

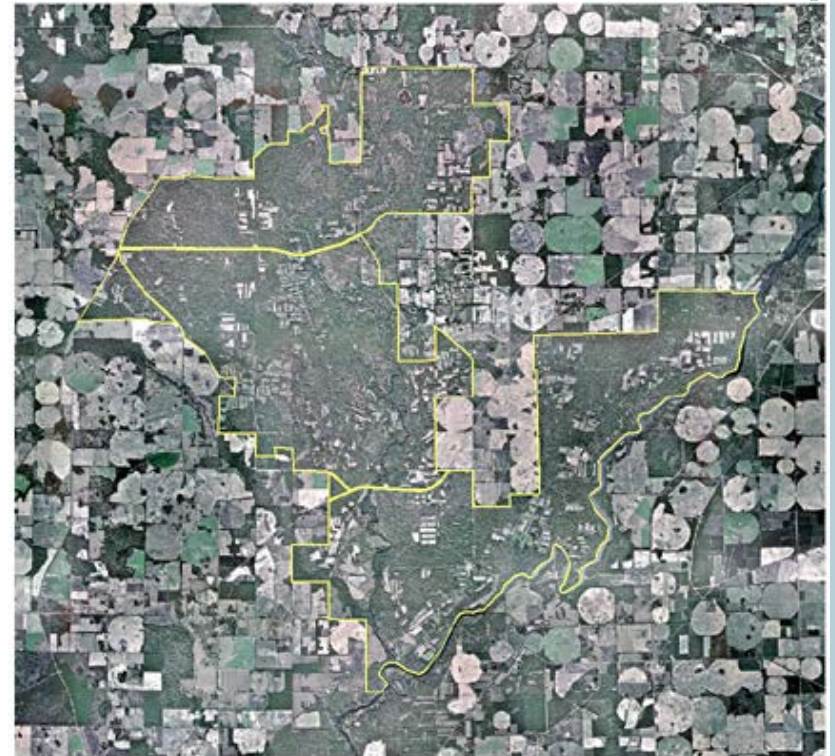
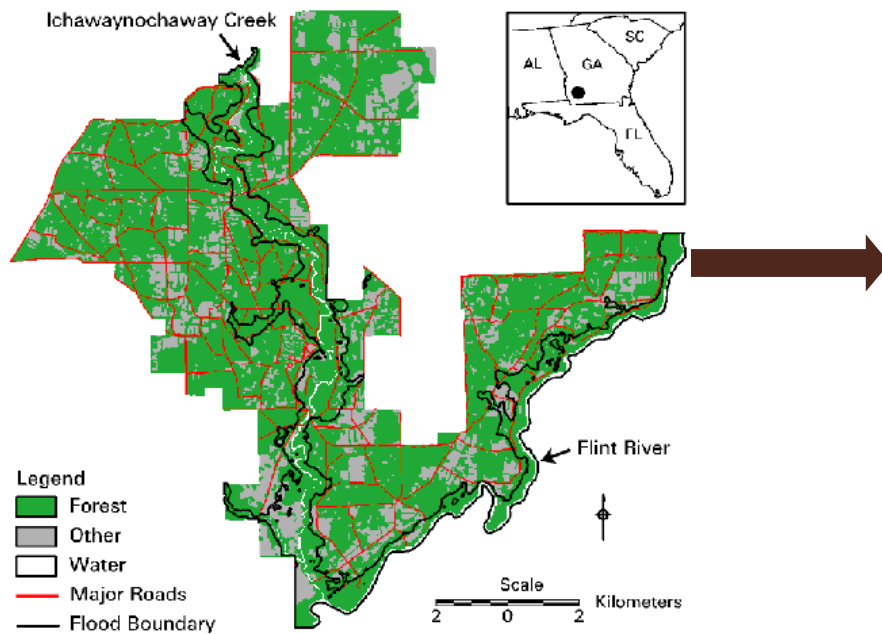
MICROHABITAT PREFERENCES OF LARVAL MOSQUITOES

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STUDY SITE

- Ichauway Ecological Reserve
- 29,000 acres longleaf pine forest
- Minimally disturbed wetlands



ISOLATED WETLANDS

- Not connected to surface waters
- Variable periods of flooding and drying
- Small
- Role in landscape is poorly known
- Lack legal protection
- Frequently disturbed by agricultural land use and urbanization



Isolated wetlands

Significant due to their contribution to regional biodiversity



Plants

Amphibians

Invertebrates

Reference Wetlands



Grass-Sedge Marsh

- Open and treeless
- Groundcover dominated by panic grasses & cutgrass
- Sandy or sandy soil clays



