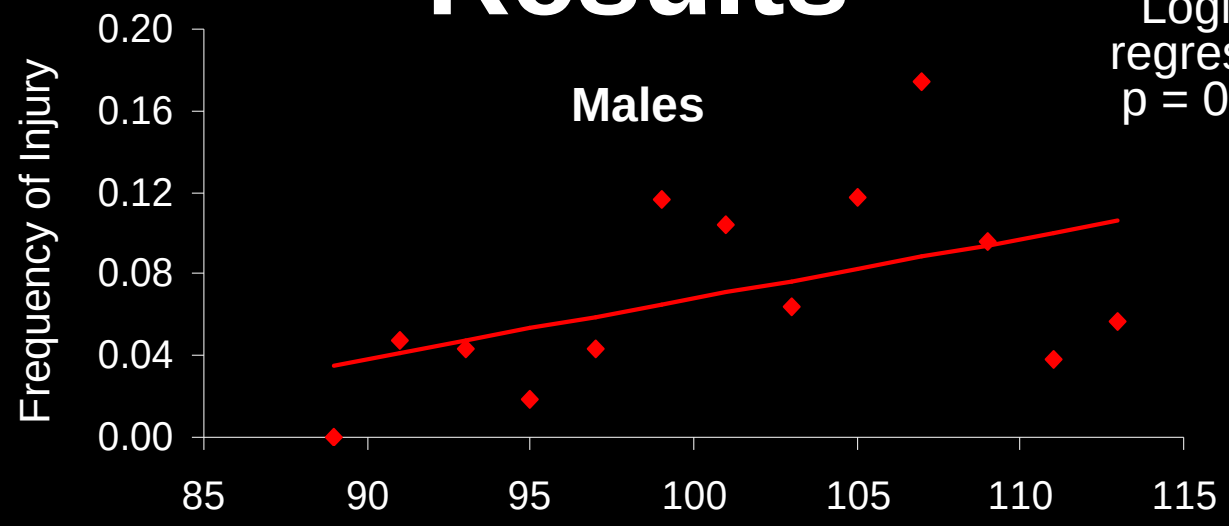
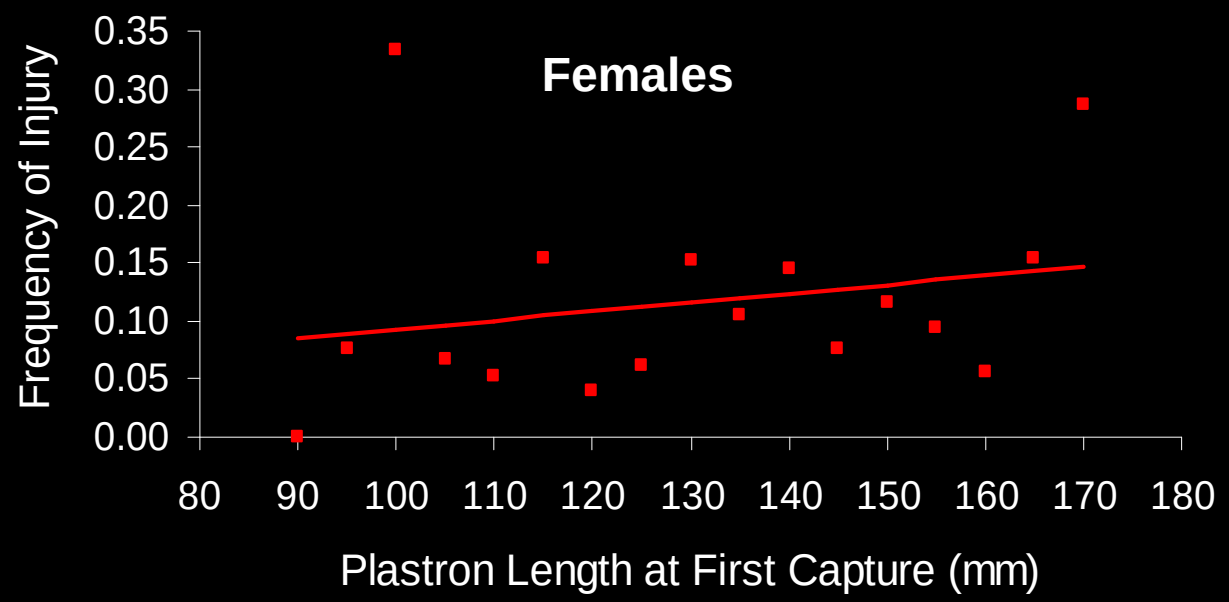


Limb loss frequency did not vary among limbs (p = 0.385).



The carapace was injured more frequently.

Results



Logistic regression
p = 0.005