WILDLIFE MANAGEMENT AND RESEARCH NOTES

INDIANA DIVISION OF FISH & WILDLIFE

No.	AUTHOR: Steven E. Backs, Wildlife Research Biologist	Date
2036	TITLE: Wild Turkey Summer Brood Production Indices - 2017	1/16/2018

Abstract: In 2016, a new web-based brood reporting system was initiated using a "caspio ™" on-line data entry software platform (https://www.caspio.com/). This system 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 second year, 2017, there was a 69% increase in the number of reports and 158% increase in the number of participants. The 2017 statewide mean wild turkey production index was 2.7 poults:hen (PI = total poults:total adult hens), with 74% of the hens observed with at least one poult. The 2017 PI was 17% higher than the 2.3 PI in 2016, but not different from 2.6 PI of the previous five years (2012-2016; $\alpha = 0.05$). 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 2017 had above normal precipitation and below normal temperatures in southern Indiana, marking the 12th consecutive year of above normal precipitation in this region during the early brood rearing periods of June-July. Regional inferences from the 2017 summer production survey are still limited due to the scarcity and the uneven distribution of brood observations across the state.

Project/Activity Codes: 300FW1W36R04000/W36R510

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.

In 2016, a new web-based brood reporting system was initiated using a "caspio ™" on-line data entry software platform (https://www.caspio.com/). This system 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 "Wanted Poster" (Figure 1) available either on-line, as a letter size cardstock poster, or wallet 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 2017, a total of 972 observations of at least one wild turkey was received from 765 participants during July (69% of observations) and August 2017 reporting period; an overall 69% increase in total observations and 158% increase in participants over 2016. Observations from non-DNR personnel accounted for 80% of the observation records. Observation reports with either incomplete information or of questionable validity (e.g., observer likely combined

multiple observations into one report) were censored (5 in 2017). The 967 useable observations represented 7,659 wild turkeys (2,069 hens, 5,590 poults) with 747 brood observations (Table 1). The 2017 production index (PI) was 2.7 poults: hen, with 74% of the hens observed with at least one poult. The 2017 PI was 17% higher than the 2016 PI (2.3; Figure 2). The average size of the 747 broods reported (where at least one adult hen and one poult were observed together) was 9.5 birds. The overall 2.7 PI and percent of hens with broods (74%) in 2017 were not different from the 2.6 and 74% of the previous five years (2012-2016; $\alpha = 0.05$; 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 notable improvement in observation coverage in 2017 compared to 2016 and hopefully the number of participants in the survey will continue to build 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 2017 spring/early summer marked the 12th consecutive year of above normal precipitation and flooding events in the southern 2/3 of the state during either nesting or early brood rearing period of June-July.

An effort to increase participation of obtaining turkey brood reports across the state appears to be improving and efforts to solicit more participation needs to continue to strive towards obtaining a minimum of 3,000 brood reports with a better distribution across the various regions. Data collection was simplified in 2017 and other improvements were made to the web site instructions to facilitate better reporting. Michelle Cain, Wildlife Information Specialist, was extremely instrumental in the development of the web-based reporting system and is thanked along with the 765 survey participants, many of whom communicated other information and pictures related to their wild turkey observations.

Literature Cited

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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.

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

Table 1. Indiana wild turkey brood production - Summer 2017.

July & August	Adult Hens	No. of Poults	Brood Size *	Poults/ Hen **		
Total	2,069	5,590		**2.7**	Percent hens with broods	74%
No. Observations	967	747	747		Mean No. "barren" hens in a group	2.4
Mean	2.2	7.5	9.5		Observations of "barrens" hens	225
SE	0.07	0.27	0.31			

Jul-17	Adult Hens	No. of Poults	Brood Size *	Poults/ Hen **		
Total	1,386	3,824		**2.8**	Percent hens with broods	73%
No. Observations	666	505	505		Mean No. "barren" hens in a group	2.2
Mean	2.1	7.6	9.6		Observations of "barrens" hens	165
SE	0.05	0.24	0.28			

Aug-17	Adult Hens	No. of Poults	Brood Size *	Poults/ Hen **		
Total	683	1,766		**2.6**	Percent hens with broods	75%
No. Observations	301	242	242		Mean No. "barren" hens in a group	2.8
Mean	2.3	7.3	9.4		Observations of "barrens" hens	60
SE	0.11	0.31	0.37			