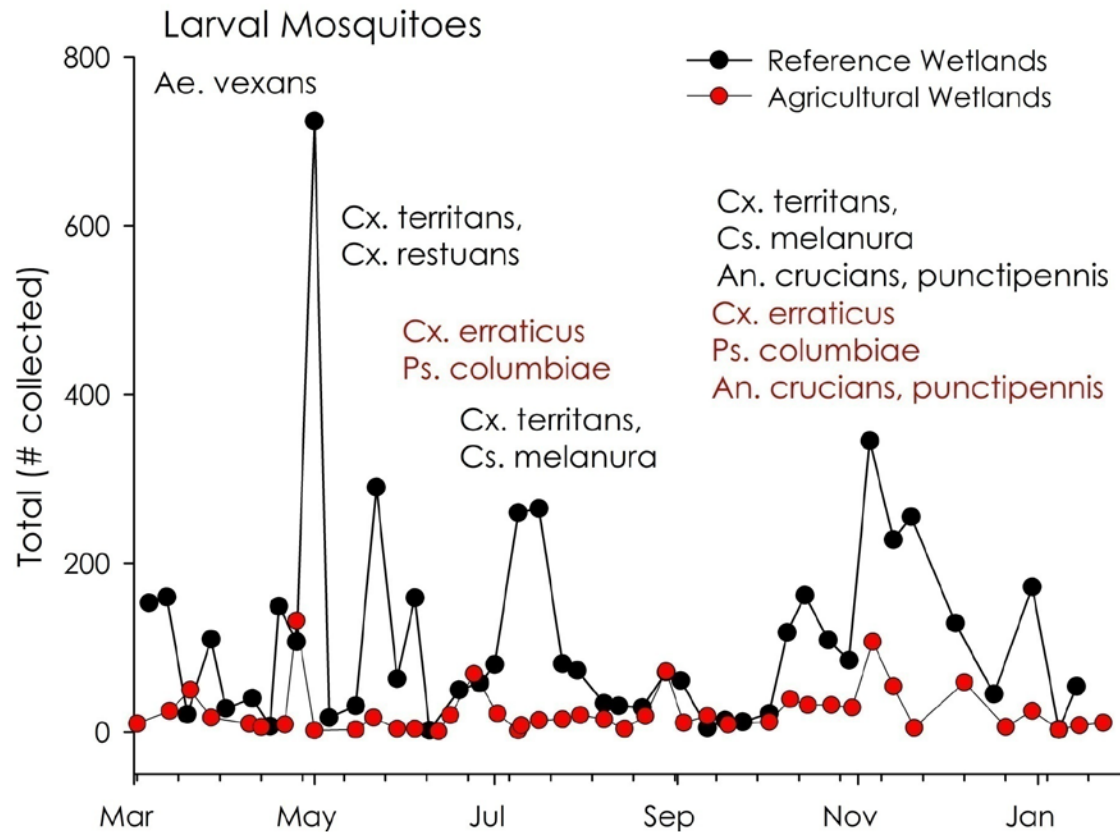
Cypress-Gum Swamp

- Dense canopy of cypress and gums
- Inundated for longer periods
- Organic soils over clay



