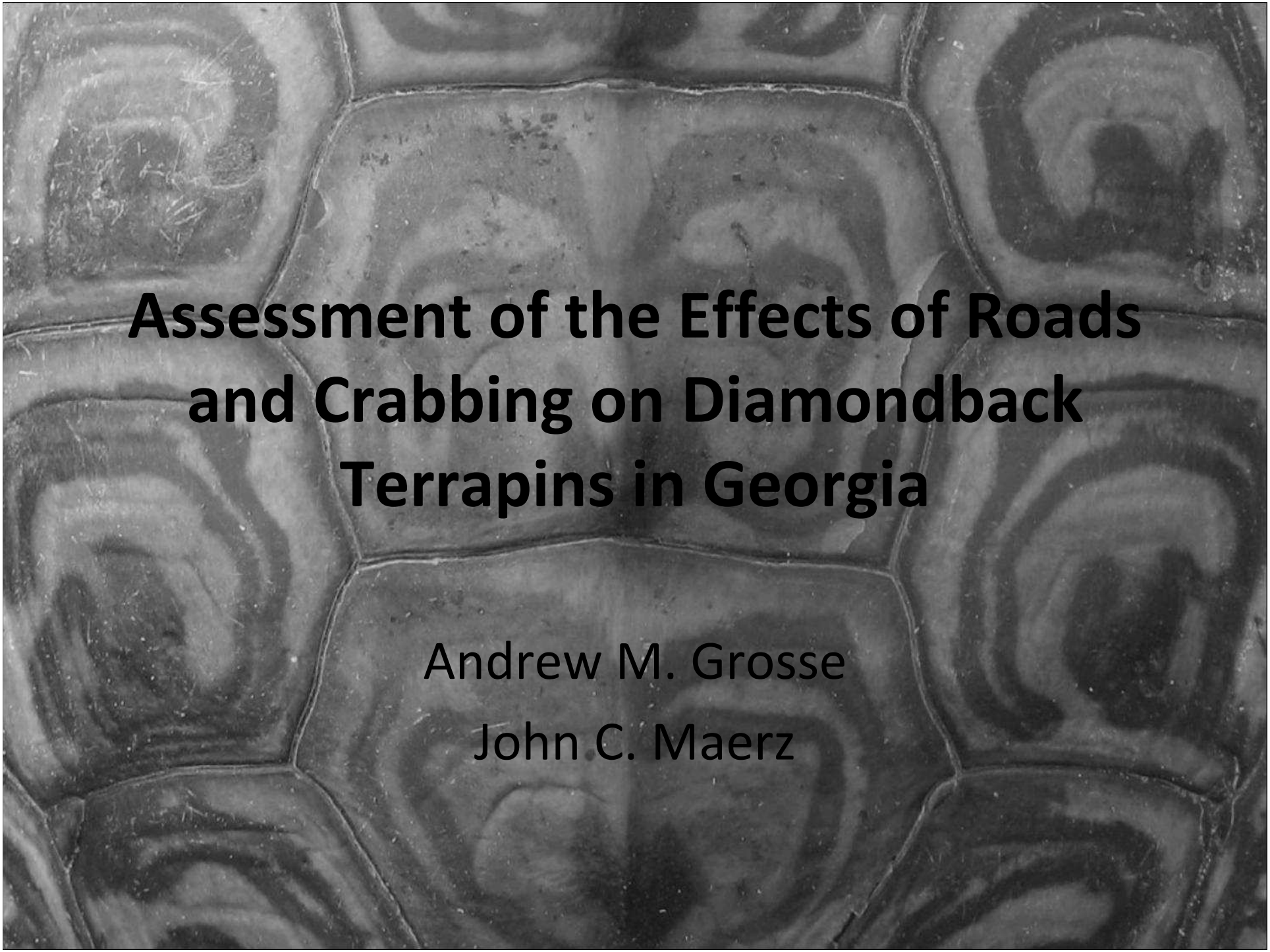


Assessment of the Effects of Roads and Crabbing on Diamondback Terrapins in Georgia

Andrew M. Grosse

John C. Maerz

In Georgia

- Diamondback terrapin identified as a high priority species in coastal habitats

-Population declines attributed to:

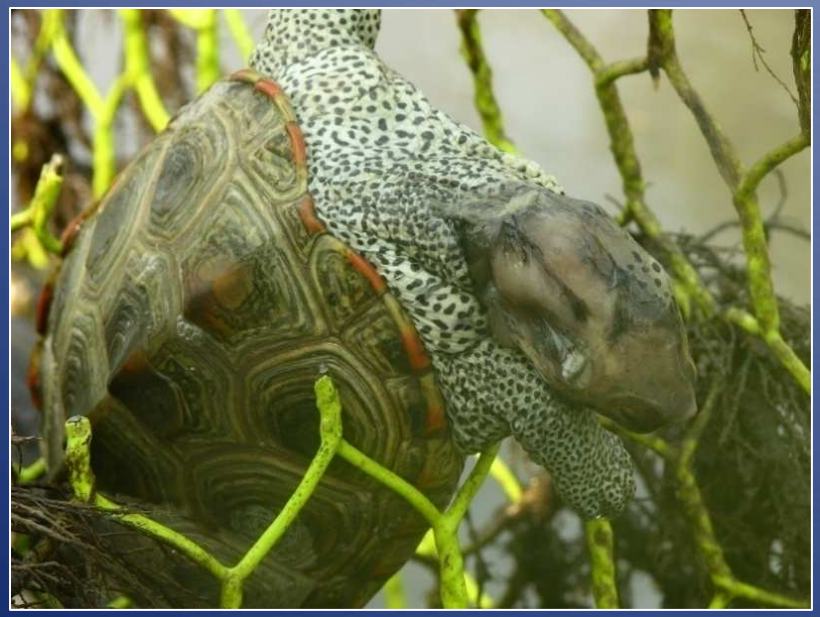
- Habitat loss and conversion
- Increased nest predation
- Road mortality
- Commercial and recreational activities [crabbing]

Road Mortality

- Documented high numbers of turtle mortality on roadways (Wood and Herlands 1997)
- Disproportionately affects females as a result of nesting

Crabbing

- Also documented cases of high numbers of turtles killed in crab pots
- Estimates that bycatch mortality is sufficient to significantly reduce terrapin populations
- Bycatch in crab pots biased towards males and juveniles



So…..

- both roads and crabbing could reduce terrapin populations; however roads and crabbing should have different effects on sex ratios.
  - road mortality should create more male biased populations , and
  - crabbing should create less male biased populations

Kiawah Island, SC

Dorcas et al. 2007, *Biological Conservation*

- Tremendous development
  - Higher density of roads and more traffic
- Increased females and size classes despite increased roads
- Crabbing pressures may be driving populations

Objectives

To test the "Kiawah hypothesis" and determine whether along the Georgia coast...

