

Wild Turkey Summer Brood and
Fall Harvest Report
2018 – 2019



Roger Shields
Wild Turkey Management Program Coordinator
Wildlife and Forestry Division

TWRA Wildlife Technical Report 20-1, January
2020



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TENNESSEE WILDLIFE RESOURCES AGENCY

Roger Shields, Wild Turkey Management Program Coordinator

TWRA Wildlife Technical Report 20-1

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Statewide Summer Wild Turkey Survey

Each year the Tennessee Wildlife Resources Agency (TWRA) maintains records of sightings of wild turkeys to provide supplemental data on population trends. These sightings provide us estimates for monitoring trends in nesting success, trends in brood survival, trends in annual productivity, peak hatching dates on turkey brood range, and carry-over of males from the spring hunting season.

The summer survey records observations of wild turkeys made incidental to regular field activities and is conducted from June through the end of August by agency staff and other natural resource professionals. Observations are recorded on the “Wild Turkey Survey Report” form (Appendix A) or with a mobile device using a Survey123 electronic survey form. The observer records the date and county of the observation, the number of adult individuals by sex, the number and age class of poults, and whether the observation was made on private or public lands as indicated on the “Wild Turkey Survey Report” form. Accurate counts are important; if more than one hen is present with a group of poults, the observer ascertains if there is more than one age group present. The observer also notes if vegetation inhibited an accurate poult count and whether they had likely seen this group of turkeys before.

The main purpose of the summer survey is to obtain wild turkey production and population data which can be compared with previous year’s data in evaluation of population trends. Data is collected from June to August, but historically only August data has been used to obtain most of the estimates, including an overall poult to hen ratio estimate. The reasoning behind this is based on the fact that if a poult makes it into the month of August, survival odds are much greater.

Metrics estimated from data collected during the survey provide indices of productivity and population status. The percentage of hens observed with poults is an estimate of annual nesting success. The number of poults accompanying hens observed with poults (or poults per brood) is an indication of poult survival, as is brood attrition by age-class. The poults per hen ratio is a measure of overall productivity. Back-dating based on age class of poults observed generates an estimated nest chronology and an indication of when peak nesting for the year occurred. Lastly, the ratio of gobblers to hens provides an estimate of gobbler carry-over from the spring hunting season. Large harvests in the spring will typically lead to lower numbers of gobblers observed in the summer relative to hens. Estimates <0.50 gobblers per hen indicate that excessive gobbler harvests may be occurring if quality spring harvest (i.e., abundant older-aged gobblers) is a management goal, while estimates approaching 1.0 gobbler per hen indicate there may be an additional harvestable surplus of gobblers.

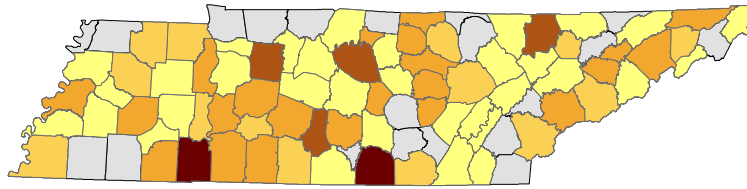
Results

Observations were recorded during the 2018 summer survey by 106 different observers; slightly fewer people recorded observations in 2019 ($n=94$). Participants recorded a total of 835 and 749 separate observations in 2018 and 2019, respectively. Not all counties were represented in the surveys and not all counties were represented equally (Table 1, Figure 1). To improve reliability of the estimates generated by these surveys, it would be preferable to obtain more total observations and greater coverage of the state (i.e., more counties with more observations).

Table 1. Number of Summer Wild Turkey Survey observations by county, 2018 and 2019.