History

-Part of a long term study examining mosquito species within isolated wetlands



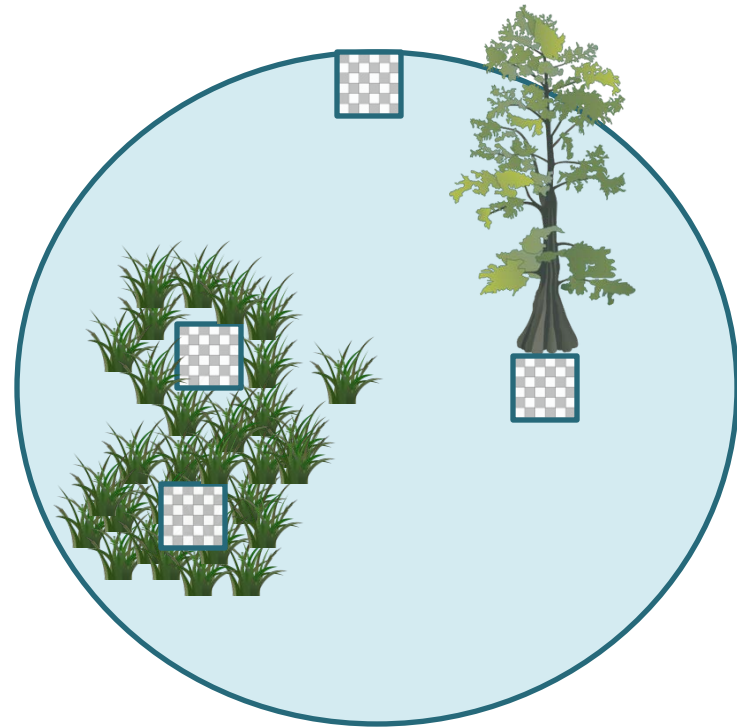
Objectives

- Improve sampling techniques for larval surveillance
 - Compare suitability of microhabitat characteristics as breeding habitat for larval mosquitoes
 - Examine microhabitat characteristics as predictors of species diversity and abundance



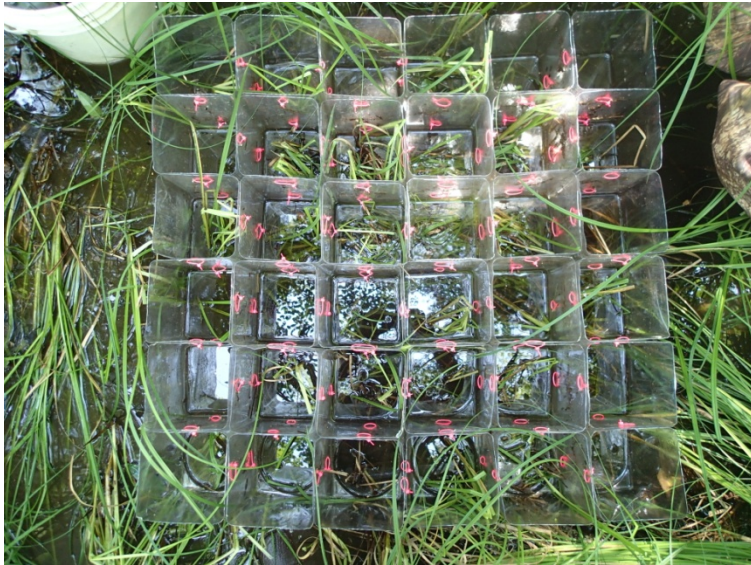
Microhabitats

1. Edge
2. Vegetation gaps
3. Continuous vegetation coverage
 - *Panicum sp.*
 - *Carex sp.*
4. Cypress
5. Depth (recorded for every individual square within every microhabitat)



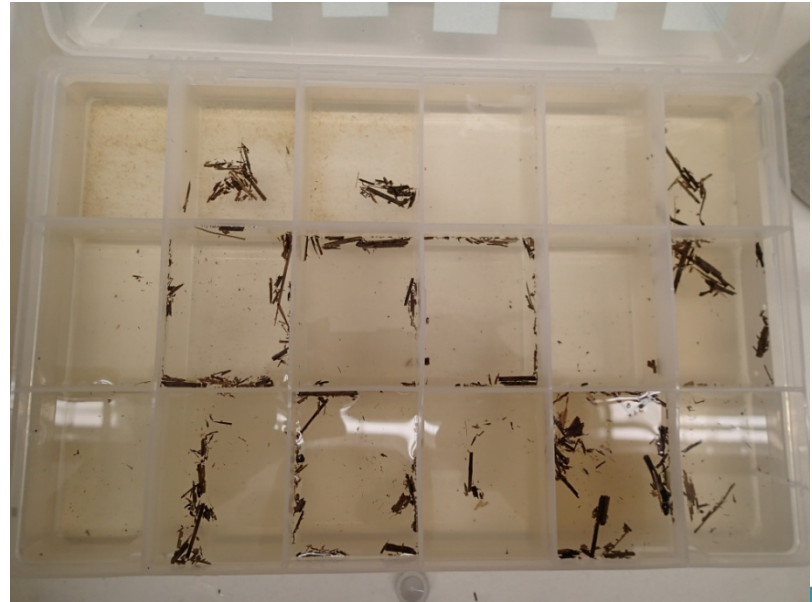
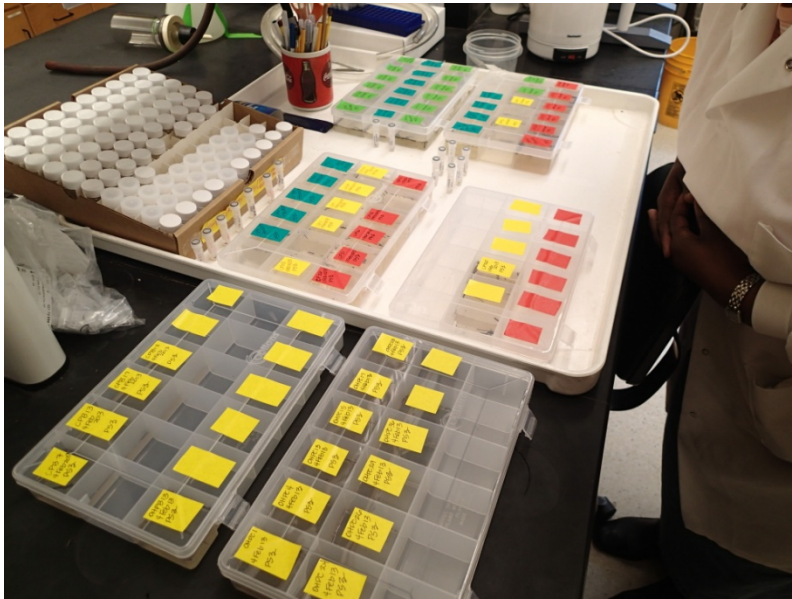
Methods