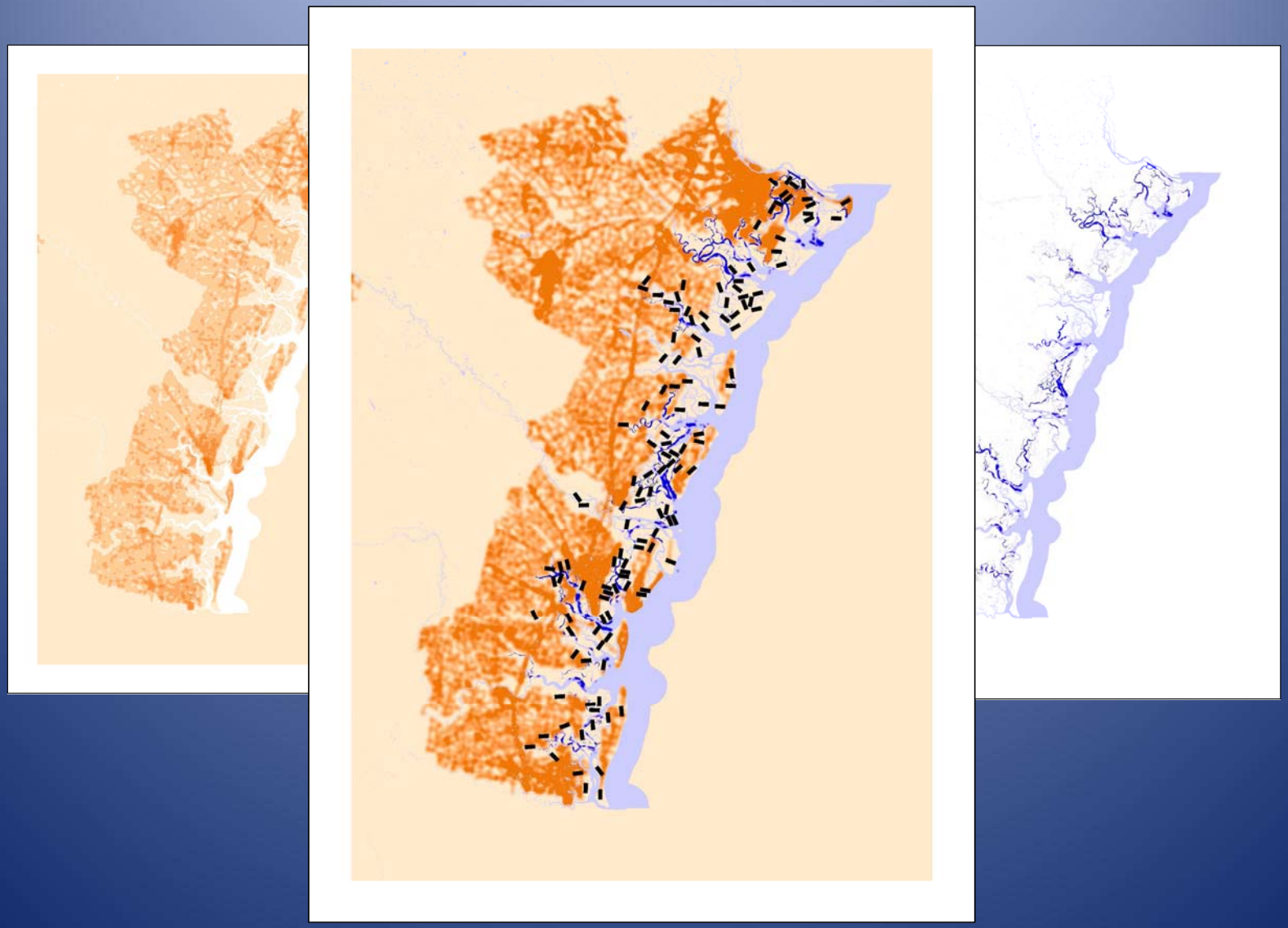
- a high density of or proximity to roads is negatively correlated with terrapin abundance and the proportion of the population that is female.

- a high number of crab pots is negatively correlated with terrapin abundance and the proportion of the population that is male.

Study Design

- 2 – Phase Approach
  - **Generation of GIS database of Road Density and Crabbing Pressures for all Georgia's Tidal Creeks**
  - **Measure Terrapin Abundance in randomly selected tidal creeks of varying road and crabbing pressure**

Generation of GIS



Generation of GIS

- Randomly selected 24 tidal creeks in four classes
  - High crabbing, high roads = 6 Creeks
  - High crabbing, low roads = 6 Creeks
  - Low crabbing, high roads = 6 Creeks
  - Low crabbing, low roads = 6 Creeks

So what is the best method for capturing and estimating terrapin abundance?

So what is the best method for capturing and estimating terrapin abundance?

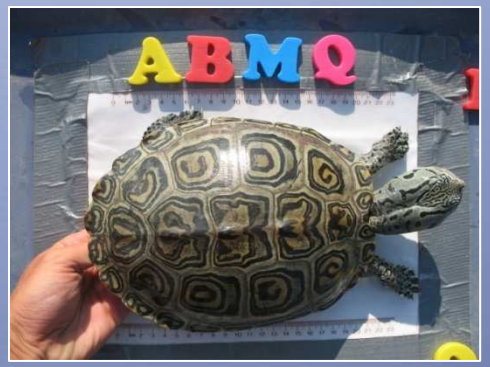
- Head Counting
- Mark-Recapture
  - Ambushing
  - Disguises
  - Trapping
  - Seining

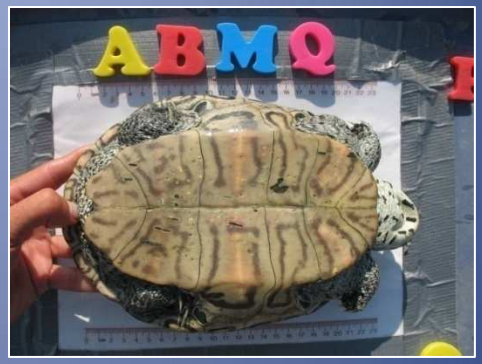
Method used

- Seine each creek at low tide

Data Collection

- Photograph
- Measure/Weigh
- Age
- Notch





Preliminary Results

- In 2007, 12 creeks were sampled 5 times from April 1 to June 24
- GDNR GIS data on crab pots was inaccurate
  - Observed “no” crabbing creeks with high numbers of crab pots
- We captured ~800 individual terrapins