Region	County	2018 Count	2019 Count		Region	County	2018 Count	2019 Count
1	Benton	29	9		3	Bledsoe	3	1
1	Carroll	4	2		3	Bradley	2	2
1	Chester	2	2		3	Clay	15	1
1	Crockett	3	1		3	Cumberland	9	38
1	Decatur	6	17		3	Dekalb	4	1
1	Dyer	1	3		3	Fentress		
1	Fayette				3	Grundy		
1	Gibson	7	24		3	Hamilton	4	4
1	Hardeman		3		3	Jackson	28	11
1	Hardin	53	46		3	Marion	9	7
1	Haywood	3	1		3	McMinn		10
1	Henderson	3	10		3	Meigs	3	17
1	Henry	7	1		3	Monroe	10	16
1	Houston	4			3	Morgan	3	11
1	Humphreys	2	19		3	Overton	7	
1	Lake		1		3	Pickett		1
1	Lauderdale	19	11		3	Polk		6
1	Madison	19	20		3	Putnam	16	11
1	McNairy	17	7		3	Rhea	1	2
1	Obion		9		3	Roane	2	2
1	Perry	11	9		3	Seqatchie		
1	Shelby	6			3	VanBuren	11	3
1	Stewart		2		3	Warren		
1	Tipton	2	3		3	White	24	18
1	Weakley	6	26		4	Anderson	2	10
2	Bedford	11	24		4	Blount	11	5
2	Cannon	16	19		4	Campbell	34	1
2	Cheatham	1	2		4	Carter		
2	Coffee	2	1		4	Claiborne	1	3
2	Davidson	3	9		4	Cocke	4	4
2	Dickson	41	8		4	Grainger		1
2	Franklin	86	25		4	Greene	13	4
2	Giles	9	33		4	Hamblen	11	6
2	Hickman	13	4		4	Hancock		
2	Lawrence	22	8		4	Hawkins	1	1
2	Lewis	10	2		4	Jefferson	14	11
2	Lincoln	4	7		4	Johnson	2	
2	Macon				4	Knox	4	2
2	Marshall	38	47		4	Loudon		1
2	Maury	13	20		4	Scott	3	
2	Montgomery		4		4	Sevier	8	4
2	Moore		4		4	Sullivan	13	9
2	Robertson				4	Unicoi	1	3
2	Rutherford	3	14		4	Union	7	
2	Smith	2	1		4	Washington	6	19
2	Sumner	1				Grand Total	834	749
2	Trousdale	26				Unknown Co.	1	
2	Wayne	11	18					
2	Williamson	1	22					
2	Wilson	31	5					

2018 Survey



2019 Survey

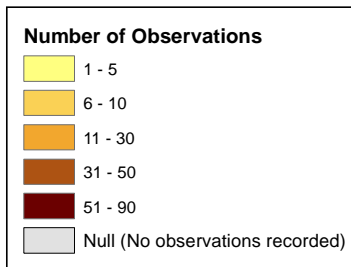
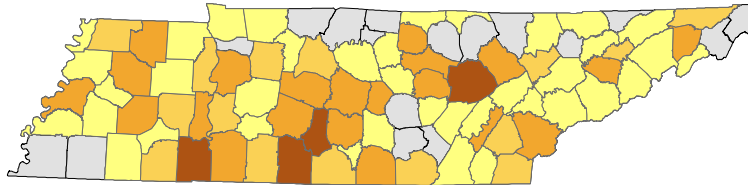


Figure 1. Observations of wild turkeys by county during the Summer Turkey Survey, 2018 and 2019.

Regionally, middle Tennessee (TWRA Regions 2 and 3) had greater reproductive output both in terms of poult per hen and brood size than either west Tennessee (TWRA Region 1) or east Tennessee (TWRA Region 4; Table 2, Figure 2) in 2018. In 2019, overall productivity for Region 3 was substantially greater than the other regions, likely driven by the large number of hens that successfully nested, as evidenced by the high proportion seen with poults. Estimates obtained for Region 4 were very low in 2019, but it should be noted that observations in east Tennessee were quite limited, so estimates for Region 4 lack in confidence.