- 1m² grid
- 36 individual “capture chambers”
- 3 dips per square using standard dipper
- Each microhabitat sampled three times: 108 squares
- January, May and September



Methods

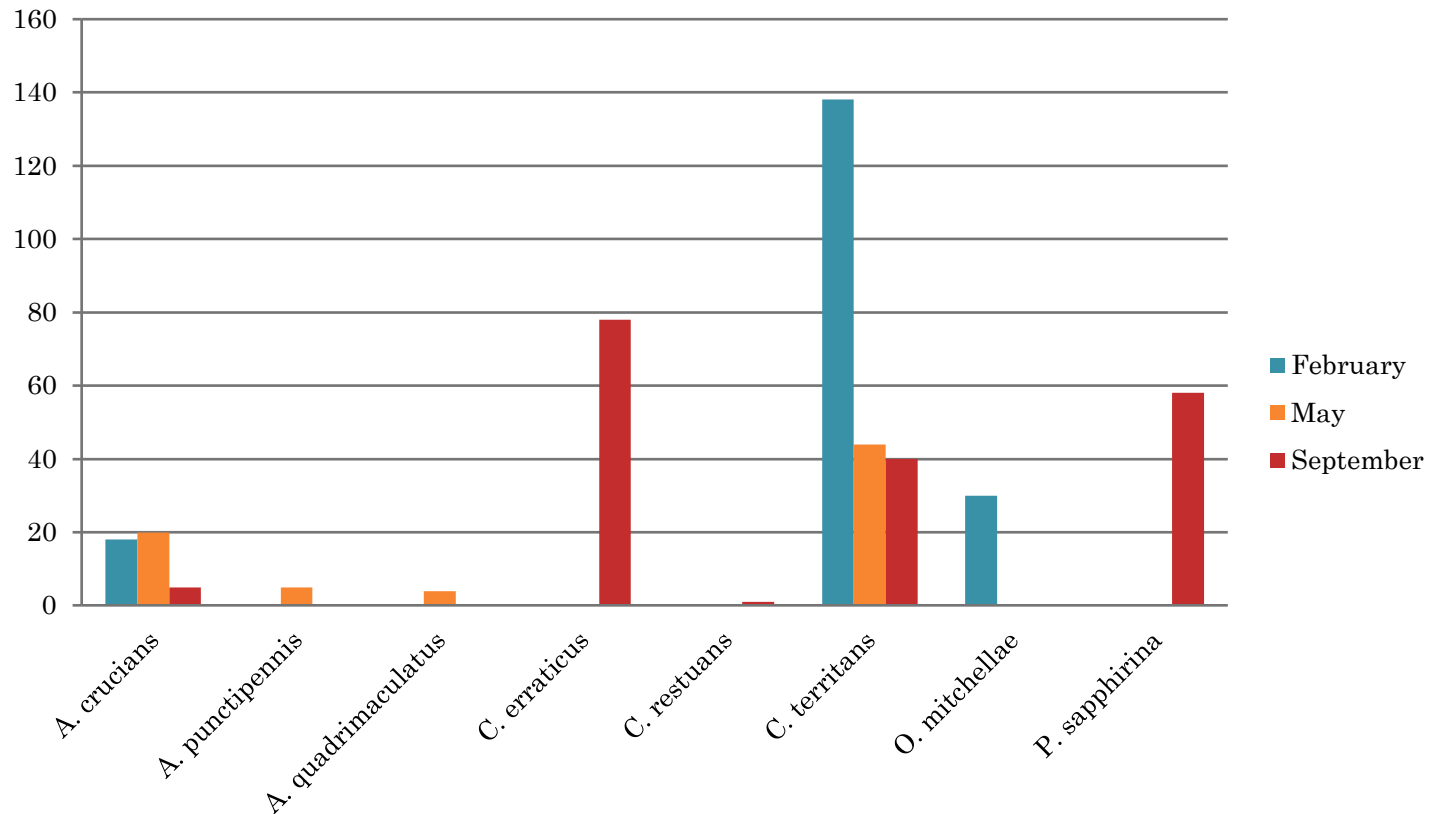
- Captured larvae were raised in rearing chambers
- Preserved once they reached the fourth instar
- Identified to the lowest possible taxonomic level