Preliminary Results

- In study area, observed high road mortality
  - *98%* of road mortality were females
- Observed high crab pot mortality
  - 800 live captures in seine
  - 133 dead turtles found in crab pots
  - *80%* of crab pot mortalities were males

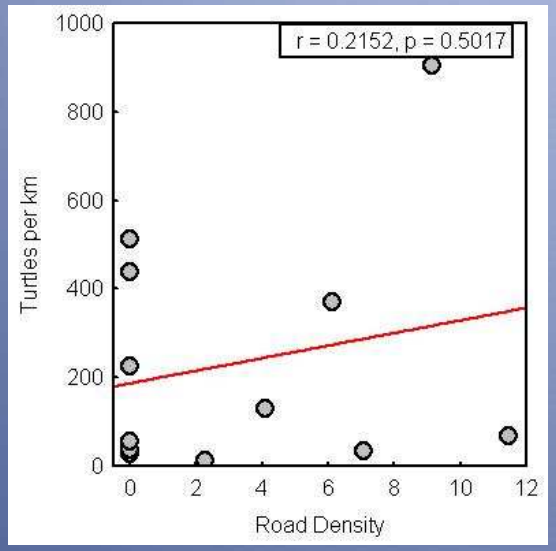
Pot of Death

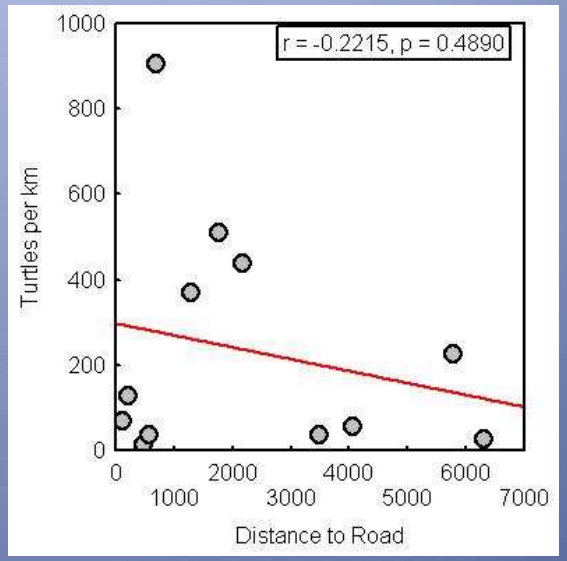
Preliminary Results

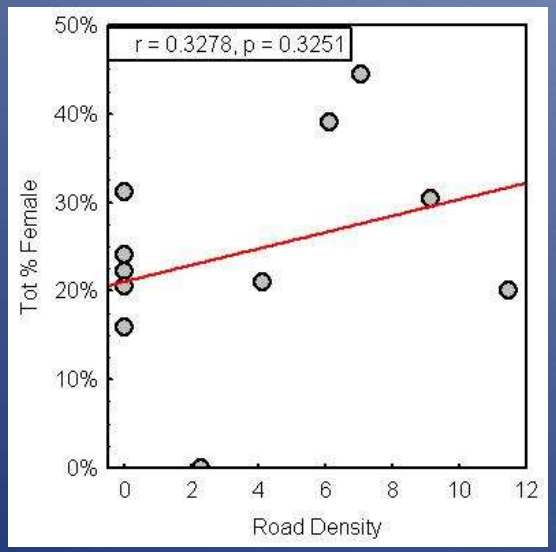
- Terrapin recaptures in only 6 of 12 creeks, so...

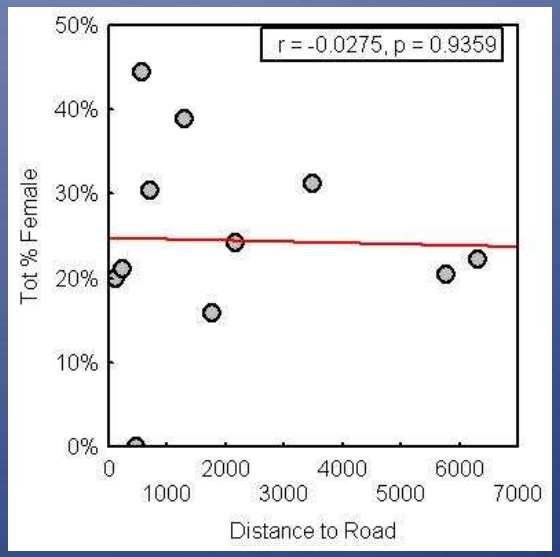
- used Royle and Nichols (2005) approach to estimating abundance from repeated samples.