Long-term August poult to hen ratios show a fairly steady decline (Table 3, Figure 3), although the past 6 years has been fairly stable at just under 2.0 poults per hen. The 2018 results (2.1 poults per hen) were slightly above the previous 5-year average (1.9), while productivity in 2019 (1.8 poults per hen) was just below it. In 2018 and 2019, broods averaged 3.5 and 3.3 poults, respectively. These estimates are substantially lower than results reported prior to 2015, but methodology used to calculate the estimate was different prior to 2015. The proportion of hens with poults has steadily declined over the years of data collection, from >75% in the 1980's to <60% in the 2010's (58.8% in 2018, 54.7% in 2019). These lower but relatively stable estimates of productivity observed over the past 5-10 years may be reflective of a statewide population that peaked after years of steady increase and has now settled into a more stable population with annual variation around a point of lower average productivity.

Table 2. Summary of reproductive data from the Summer Wild Turkey Survey^a, 2018 and 2019.

	Total Turkeys Reported	Total Hens Reported	% of Hens w/ Poults	Poults per Hen Ratio	Poults per Brood	Total Poults Reported	Gobbler to Hen Ratio
2018							
Region 1	596	183	55.2%	1.91	3.46	349	0.31
Region 2	973	246	58.5%	2.18	3.72	536	0.66
Region 3	332	98	53.1%	2.13	4.02	209	0.25
Region 4	265	80	75.0%	2.04	2.72	163	0.44
Statewide	2,166	607	58.8%	2.07	3.52	1,257	0.46
2019							
Region 1	621	225	47.1%	1.60	3.39	359	0.21
Region 2	1,025	290	53.8%	1.65	3.07	479	0.58
Region 3	447	111	78.4%	2.90	3.70	322	0.26
Region 4	35	16	12.5%	0.38	3.00	6	0.38
Statewide	2,128	642	54.7%	1.82	3.32	1,166	0.38

^a All estimates are from August observations only, except the Gobbler to Hen ratio, which is calculated from all observations during the June - August survey period.

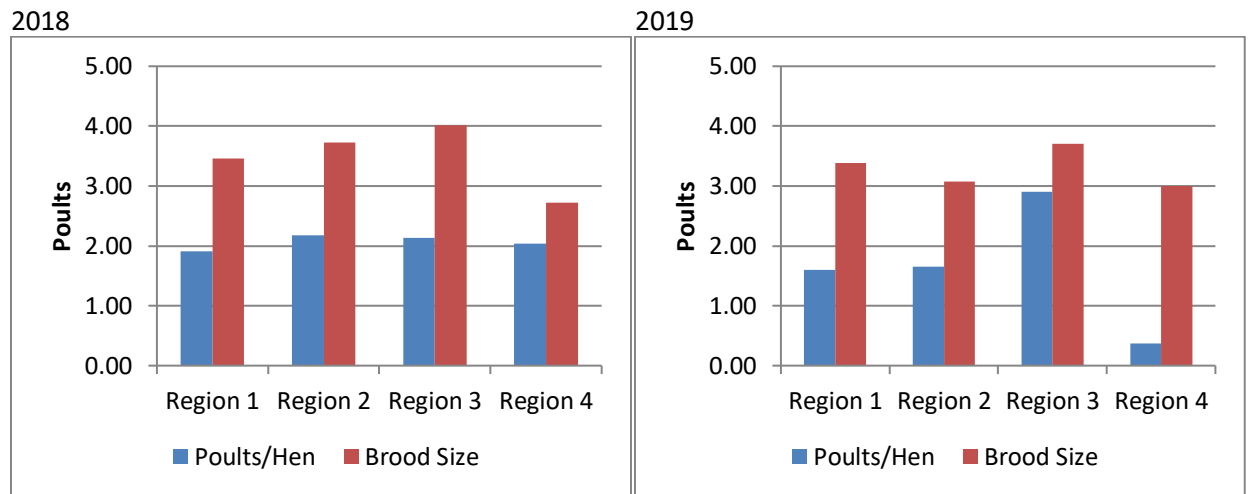


Figure 2. Overall productivity and brood size by region estimated from the Summer Wild Turkey Survey, 2018 and 2019.

