

Summer Deer Observations 2014

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Abstract

Fawn:doe ratios (FDRs) were below county-group 5-year means in 2014 in all 4 Forest Zone county groups and 2 of 5 Farmland Zone county groups. The number of SDO and ODW observers decreased from 2013. The statewide SDO-based FDR increased from 0.80 in 2013 to 0.87 in 2014. Fawn:doe ratio estimates from the SDO survey were lower in 2013 than 2012 in all but 2 unit groups. Similar to previous years, average FDRs from ODW are lower than SDO.

Introduction

Fawn:doe ratios (FDRs) are often used for monitoring white-tailed deer population trends (e.g., Roseberry and Woolf 1991) because they provide inference to fawn production and survival, primary vital rates in ungulate population growth (DeCesare et al. 2012). Roadside deer observation surveys are a commonly used method of collecting FDRs over broad geographic areas where deer observations are strategically or opportunistically recorded within a specified time frame. Although roadside surveys have known biases, particularly underrepresentation of habitat types, the low cost and relatively simple implementation make this a useful method to assess deer demographics over a broad area. Roadside deer surveys have been used by the Wisconsin Department of Natural Resources (WDNR) for estimating summer FDRs across several geographic regions of Wisconsin since the 1960s. Due to sampling limitations, FDRs are only estimated for 9 groups of management units (now counties) across the state. Though no bias-free measure has yet been developed for measuring net addition of fawns to the fall deer population, roadside summer deer observations have tended to produce values that match expectations in the forested regions of Wisconsin. In the northern and central forest management units, annual FDRs are used as parameter inputs in WDNR's Sex-Age-Kill deer population estimate.

Methods

The Summer Deer Observation (SDO) survey used WDNR and cooperating U.S. Forest Service and U.S. Fish and Wildlife Service personnel to record deer observations during August–September 2014 during normal duty travels. Deer observed during daylight hours were recorded by month and management unit (now county). Deer observations were classified as adult bucks, does without fawns, does with one, two, and three fawns, fawns without does, and unidentified. The number of fawns observed per doe was calculated by county group (Fig. 1) and the total numbers of fawns and does reported throughout the summer (August–September) was used to calculate summer-long FDRs for each unit group. July observations have not been included since 2011, as such estimates result in negative bias associated with adult does hiding their fawns through early July (Verme 1989). Agency staff participating in the SDO survey could submit their observations using a paper or electronic web-based method. Web-based instructions and regular paper survey protocol were identical.

The Operation Deer Watch (ODW) survey provided a mechanism for the public to opportunistically record deer observations during August–September 2014. This program was initiated in 2010 to increase public involvement in Wisconsin's deer management program while

supplementing the Department's existing SDO database with additional deer observations. Public participants recorded deer observations into categories (e.g., adult bucks) analogous to those in the SDO survey. Observations were submitted through a web-based interface that provided participants survey instructions identical to the SDO survey protocol. We used identical calculations to estimate unit group FDRs.

Results

Statewide, a minimum 215 SDO observers recorded observations of 5,383 does and fawns, compared to at least 434 ODW observers (based on independent IP addresses) that recorded 14,006 does and fawns (Table 1). In 2014, SDO observers declined by 14% from 2013 and 25% from 2012. In 2014, ODW observers decreased by at least 34% from 2013. The number of does and fawns observed by SDO observers in 2014 was nearly equal to the number observed in 2013 while ODW observers recorded 25% fewer does and fawns than the prior year.

The average fawn:doe ratio across all county groups was 0.87, a 9% increase from the 2013 statewide average fawn:doe ratio. Fawn:doe ratios in 2014 remained below the 5-year mean in forest county groups (Figure 2). Fawn:doe ratios were above 5-year means in 3 farmland county groups and below average in 2 farmland county groups (Figure 2).

Across county groups, SDO fawn:doe ratios were an average of 31% higher than ODW and ranged between 7% and 74% higher (Table 1). Fawn:doe ratios from SDO and ODW were correlated (Figure 3).

Discussion

In 2013, the Department actively solicited help from 14,000 licensed deer hunters to boost participation in ODW. This resulted in at least a 7% increase in ODW observers over the previous year. However such gains were short-lived, as ODW observations dropped by a third from 2013 to 2014. Note - while the individual number of ODW participants that file their reports electronically is known, based on IP addresses, those that mail in their reports are not individually identified, thus we do not know how many individuals participated in ODW.

