

# 2022 Kentucky Wild Turkey Brood Survey Report

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*Figure 1. photo credit: Joe Lacefield*



## **INTRODUCTION**

This report summarizes results of the 2022 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 insights of annual wild turkey reproductive success, including nesting success and brood survival. This information helps us track changes in turkey populations and subsequent hunter harvest over time. A dual benefit is public involvement, as hunters and wildlife watchers provide data to augment data collected by KDFWR staff. Results reported here provide general and somewhat technical information for a wide audience.

## **METHODS**

The turkey brood survey is conducted by volunteers and KDFWR staff who record turkeys they see during routine travels across the state in July and August. For each observation, these cooperators report the number of all turkeys seen, including hens (adult females), poults (young turkeys), gobblers (adult males), and jakes (juvenile males). Cooperators also report the location of the observation and whether they previously saw those turkeys. Cooperators can report turkey observations using a mobile phone app, website, or paper forms that can be printed and submitted by mail or e-mail. For more information, such as instructions or past-year reports, visit <https://fw.ky.gov/Hunt/Pages/TurkeyBroodSurvey.aspx>.

Our primary objective for brood survey data is to indicate annual turkey reproductive success based on observations of hens with and without poults. From these observations we calculate a poults-per-hen ratio (PPH) as our primary indicator of reproductive success. Historically, we calculated PPH simply by dividing the total number of poults by the total number of hens; we continue to calculate PPH this way for tracking long-term trends in PPH. Since 2017, we have also calculated PPH for each individual observation of hens with poults; this adjustment allows us to estimate the statistical uncertainty (e.g., confidence intervals) of the PPH averages we estimate. Although PPH figures may differ slightly between calculation methods, trends over time should be similar. The new PPH calculation method follows a standardized survey protocol developed by agency biologists for the National Wild Turkey Federation Technical Committee to foster consistency and comparability of results across states and regions. In addition, the protocol specifies quality control criteria for observations, meaning some observations get filtered out before analysis. This includes observations for which sex or age were not recorded for 25% or more of the turkeys seen, eight or more hens but no poults were seen, poults but no hens were seen, more than 16 poults per hen were seen, or turkeys were seen before.

In addition to PPH, we calculate a poults-per-brood ratio (PPB) to indicate poult survival, the proportion of hens observed with a brood to indicate nesting success, and the ratio of male to female turkeys to indicate gobbler carryover after the spring hunting season. We also report the total number of turkey observations, the number of observations used for analysis, and the number of turkeys observed in each observation (hens, poults, males, unidentified sex or age).

## **RESULTS AND DISCUSSION**

Survey cooperators reported a statewide total of 2,676 turkey observations (Table 1). Most of the observations were reported using the survey phone app and website (70%) and were of turkeys not

previously seen by cooperators (63%). Most observations were reported from the Central Region (44%), followed by the Western Region (21%; Figure 1). The total number of observations and of turkeys seen in those observations increased by 393% and 374%, respectively, compared to 2021. Those totals depend on levels of public participation and turkey program outreach efforts. The significant increase in observations from 2021 to 2022 is likely due to increased outreach efforts by KDFWR, including a press release, social media posts, and direct mailings to recipients of our annual spring turkey hunter survey.

Estimated PPH was 2.3 statewide (Table 2). This number differed from recent years: 28% lower than 2021, 4% lower than 2020, 4% lower than 2019, 14% higher than 2018, and 71% higher than 2017 (Table 3). Similarly, PPH for each survey region differed: Western Kentucky's 2.6 PPH was 16% lower than 2021, 11% lower than 2020, 0% change from 2019, 47% higher than 2018, and 76% higher than 2017; Central Kentucky's PPH of 2.1 was 42% lower than 2021, 22% lower than 2020, 7% lower than 2019, 1% higher than 2018, and 60% higher than 2017; and Eastern Kentucky's PPH of 2.1 was 19% lower than 2021, 51% higher than 2020, 14% lower than 2019, 0.5% higher than 2018, and 71% higher than 2017. Comparisons going back to 2017 are insightful considering that the turkey program has received an increasing number of anecdotal reports from hunters of lower turkey populations. Lower reproductive success in 2017 and 2018 has probably influenced turkey numbers and hunter harvest (i.e. fewer turkeys were produced, so fewer turkeys have been observed).

