



2020 EASTERN COTTONTAIL POPULATION STATUS REPORT

December 2020

Summary

The eastern cottontail rabbit (*Sylvilagus floridanus*) is one of the most common wildlife species in Ohio. Although native to the state, it was not nearly as widespread prior to European settlement. As with several other species of wildlife, the eastern cottontail was a beneficiary of settlement; the clearing of woodlands and forests and the establishment of more open areas along wooded borders provided an ideal environment. This brushland edge species is one of Ohio's most popular small game animals. Its adaptability to a variety of habitat types and conditions has allowed it to maintain reasonable numbers despite human population growth, habitat loss, and intensive land use.

Ohio's eastern cottontail population has remained relatively stable over the past several decades. The statewide spring population index for eastern cottontail in 2019 was 8.5 rabbits/route, an 8.5% increase from 2018 (7.8 rabbits/1000 survey miles). During 2020, the relative statewide abundance for eastern cottontails was 3.5 rabbits/route during the spring, a 3% increase from 2019. There were an estimated 58,987 rabbit hunters during the 2019–20 hunting season. Total hunter harvest was estimated to be 197,041 rabbits during the 2019–20 hunting season.

Methods

In Ohio, eastern cottontail populations have been monitored through the Rural Mail Carrier (RMC) survey since the 1950s. The RMC survey is run for two working weeks in the spring and two working weeks in the summer. However, the 2020 summer RMC survey was skipped in 2020. Surveys are done voluntarily by rural mail carriers. Each day participating mail carriers record the number of rabbits observed driving their route for 12 consecutive working days. Relative abundance of rabbits/route is calculated statewide and by weather region (defined in Spinola and Gates 2008) calculated using a *N*-mixture model as implemented in the *unmarked* package for program R (Royle 2004, Fiske and Chandler 2011, R Core Team 2020).

To estimate hunters and harvest, the Ohio Hunter Questionnaire was distributed to a random sample of adult license holders in Ohio following the 2019–20 hunting season. Number of hunters pursuing rabbits is calculated by dividing the number of hunters indicating they pursued rabbits by the total number of responses, this is then extrapolated to the pool of hunters from which the sample was drawn. Confidence intervals were derived by bootstrap resampling the data 5,000 times. All analyses were done in program R (Version 4.0.3; R Core Team 2020).

Results and Discussion

Predictably, eastern cottontail abundance/route was a linear function of route length, with estimated abundance increasing as route length increased (Fig. 1). The relative abundance of eastern cottontail statewide after the spring 2020 survey was 3.5 rabbits/route (SE = 0.1; 95% confidence interval: 3.3–3.6), a 3% increase from 2019 (3.4 rabbits/route, SE = 0.1, 95% confidence interval: 3.2–3.5; Fig. 2). The 2020 spring population index is 33% greater than the 10-year average (2.6 rabbits/route) and 7% greater than the 5-year average (3.3 rabbits/route). Spring population indices indicate eastern cottontail populations have been increasing over the past 6 years (Fig. 2). The 2019 summer RMC survey yielded a relative abundance of 1.2 rabbits/route (SE = 0.9; 95% confidence interval: 0.3–4.9). The relative abundance of cottontails in 2019 summer RMC decreased 79% when compared to the relative abundance from 2018 summer RMC statewide

index (5.8 rabbits/route; SE = 0.2; 95% confidence interval = 5.5–6.2); however, there was considerable variance surrounding the 2019 estimate and there was no statistical difference between 2018 and 2019.

The 2020 spring RMC survey indicates populations are well distributed throughout the state (Fig. 4). In general, relative abundance of eastern cottontail populations were greatest in the south-central and northwestern Ohio weather regions (Fig. 4). The northeastern and central Ohio weather regions had the lowest relative abundance of rabbits in the state (Fig. 4).

Eastern cottontails were pursued by 16.9% of Ohio Hunter Questionnaire respondents and there were an estimated 58,987 rabbit hunters (95% confidence interval: 58,550–59,412) in Ohio during the 2019–20 season. Rabbit hunters averaged 5.3 days afield. Of the questionnaire respondents in pursuit of rabbit, 73.1% hunted solely on private land, 14.9% hunted solely on public land, and 12.2% hunted on both public and private land. Of all respondents that hunted rabbit, 20.4% hunted on ODOW Wildlife Areas, 1.1% hunted on state forests, 0.9% hunted on national forests, and 5.1% hunted on ODNR State Parks. Average harvest was 3.3 eastern cottontail per hunter, for a total estimated harvest of 197,041 (95% confidence interval: 163,265–235,703) during the 2019–20 season.

