

Kentucky Wild Turkey Brood Survey Report

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Methods

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has conducted a summer brood survey for wild turkeys since 1984. Staff and volunteers record observations of turkeys seen during routine travels in July and August. All turkey observations are collected and are important, although the primary focus of the survey is hen turkeys with and without young poults. From these observations we calculate 4 metrics: a poult per hen (PPH) ratio to indicate overall productivity, the percentage of hens with poults to indicate nesting success, and a poults per brood (PPB) ratio to indicate poult survival. We also calculate a male to female ratio to indicate summer sex ratio, which may relate to carryover of gobblers after the hunting season.

Beginning in 2018, we provided a mobile phone app and a website for survey participants to report their turkey observations along with the traditional paper form. Using the app allowed users to allow their phone's GPS to collect location information, or they could manually enter the county of the observation.

The survey period was 1 July – 31 August. Each turkey observation was recorded as a separate event. We asked participants to record all turkeys observations and note whether they thought those turkeys had been seen before. Prior to data analysis, we followed a data filtering protocol to make Kentucky's results comparable with those of other states. This involved censoring (removing) the following types of observations: those in which 25% or more of the turkeys were recorded as unidentified sex or age; those of 8 or more hens but no poults; those of poults but no hens; and those with more than 16 poults per hen.

Results

For the 2019 brood survey, we received 850 distinct reports of turkeys from across the state (Figure 1). Most observations (67%) were collected via the Survey123 mobile phone app or website. Likewise, most observations (70%) were of turkeys the observer had not seen before. Although the number of observations was 8% more than in 2018 (850 vs. 789), the total number of turkeys reported in those observations was 22% less than in 2018 (1,010 vs. 1,287). Thus, there was greater variability in survey indices (i.e., wider confidence intervals around the mean), which should be noted when interpreting results.

Survey indices for overall productivity (PPH) and poult survival (PPB) were better and nesting success (% hens with brood) appeared stable. The statewide average PPH was 2.20 (1.95-2.45 95% C.I., Table 1), which was 10% higher than in 2018 (2.01, 1.83-2.21 95% C.I., Figure 2B) and 25% higher than the 5-year average (1.76). The statewide PPB was 4.05 (3.79-4.31 95% C.I., Table 1), which was 10% higher than in 2018 (3.67, 3.42-3.93 95% C.I.). The % of hens with a brood was 66% (n = 463, Table 1), which was just 4% less than in 2018 (69%, n = 563). Statewide, the male to female ratio (0.40, n = 557) was similar to 2018 (0.45, n = 624).

Regional averages for PPH were above the 2.0 “break-even” benchmark in all 3 survey regions, although due to the smaller sample sizes within regions, confidence intervals for the means overlapped 2.0. The most notable change was in the West, where means for PPH (2.5 vs. 1.77), PPB (4.33 vs. 3.79), and % hens with brood (74% vs. 61%) were higher than in 2018; only the male to female ratio was lower (0.26 vs. 0.44 in 2018). In the Central Region, PPH (2.07 vs. 2.08), PPB (3.88 vs. 3.55), % hens with brood (63% vs. 69%), and male to female ratio (0.45 vs. 0.43) were similar to 2018. In the East Region, PPH (2.12 vs. 2.09) and male to female ratio (0.48 vs. 0.42) were similar to 2018, but % hens with broods was lower (67% vs. 78%) while PPB was higher (4.15 vs. 3.60) than in 2018.

Discussion

KDFWR’s annual brood survey is an important population monitoring tool. It illustrates that fluctuations in turkey reproductive success appear to be the norm in the current post-restoration era of wild turkey management in Kentucky. This is evident in the survey’s annual PPH index (Figure 2A, B). PPH has differed by at least 10% from the previous year in 8 of the past 10 years (2010–2019), ranging from -42% between 2010 and 2011, to +54% between 2017 and 2018. Looking back further, PPH increased 95% in 2008 when 17-year periodical cicadas hatched across two-thirds of the state, providing a boost to poult survival that summer and supplying many extra 2-year-old gobblers for the 2010 record spring harvest (over 36,000).

The 2019 brood survey’s results should be encouraging for Kentucky turkey hunters. For the second straight year, the statewide PPH index climbed above 2.0. This past spring (April–May 2020), Kentucky hunters killed 31,720 turkeys – about 8% more than in 2019. Many of these birds were 2-year-old gobblers hatched in 2018. The 2019 brood survey indicates that there should be another healthy jake population available to hunters next spring in 2021. Since the 2010 peak harvest year there has been a significant positive correlation between PPH and spring harvest (Figure 2A, B). Thus, while many factors influence turkey populations and spring harvest, reproductive success is an important one we can count on.