Among the other survey statistics tabulated, estimated PPB was 3.5 statewide, which was 20% less than 2021 (Table 4). Regionally, PPB was 6% greater in Eastern Kentucky, but was 22% and 29% below 2021 in Central and Western Kentucky, respectively. The proportion of hens observed in association with a brood decreased statewide (-20%; Table 5) but was stable in the western region (+3%), which could indicate lower reproductive success on average, or this may be due to the higher number of observations overall. The male-to-female ratio was 0.43 statewide, which was considerably higher than 2021 (+87%; Table 6), but varied from 2020-2017 (-12%, +7.5%, -4%, -26%). Regional changes in male-to-female ratios followed the same trend with the exception of the Eastern region, where the male-to-female ratio shows an increase overall. The male-to-female ratio has been interpreted as an indicator of potential over-harvest of male turkeys, so a positive change from past years may indicate more male turkeys will be available for hunter harvest in coming years. Our data suggests this at the statewide level.

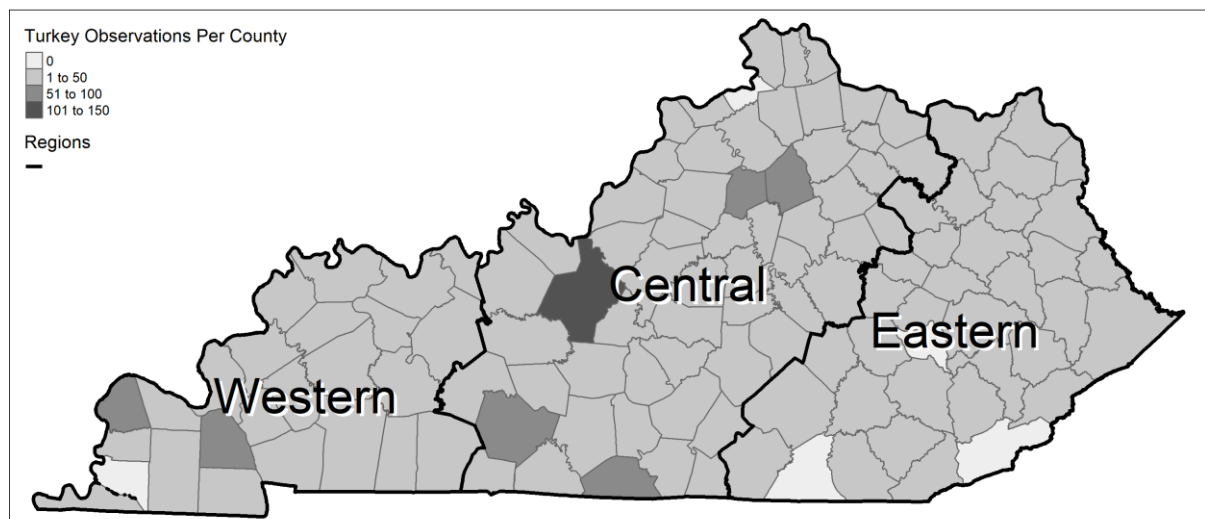
In conclusion, wild turkey reproductive success output seems to have decreased slightly in 2022, although the level of productivity was better than 4-5 summers ago. In addition to the typical hurdles our wild turkeys face (generally high predator densities and poor nesting and brood-rearing habitat throughout the state), weather conditions may have decreased reproductive success. Temperatures and precipitation in spring (April-May; turkey nesting season) were only marginally different than average, but precipitation this summer (June-August; turkey brood-rearing season) was much drier than in 2021, with some parts of the state in moderate and even extreme drought conditions (<https://www.weather.gov/wrh/climate?wfo=lmk>). Lack of rainfall throughout the summer could have reduced vegetation growth, limiting cover for both turkeys and the insects they forage on.

Hunters and landowners interested in wild turkeys should consider improving nesting and brood-rearing habitat, which might buffer the impacts of weather and predators to help maintain strong

turkey numbers in their area. Contact KDFWR for information on turkey habitat improvement ([https://fw.ky.gov/More/Documents/privatelands\\_biologists.pdf](https://fw.ky.gov/More/Documents/privatelands_biologists.pdf)).

**Table 1.** Total number of turkey observations reported and the number of hens, poult, males, and unknown sex-age turkeys in those observations during the 2022 Wild Turkey Brood Survey.

