

WILDLIFE MANAGEMENT AND RESEARCH NOTES



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	TITLE: Wild Turkey Summer Brood Production Indices - 2018	

Abstract: Since 2016, a web-based brood reporting system using a “caspio”™ on-line data entry software platform (<https://www.caspio.com/>) has allowed both natural resource agency personnel and interested members of the public to submit observations of wild turkey hens and poults during the July-August brood survey period. In the third year, 2018, there was a 30% decrease in the number of observations and 56% decrease in the number of participants, lower than the initial 2016 web-based survey. The 2018 statewide mean wild turkey production index was 2.8 poults:hen (PI = total poults:total adult hens), with 75% of the hens observed with at least one poult. The 2018 PI was 4% higher than the 2.7 PI in 2017, but not different from 2.5 PI of the previous five years (2013-2017; $\alpha = 0.05$). Since 1993, the average PI has progressively declined, reaching a lower level indicative of a post-restoration, stabilizing turkey population. Annual fluctuations in the PI around the long term average are expected, indicating a relatively stabilized population that has settled to a new level, reflective of suitable habitat and climatic conditions across the landscape. Climatically, the spring/early summer of 2018 had above normal precipitation in southern Indiana, marking the 13th consecutive year of above normal precipitation in this region during the early brood rearing periods of June-July. Regional inferences from the 2018 summer production survey are still limited due to the scarcity and the uneven distribution of brood observations across the state.

Project/Activity Codes: W36R4/36R510

METHODS

From 1993 to 2015, wildlife biologists and conservation officers annually recorded observations of wild turkey hens and poults, including hens without poults, during July and August on observation cards. The wild turkey summer brood Production Index (PI) is calculated as total poults/total adult hens (poults:hen ratio) compiled from July and August into one combined index. The PI is a more accurate index of production because it includes all hens, including those without poults. A chronic bias in the brood observation data is the tendency of observers to report hens with poults more readily than “barren hens”, resulting in a higher PI than actually occurred. The August production index is generally higher than in July due to “gang” brood behavior that occurs when several individual broods and hens without broods combine into brood flocks.

Since 2016, a web-based brood reporting system using a “caspio”™ on-line data entry software platform (<https://www.caspio.com/>) has allowed both natural resource agency personnel and interested members of the public to submit observations of wild turkeys during the July-August brood survey period. The inclusion of “citizen scientists” observations will hopefully enhance the robustness of the survey by increasing the statewide coverage and number of observations. Instructions for reporting wild turkeys observations were developed and posted on the new web-based system promoted through agency communications, including a refreshed “Wanted Poster” (Figure 1) available on-line to be printed as a letter size cardstock poster, or smaller size cards. Observers, including Department of Natural Resources (DNR) personnel, were requested to create a personalized username with their contact information and to report observations of wild turkey hens, poults, gobblers, county, date observed, and if the observation was associated with a natural resource agency property. The on-line observation system was active during the traditional brood reporting period (July and August).

RESULTS and DISCUSSION

In 2018, a total of 678 usable observations of at least one wild turkey was received from 278 participants during July (61% of observations) and August 2018 reporting period; a 30% decrease in total observations and 56% decrease in participants over 2017, negating the gains in both categories from 2016. Observations from non-DNR personnel accounted for 65% of the observation records. Observation reports with either incomplete information or of

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questionable validity (e.g., observer likely combined multiple observations into one report) were censored (2 in 2018). The 678 useable observations represented 5,423 wild turkeys (1,434 hens, 3,989 poults; compared to 2,069 hens and 5,590 poults in 2017) resulting in 527 brood observations in 2018 (compared to 747 in 2017) (Table 1.) The 2018 production index (PI) was 2.8 poults: hen, with 75% of the hens observed with at least one poult. The 2018 PI was 4% higher than the 2017 PI (2.7; Figure 2). The average size of the 527 broods reported (where at least one adult hen and one poult were observed together) was 9.6 birds. The overall 2.8 PI and percent of hens with broods (75%) in 2018 were not different from the 2.5 and 78% of the previous five years (2013-2017; $\alpha = 0.05$; Table 2). Since 1993, the average PI has progressively declined from around 3 to 4 in the 1990's to around 2 from 2005-2013, with some encouraging signs of recovery to around 2.5 in recent years (Figure 3). The general downward log trend in the PI is indicative of a wild turkey population transitioning from a colonizing population with geometric growth during restoration to an established population where annual production and growth rates flatten to maintenance levels of a relatively stabilized population.