Capture Results

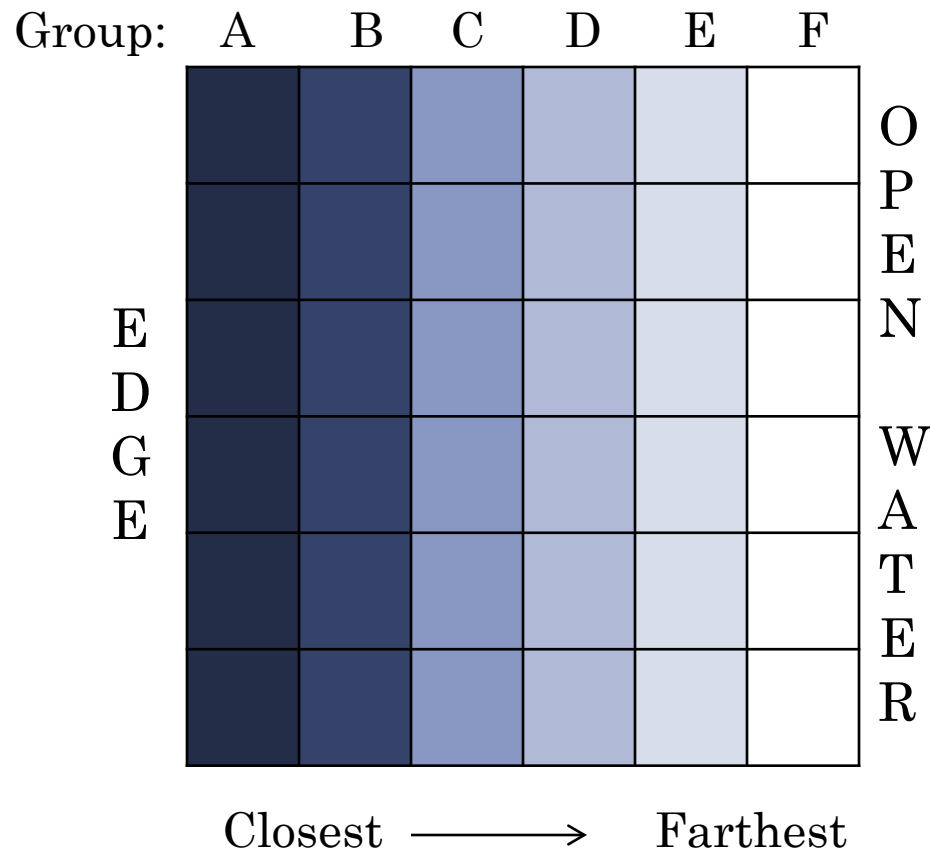
- Eight species were captured representing four genera
- Species capture and abundance differed depending on the time of year

