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Ecological Responses of Midwestern Snakes to Prescribed Fire

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ABSTRACT

Prescribed burning is a commonly used land management tool to reduce the risk of hazardous wildfires and improve wildlife habitat, especially for grassland ecosystems. However, prescribed fire has widely varying effects on differing wildlife taxa. The effects of prescribed fire on herpetofaunal biodiversity have been examined, but the responses of a common and wide-ranging species, the common garter snake (*Thamnophis sirtalis*), to fire and subsequent effects on its ecology have not been closely studied. The primary goal of this research was to evaluate differing resource use or movement patterns of common garter snakes in burned and unburned habitats. Our objectives were to evaluate habitat use by garter snakes using mark-recapture methods and compare this use between burned and unburned sites. We also collected tissue samples (blood and shed skins) to determine the diet of snakes using stable isotope analysis and compare diets between burned and unburned sites. We performed vegetation surveys to evaluate the effect of differing habitat variables on trap success. Our results suggest that snakes may select for burned grasslands because we trapped more snakes in burned grids. Large amounts of short grass (< 15 cm) near a trap had a negative effect on trap success. The amount of tall grass or bare ground near a trap was not demonstrated to have any effect on trap success. Stable isotope analysis of blood and prey samples and collection of mark recapture data are still ongoing and will provide more insight on resource use of snakes in burned grasslands.

KEYWORDS

Dekay's brown snake, fox snake, habitat selection, snake ecology, prescribed fire, garter snake, stable isotope analysis