Changes in annual production are often reflected in a greater proportion of juvenile males (jakes) in the subsequent spring harvest and again two springs later, in both the pre-season gobbling survey and spring harvest age structure, because 2-yr-old males are the most active gobbling cohort and generally the most vulnerable to spring harvest. Long term trends in turkey populations are influenced by availability of suitable habitat across the landscape. Recent declines across the eastern United States are likely a manifestation of various density-dependent factors as populations peaked following restoration (Porter et al. 2011). Downward trends in spring turkey harvests and summer production indices were observed in the last decade throughout the eastern United States (Eriksen et al. 2015). Periodic fluctuations above and below the long term production mean are expected to continue as turkey populations stabilize at lower, "new normal" population levels (Casalena et al. 2015). The changing population dynamics of maturing wild turkey populations will likely influence future harvest trends, hunter success, and hunting opportunities (Parent et al. 2015).

Inferences from the regional production summaries (Figure 4) should be viewed with caution due to the relative scarcity of brood reports in regions of the state that traditionally support higher spring harvests (e.g. southeast Indiana; Figure 5). There was a significant declines in both observer participation, observations, and observation distribution in 2018 coverage compared to 2017. Reasons for the declines in 2018 after a notable increase in 2017 are speculative and possible factors related to communicating the need for participation need to be examined. Hopefully the gains in participation and observation numbers can be recouped and continue to increase to build on each subsequent year with an improved distribution across the entire state. Other potential biases include variable brood detection rates among regions due to differences in vegetation, road density and topography. Climatically, the 2018 spring/early summer marked the 13th consecutive year of above normal precipitation and flooding events in the southern 2/3 of the state during early brood rearing period of June-July.

An effort to increase participation of obtaining turkey brood reports across the state appeared to be improving in 2017 but undetermined reasons, the number of brood reports was similar to 2016 and observer participation (278) fell below the 297 of 2016, the first year of the web-based brood reporting system. Considerably more effort to solicit more participation needs to be a priority to obtain a minimum goal of 3,000 brood reports with a fairly even distribution across the various regions of the state.

Literature Cited

- Casalena, M. J., M.V. Schiavone, A. C. Bowling, I. D. Gregg, and J. Brown. 2015. Understanding the new normal: wild turkeys in a changing Northeastern landscape. *Proceedings of the National Wild Turkey Symposium*. 11:45-57.
- Eriksen, R. E., T. W. Hughes, T. Brown, M. D. Akridge, K. B. Scott, and Cecilia S. Penner. 2015. Status and distribution of wild turkeys in the United States: 2014 status. *Proceedings of the National Wild Turkey Symposium*. 11:7-18.
- Parent, C. J., B. S. Stevens, A. C. Bowling, and W. F. Porter. 2015. Wild turkey harvest trends across the Midwest in the 21st century. *Proceedings of the National Wild Turkey Symposium* 11: 211-223.
- Porter, W. F., W. M. Healy, S. E. Backs, B. F. Wakeling, and D. E. Steffen. 2011. Managing wild turkeys in the face of uncertainty. *Proceedings of the National Wild Turkey Symposium* 10:1-9.

Figure 1. Promotional poster for web-based wild turkey brood reporting system.

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Table 1. Indiana wild turkey brood production - Summer 2018.