The average WSI recorded in the north during the winter of 2013–2014 was the most severe on record (WSI = 149.3). Despite the record-severe winter, fawn:doe ratios did not decline dramatically, except in the Lake Michigan Farmland county-group, where it dropped below 1.00 for the 1st time. While, fawn:doe ratios tended not to drop dramatically from the previous year, 3 of 9 county groups had the lowest fawn:doe ratios recorded since 1997 and 3 others had fawn:doe ratios near the lowest observed. Long-term (5 years or more) declines are evident in a number of county groups (Figure 2).

Fluctuations in FDRs are expected due to variation in fawn production and neonatal survival. These can be affected by a number of factors including nutritional condition of does, which is a function of population levels relative to biological carrying capacity and environmental stress (e.g., winter severity), as well as predation. The recently-completed fawn survival studies in northern and east-central Wisconsin suggest that predation is the leading source of neonatal fawn mortality in the northern study area, but starvation is the leading cause in the east-central study area. Starvation occurs when does do not have nutritional reserves to produce adequate milk for newborn fawns, and does will tend to be in poorer nutritional condition following a severe winter. Predation risk is related not only to abundance of predators, but also to other density-dependent (e.g., deer density and suitability of fawning habitat) and density-independent

(e.g., winter severity) factors. Predation rates on neonate fawns were higher following harsh winters. Does in poor condition may provide inferior maternal care, which could increase a fawn's susceptibility to predation. In particular, an abandoned fawn may repeatedly bleat, which could alert predators to its presence.

On average, FDRs from ODW are lower than FDRs from SDO. This may be due to the wildlife professionals conducting SDO having greater experience in observing deer and following protocol more carefully (i.e. taking time to observe deer with binoculars). Within unit groups, there is little consistency in the difference in FDR between SDO and ODW. This is certainly due in part to sampling variation, but may also be due to variation in the spatial and temporal coverage of the observations and variation in skill-level and interest of observers. The lack of consistency in SDO and ODW observations is a topic deserving of consideration.

Acknowledgements

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Literature Cited

- DeCesare, N. J., M. Hebblewhite, M. Bradley, K. G. Smith, D. Hervieux, and L. Neufeld. 2012. Estimating ungulate recruitment and growth rates using age ratios. *Journal of Wildlife Management* 76:144–153.
- Roseberry, J. L., and A. Woolf. 1991. A comparative evaluation of techniques for analyzing white-tailed deer harvest data. *Wildlife Monographs* 117:1–59.
- Verme, L.J. (1989). Maternal investment in white-tailed deer. *Journal of Mammalogy*, 70, 438–442.