Literature Cited

- Fiske, I., and R. Chandler (2011). unmarked: an R package for fitting hierarchical models of wildlife occurrence and abundance. *Journal of Statistical Software* 43:1–23.
- R Core Team (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>
- Royle, J.A. 2004. N-mixture models for estimating population size from spatially replicated counts. *Biometrics* 60:108–115.
- Spinola, R.M., and R. Gates. 2008. Population Status and Trends of Northern Bobwhite (*Colinus virginianus*) in Ohio: 1984- 2004. *Ohio Journal of Science* 108:26–30.

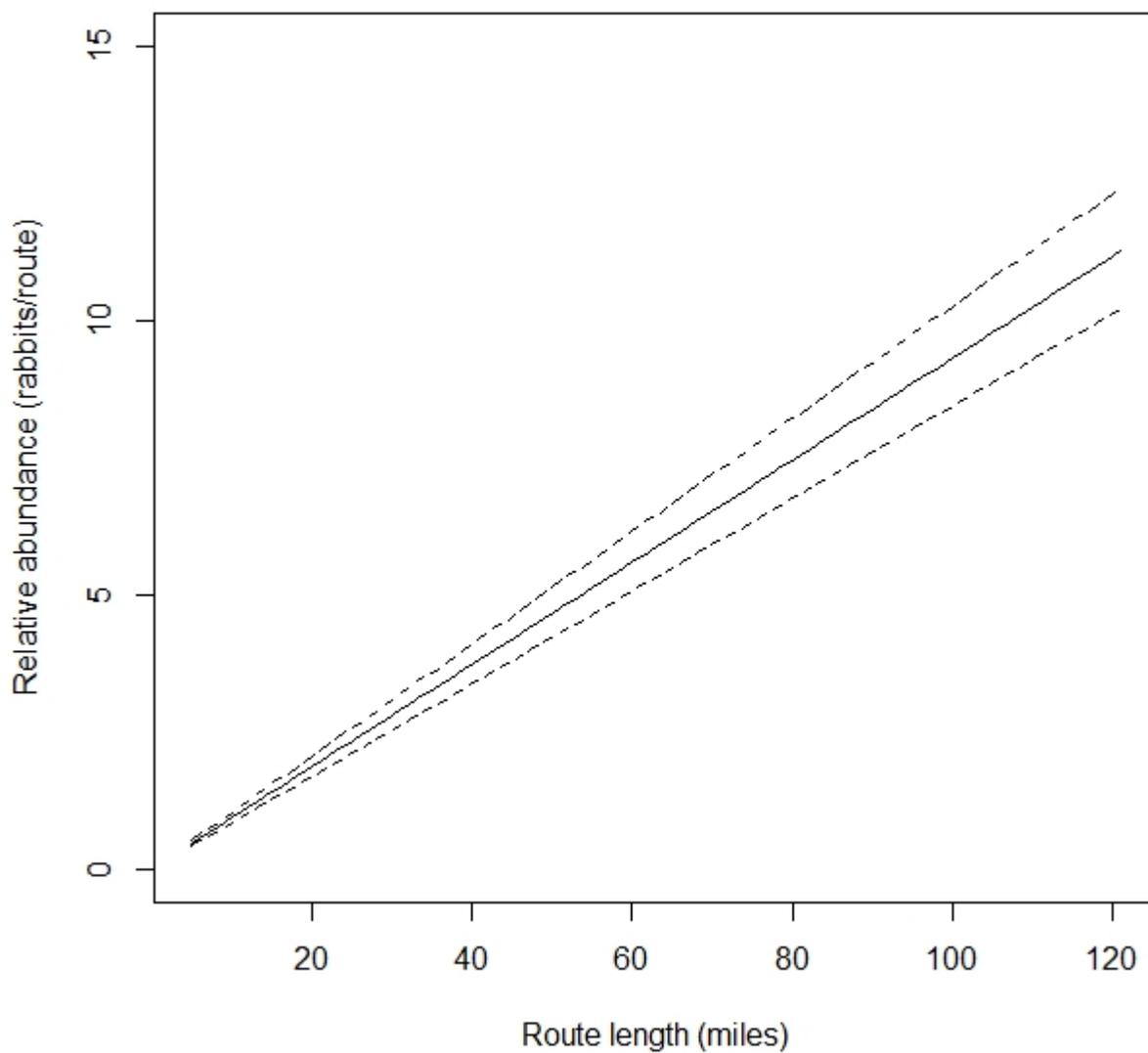


Figure 1. Average eastern cottontail observed by rural mail carriers during spring 2020 for the state of Ohio as a function of route length. Dashed lines indicate 95% confidence intervals.

