

# Summer Deer Observations 2015

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## **Abstract**

Fawn:doe ratios (FDRs) in 2015 were below county-group 5-year means in the Northcentral Forest, Northeastern Forest, and Southeast Farmland county groups. In 2015, FDRs were above 5-year means in the Northwest Forest, Western Farmland, and Southwest Farmland county groups and were about equal to 5-year means in the Central Forest, Central Farmland, and Lake Michigan Farmland. The number of SDO and ODW observers decreased from 2014. The statewide SDO-based FDR increased very slightly from 0.87 in 2014 to 0.89 in 2015. Fawn:doe ratio estimates from the SDO survey in 2015 were higher than in 2014 in 6 of 9 county 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 2015 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 2015. 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 193 SDO observers recorded observations of 3,547 does and fawns, compared to at least 369 ODW observers (based on independent IP addresses) that recorded 9,135 does and fawns (Table 1). In 2015, SDO observers declined by 10% decrease from 2014, which itself decreased 14% from 2013. In 2015, ODW observers decreased by at least 15% from 2014. The number of does and fawns observed by SDO observers in 2015 was 34% fewer than the number observed in 2014 while ODW observers recorded 35% fewer does and fawns than the prior year.

The average FDRs among SDO observations across all county groups was 0.89, a 2% increase from the 2014 statewide average fawn:doe ratio. FDRs ratios in 2015 remained below the 5-year mean in 2 of 4 forest county groups (Figure 2). For farmland county groups, FDRs were above 5-year means in 2 county groups, below average in 1 county groups, and essentially the same in 2 county groups (Figure 2).

Across county groups, SDO FDRs were an average of 22% higher than ODW and ranged between 2% and 47% higher (Table 1). FDRs from SDO and ODW were moderately 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 and a further 35% in 2015. 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 2014–2015 (WSI = 49.6) was on the upper end of the ‘mild’ category and below the 55-year average (WSI = 62). The mild winter evidently had a positive effect on deer recruitment as only 3 county groups exhibited decreased FDR from the previous year. Two of these county groups, Southwestern Farmland and Southeastern Farmland have lower sample size, thus FDR estimates and year-to-year changes have low certainty. Despite increased FDR observed throughout most of the state during 2015, 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 alter 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**

The data presented in this report depends on the cooperative efforts and timely recording and reporting of deer observations by WDNR, U.S. Forest Service, U.S. Fish and Wildlife Service personnel, and the public. Sincere thank you go to all that participated. Also, thank you to several reviewers who provided comments to this report prior to publication.

### **Literature Cited**

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# County Groupings Used to Summarize Fawn:Doe Ratio