County Groupings Used to Summarize Fawn:Doe Ratio

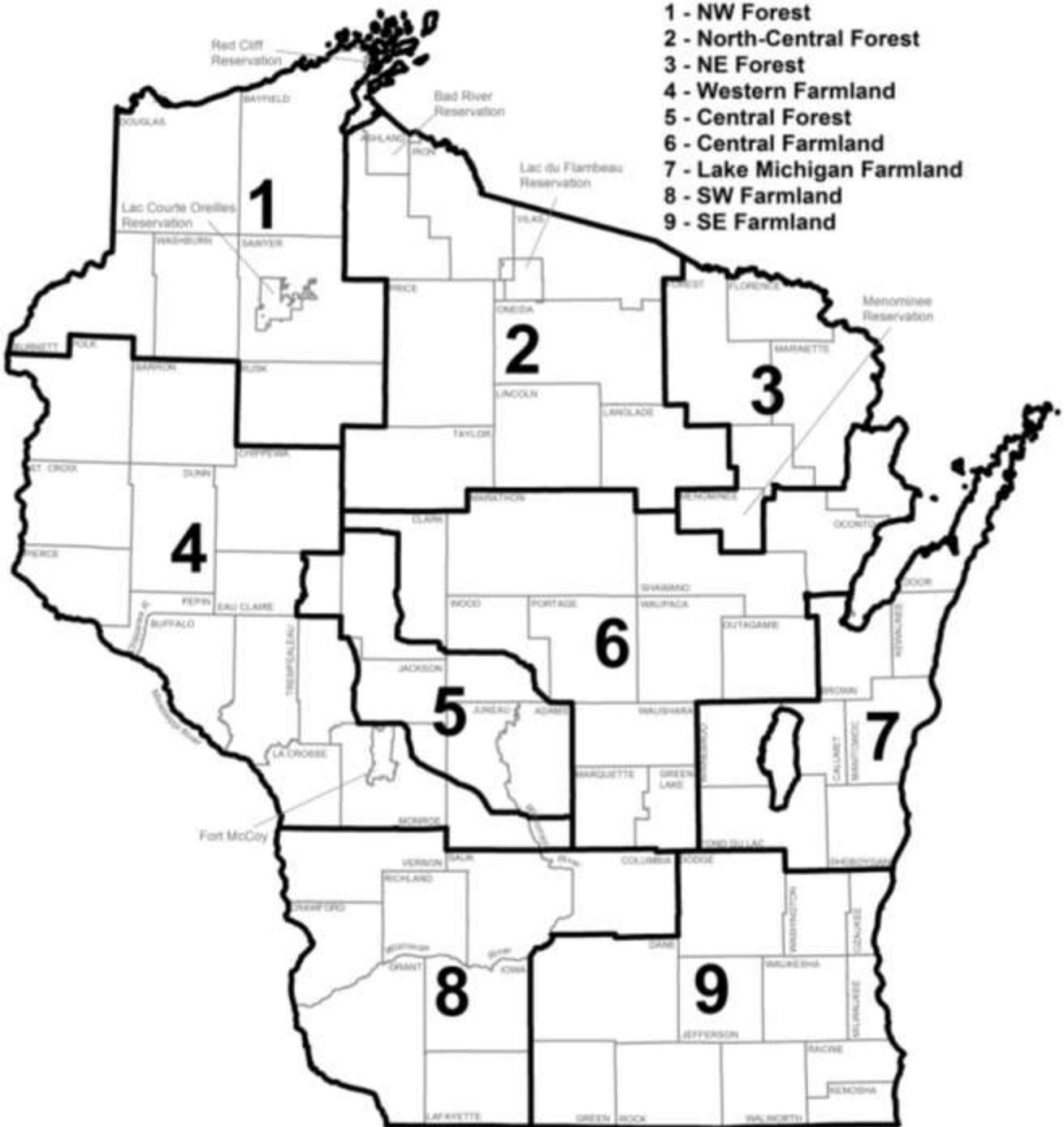


Figure 1. Groups of deer management units used for 2014 summer deer observations.

Table 1. Number of doe and fawns observed during 2014 Summer Deer Observation Survey and Operation Deer Watch and estimated fawn:doe ratio by deer unit group.

Doe and fawn observations during Summer Deer Observation and Operation Deer Watch surveys, 2014

County group	Summer Deer Observation			Operation Deer Watch			SDO and ODW Combined			(SDO+ODW)/2	SDO/ODW
	Does	Fawns	Fawns/doe	Does	Fawns	Fawns/doe	Does	Fawns	Fawns/doe		
NW Forest	507	345	0.68	1,381	602	0.44	1,888	947	0.50	0.56	1.56
NC Forest	556	461	0.83	1,878	1,083	0.58	2,434	1,544	0.63	0.70	1.44
NE Forest	112	63	0.56	371	188	0.51	483	251	0.52	0.54	1.11
West Farm	439	435	0.99	1,024	825	0.81	1,463	1,260	0.86	0.90	1.23
Central Forest	79	57	0.72	560	379	0.68	639	436	0.68	0.70	1.07
Central Farm	754	670	0.89	1,626	1,300	0.80	2,380	1,970	0.83	0.84	1.11
Lk Mich Farm	234	223	0.95	701	593	0.85	935	816	0.87	0.90	1.13
SW Farmland	95	118	1.24	532	484	0.91	627	602	0.96	1.08	1.36
SE Farmland	106	129	1.22	282	197	0.70	388	326	0.84	0.96	1.74
Total	2,882	2,501	0.87	8,355	5,651	0.68	11,237	8,152	0.73	0.77	