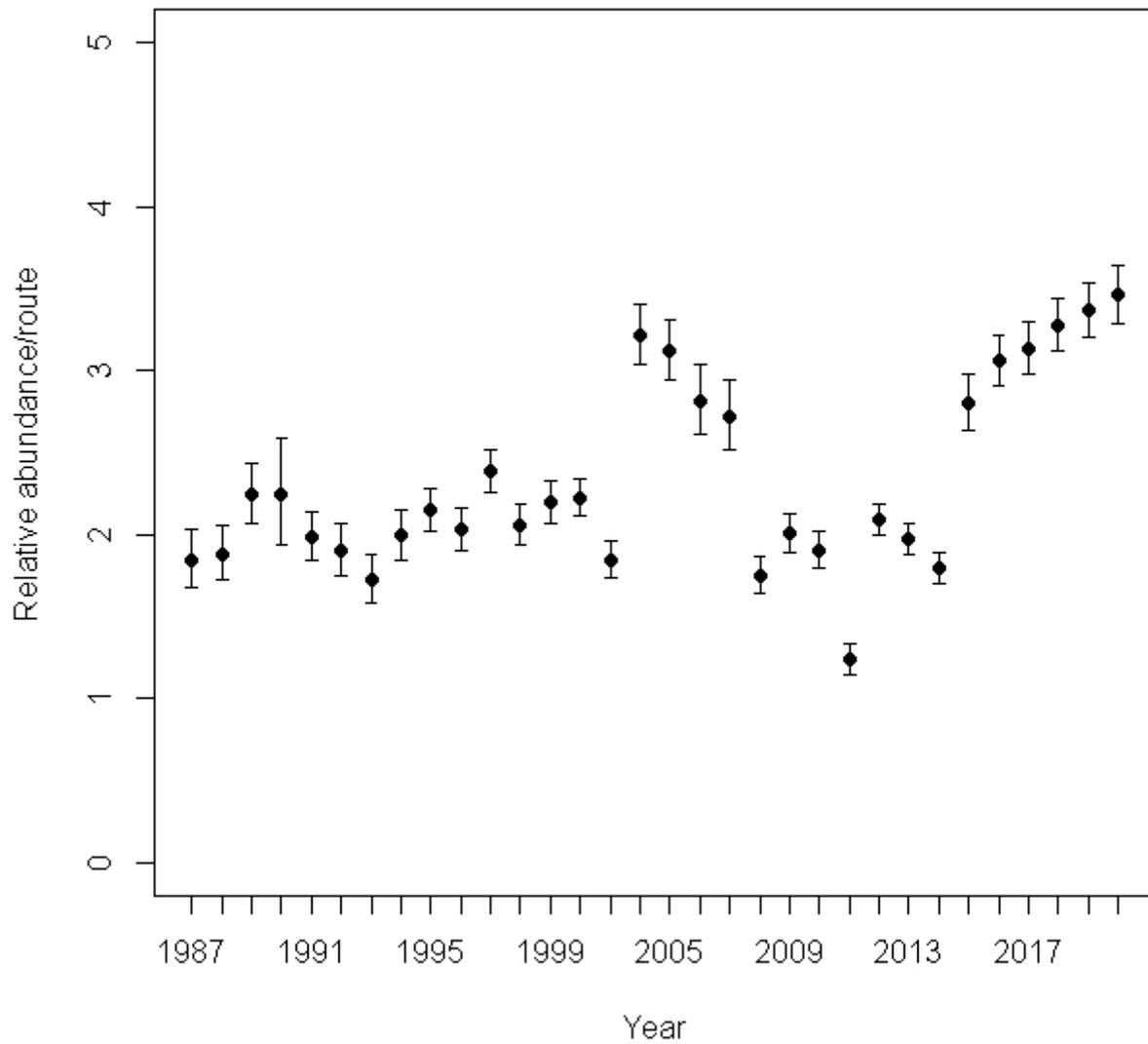


Figure 2. Average annual eastern cottontail observed by rural mail carriers during the spring for the state of Ohio (rabbits/route), 1987-2020. Error bars indicate 95% confidence intervals.

