Everglades Florida Apple Snail Density

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What habitat conditions allow Florida apple snails to occur?
What is the importance of their occurrence?

Introduction

- The Florida apple snail (*Pomacea paludosa*) is found in the Florida Everglades, a subtropical wetland shaped by water level fluctuations, including periods of extreme inundation then periods of severe drought (Darby et al., 2008).
- Apple snails are nearly the exclusive prey of the highly Endangered Snail Kite (*Rostrhamus sociabilis plumbeus) (*Darby et al., 2008). Thus the driving force behind studying Florida apple snails is their connection to the endangered bird.
- We examined some environmental conditions which afford the survival and subsequent density of Florida apple snails and how their simultaneous occurrence with Snail Kites affects the existence of both species.

Method

- Florida apple snails were collected from 1-m^2 throw traps as part of an aquatic prey study of wading birds Dec-May 2005-2014 (Fig. 1). Habitat categories are shown in Figure 2.
- Contingency tables were used to determine the likelihood that habitat type and the occurrence of Florida apple snails is random and the likelihood that successful foraging habitats for Snail Kites relative to the habitat type is random. Florida apple snail density > ~0.1–0.2 snails m^2 deemed a site suitable for Snail Kite foraging (Darby et al., 2012).
- Water depth data was used as an additional variable affecting the occurrence of Florida apple snails (Fig. 3).
- Vegetation structure (dense vs. sparse) was also measured within the throw traps.

Figure 1. Apple Snail Density by Year

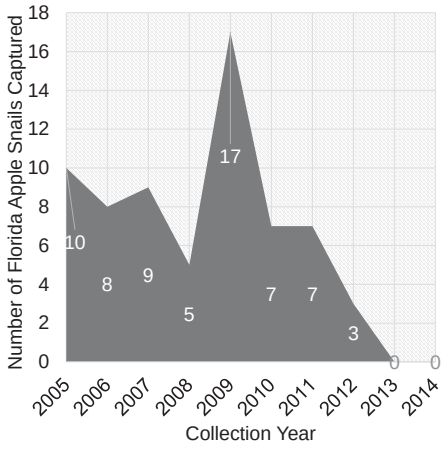


Figure 3. Water Depth Comparison Between Suitable and Unsuitable Foraging Habitats for Snail Kites based on Florida Apple Snail Density

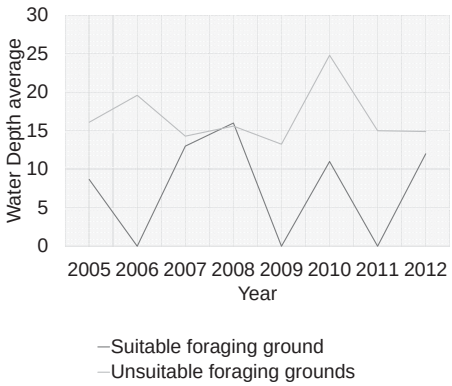
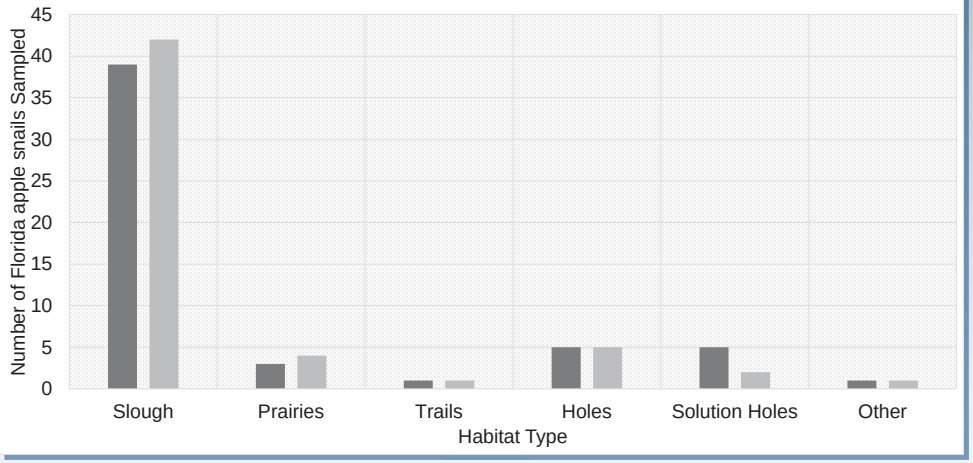


Figure 2. Number of Florida Apple Snails Sampled Relative to Habitat Type



Results

- Florida apple snails in 6% of the total sites. P-value = 0.37, 0.31 after two separate chi tests. 9/54 (apple snail) sites = > ~0.1–0.2 snails / m^2
- Avg. water depths = 7.6cm/14.9cm for suitable/ unsuitable foraging habitats, respectively.
- Suitable foraging habitats = 8 cm avg. distance of emergent vegetation from center of trap; unsuitable foraging habitats = 16 cm.

Discussion

- The null hypothesis that Florida apple snail distribution in different habitat types is a random occurrence was not rejected (p-value = 0.37). Suitable foraging habitat relative to habitat type is also random with a chi-square p-value = 0.31.
- Due to specific Snail Kite preferences, suitable foraging habitats are sparse even though from our statistical analysis, Florida apple snails can occur independently of habitat type.
- Snail Kites prefer to forage in lower water levels because the access is easier (The Pomacea Project, Inc., 2013).
- It is a possibility that more Florida apple snails inhabit densely vegetated habitats to have access to a substrate.
- Variables: water depth, vegetation etc. will be useful for water management to control to increase the abundance of Florida apple snails in the preferred foraging habitats for Snail Kites.

References

Darby, P., Bennetts, R., & Percival, F. (2008). Dry Down Impacts on Apple Snail (Pomacea Paludosa) Demography, Implications for Wetland Water Management. *Wetlands, 28*(1), 204-214

Darby, P., Fujisaki, I., & Mellow, D. (2012). The Effects of Prey Density on Capture Times and Foraging Success of Course-Hunting Adult Snail Kites. *The Condor, 114*(4), 755-763.

The Pomacea Project, Inc. (2013). Literature Review of Florida Apple Snails and Snail Kites and Recommendations for their Adaptive Management. *U.S. Department of the Interior, National Park Service Everglades National Park*.