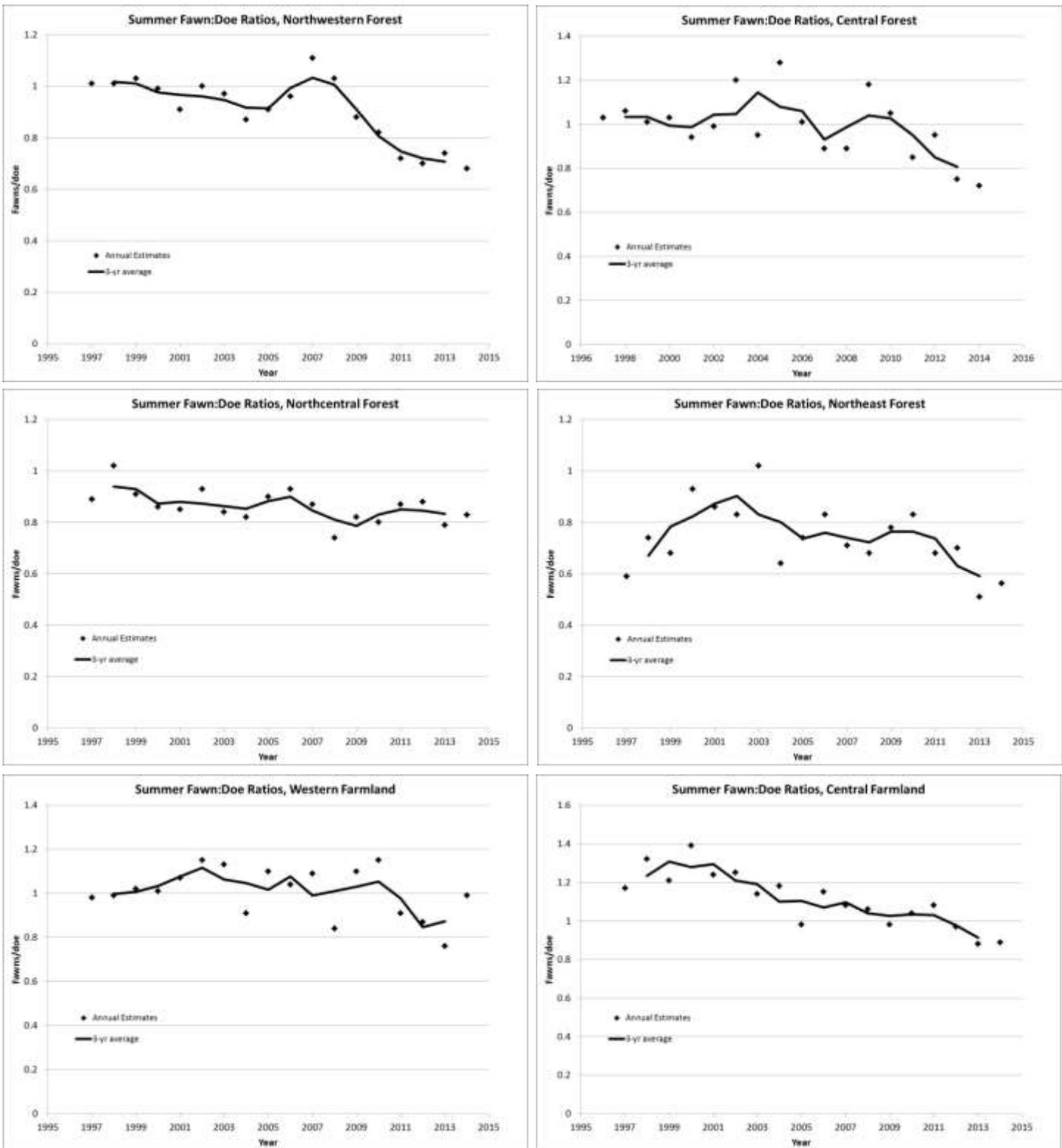


Figure 2. Trends in fawn:doe ratios estimated from the Summer Deer Observation survey in the nine county groups of Wisconsin, 1997–2014.