Table 3. Historical statewide Summer Wild Turkey Survey data, 1983-2019.

Year	Total Turkeys Reported	Total Hens Reported	% of Hens With Poults	Poults per Hen Ratio	Poults per Brood ^a	Total # of Poults
1983	471	68	61.8	5.3	6.8	360
1984	837	131	72.5	4.8	6.9	629
1985	1,216	138	76.8	7.0	7.2	966
1986	1,505	198	72.9	5.9	6.4	1,168
1987	1,528	235	81.3	4.9	7.0	1,152
1988	1,838	298	81.3	4.6	4.7	1,371
1989	1,976	232	88.4	6.4	7.4	1,485
1990	1,893	273	89.0	4.4	6.2	1,206
1991	2,739	421	85.5	4.9	7.4	2,028
1992	1,816	424	63.2	2.9	5.9	1,233
1993	3,037	491	84.5	4.6	6.7	2,258
1994	5,310	870	78.9	4.5	6.5	3,895
1995	3,173	518	72.6	4.5	6.7	2,350
1996	4,179	760	78.6	4.2	6.4	3,164
1997	2,856	663	60.5	2.8	5.7	1,831
1998	5,124	893	78.4	4.3	6.2	3,853
1999	3,100	592	74.5	3.8	6.4	2,229
2000	4,726	837	77.3	3.8	5.8	3,192
2001	3,573	606	76.9	4.0	6.1	2,415
2002	5,796	1,063	73.6	3.8	5.8	4,054
2003	2,126	574	60.6	2.4	6.0	1,365
2004	2,640	611	65.3	3.0	6.5	1,828
2005	1,540	369	50.1	2.6	5.0	964
2006	2,768	707	55.7	2.6	6.0	1,819
2007	2,100	593	53.8	2.2	4.2	1,277
2008	2,409	598	54.5	2.4	4.8	1,418
2009	1,478	377	57.8	2.5	6.2	957
2010	1,964	568	53.9	2.2	6.0	1,241
2011	4,278	1,110	56.7	2.3	6.1	2,587
2012	2,066	654	57.4	2.2	5.3	1,412
2013	2,487	806	51.9	2.1	5.6	1,683
2014	2,533	820	53.2	1.8	5.5	1,483
2015	2,760	746	59.8	2.3	3.8	1,689
2016	3,328	1,097	53.3	1.6	3.0	1,737
2017	2,661	836	56.8	1.7	3.0	1,444
2018	2,166	607	58.8	2.1	3.5	1,257
2019	2,128	642	54.7	1.8	3.3	1,166
Average	2,652	579	67.1	3.5	5.7	1,788

^a Prior to 2015, surveys recorded number of broods for each observation and the poults per brood (PPB) estimates were calculated based on that number; beginning 2015, PPB was calculated as PPB = #poults/#hens with poults