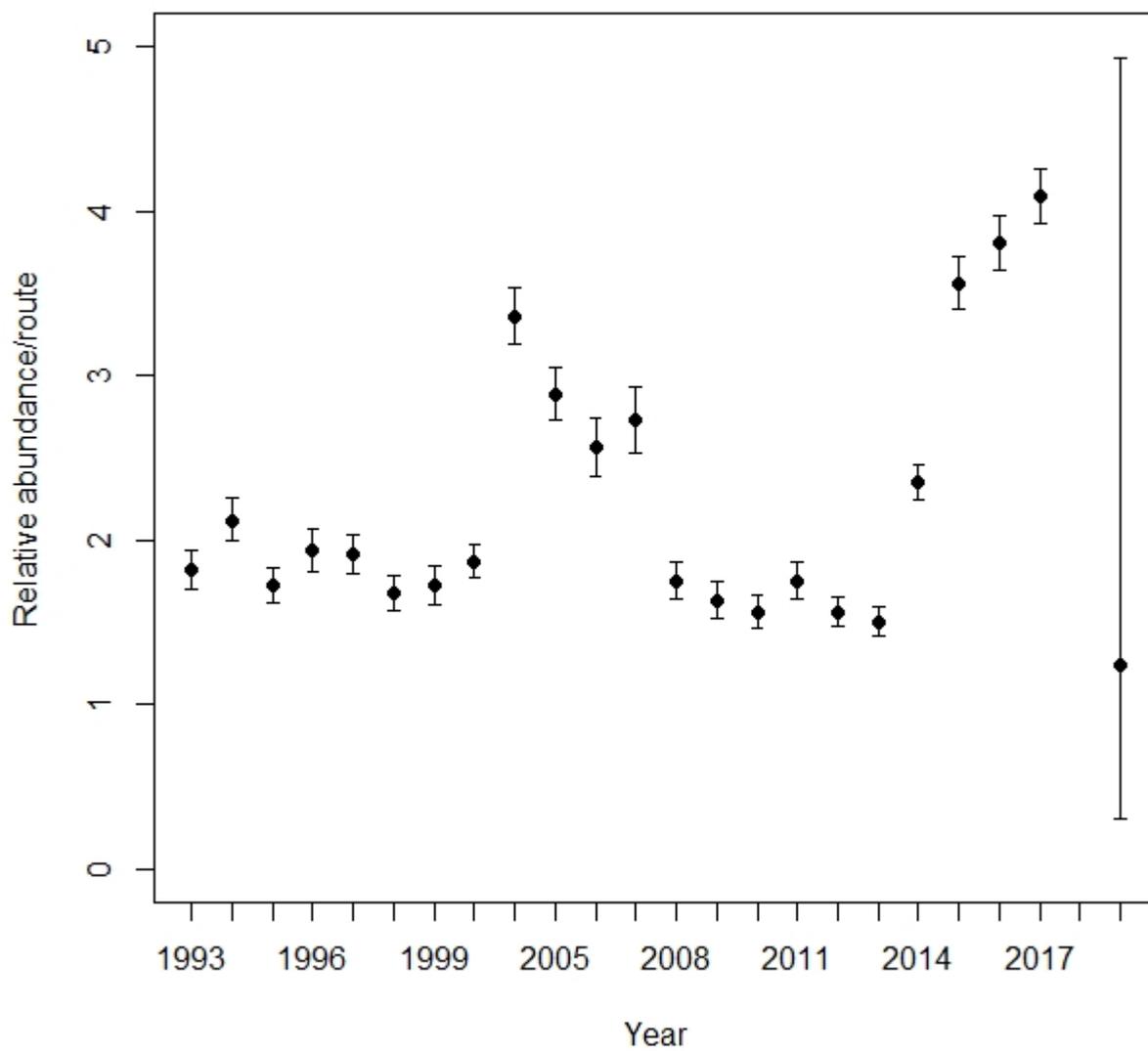


Figure 3. Average annual eastern cottontail observed by rural mail carriers during the summer for the state of Ohio (rabbits/route), 1987-2020. Error bars indicate 95% confidence intervals.

