

FLORIDA FRIENDLY POND LANDSCAPING INCREASES BIODIVERSITY

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Abstract

- Florida friendly landscapes are developed lands that follow guidelines designed to benefit Florida ecosystems.
- This study compared the biodiversity found at three ponds that met this criteria to three ponds that did not.
- To quantify biodiversity we surveyed each site for ten minutes, twice a day, three days a week for six weeks, counting indicator species.
- We provide support that Florida friendly landscaping is beneficial for biodiversity.
- Ponds that were Florida friendly had more indicator species and should have more biodiversity than other ponds.
- These findings are useful for determining how to use resources in landscaping to sustain both development and ecological processes.

Introduction

- Urban development causes habitat loss and fragmentation, increased pollution entering our environments, and a decrease in plant and animal species (Hamer & McDonnell, 2008).
- Indicator species, such as amphibians, are major determinants of ecosystem health.
- The connection between environmental health and the health of indicator species is indicative of the level of human impact on an environment
- 'Florida Friendly' sites are landscapes that protect natural resources through the conservation of water, prevention of erosion, creation of wildlife habitat, and the reduction of waste and pollution (University of Florida, 2009)



Do ponds that meet Florida friendly criteria have increased biodiversity compared to those that do not?

Methods

- Six ponds were selected, three Florida Friendly and three that were not, from the UCF main campus.
- We randomly placed two minnow traps in each of the six ponds.
- Traps were secured one foot off shoreline and parallel to the shoreline.
- The traps were checked twice per day, three times per week for six weeks.
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- Each pond was surveyed for ten minutes by transecting the perimeter of the pond.
- The water quality of each pond was checked to test for pH, nitrate, dissolved oxygen and bacteria.

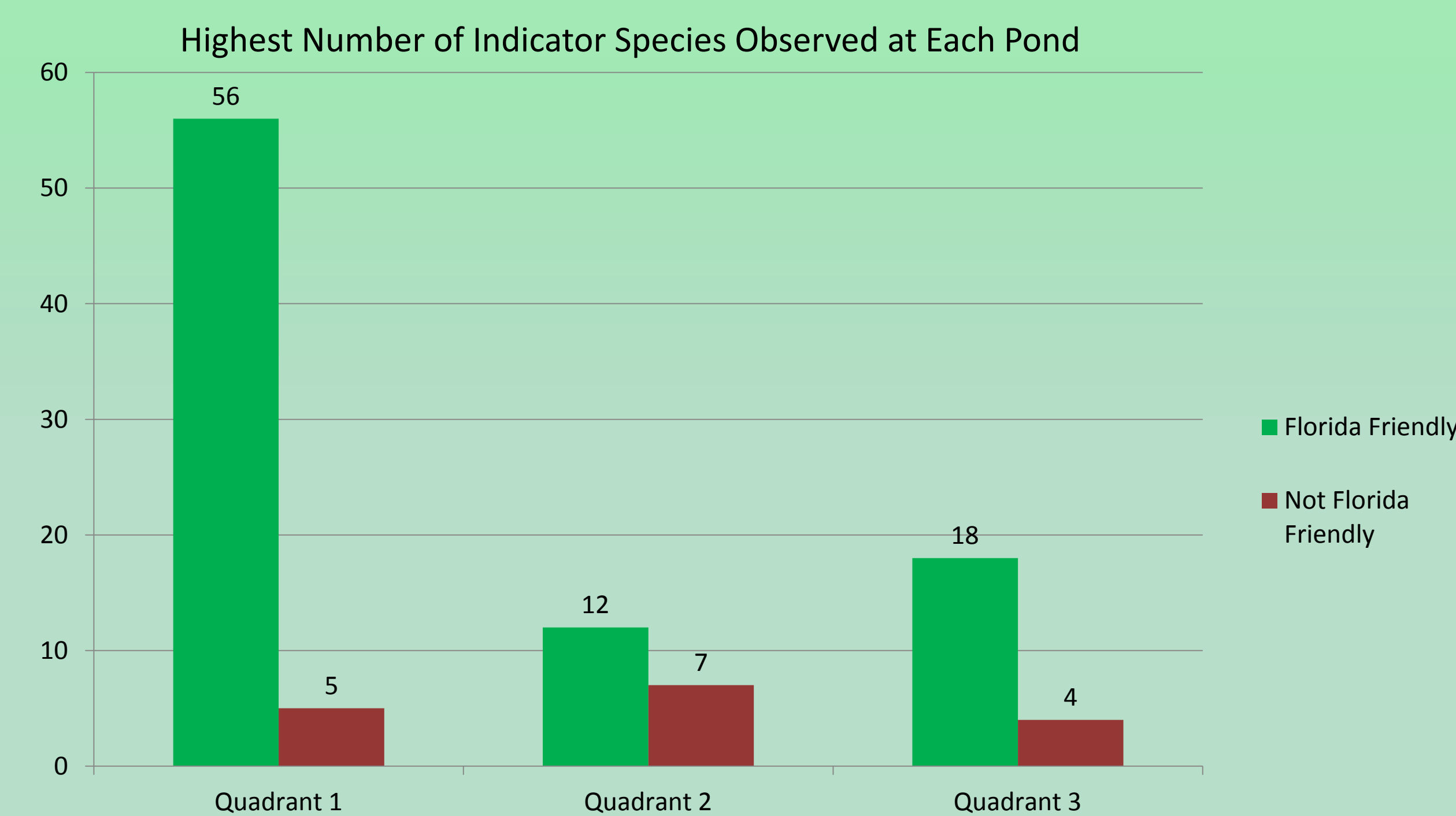


Results

- Observed a higher species richness and higher relative abundance in the Florida Friendly ponds.
- The Florida Friendly ponds had a higher biodiversity than the non-Florida Friendly ponds.
- Compared to the non-Florida Friendly ponds, the Florida Friendly ponds had a more basic (lower) pH, lower level of dissolved Oxygen, and higher amount of Nitrate.

Indicator Species Observed at Ponds

Florida Friendly	Not Florida Friendly
<i>Lithobates sphenoccephalus</i> (Southern Leopard frog)	<i>Lithobates sphenoccephalus</i> (Southern Leopard frog)
<i>Hyla cinerea</i> (Green Tree Frog)	<i>Osteopilus septentrionalis</i> (Cuban Tree frog)
<i>Anaxyrus terrestris</i> (Southern toad)	<i>Rana catesbeiana</i> (Bull frog)
<i>Osteopilus septentrionalis</i> (Cuban Tree frog)	<i>Gastrophryne carolinensis</i> (Narrow mouth toad)
<i>Rana catesbeiana</i> (Bull frog)	



Discussion

- Biodiversity is correlated to the number of plants and invertebrate species currently in the area (Nicolet et. al, 2004).
- The pond at Garage H had the highest species richness and the highest abundance of amphibians due to its unique perimeter vegetation.
- The ponds that had the least human influence on the outskirts of the UCF campus had a greater abundance of mammals and other non-indicator species.
- Frogs and toads were significantly more abundant than all other indicator species for all ponds surveyed regardless of criteria.
- The specific plant species present influenced the indicator species that inhabited the area.
- The ponds at Florida Friendly sites had healthier water qualities in regards to pH, dissolved Oxygen and Nitrate levels.
- The water quality of the Florida Friendly ponds is likely attributed to the increased number and abundance of plant species in and surrounding those ponds.
- Increased aquatic detritus present in non-Florida Friendly ponds was a probable cause for the lower oxygen levels.



Acknowledgements

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References

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