

The correlation between landscape fragmentation and parasite prevalence

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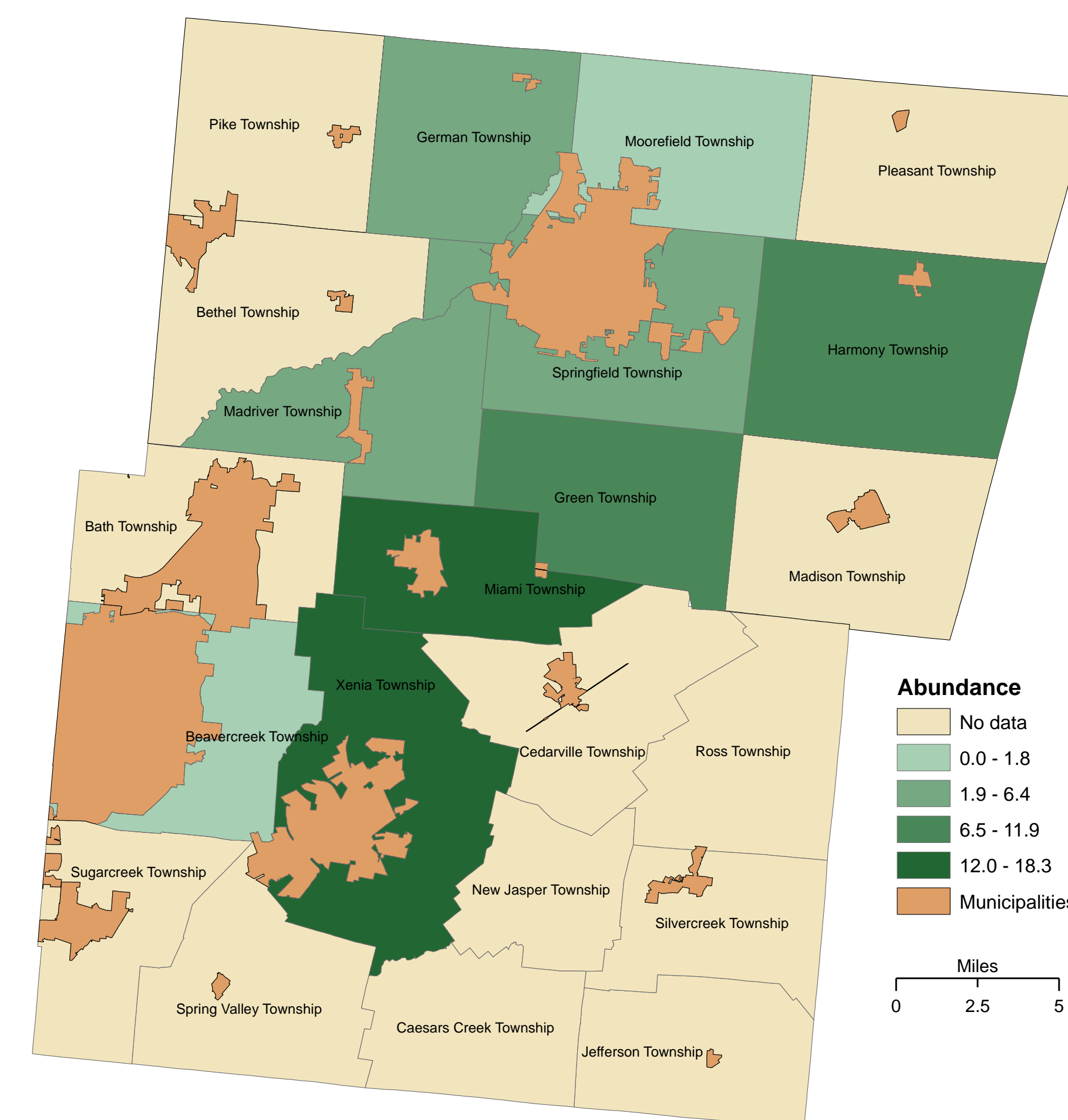
Introduction:

Raccoons (*Procyon lotor*) are the final host for raccoon roundworms (*Baylisascaris procyonis*) (Page et al., 2005). Raccoon roundworm is the leading cause of a dangerous neurological disease known as larva migrans encephalopathy (Blizzard et al., 2010). Land fragmentation occurs when natural environments are broken up by urban or agricultural landscapes. Raccoons thrive in urban environments (Randa & Yunger, 2006). Furthermore, raccoons in agricultural settings forage over larger areas than do raccoons in urban settings. Page et al. (2005) demonstrated that land fragmentation affects concentrations of *Baylisascaris procyonis* parasites in intermediate hosts.