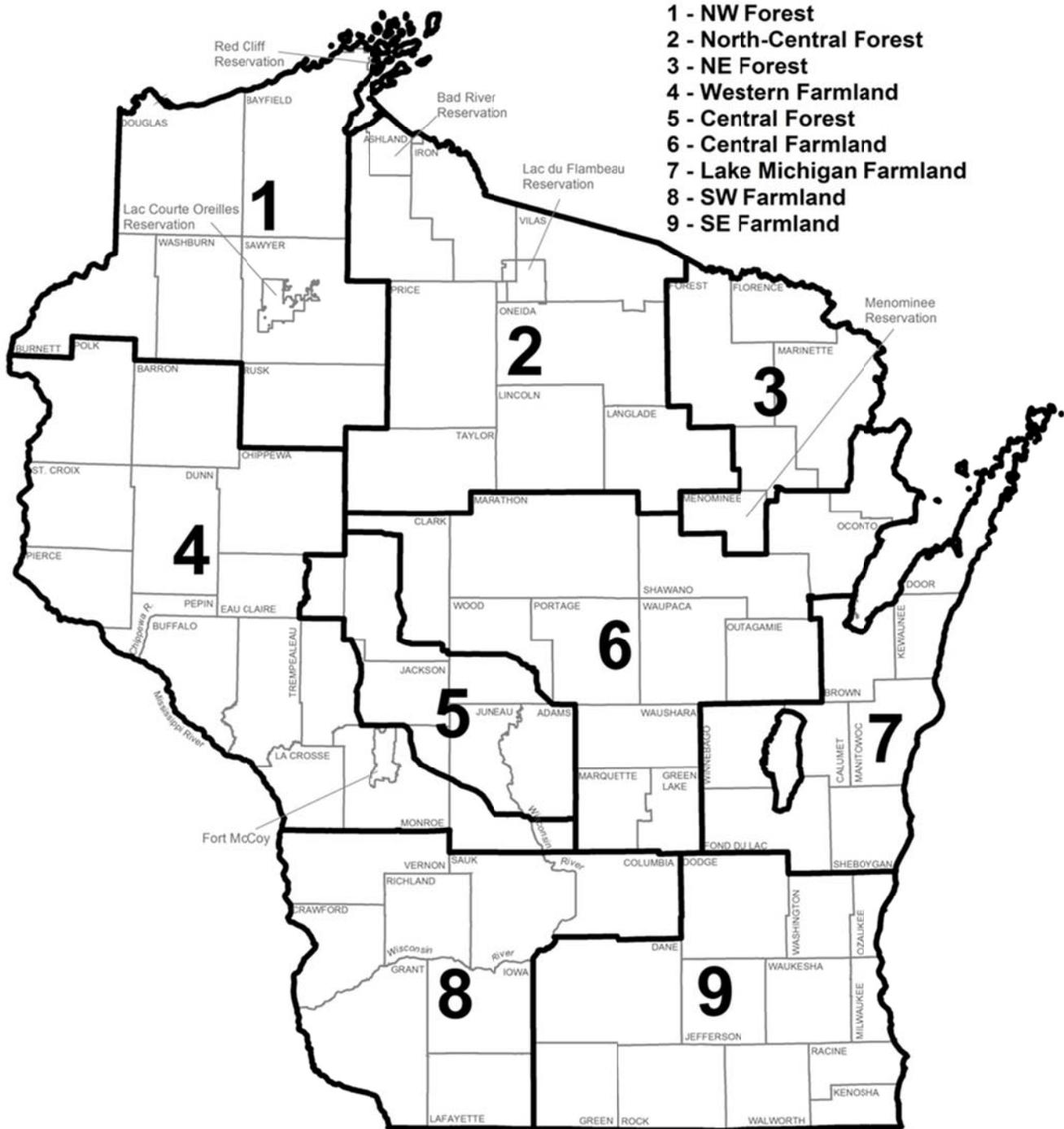
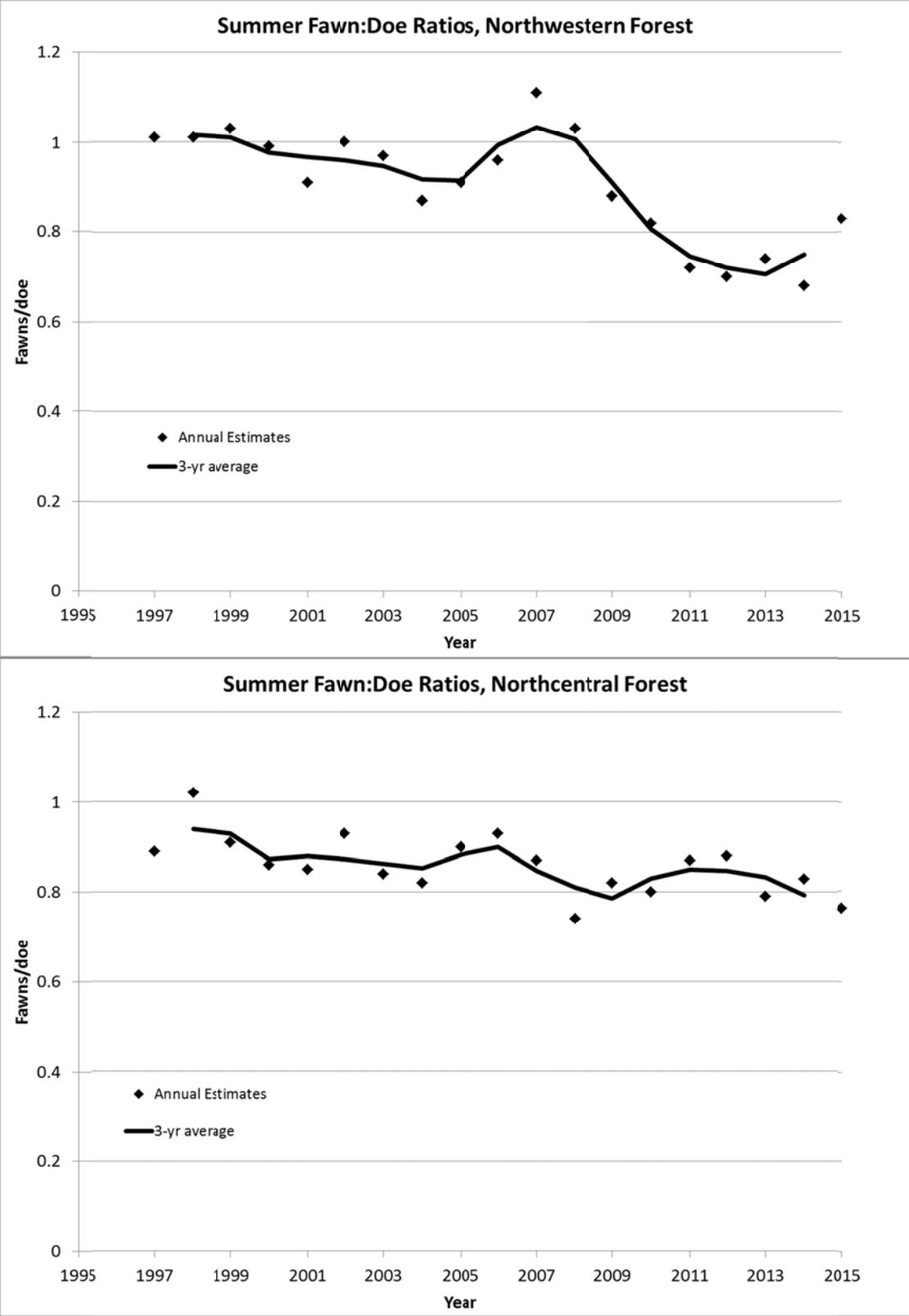