Species Captures/Month



Results: Edge

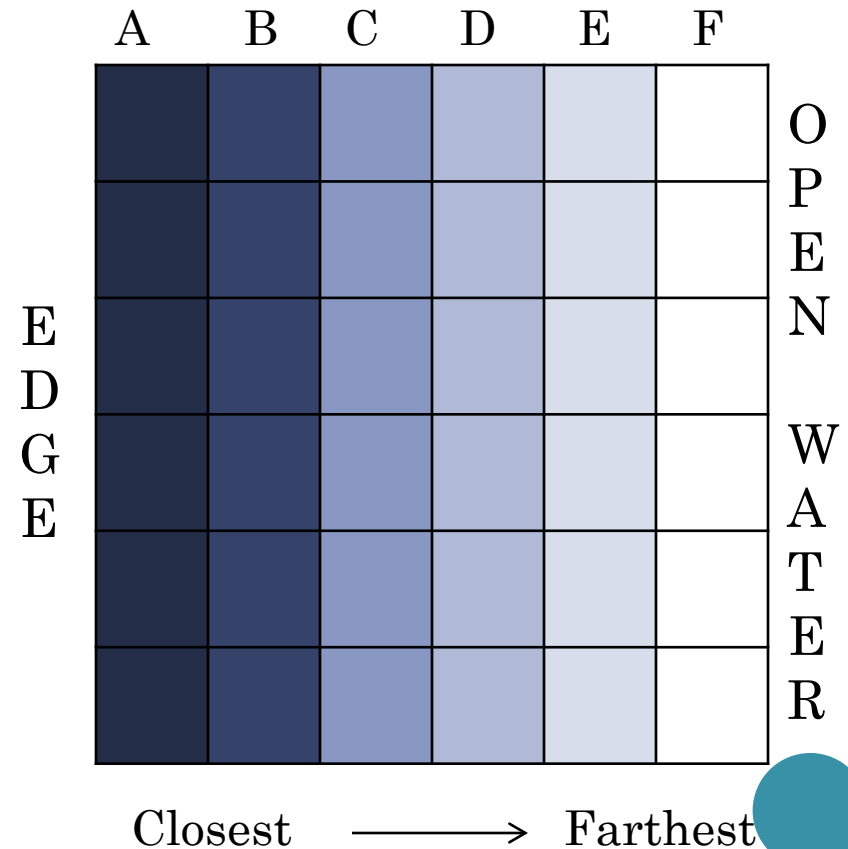
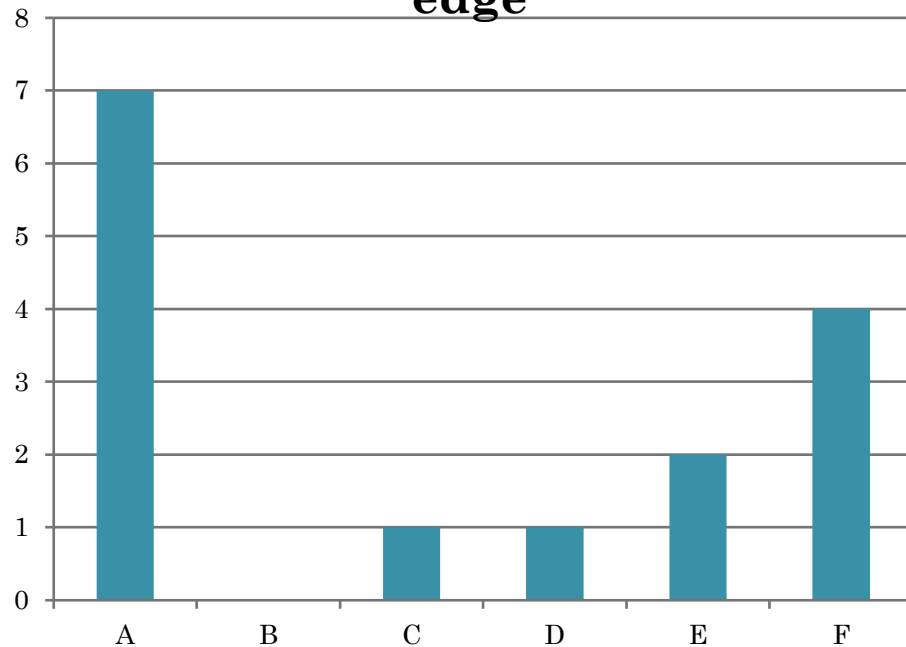
We analyzed data based off of proximity to “edge”



Results: Edge

We analyzed data based off of proximity to “edge”
ANOVA on Ranks (P=.008)

Captures in relation to
“edge”



Results: Vegetation

Vegetation vs. Open Water Patches

There are statistically more larvae found within vegetation patches than are found within open water patches

$P = <.001$

Mann-Whitney Rank Sum Test

Vegetation vs. Edge

There are statistically more larvae found within vegetation patches than are found along the edges of the wetlands