Methods:

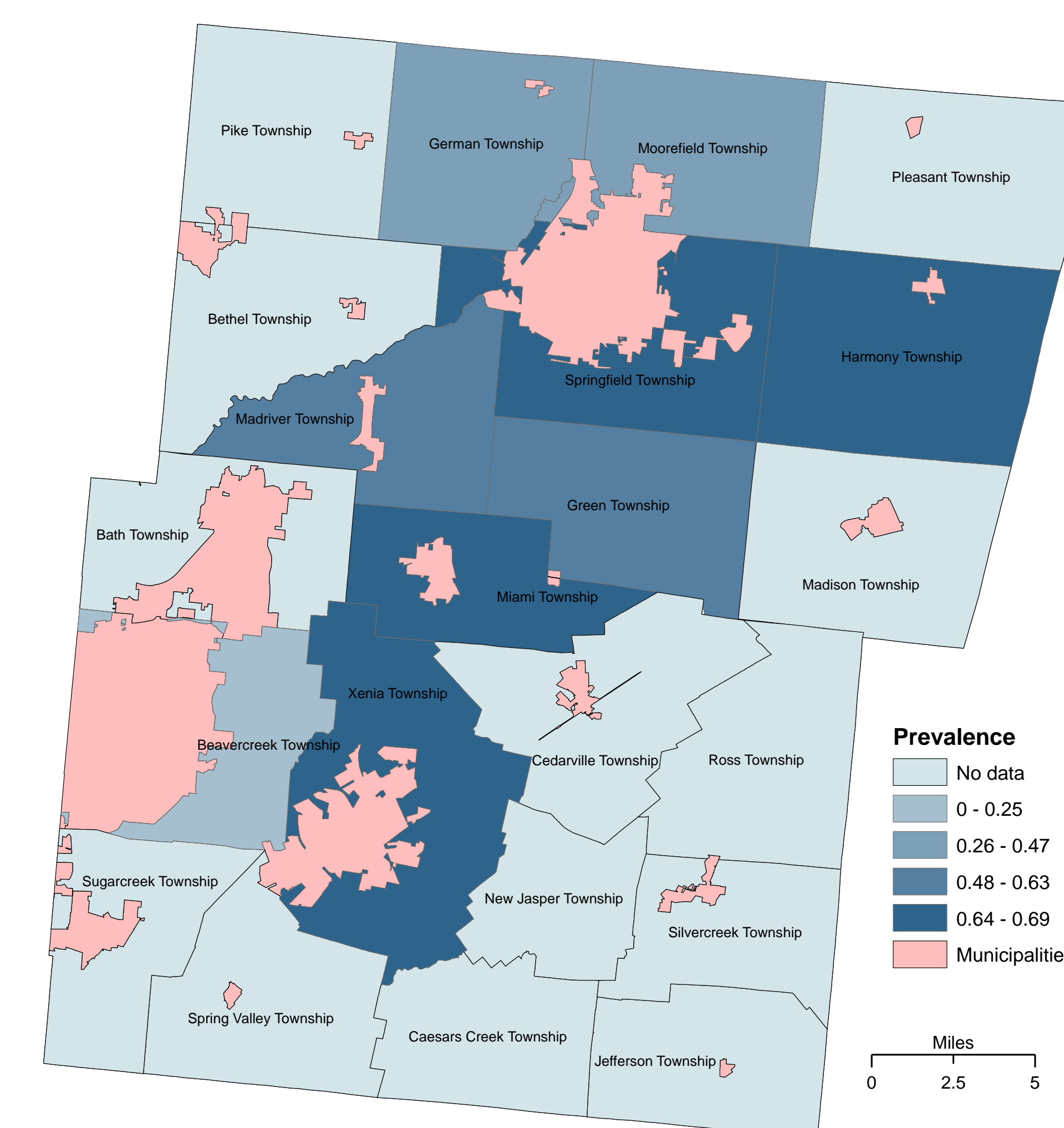
We calculated the prevalence of raccoon roundworm in ten townships of Greene and Clark Counties by necropsying 226 raccoon intestines. We measured prevalence as the number of raccoons infected with roundworm divided by the total number of raccoons sampled. Using ArcGIS and Fragstats, we developed a method of quantifying the fragmentation in each township. We ran a linear regression model to determine whether or not fragmentation is a valuable factor to predict and estimate parasite prevalence.

Results:



Map of the townships of Greene and Clark Counties Ohio. The areas incorporated into cities or villages are blanked out as they were not part of the analyses. The data represent the average number of raccoons found per individual raccoon from the various townships. The darker the color, the higher the parasite abundance. Parasite abundance ranges from 0 roundworms per individual to more than 18 roundworms per individual.

Map of the townships of Greene and Clark Counties Ohio. The areas incorporated into cities or villages are blanked out as they were not part of the analyses. The data represent the proportion of raccoons from an individual township that had raccoon roundworms when necropsied. The darker the color, the higher the parasite prevalence. Parasite prevalence ranges from 0.00 to 0.69.



Conclusions:

We determined that the degree of fragmentation varied between the sampled townships, and that some of the variation in parasite prevalence was accounted for by the variation in fragmentation. The townships in Green County represented some of the highest and the lowest prevalence and abundance. The most populated township (Beavercreek) had the lowest recorded prevalence of any township with more than 5 raccoons trapped. This warrants further study. We need more data on fragmentation to speak on the correlation between fragmentation and parasite prevalence and abundance.

References:

- Blizzard, E. L., Yabsley, M. J., Beck, M. F., & Harsch, S. (2010). Geographic Expansion of *Baylisascaris procyonis* Roundworms, Florida, USA. *Emerging Infectious Diseases*, 16(11), 1803-1804.
- Page, K. L., Gehrt, S. D., Titcombe, K. K., & Robinson, N. P. (2005). Measuring prevalence of raccoon roundworm (*Baylisascaris procyonis*): a comparison of common techniques. *Wildlife Society Bulletin*, 33(4), 1406-1412.
- Randa, L.A. & Yunger, J.A. (2006). Carnivore occurrence along an urban-rural gradient: A landscape-level analysis. *American Society of Mammalogists*, 87(6), pp. 1154-1164.