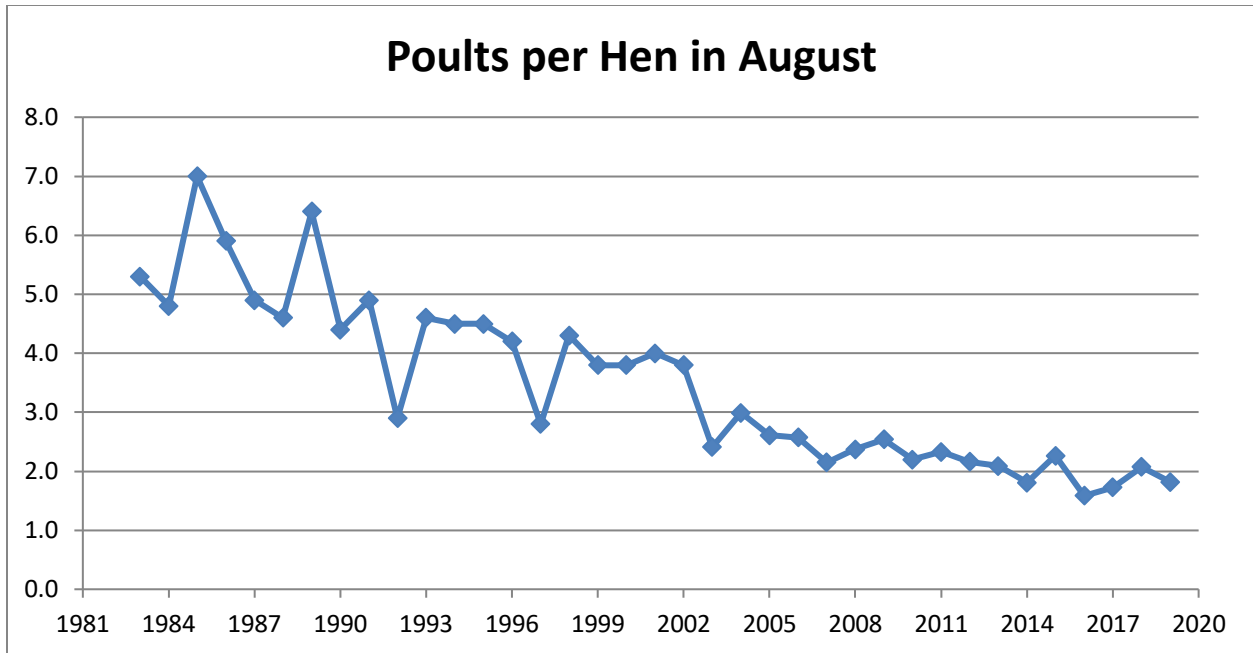


Figure 3. Statewide productivity estimates (poults per hen ratios) obtained from Summer Wild Turkey Survey data during the month of August, 1983-2019.

Table 4. Statewide average brood size by age class, 2003-2019.

Year	Poult Age Class ^a		
	1	2	3
2003	6.6	4.2	5.2
2004	7.4	6.4	5.4
2005	4.8	5.6	5.1
2006	6.4	5.0	4.6
2007	7.3	5.3	4.5
2008	6.3	6.0	4.7
2009	6.8	5.6	5.0
2010	6.6	4.8	5.0
2011	5.3	6.1	5.5
2012	5.1	6.3	5.9
2013	5.8	4.6	4.2
2014	3.7	3.5	4.4
2015	5.1	4.5	4.2
2016	4.1	4.1	3.3
2017	5.0	3.4	3.2
2018	4.7	3.8	3.5
2019	4.2	4.0	3.6
Average	5.6	4.9	4.5

^a Age classes: 1 = 1 week; 2 = 2-5 weeks; 3 = 6-8 weeks and older

Based on estimated age-classes of poults observed during the summer surveys (Table 4) and standard back-dating, earliest onset of egg-laying began the week of March 8 and March 22 in 2018 and 2019, respectively, but most nests (including initial attempts and re-nesting attempts) were initiated between the weeks beginning April 19 and May 31 (Figure 4). Median date of nesting for both years was during the week of May 10.

