

The Eastern Box Turtle (*Terrapene c. carolina*) as a Dispersal Vector of Seeds and Spores in Central Illinois

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Introduction:

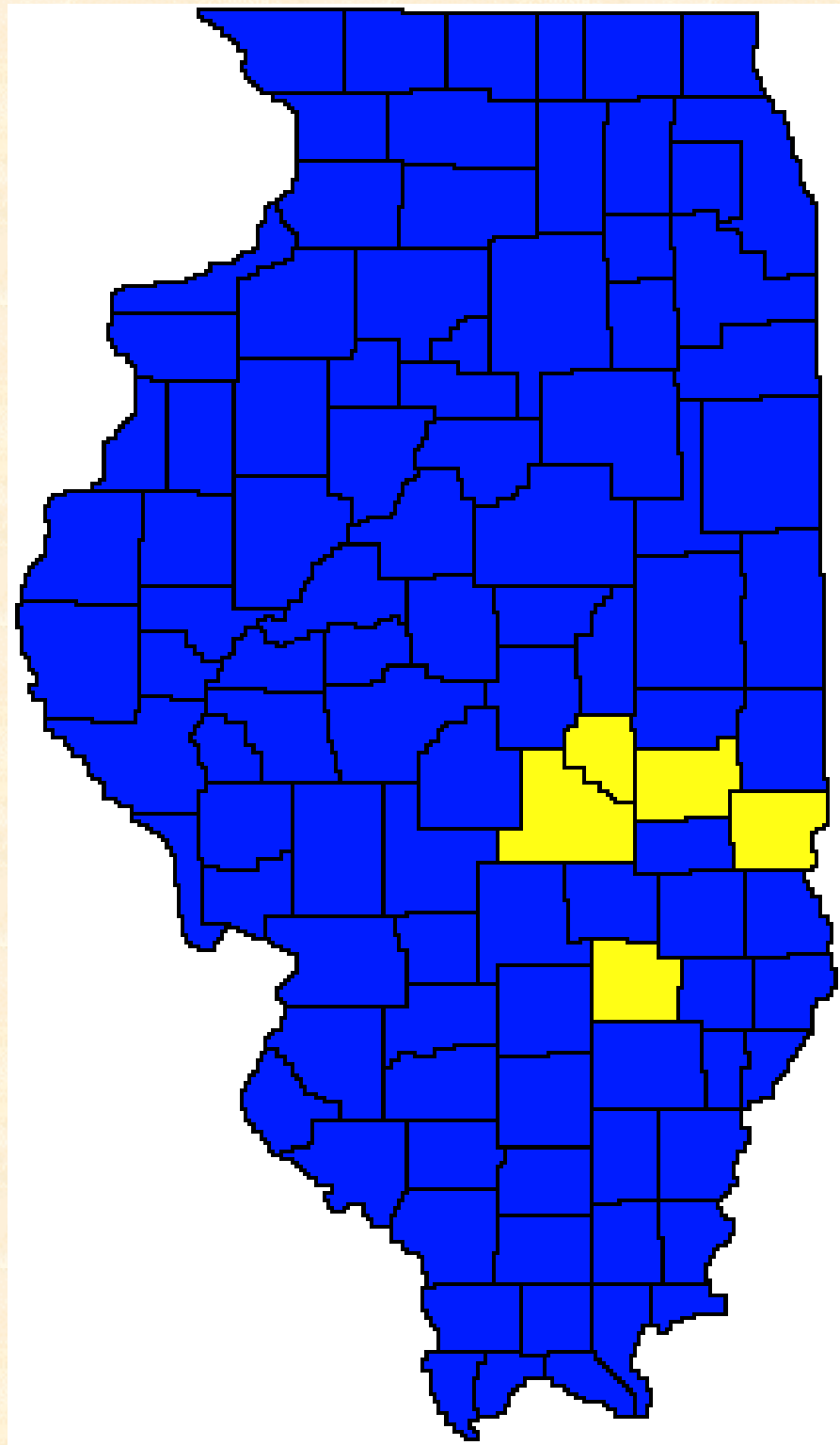
- The ability of plants to persist in highly fragmented landscapes depends critically on dispersal of seeds into suitable habitats.
- Dispersal can effect invasion dynamics, population genetic structure, and vegetation response to future climate change.
- Very little information exists on the dispersal of seeds by naturally occurring populations of turtles, and many documented examples of such mechanisms are limited to only a few anecdotal reports and laboratory experiments.
- An inadequate amount of information exists on the dispersal of spores by vertebrates let alone turtles. Most research has focused on a couple small mammalian and avian taxa.

Objectives:

- To quantify the amount of seeds eastern box turtles disperse.
- To quantify the amount of spores eastern box turtles disperse.
- To analyze the temporal pattern of dispersal events.

