

2020 Kentucky Wild Turkey Brood Survey Report

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INTRODUCTION

This report summarizes the results of the 2020 Kentucky Wild Turkey Brood Survey. This survey has been conducted by the Kentucky Department of Fish and Wildlife Resources (KDFWR) each summer since 1984. Its purpose is to provide statewide and regional indices for wild turkey reproductive success, including summer nesting success and brood survival. The brood survey helps us track changes in turkey populations and subsequent hunter harvest. A dual benefit is public involvement, as hunters and wildlife watchers provide data to augment data collected by KDFWR staff.

METHODS

The survey involves cooperating volunteers and KDFWR staff recording and reporting turkeys they see during their routine travels across the state in July and August. Cooperators are asked to report all turkeys they see, including hens (females), poults (young turkeys), gobblers (adult males), and jakes (juvenile males), and whether they believe they have seen those turkeys before. While all observations are important, the survey's primary objective is to indicate to reproductive success based on observations of hens with and without broods of poults.

Most survey cooperators now report turkey observations through a mobile phone app or website, but paper forms may still be mailed in. For information on how to obtain and use the app, and to see the results of previous years' reports, see KDFWR's turkey brood survey webpage at <https://fw.ky.gov/Hunt/Pages/TurkeyBroodSurvey.aspx>.

Below, we summarize the turkey brood survey data as follows:

- total number of turkey *observations* (i.e., individual sightings)
- total number of observations *used for analysis* (more on this below)
- total number of *turkeys* observed (hens, poults, males, unidentified sex or age)
- poults-per-hen ratio (PPH; indicates overall productivity)
- poults-per-brood ratio (PPB; indicates of poult survival)
- proportion of hens observed with a brood (indicates nesting success)
- ratio of male to female turkeys (summer sex ratio and/or gobbler carryover after the spring hunting season).

Note that the method used to calculate PPH has undergone a slight change. Since 2017, we have performed this calculation for each individual observation where at least one hen and poults are observed. This change reflects participation in a standardized brood survey protocol developed by National Wild Turkey Federation's Technical Committee of state agency biologists. Prior to 2017, we totaled up the overall number of poults and the overall number of hens and then divided. For 2020 results, we use the former method; to display a trend in PPH, we use the latter traditional method.

In addition, before the analysis we filter out observations that do not meet certain standards in the above-mentioned protocol. The filtering process removes individual observations in which:

- $\geq 25\%$ of turkeys are marked as unidentified
- ≥ 8 hens with no poults
- There were poults with no hens
- ≥ 1 hen and ≥ 1 poult in which there are more than 16 poults per hen
- turkeys were believed to have been seen before

The purpose of these changes to how brood survey observations are analyzed is to foster consistency and comparability of survey results with other states. This will be increasingly important in light of declining turkey populations observed in several states and the likely link to recent volatility in turkey reproductive success.

RESULTS

Survey cooperators reported a total of 910 turkey observations. More observations were reported via the Survey123 app/website (73%) than from paper datasheets. Most observations were of turkeys not previously seen by cooperators (61%). Most (435; 48%) observations were reported from the Central Region, followed by the Eastern Region (286; 31%) and the Western Region (137; 15%) (Figure 1). After filtering, we included 488 in the analysis (Table 1).

Figure 1: Total turkey observations per county in the 2020 Wild Turkey Brood Survey:

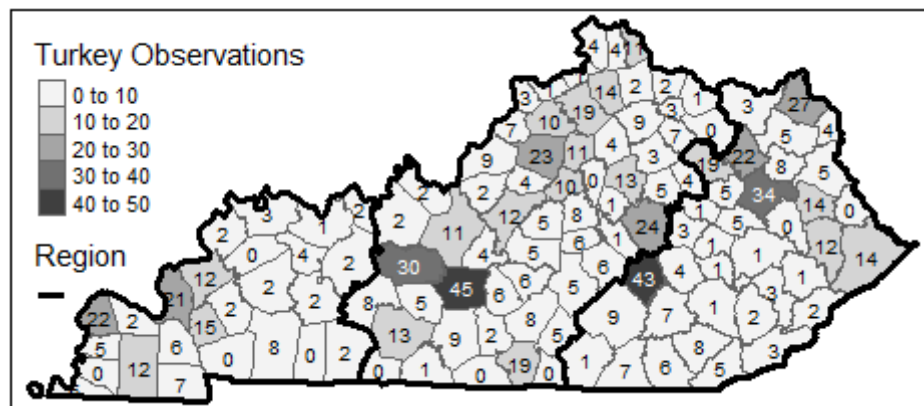


Table 1: Total number of hens, poults, males, and unknown turkeys observed during the survey in each region and at the statewide scale:

	Hens	Poults	Males	Unknown	Total
Western	162	362	78	8	610
Central	525	1,018	236	16	1,795
Eastern	249	284	138	5	676
Unknown	56	92	35	0	183
Statewide	992	1,756	487	29	3,264

Overall productivity, as measured by the PPH index, was much higher in Western and Central Kentucky than in Eastern Kentucky in 2020 (Table 2). The same was true for PPB (Table 3). However, the proportion of hens observations where a brood was also observed was similar across regions (Table 4). The male:female ratio was similar in Western and Central Kentucky but higher in Eastern Kentucky (Table 5).

Table 2: Poult-per-hen (PPH) ratios & 95% CIs, standard errors, and sample sizes for each region and at the statewide scale:

	PPH	2.5%	97.5%	SE	n
Western	2.95	2.29	3.63	0.04	71
Central	2.70	2.30	3.11	0.01	196
Eastern	1.39	0.97	1.90	0.02	93
Unknown	2.05	1.19	3.14	0.10	25
Statewide	2.40	2.13	2.69	0.01	385

Table 3: Poults-per-brood (PPB) ratios & 95% CIs, standard errors, and sample sizes for each region and at the statewide scale:

	PPB	2.5%	97.5%	SE	n
Western	4.69	4.01	5.49	0.06	45
Central	4.18	3.73	4.69	0.02	127
Eastern	2.97	2.29	3.75	0.06	43
Unknown	3.43	2.49	4.59	0.14	15
Statewide	4.01	3.65	4.35	0.01	230

Table 4: Proportion of hens observed with in association with a brood for each region and at the statewide scale:

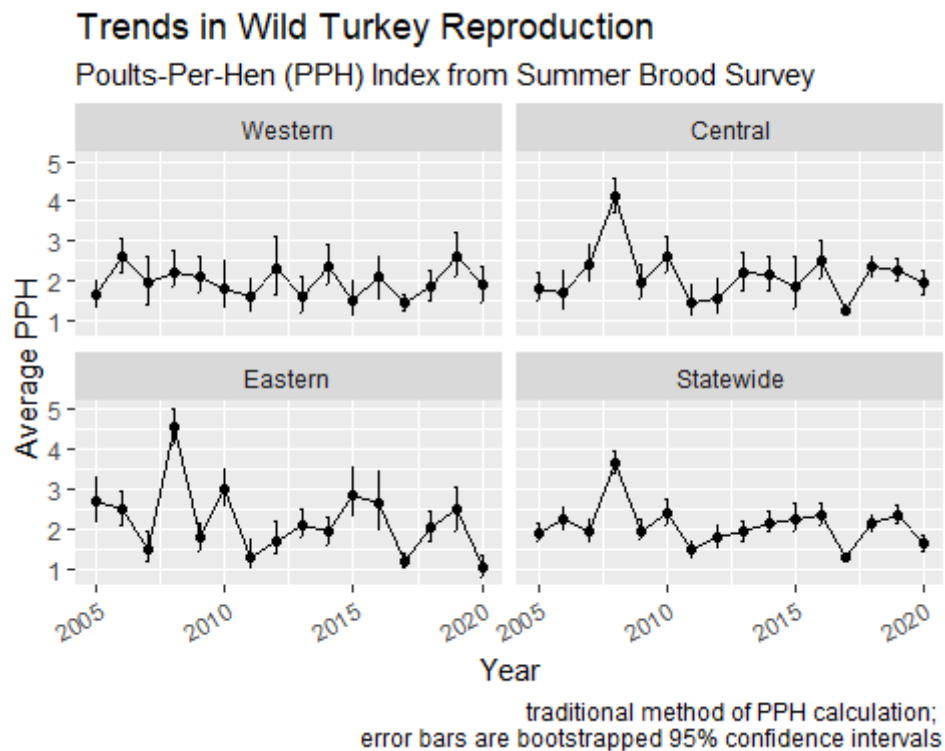
	Proportion of Hens with a Brood	n
Western	0.59	71
Central	0.67	196
Eastern	0.60	93
Unknown	0.48	25
Statewide	0.63	385