KDFWR commonly gets reports of turkey populations being lower than in past years. Hunters typically express concern over predator populations, disease outbreaks, poaching, or excessive legal harvest. These factors are certainly important, but currently we have no evidence suggesting these are causing a steep decline in our turkey flock, especially compared to other states that have reported more drastic declines. The real issues are weather and habitat. Every year we must cross our fingers that turkey nests hatch before the hay is cut and that we won’t get excessively cold, rainy stretches in late May or early June that could drench poults or flood their cover. The habitat turkeys need for nesting and brood-rearing is based on the land management decisions of private landowners. KDFWR biologists provide free advice to help grow more wildlife, turkeys included. Call 1-800-858-1549 or visit fw.ky.gov for more information.

Acknowledgments

The KDFWR turkey program sincerely thanks the many volunteers and staff who recorded turkey observations for this survey. Please share this information with others.

Table 1. Data obtained during Kentucky’s 2019 Wild Turkey Brood Survey conducted 1 July - 31 August.

| Region | Hens | Poults | Males | Uniden- tified | Total Turkeys | PPH (95% CIs) ^a | PPB (95% CIs) ^b | % Hens w/ Brood (n) ^c | Male:Female Ratio (n) ^d |
|------------------------------|--------------|--------------|------------|-------------------|------------------|-------------------------------|-------------------------------|-------------------------------------|---------------------------------------|
| Western | 257 | 642 | 68 | 4 | 971 | 2.5 (1.9-3.2) | 4.33 (3.86-4.82) | 73.6 (110) | 0.26 (122) |
| Central | 537 | 1,109 | 240 | 5 | 1,891 | 2.07 (1.79-2.37) | 3.88 (3.52-4.25) | 62.9 (259) | 0.45 (318) |
| Eastern | 116 | 246 | 56 | 2 | 420 | 2.12 (1.39-2.97) | 4.15 (3.41-4.96) | 66.7 (51) | 0.48 (68) |
| Statewide^e | 1,010 | 2,221 | 407 | 13 | 3,651 | 2.2 (1.95-2.45) | 4.05 (3.79-4.31) | 66.1 (463) | 0.4 (557) |

^aPoults-per-hen (calculated by bootstrapping the sample).

^bPoults-per-hen (calculated by bootstrapping the sample).

^cPercentage of hens that were observed with ≥ 1 poult during the survey; n = number of observations where ≥ 1 hen was observed).

^dTotal number of males observed during the survey divided by the total number of hens observed during the survey; n = number of observations where ≥ 1 hen or ≥ 1 male was observed during the survey.

^eMay include observations in which region was not indicated in data file.

Figure 1. Wild turkey observations by county for the KDFWR Brood Survey, 1 July – 31 August 2019.