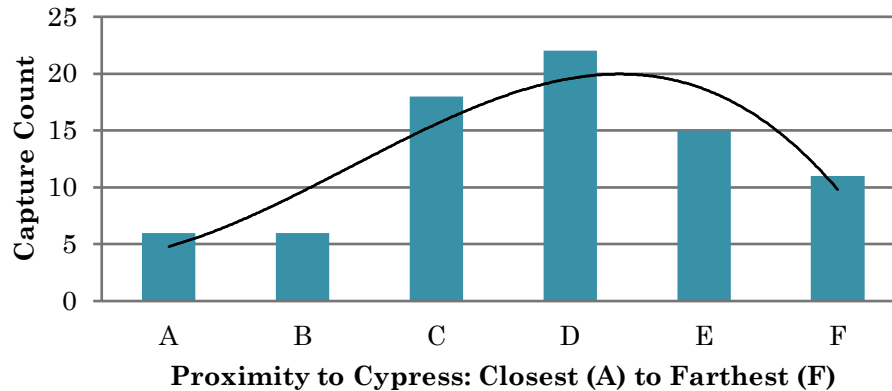
$P = <.001$

Mann-Whitney Rank Sum Test

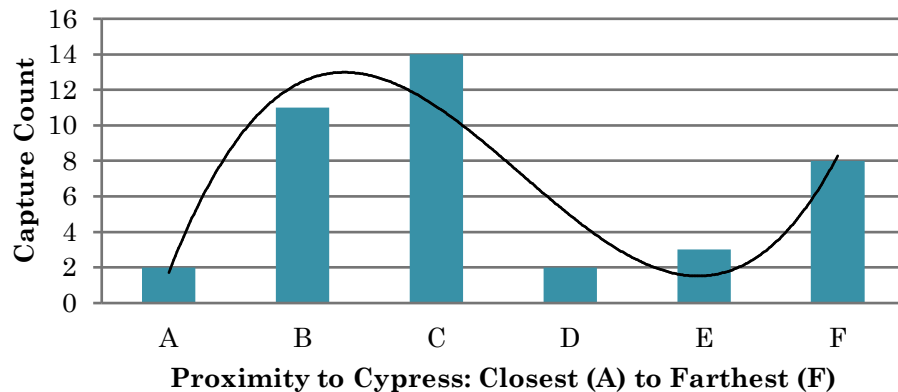


Results: Cypress

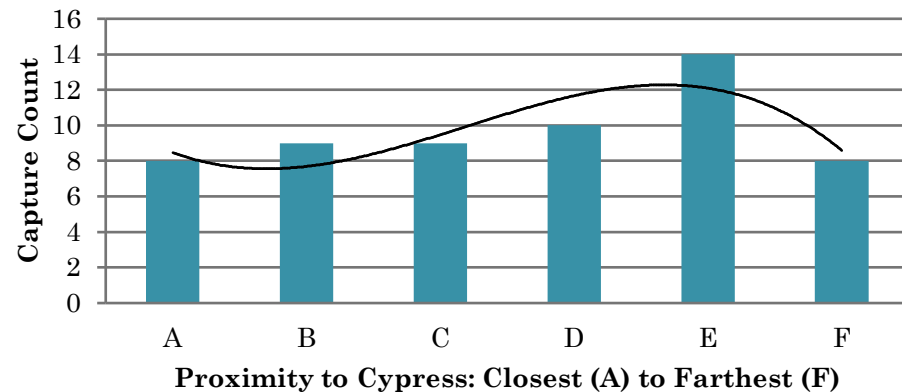
C. erraticus capture success in relation to Cypress tree



