



Spatial Ecology of the Smooth Softshell Turtle (*Apalone mutica*) in the Kaskaskia River of Illinois

Turtles are an important, though often overlooked, part of river ecosystems. They can attain high biomasses and facilitate energy flow and nutrient cycling in riverine food webs. Specialized river turtles have ecological, behavioral, and morphological adaptations allowing them to thrive in dynamic river ecosystems, yet this restricted habitat use makes them vulnerable to anthropogenic modification of riverine habitats. The Smooth Softshell Turtle (*Apalone mutica*) is highly aquatic and generally considered a big river specialist. It is characterized by a round, flat body and webbed feet to allow easy movement in strong river currents. Although the Smooth Softshell is capable of attaining high population densities, it is susceptible to habitat degradation and modification of riverine systems. The Smooth Softshell is listed as an endangered species in Illinois.

Little work has been done on the Smooth Softshell, especially in Illinois, and we do not have a complete understanding of its ecology and life history. In particular, the spatial ecology of the Smooth Softshell is not well described over a seasonal and multi-year scale. This is problematic because conservation of animal populations requires knowledge of space use—where animals are, where they are not, and why. Without such knowledge, it is difficult to estimate the size and characteristics of space required for survival. In light of the importance of turtles in river ecosystems



Male Smooth Softshell Turtle with radio transmitter basking on a sandbar. Photo by Jason Ross.

and their potential vulnerability, there is a need for detailed knowledge of spatial ecology for the Smooth Softshell in Illinois.

With a State Wildlife Initiative Grant, we are investigating the spatial ecology of the Smooth Softshell in the Kaskaskia River. Our goals are to determine what

variables best explain movement rates, home range size, and habitat use. Furthermore, the Kaskaskia River has an altered hydrological regime due to dams, providing an opportunity to see how river modification may affect the species. We began our study in June of 2013 by capturing turtles with baited hoop nets and attaching radio transmitters. We





Jason Ross radio-tracking a Smooth Softshell Turtle in the Kaskaskia River near Fayetteville, Illinois. Photo by Travis Russell.

are radio-tracking these turtles by boat and collecting location, habitat, environmental, and behavioral data. During the first year of our study, we captured 92 Smooth Softshells and equipped 31 with radio transmitters.

Data from the first year of the study show that Smooth Softshells in the Kaskaskia River use the main channel heavily and seem to avoid smaller streams and backwaters. On average, males use shallower waters than females, and use sandy point bars whereas females frequent deeper waters along cut banks. On warm days, they sometimes bask on sandbars, but

they don't venture far from the water's edge. We found that Smooth Softshells are capable of moving long distances, though not all of them do so. One female turtle swam 36 km upriver, while another female was never found more than a kilometer from her initial location. We documented similar differences in males; one male had a home range length of over 9 km while another had a home range length of only 0.5 km.

We will continue to radio-track these turtles throughout 2014. By the end of our study, we will better understand the spatial ecology of Smooth Softshells and

how movement, home range, and habitat use change throughout the year and with varying environmental conditions. New findings from our study will help guide conservation efforts for the Smooth Softshell Turtle.

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