Preliminary Road Results

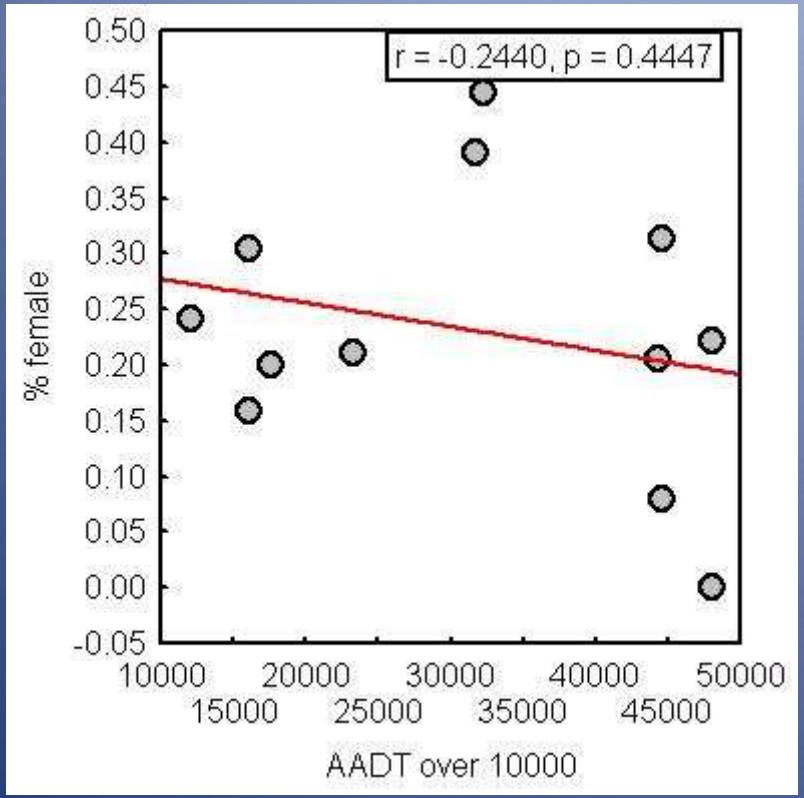


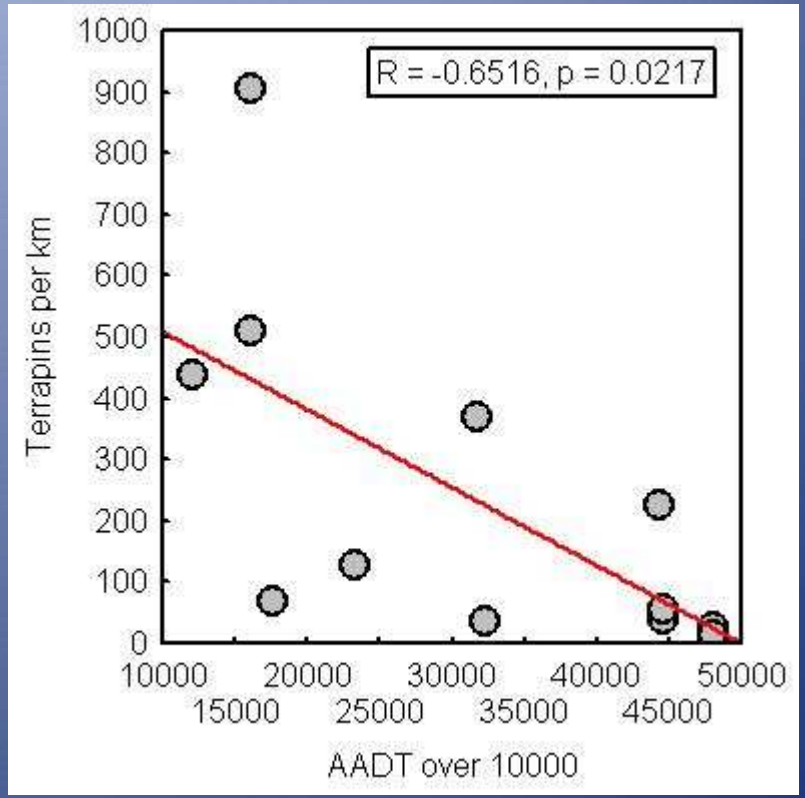




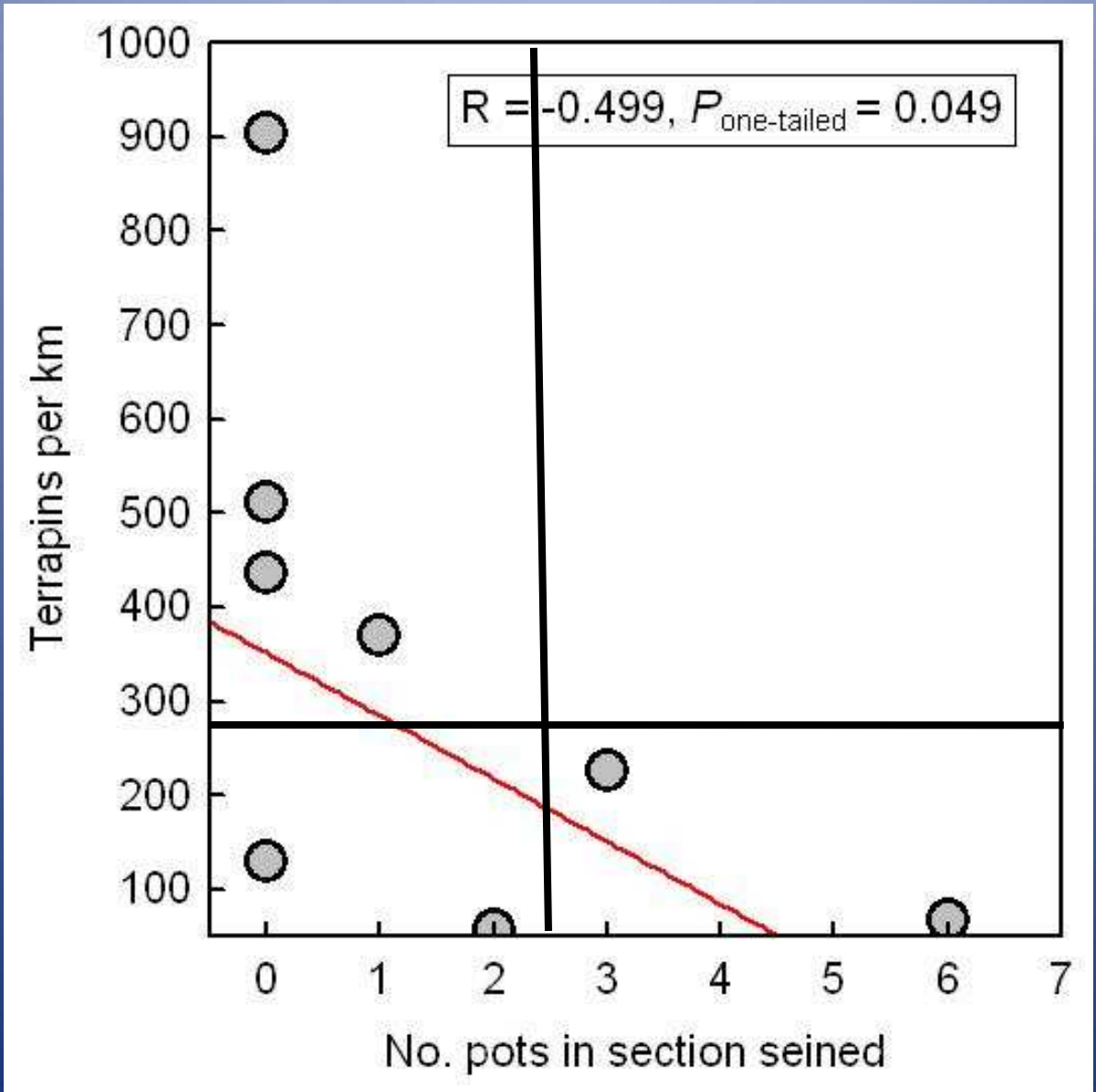


Preliminary Road Results





Preliminary Crabbing Results



Conclusions

- Our preliminary data show no relationship between road density and terrapin abundance or sex ratio in tidal creeks, however we did find a negative relationship between traffic intensity and terrapin abundance