* 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

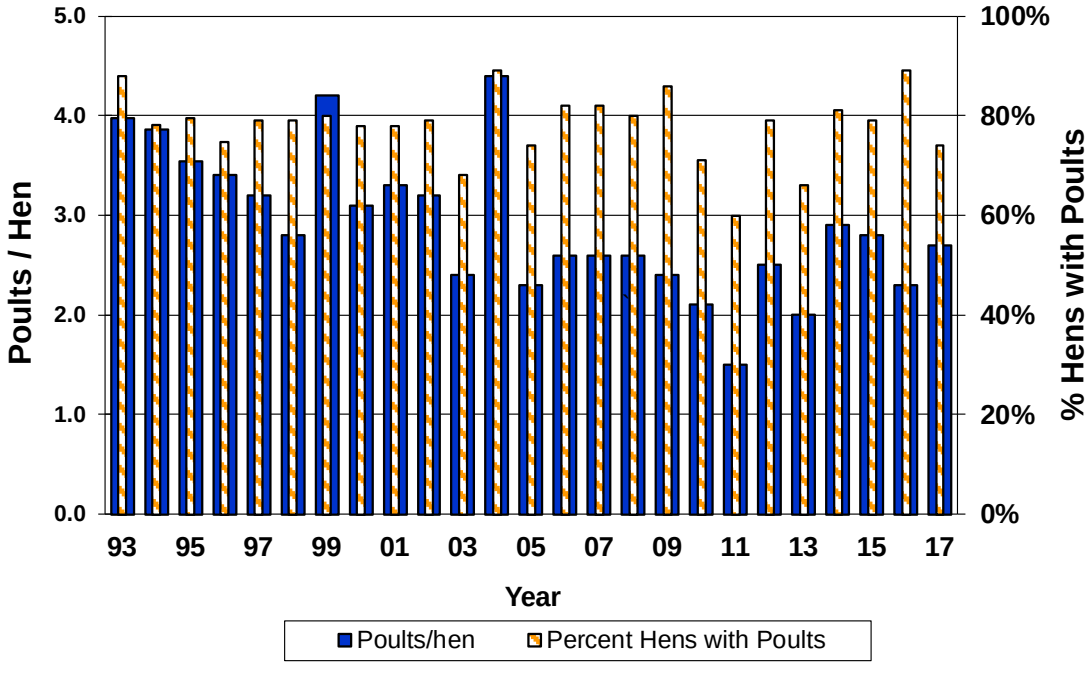

Table 2. Indiana wild turkey production indices, 1993-2017.

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	
2012-2016 Mean (SE)	*2.6*	*(0.16)*	*74%*	*(2.7%)*	*343*	*(15.3)*
2017	2.7		74%		747	

[a] *P* roduction index (PI) is the total poults/total hens observed in July and August.