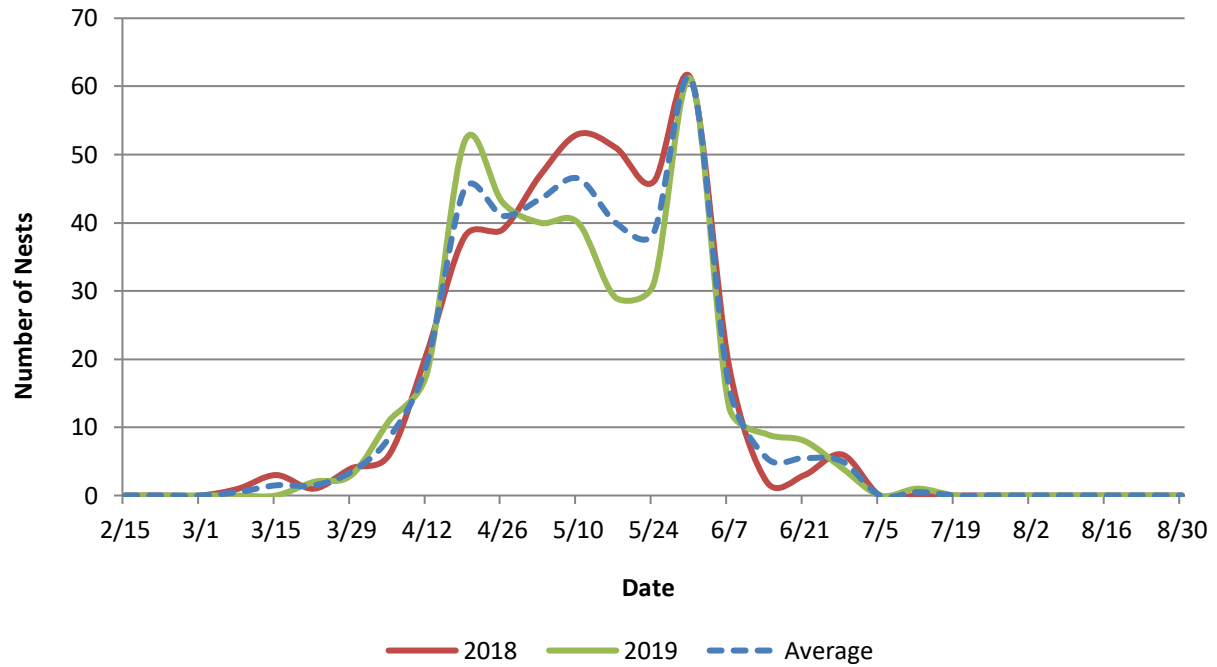


Figure 4. Statewide wild turkey nests initiated per week, 2018-2019.

Fall Turkey Season

In 2018, the Tennessee Fish and Wildlife Commission eliminated either-sex fall hunting in favor of bearded turkeys only during the fall beginning with the 2018 season. Consequently, 2018 and 2019 fall harvest numbers are not readily comparable to earlier harvests. The total reported 2018 fall season harvest was 278 birds, which is 816 birds below the 2017 fall season harvest. This significant drop in harvest can largely be explained by the decrease in hen harvest as a result of the new regulations. Looking at just the male segment, however, a drop in harvest was still evident—from 462 gobblers in 2017 to just 259 in 2018—suggesting that hunters were either less successful in general in 2018, or that with the stricter legal to take definition, hunters exercised greater caution in their harvest attempts. The total 2019 fall season harvest was 360 birds, up 30% from 2018. Greene, Knox, Maury and Jefferson counties were the top four counties in the state for the two years combined (Table 5). Harvest in the fall on WMAs was minimal (Table 6).

Juvenile males (i.e., “jakes”) accounted for 10% and 14% of the statewide gobbler harvest in 2018 and 2019, respectively. Jakes comprised the highest proportion of the harvest in Region 3, representing on average 16% of the harvest over the two years (Figure 5). Region 1 reported over 21% of the 2019 harvest consisted of jakes, but it should be noted that several regions had average spur measurements for jakes that exceeded one inch, which indicates many of the birds were misidentified as jakes (perhaps due to short/broken beards) since spurs on jakes will be much less than an inch, especially during the fall season. Consequently, the proportion of jakes in the harvest is likely overestimated for these regions.

Bearded females represented about 7% (19 birds) of the fall harvest in 2018; females represented about 9% (32 birds) of the harvest in 2019, and if harvest reports are accurate, at least four of these birds (all juvenile hens) were likely illegally taken because no beard length was associated with the harvest report.

Table 5. Fall turkey harvest by county (inclusive of WMA harvests), 2018-2019.