Figure 1. Groups of deer management units used for 2015 summer deer observations.

**Table 1.** Number of doe and fawns observed during 2015 Summer Deer Observation Survey and Operation Deer Watch and estimated fawn:doe ratio by county group.

County group	Summer Deer Observation			Operation Deer Watch			SDO and ODW Combined			SDO+ ODW/2	SDO/ ODW
	N. does	N. fawns	Fawns/ doe	N. does	N. fawns	Fawns/ doe	N. does	N. fawns	Fawns/ doe		
NW Forest	469	389	0.83	753	495	0.66	1,222	884	0.72	0.74	1.26
NC Forest	345	263	0.76	1,124	769	0.68	1,469	1032	0.70	0.72	1.11
NE Forest	118	73	0.62	565	331	0.59	683	404	0.59	0.60	1.06
West Farm	216	227	1.05	602	519	0.86	818	746	0.91	0.96	1.22
Central Forest	86	75	0.87	600	355	0.59	686	430	0.63	0.73	1.47
Central Farm	315	314	1.00	824	658	0.80	1,139	972	0.85	0.90	1.25
Lk Mich Farm	92	101	1.10	459	363	0.79	551	464	0.84	0.94	1.39
SW Farmland	104	101	0.97	212	201	0.95	316	302	0.96	0.96	1.02
SE Farmland	130	129	0.99	169	136	0.80	299	265	0.89	0.90	1.23
Total	1,875	1,672	0.89	5,308	3,827	0.72	7,183	5,499	0.77	0.81	



**Figure 2.** Trends in fawn:doe ratios estimated from the Summer Deer Observation survey in the nine county groups of Wisconsin, 1997–2015.