Region	Observations	Hens	Poult	Males	Unknown	Total
Western	573	828	1,798	275	5	2,906
Central	1,183	1,352	2,170	561	40	4,123
Eastern	434	389	647	230	9	1,275
Unknown	486	469	783	242	23	1,517
Statewide	2,676	3,038	5,398	1,308	77	9,821



**Figure 1.** Total turkey observations per county for the 2022 Wild Turkey Brood Survey. Counties are grouped regionally.

**Table 2.** Summary statistics for the 2022 Wild Turkey Brood Survey. Poults per hen = PPH, poults per brood = PPB. Calculations based on NWT Technical Committee standardized protocol.

Region	PPH (95% CIs, n) <sup>a</sup>	PPB (95% CIs, n)	% Hens With Brood (n) <sup>b</sup>	Male:Female (n) <sup>c</sup>
Western	2.6 (2.4-2.8, 344)	3.5 (3.3-3.8, 251)	69.8 (344)	0.33 (395)
Central	2.1 (1.9-2.3, 557)	3.5 (3.2-3.7, 341)	59.5 (557)	0.41 (663)
Eastern	2.1 (1.7-2.5, 169)	3.6 (3.2-4, 99)	55.3 (169)	0.59 (228)
Unknown	2.1 (1.8-2.5, 183)	3.4 (3-3.8, 116)	61 (183)	0.52 (219)
Statewide	2.3 (2.1-2.4, 1253)	3.5 (3.3-3.7, 807)	62 (1253)	0.43 (1505)

<sup>a</sup> 95% confidence intervals calculated by bootstrapping; n = number of observations used in calculation

<sup>b</sup> Percentage of hens observed with at least 1 poult

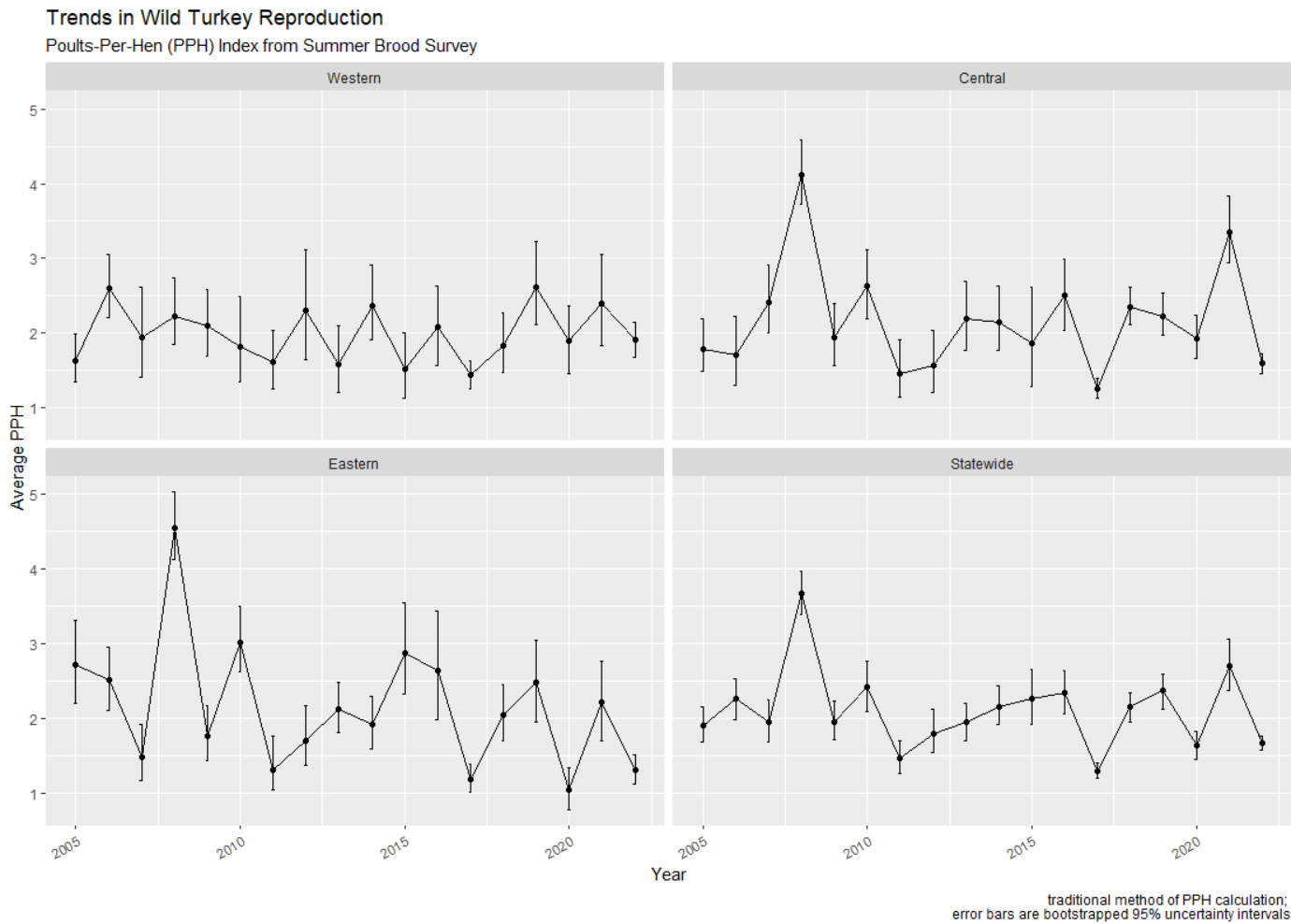
<sup>c</sup> Total number of males observed divided by total number of hens observed