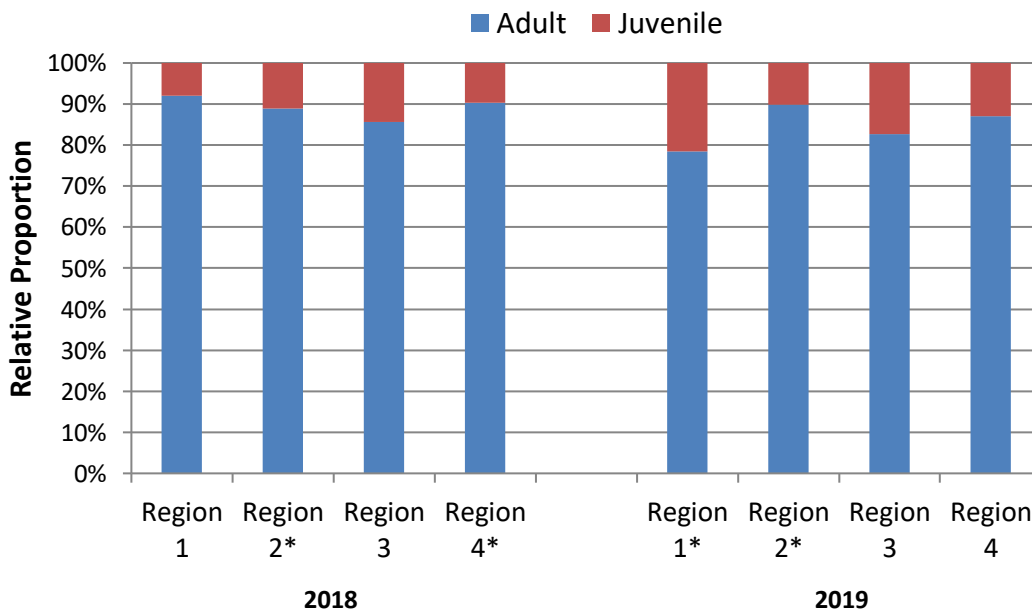
County	Region	2018 Harvest	2019 Harvest
Anderson	4	0	3
Bedford	2	4	7
Benton	1	1	4
Blount	4	4	6
Campbell	4	2	3
Cannon	2	0	2
Carroll	1	2	4
Carter	4	3	9
Cheatham	2	2	1
Chester	1	0	2
Claiborne	4	0	3
Clay	3	0	2
Cocke	4	3	6
Coffee	2	3	1
Cumberland	3	4	7
Davidson	2	5	1
Decatur	1	4	4
DeKalb	3	5	5
Dickson	2	7	10
Fayette	1	4	1
Fentress	3	4	1
Franklin	2	2	4
Gibson	1	5	4
Giles	2	1	1
Grainger	4	4	6
Greene	4	11	19
Grundy	3	1	1
Hamblen	4	2	4
Hamilton	3	2	7
Hancock	4	2	0
Hardeman	1	3	3
Hardin	1	5	3
Hawkins	4	8	8
Henderson	1	5	2
Henry	1	4	5
Hickman	2	6	6
Houston	1	5	3
Humphreys	1	7	5
Jackson	3	1	2
Jefferson	4	11	10
Johnson	4	1	4

County	Region	2018 Harvest	2019 Harvest
Knox	4	12	11
Lewis	2	5	2
Lincoln	2	2	3
Macon	2	1	0
Madison	1	4	1
Marion	3	4	6
Marshall	2	4	5
Maury	2	8	15
McNairy	1	1	1
Meigs	3	3	6
Monroe	3	1	0
Montgomery	2	4	5
Morgan	3	2	3
Obion	1	0	4
Overton	3	0	1
Perry	1	2	4
Pickett	3	1	1
Putnam	3	3	3
Rhea	3	4	7
Roane	3	7	6
Robertson	2	3	2
Rutherford	2	7	11
Scott	4	9	2
Sequatchie	3	2	1
Sevier	4	2	5
Smith	2	2	2
Stewart	1	3	7
Sullivan	4	6	11
Sumner	2	3	10
Trousdale	2	5	2
Union	4	1	1
Van Buren	3	1	3
Warren	3	6	6
Washington	4	6	10
Weakley	1	1	3
White	3	3	10
Williamson	2	3	3
Wilson	2	3	8
Grand total		277	360

Table 6. Fall turkey harvest by WMA, 2018-2019.