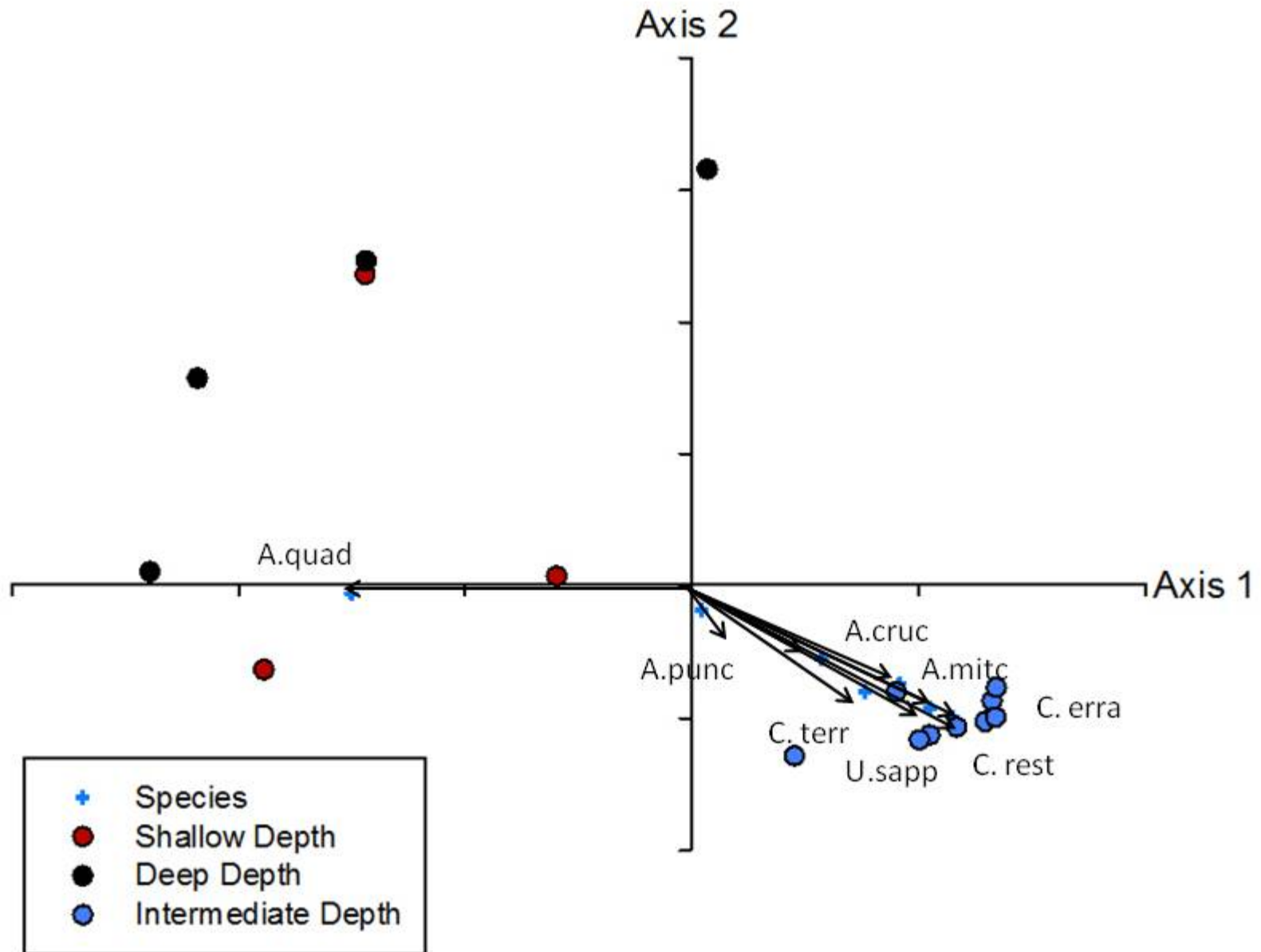
C. territans capture success in relation to Cypress tree



U. sapphirina capture success in relation to Cypress



Results: Depth



Conclusions: How can sampling techniques improve for larval surveillance?

- Sampling within an array of microhabitats will improve capture diversity and abundance



- With more research, it may be possible to pinpoint specific microhabitats where target species (i.e. vector species) typically reside.



Conclusions: How do microhabitat characteristics differ as breeding habitat for larval mosquitoes?

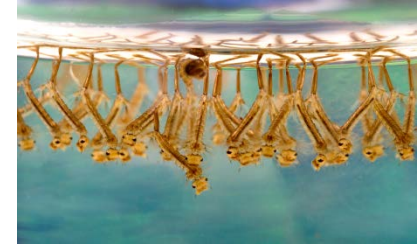
- Microhabitat's have characteristics that differ as potential breeding habitat

- We have shown that within a specific habitat (i.e. forested swamp) there are microhabitat characteristics that species “select” (i.e. vegetation, distance from edge)

- An interesting question is whether the larvae remain within close proximity to the specific microhabitat where oviposition occurs
(ex: *A. quadrimaculatus*)



Conclusions: Can certain microhabitats be used as predictors of species diversity and abundance?



Within our isolated wetlands:

- Depth: <8cm is an ideal place to find *A. quadrimaculatus*. Depths over 8 cm result in greater species diversity.
- Vegetation: Stands of emergent vegetation are the greatest predictor of diversity and abundance



Conclusions

Conducting more microhabitat sampling events would:

- allow for a more complete investigation of the 24 other species we have collected in SW Georgia
- allow us to identify microhabitat characteristics of a more diverse set of mosquitoes
- Perhaps make sampling for particular species more efficient by targeting microhabitats.

Many of the mosquitoes we observed can serve as vectors for arboviruses.

- transmission of arboviruses is an emerging public health issue in the southeastern U.S.
- little surveillance has occurred in rural areas of SE U.S.