**Table 3.** Comparison of poults per hen (PPH) in 2022 compared to previous years. Positive change is represented by green, stable conditions are represented by yellow, and negative change is represented by red.

Region	2017	2018	2019	2020	2021	2022
Central	1.31	2.08	2.27	2.7	3.6	2.1
Eastern	1.23	2.09	2.46	1.39	2.6	2.1
Western	1.48	1.77	2.6	2.95	3.1	2.6
Statewide	1.34	2.01	2.4	2.4	3.2	2.3

**Table 4.** Comparison of poults per brood (PPB) in 2022 compared to previous years. Positive change is represented by green, stable conditions are represented by yellow, and negative change is represented by red.

Region	2017	2018	2019	2020	2021	2022
Central	3.77	3.55	3.31	4.18	4.3	3.5
Eastern	2.58	3.6	3.34	2.97	3.4	3.6
Western	3.11	3.79	3.33	4.69	4.5	3.5
Statewide	3.32	3.67	3.36	4.01	4.2	3.5



**Figure 2.** Trends in poults per hen (PPH) from Kentucky’s Wild Turkey Brood Survey since 2005. 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). Values for PPH in this figure differ from values in Table 3 because hens with no poults are included in the calculations for this figure (traditional method) but not in the calculations for Table 3 (new method).

**Table 5.** Comparison of percent of hens associated with a brood in 2022 compared to previous years. Positive change is represented by green, stable conditions are represented by yellow, and negative change is represented by red.

Region	2017	2018	2019	2020	2021	<b>2022</b>
Central	44	69	69	67	88	<b>60</b>
Eastern	58	78	80	60	77	<b>55</b>
Western	58	61	76	59	68	<b>70</b>
Statewide	51	69	71	63	78	<b>62</b>

**Table 6.** Comparison of male-to-female ratio for 2022 compared to previous years. Positive change is represented by green, stable conditions are represented by yellow, and negative change is represented by red.

Region	2017	2018	2019	2020	2021	<b>2022</b>
Central	0.65	0.43	0.42	0.45	0.25	<b>0.41</b>
Eastern	0.63	0.42	0.53	0.55	0.33	<b>0.59</b>
Western	0.44	0.44	0.27	0.48	0.16	<b>0.33</b>
Statewide	0.58	0.45	0.4	0.49	0.23	<b>0.43</b>

## ACKNOWLEDGMENTS

We thank the many hunters, wildlife watchers, and KDFWR field staff who took the time to diligently record and report turkey observations. Their efforts help us better understand and manage the wild turkey resource. Thanks to T. Prather and D. Vichitbandha for development and maintenance of the reporting app; to B. Clark, D. Baker, and the Information/Education staff for outreach assistance; and to R. Tyl with the Pennsylvania Department of Conservation for collaboration on computer code; and to the National Wild Turkey federation’s technical Committee for collaboration on analysis methods.