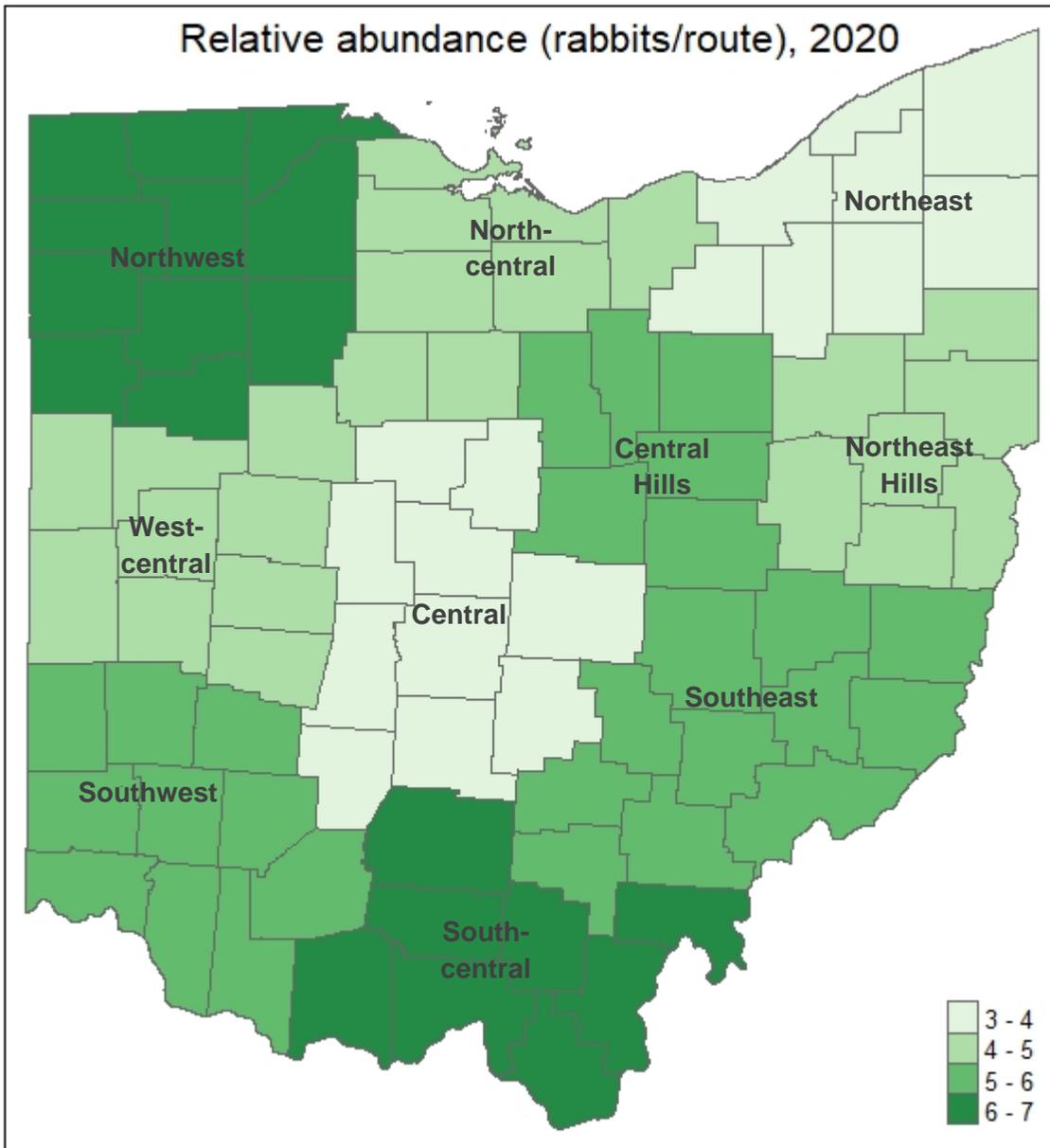


Figure 4. Relative abundance (rabbits/route) of eastern cottontail populations by weather region in Ohio, derived from the 2020 spring rural mail carrier survey using a single season *N*-mixture model.