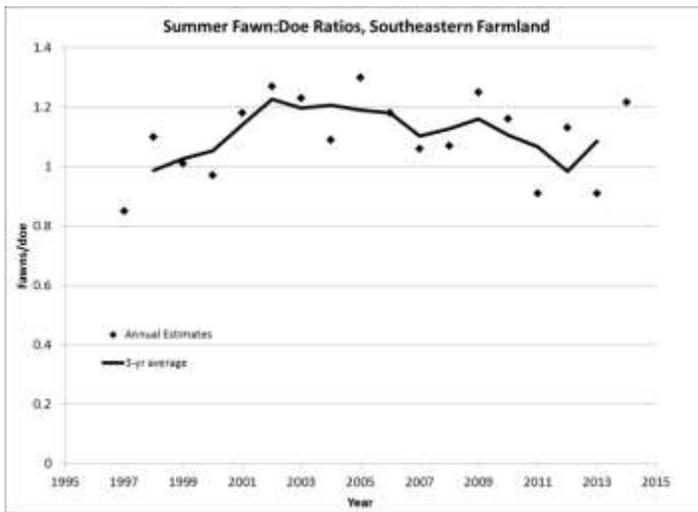
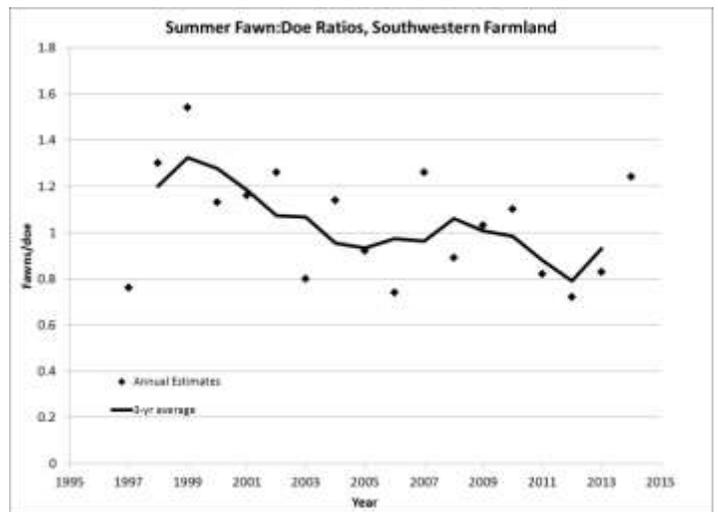
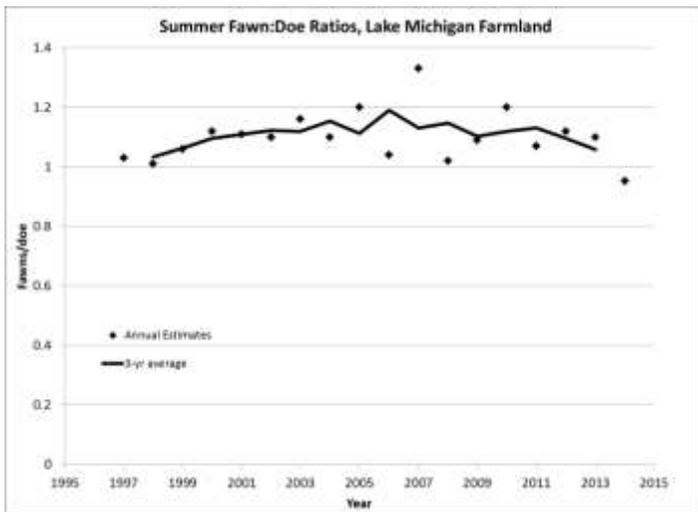


Figure 2. Continued.

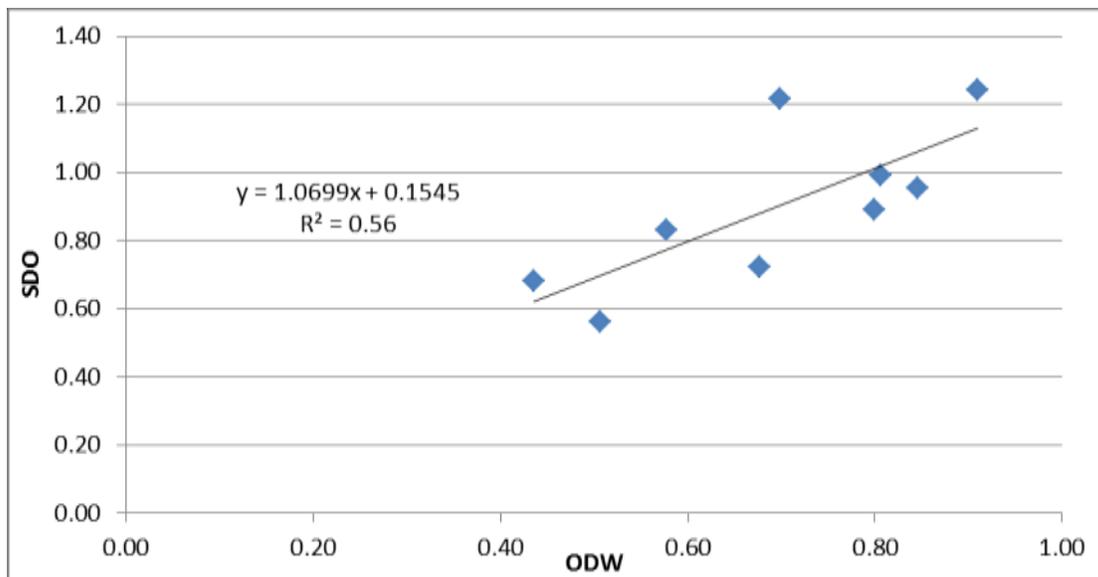


Figure 3. Correlation between county-group fawn:doe observations from Summer Deer Observations and Operation Deer Watch, during 2015.