Table 5: Male to female ratio for each region and at the statewide scale:

	Male to Female Ratio	n
Western	0.48	83
Central	0.45	240
Eastern	0.55	131
Unknown	0.62	34
Statewide	0.49	488

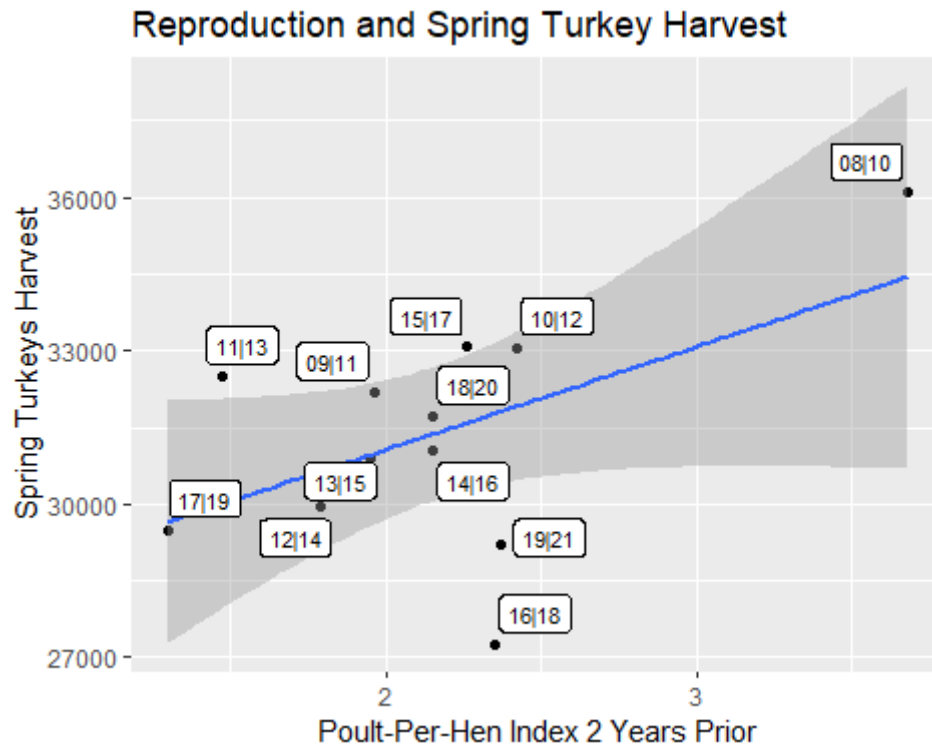
The trend in PPH continues to vary considerably from year to year (Figure 2). PPH dropped in 2020 compared to the previous 2 years, landing slightly above the 2 lowest PPH years on record (2011 and 2017). A lower PPH was observed in all 3 regions, but the steepest drop was in the East.

Figure 2: Poults-per-hen (PPH) index from summer brood survey. Note that PPH was calculated by the traditional method (total poults divided by total hens, overall) rather than by the new method used since 2018 (total poults divided by total hens, per observation).



Looking back for the past 12 years (for which full data are available), the statewide PPH has been somewhat correlated with statewide spring turkey harvest (correlation coefficient = 0.52, Figure 3). Thus, we might expect a slightly lower spring turkey harvest in 2022.

Figure 3: Correlation between statewide poult-per-hen index and spring turkey harvest.



ACKNOWLEDGMENTS

This survey would not be possible without the cooperation of the many hunters, wildlife watchers, and KDFWR staff who took the time to diligently record and report their turkey observations. Their efforts help us better understand and manage a precious natural resource, so THANK YOU! Special thanks to KDFWR information specialists G. Sprandel and K. Wethington for development and management of the reporting app and website, to B. Clark and D. Baker for social media and press release outreach, and to R. Tyl with the Missouri Department of Conservation for her collaboration in developing the statistical code for the analysis.