July & August	Adult Hens	No. of Poults	Brood Size *	Poults/ Hen **	
Total	1,434	3,989		2.8	Percent hens with broods 75%
No. Observations	678	527	527		Mean No. "barren" hens in a group 2.3
Mean	2.1	7.6	9.6		Observations of "barrens" hens 151
SE	0.06	0.39	0.28		

Jul-18	Adult Hens	No. of Poults	Brood Size *	Poults/ Hen **	
Total	789	2,435		3.1	Percent hens with broods 75%
No. Observations	410	317	317		Mean No. "barren" hens in a group 2.1
Mean	1.9	7.7	9.5		Observations of "barrens" hens 93
SE	0.06	0.34	0.37		

Aug-18	Adult Hens	No. of Poults	Brood Size *	Poults/ Hen **	
Total	645	1,554		2.4	Percent hens with broods 76%
No. Observations	268	210	210		Mean No. "barren" hens in a group 2.7
Mean	2.4	7.4	9.7		Observations of "barrens" hens 58
SE	0.10	0.45	0.45		

* Brood size = all hens + all poults observed as a group at one time.
 ** The total poults/total hens.
 The total poults/total hens observed each month; July + August = annual Production Index (PI).

Figure 2. Wild Turkey Brood Production

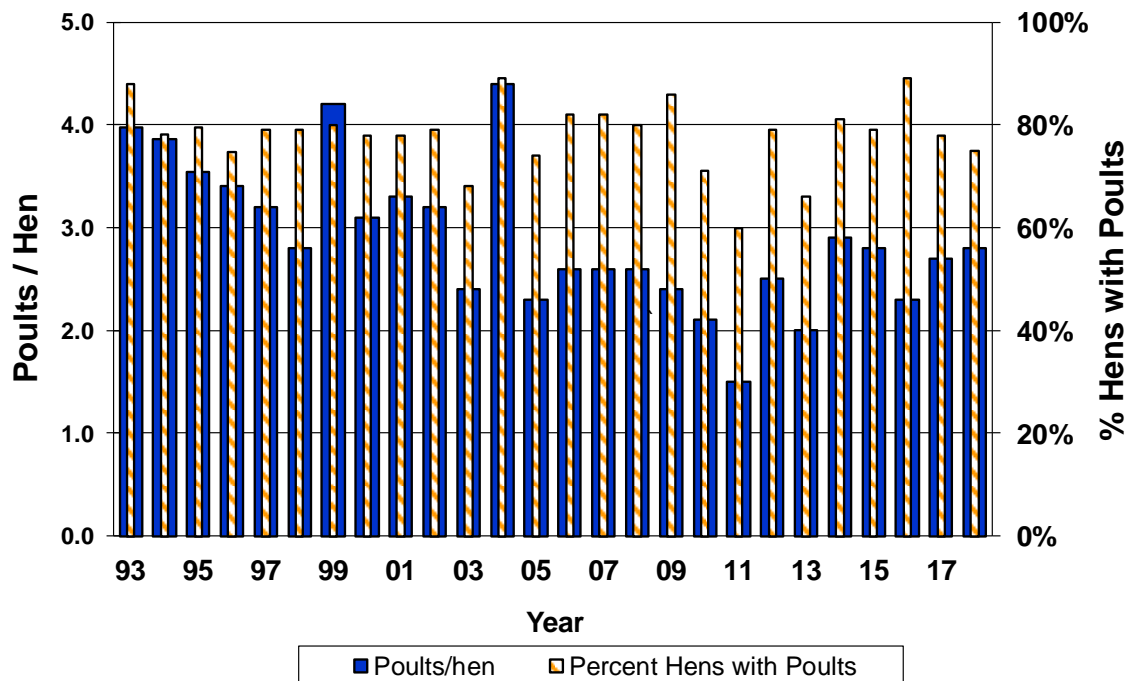


Table 2. Indiana wild turkey production indices, 1993-2018.

