

We asked small mammals if we were burning too little or too much

The small mammals of the longleaf pine forest may have a love-hate relationship with prescribed fire. On one hand, fire is required to maintain the dense herbaceous understory that many of these species need for food and cover. Without regular burns, oak shrubs can become established and shade out this understory. On the other hand, some species, particularly hispid cotton rats, become an easy target for predators in recently burned areas. Populations of cotton rats, one of the most important small mammal prey species in the Southeast, typically experience large but short-term declines following burns. To help tease out the relationship between fire and small mammal populations, we studied time between fires to determine if burning too often or too little had an adverse effect on small mammals. Our thinking was that if we don't burn often enough, habitat may become less suitable for small mammals, but if we burn too often, small mammal populations may not have time to recover between fires.

We trapped small mammals in longleaf pine-dominated sites that had been burned every two years, which is the average time between fires on our study site. We also trapped small mammals in sites that had not been burned for more than a decade and in sites that had been burned annually for more than a decade. In sites where we did not burn, overall small mammal abundance declined; this was particularly true of cotton rats. Overall small mammal abundance in annually burned sites was about the same as in those sites that were burned every two years. However,

KEY POINTS

Fire is important for maintaining wildlife habitat within longleaf pine forests.

Annual burns favored mice and burning every two years favored cotton rats.

More frequent burns are better than not burning often enough. Although annual burns favored mice, cotton rats were still present in these areas, suggesting that more frequent fires are better for all species than not burning at all.

Managers can use fire return intervals to favor some wildlife species over others.

On our site for the species we studied, the two-year return interval seems about right.



A hispid cotton rat immediately following a prescribed fire. Fire removes the vegetation cotton rats use for food and cover and leads to short-term population crashes. Annual burns led to decreased cotton rat abundance relative to other small mammals.

cotton mice and oldfield mice were most abundant in the annually burned sites while cotton rats were most abundant in the sites that were burned every two years.

Keep in mind that we did not include other relatively common fire return intervals in our study; for example, we did not have a three-year return interval. Other fire return intervals may have provided additional insight. Finally, it is important to remember that it is easier to keep fire on the landscape than to 'play catchup' after many years without fire.

MORE INFORMATION

Conner LM, A Holland, and G Morris. 2022. Fire exclusion and fire return interval affect small mammal populations in longleaf pine forests. *Forest Ecology and Management* 520: 120352. doi.org/10.1016/j.foreco.2022.120352

CONTACT

Mike Conner, mike.conner@jonesctr.org