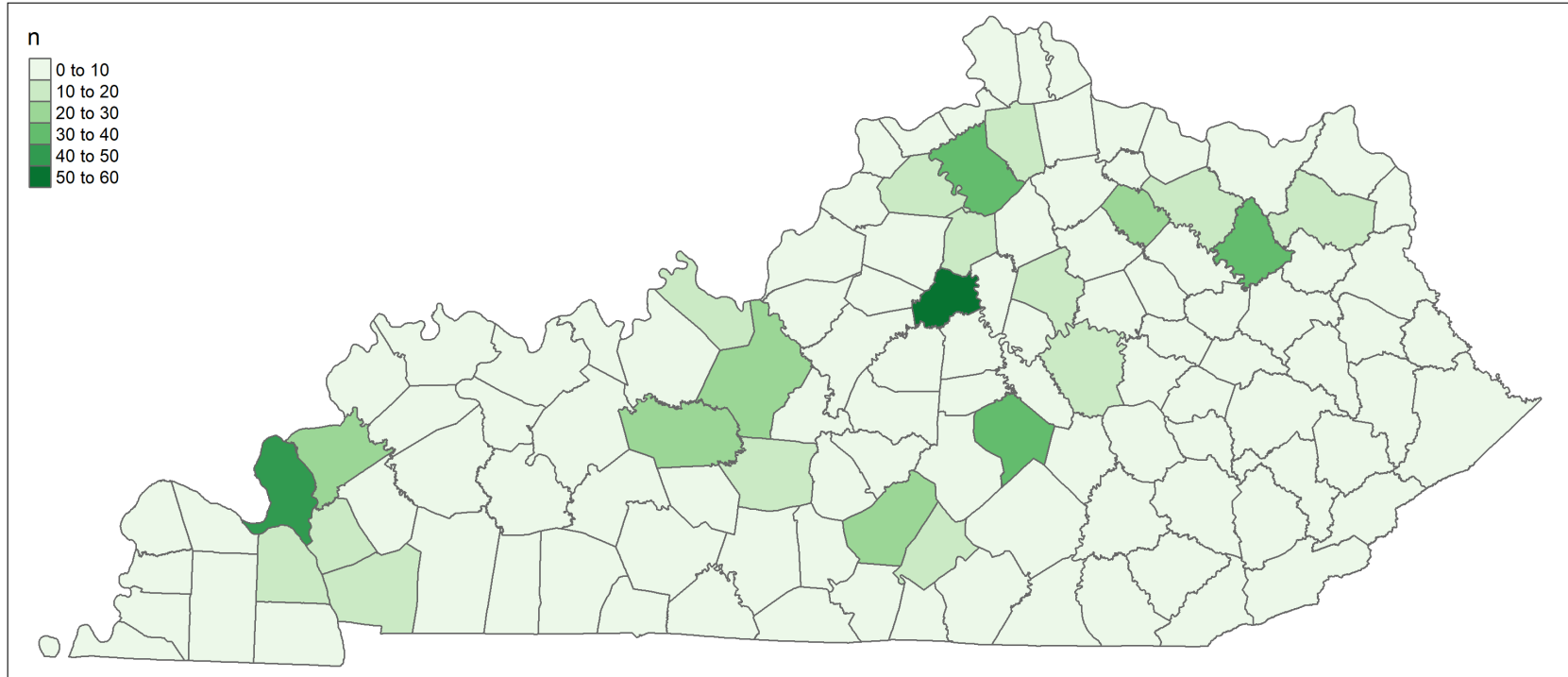
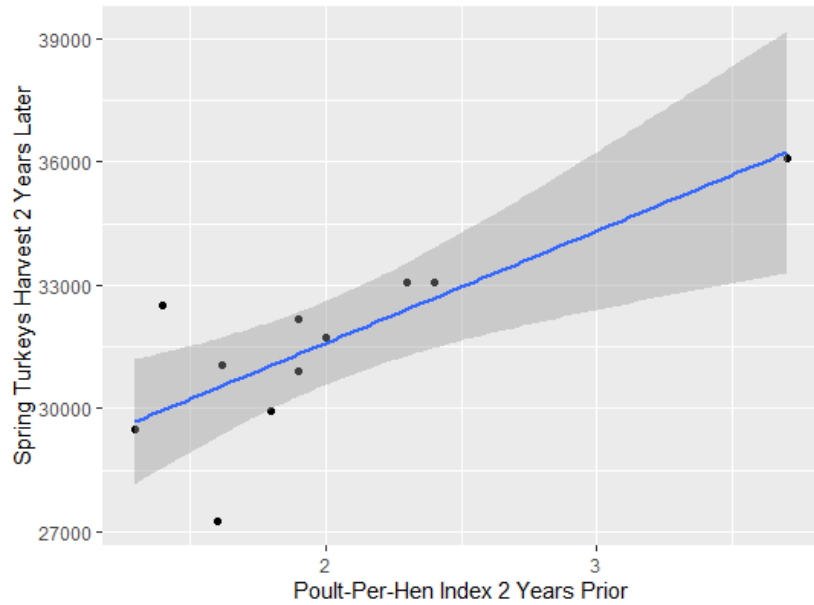


Figure 2. Wild turkey productivity and spring turkey harvest 2 years later, 2010–2020. **A.) Correlation:** the brood survey poult-per-hen index is positively related to the number of turkeys harvested 2 springs later (Spearman rank correlation = 0.73; gray shading = ± 1 standard error). **B.) Trends:** change in the poult-per-hen index (PPH, black solid line) and spring harvest (HARV, gray dashed line) through time. The x-axis shows “periods” where the production year (year of brood survey) is shown together with the harvest year (2 years later, when poults have matured to gobblers). Take home message: In general, as the poult-per-hen index in a given year increases, spring harvest increases 2 years later. Data from KDFWR annual brood survey and telecheck database.

A.) Correlation



B.) Trends