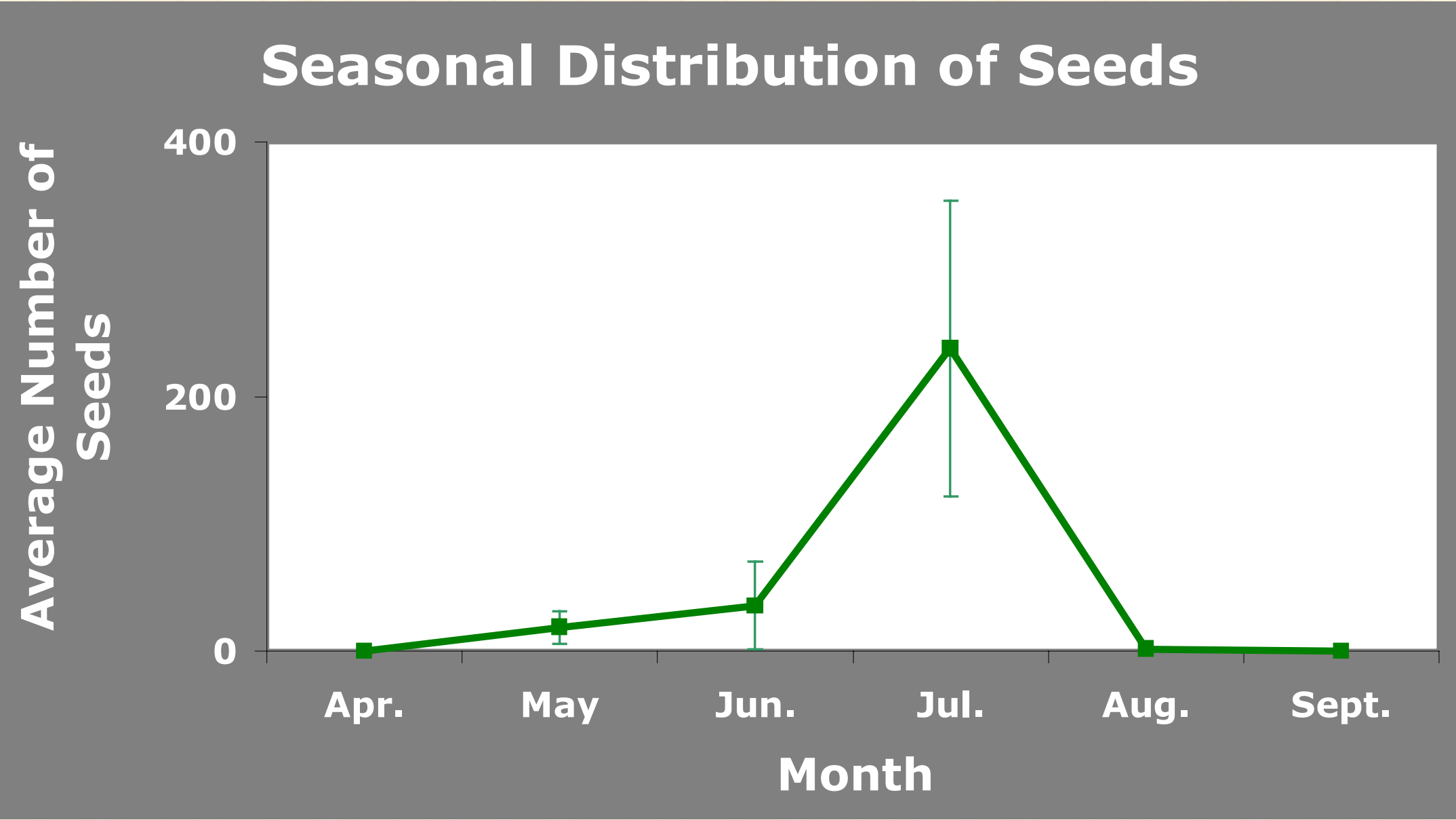
Study Areas:

- Coles
- Clark
- Moultrie
- Shelby
- Clay



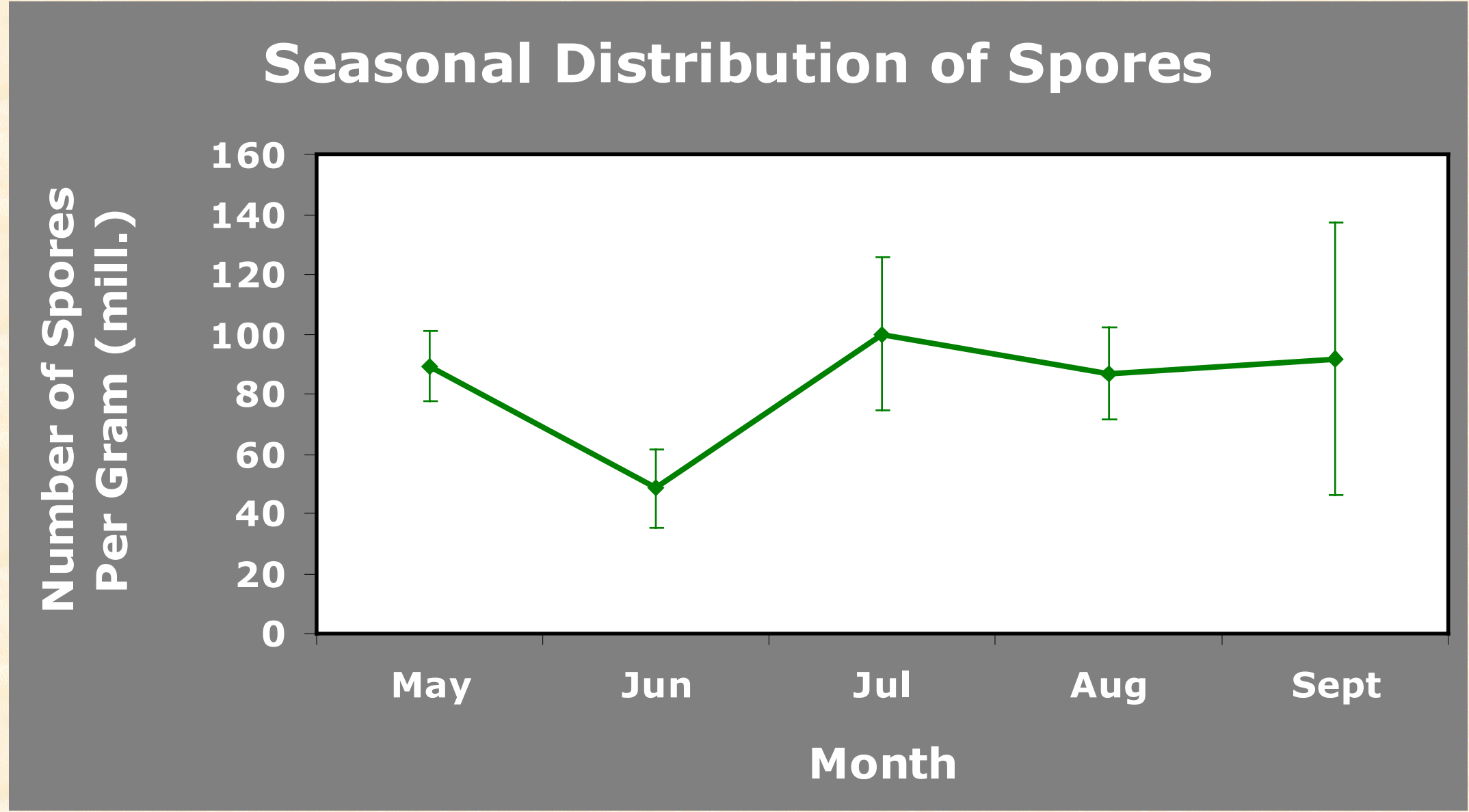
Methods:

- Turtles were captured by sight location in woodlands, grasslands, and along roadsides from April to September 2004.
- Turtles were held in plastic containers until a sample was generated or three days had passed without producing a sample.
- Samples were then dried at 28°C in an oven until completely dehydrated.
- Seeds were then removed and counted using a dissecting microscope.
- Spores were counted using serial dilutions of fecal material and a haemocytometer counting camber.



37% of samples contained seeds

A total of 38 samples were collected from April 2003 to September 2003. The temporal pattern suggests fruit availability and consumption were highest for the month of July.



100% of samples contained spores

A total of 35 samples were evaluated for the presence of fungal spores. The temporal pattern found suggests spores are dispersed at relatively large quantities throughout the field season. Samples in the month of June contained the fewest spores while other months contained a relatively stable number of spores.

Table 1. The species found in fecal samples, the total number, and proportion of each species found. (*Rubus spp.* is thought to contain *R. occidentalis* and *R. flagellaris*.)

Seed Species	Number of Seeds	Proportion of Samples Containing Seeds
<i>Rubus spp.</i>	2324	0.69
<i>Fragaria virginiana</i>	124	0.15
<i>Unknown</i>	1	0.08
<i>Prunus serotina</i>	5	0.08

Conclusion:

- Five species of seeds were found passing through the turtle digestive system intact.
- Turtles were observed dispersing *Rubus spp.* significantly more often and in greater quantities than other species.
- There is a temporal shift in the dispersal of seeds. July was the peak month in which seeds were dispersed likely due to fruit abundance and availability.
- Turtles may be important dispersers of some fruiting plants in central Illinois. However, they appear to disperse relatively few species of fleshy fruits.
- Turtles may be very important dispersers of fungal spores which are typically thought of as wind dispersed.

Future Directions:

- Seed viability tests would determine if the seeds passing through the turtle digestive tract are hindered or aided in germination.
- Fungi spores are currently being germinated and cultured to determine the species composition of fungi found in the samples.

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