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CAN PRESCRIBED FIRE REDUCE TICK PARASITISM OF BIRDS?

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Tick-borne diseases spread through enzootic transmission cycles that often involve ticks parasitizing bird hosts. Some avian species are competent reservoirs that amplify the pathogens causing tick-borne illnesses in humans. Prescribed burns in forests have the potential to reduce tick-borne disease risk if they limit interactions between ticks and infectious wildlife hosts. Although prescribed burns are increasingly being used for a variety of habitat management purposes, little is known about how they affect tick-host interactions. We hypothesize that if prescribed fires reduce tick abundance, then birds in burned forest plots will host fewer ticks than birds in unburned forest plots. Experimental forest plots were burned during Spring 2017. To assess avian tick burdens, we captured passerine birds using mist-nets, and removed ticks from each bird in two burned and two unburned plots during July 2017. Overall, we captured 43 birds (9 different species), and we removed a total of 130 larval and nymphal ticks from 23 of the birds. Birds in unburned plots ($n = 26$) had tick burdens (4.19 ± 0.93 ticks, mean \pm standard error) nearly four times greater, on average, than their burn plot counterparts ($n = 17$ birds; 1.18 ± 0.76 ticks). Juvenile birds hosted 4.86 ± 1.20 ticks, while adult birds hosted 1.23 ± 0.38 ticks. We modeled the effects of bird age and plot burn status on tick burden with a negative binomial regression. There are significant effects of both bird age and plot burn status on tick abundance, but no interaction was found between the two main effects. These results show a significant reduction in the tick burdens found on birds in burned plots compared to unburned plots, supporting our hypothesis.