Year	Poults/Hen ^a (PI)	% Hens with poults	No. Observations
1993	4.0	88%	101
1994	3.9	78%	175
1995	3.5	80%	121
1996	3.4	75%	142
1997	3.2	79%	126
1998	2.8	79%	134
1999	4.2	80%	229
2000	3.1	78%	227
2001	3.3	78%	313
2002	3.2	79%	338
2003	2.4	68%	312
2004	4.4	89%	597
2005	2.3	74%	240
2006	2.6	82%	477
2007	2.6	82%	477
2008	2.6	80%	328
2009	2.4	86%	311
2010	2.1	71%	320
2011	1.5	60%	320
2012	2.5	79%	318
2013	2.0	66%	394
2014	2.9	81%	363
2015	2.8	79%	302
2016	2.3	89%	323
2017	2.7	78%	522
<i>2013-2017 Mean (SE)</i>	2.5 (0.17)	78% (3.7%)	381 (38.7)
2018	2.8	75%	527

^a Production index (PI) is the total poults/total hens observed in July and August.

Figure 3. Wild Turkey Production - Indiana

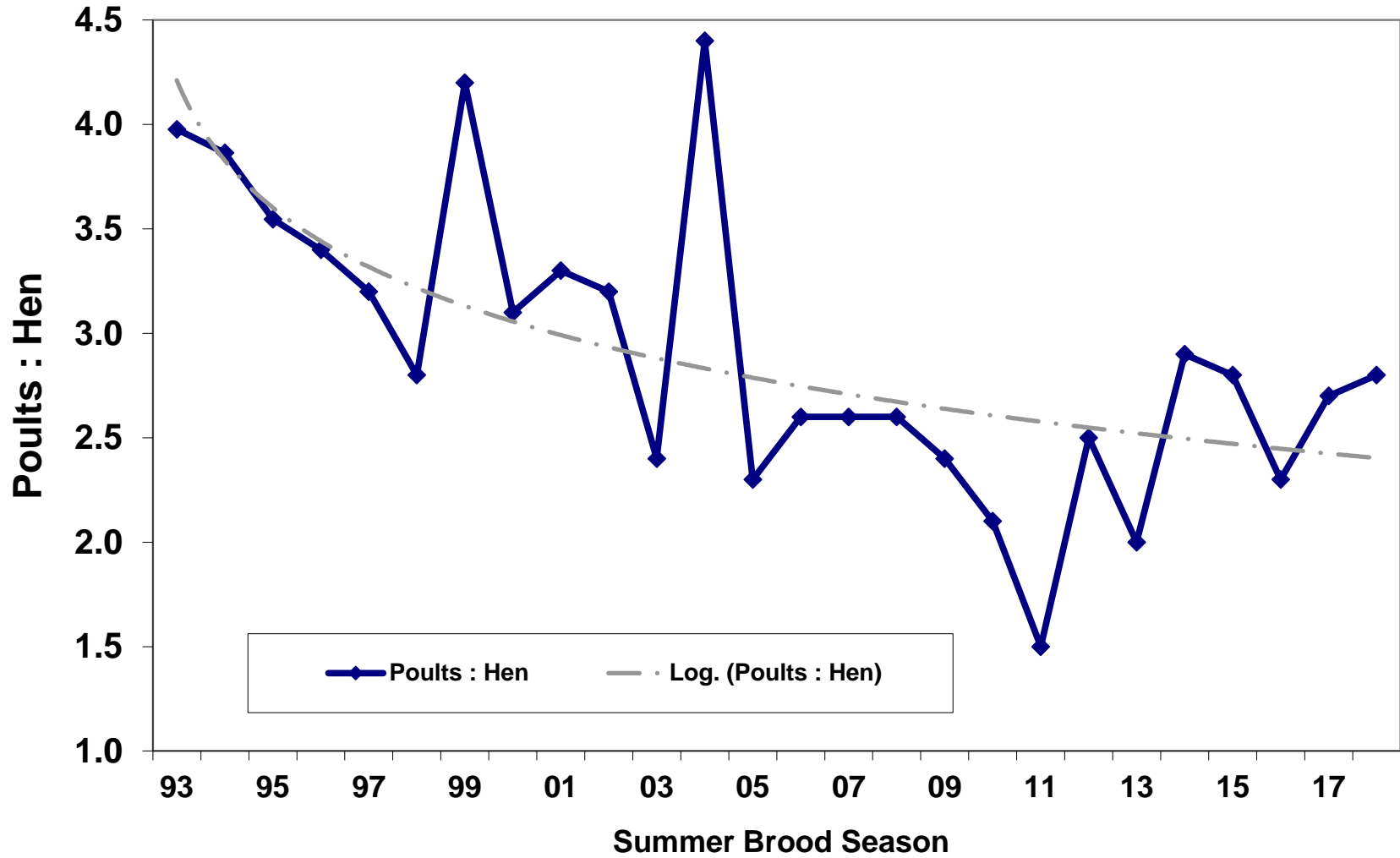


Figure 4. Summer wild turkey production by regions for July-August, 2018.

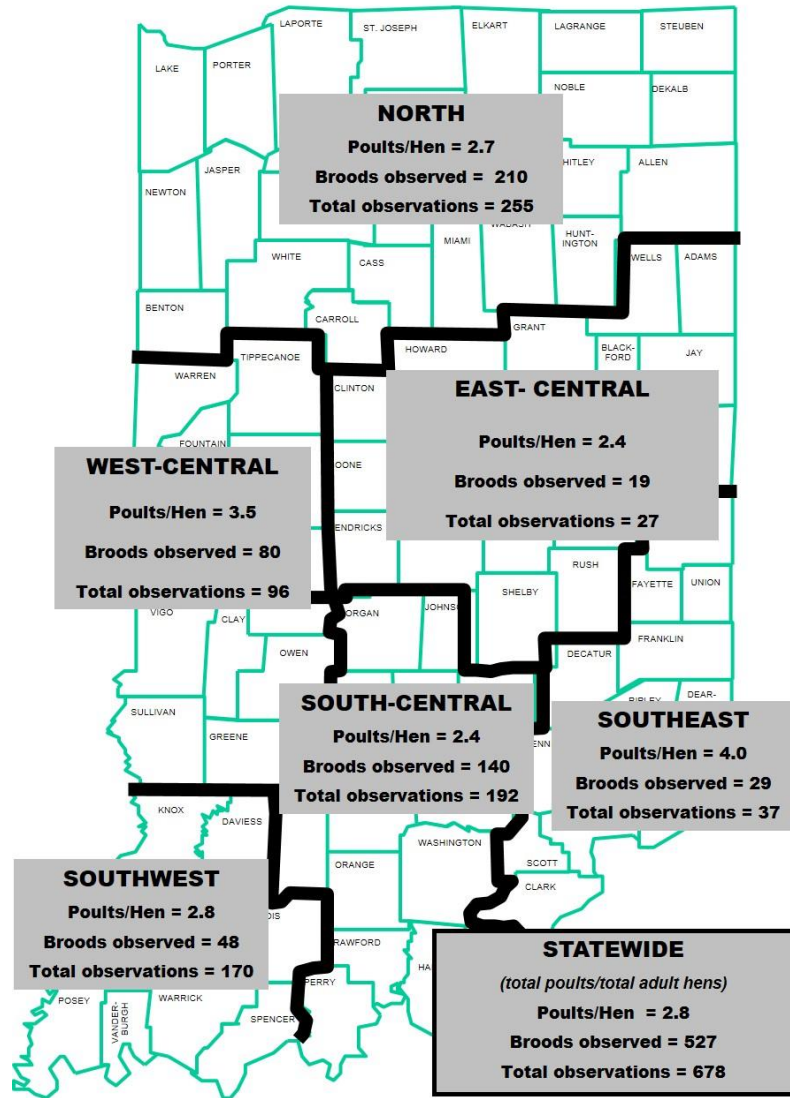


Figure 5. Distribution of web-based wild turkey observation reports (n = 678) for July-August, 2018.