- Our preliminary data does show a negative relationship between crabbing effort and terrapin abundance
  - consistent with Dorcas et al. 2007

- However, we see no relationship between crabbing effort and terrapin population sex ratio
  - Inconsistent with Dorcas et al. 2007

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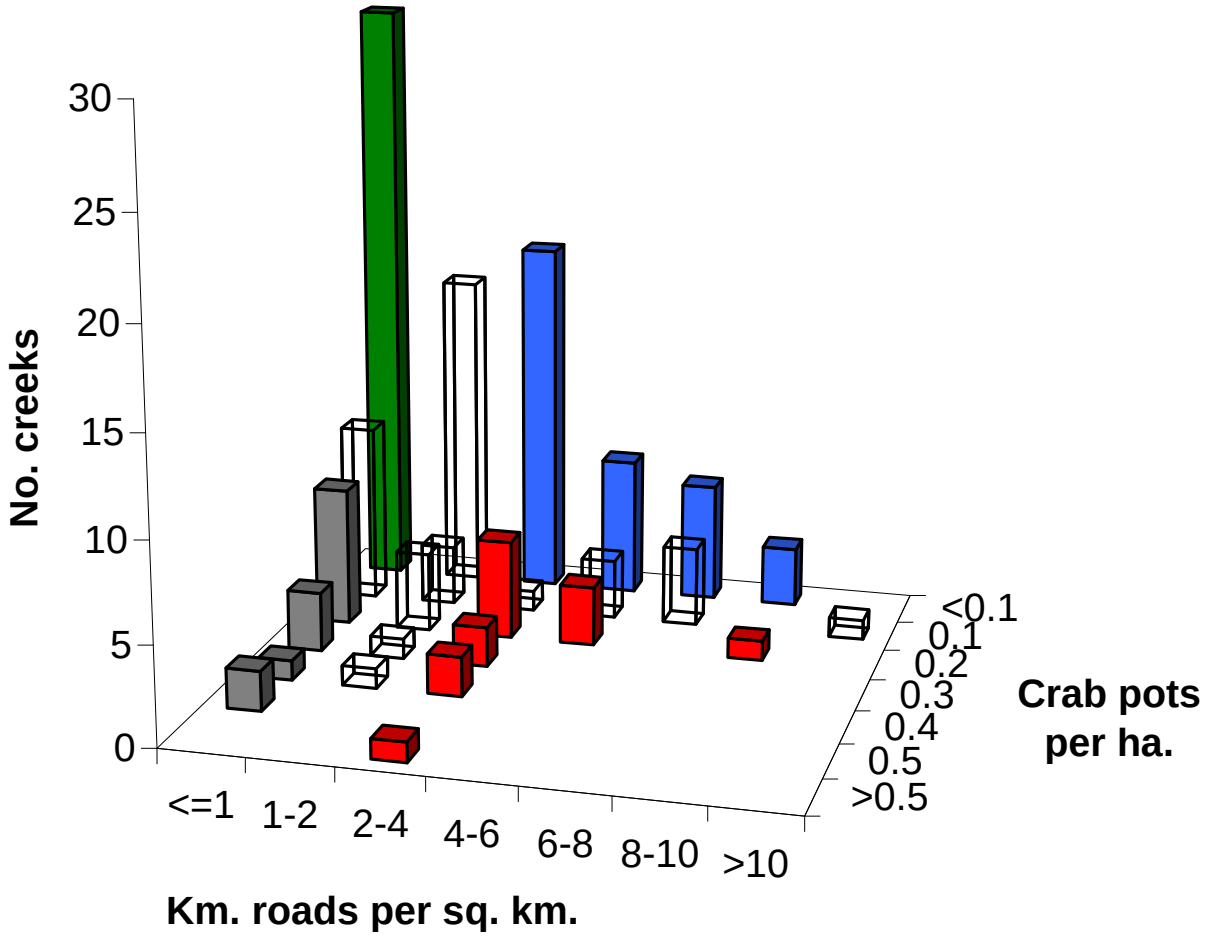
30
25
20
15
10
5
0
No. creeks
<=1
1-2
2-4
4-6
6-8
8-10
>10
Km. roads per sq. km.
<0.1
0.1
0.2
0.3
0.4
0.5
>0.5
Crab pots per ha.