WMA	Region	2018 Harvest	2019 Harvest
A.E.D.C. WMA	2	1	0
Big South Fork	3	1	1
Cordell Hull WMA	3	0	1
Cove Creek WMA	4	0	1
Edgar Evins SP & WMA	3	1	1
Gallatin Steam Plant WMA	2	0	1
Henderson Island Refuge	4	1	0
Hiwassee Wildlife Refuge	3	0	1
Lick Creek WMA	1	0	1
Milan AAP	1	0	1
Mt. Roosevelt WMA	3	1	0
Natchez Trace SF & WMA	1	1	0
North Cherokee NF & WMA	4	0	1
North Cumberland WMA	4	0	1
Oak Ridge WMA	3	0	1
Owl Hollow WMA	2	1	0
Pea Ridge WMA	3	1	0
Percy Priest WMA	2	0	2
Grand total		8	13

Figure 5. Proportion of juvenile males in the harvest by TWRA Administrative Region, 2018-2019. Juvenile turkey average spur measurements for region's marked with an "*" exceed 1.0 inch, indicating misidentification; consequently, the percentage of juvenile males in the harvest is likely inflated.



2019 WILD TURKEY SUMMER SURVEY



Name: _____

Phone Number: _____

RETURN TO:

- Supervisor by September 1
- Regional Biologist by September 5
- Nashville Office by September 10

WILD TURKEY POULT AGE CLASSES

Please classify poults observed as one of these three age classes and record in the "poult age" column.



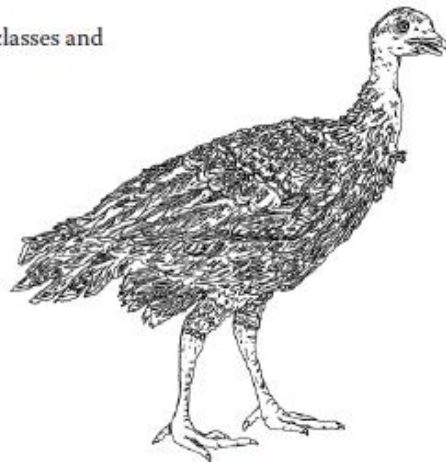
CLASS 1

cardinal size (Week 1)
up to 6 inches tall
full down
2 wing bars



CLASS 2

quail - wood duck size (Weeks 2-5)
7 - 10 inches tall
downy body, feathered wings
3 - 4 wing bars



CLASS 3

≥ chicken size (Weeks 6-8)
14 - 15 inches tall
body with contour feathers, some down at neck
black and white primaries emerging



Tennessee Wildlife Resources Agency
2019 WILD TURKEY SUMMER SURVEY



Name: _____ Affiliation: _____ E-mail: _____ Phone #: _____

Date	County	# of hens without poults	# of hens with poults	# of poults	Poult age class	Complete observation?	# of males	# of adults unknown gender	Likely seen before?	Private or public land
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.
					1 2 3	yes no			yes no	Priv. Pub.

- Please record all observations of gobblers, hens, and poults on this form.
- Record each observation on a single row. However, if poults of different age classes are present, record the number of poults in each age class on separate lines, with the accompanying hen group (brood).
- Accurate counts are important. When observing from a vehicle, pull over (if possible) to get a good look, preferably using binoculars.
- **Complete Observation:** If you are unable to get an accurate poult count due to vegetation cover, rapid movement, etc., circle "no." Incomplete counts are still used in data analysis.
- **Likely Seen Before:** If you suspect observations of the same turkey(s) are being made, record once per month and circle "yes" for subsequent observations.

Survey period begins June 1 and continues through August 31. Use multiple forms if needed.
 Direct question/ comments to: Roger Shields, TWRA Wild Turkey Program Coordinator, roger.shields@tn.gov, (615) 781-6619.
 WR-1032 (Rev. X/XX) • Wildlife & Forestry Division Thank you for participating!