Figure 3. Wild Turkey Production - Indiana

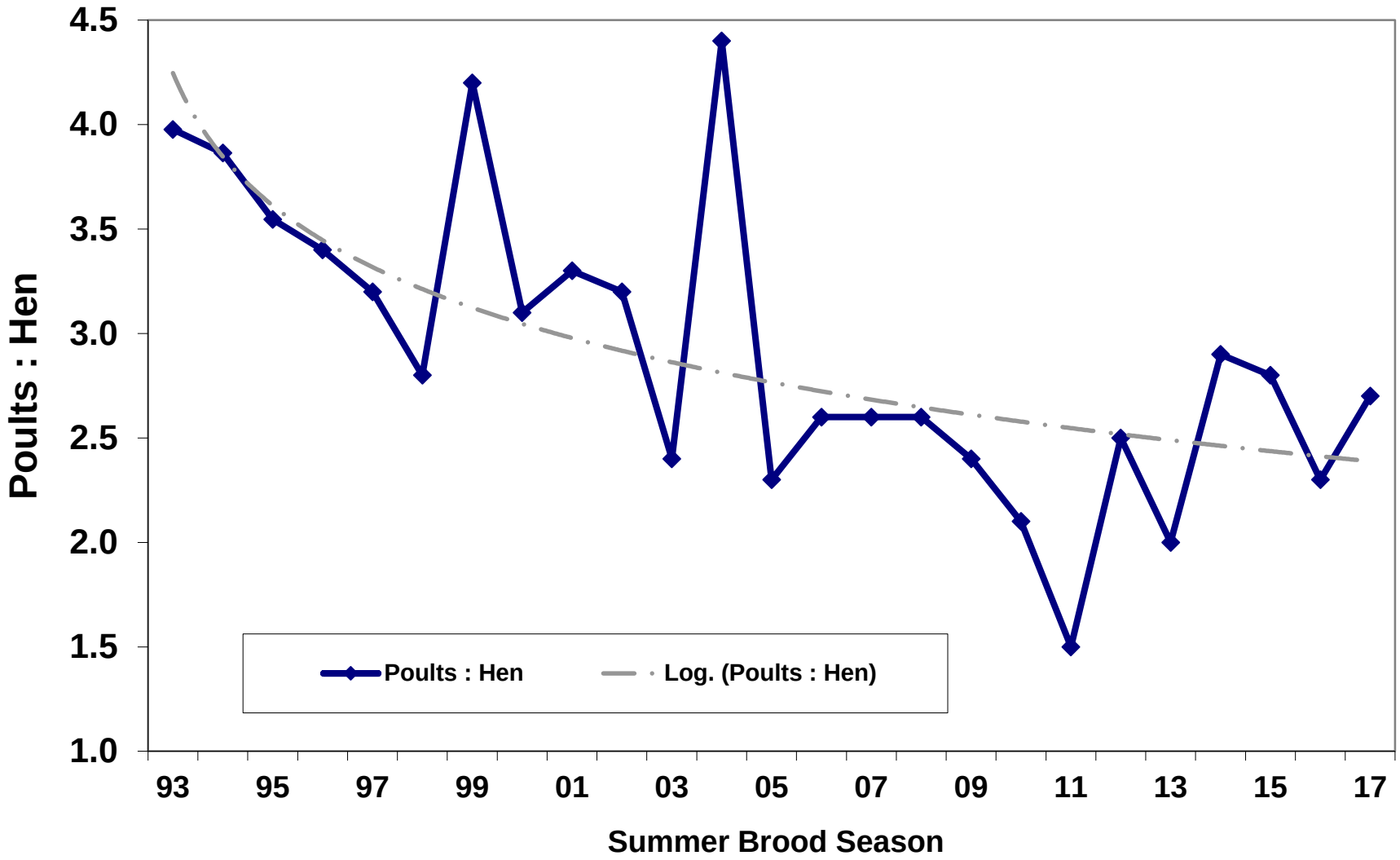

Figure 4. Summer wild turkey production by regions for July-August, 2017.

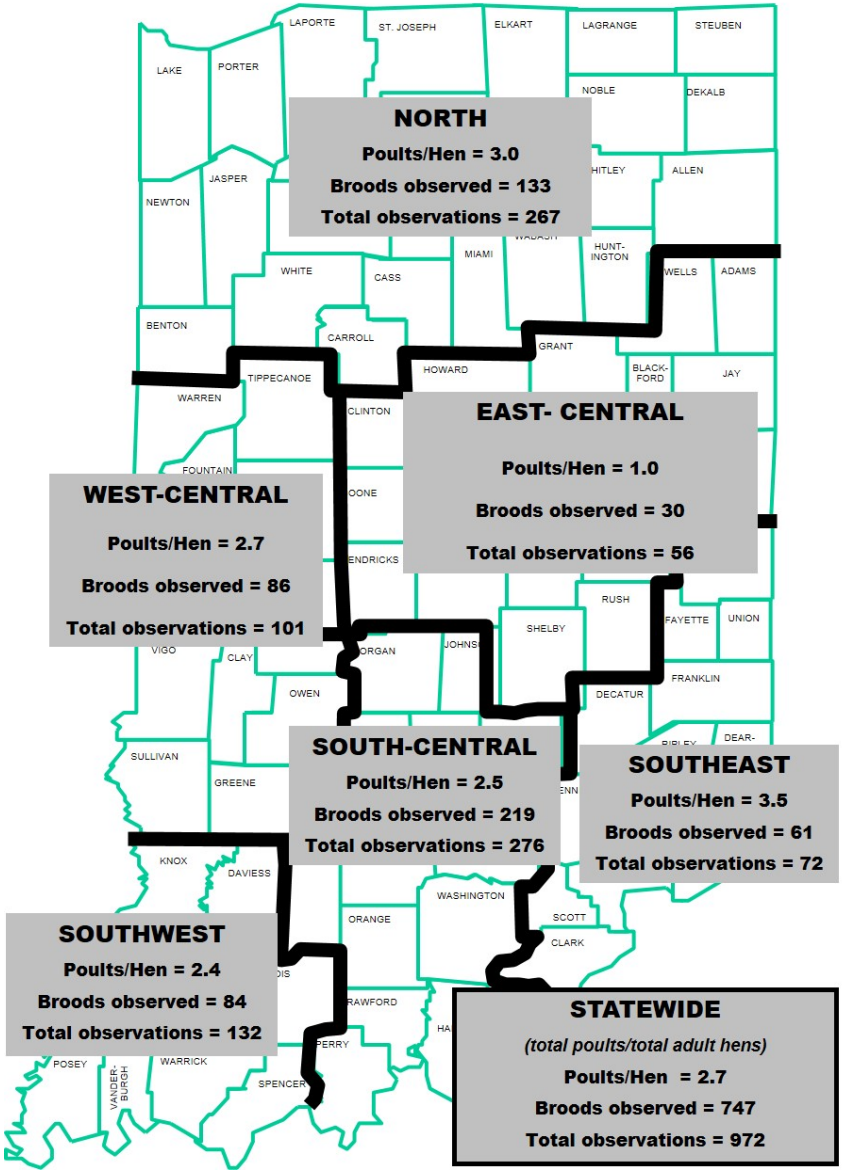

Figure 5. Distribution of web-based wild turkey observation reports (n = 972) for July-August, 2017.