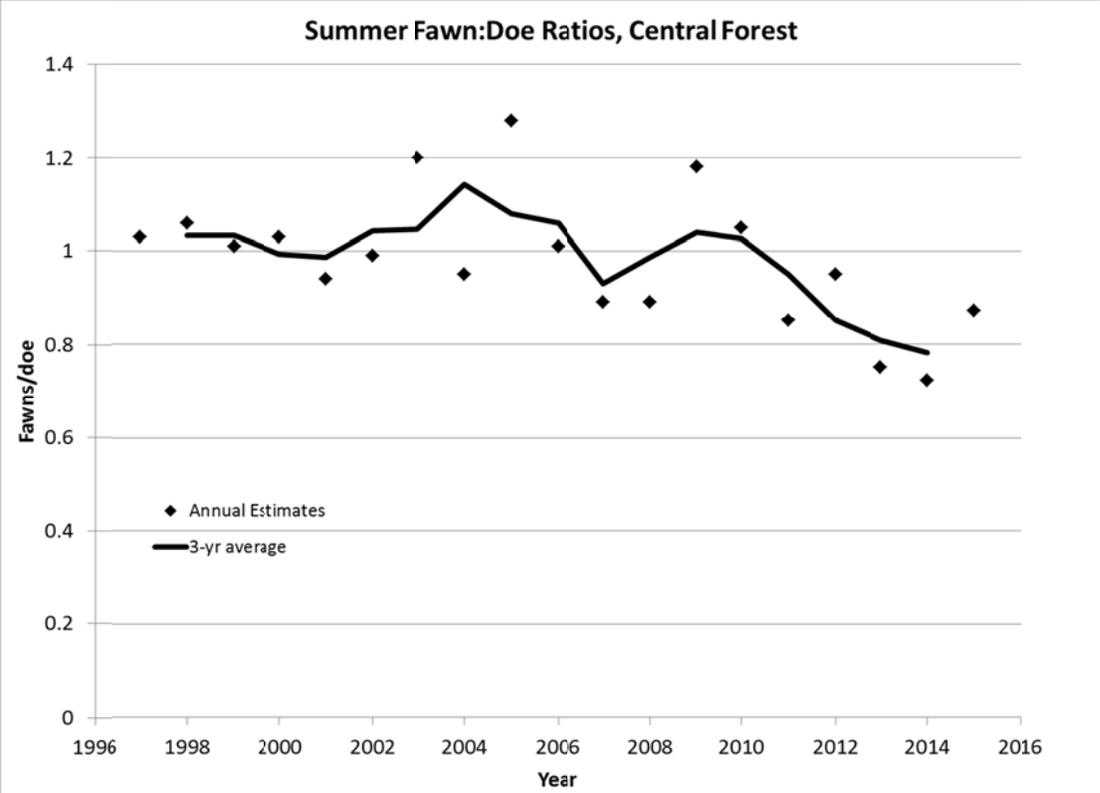
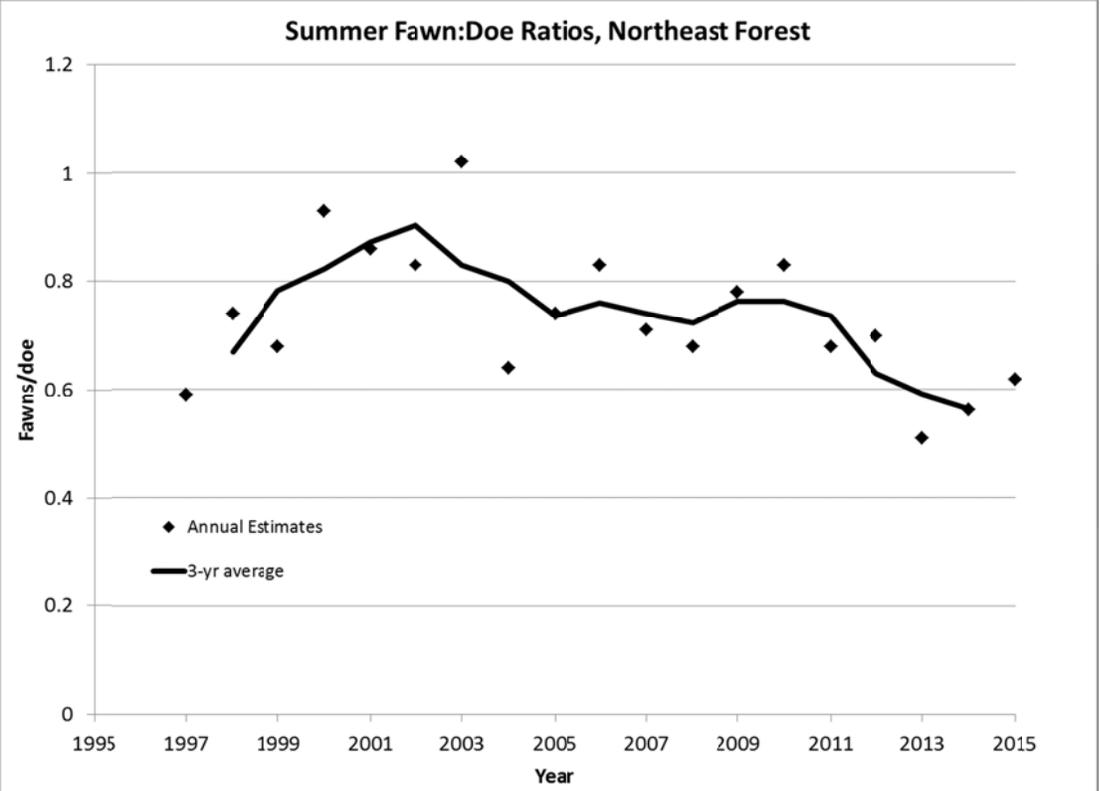


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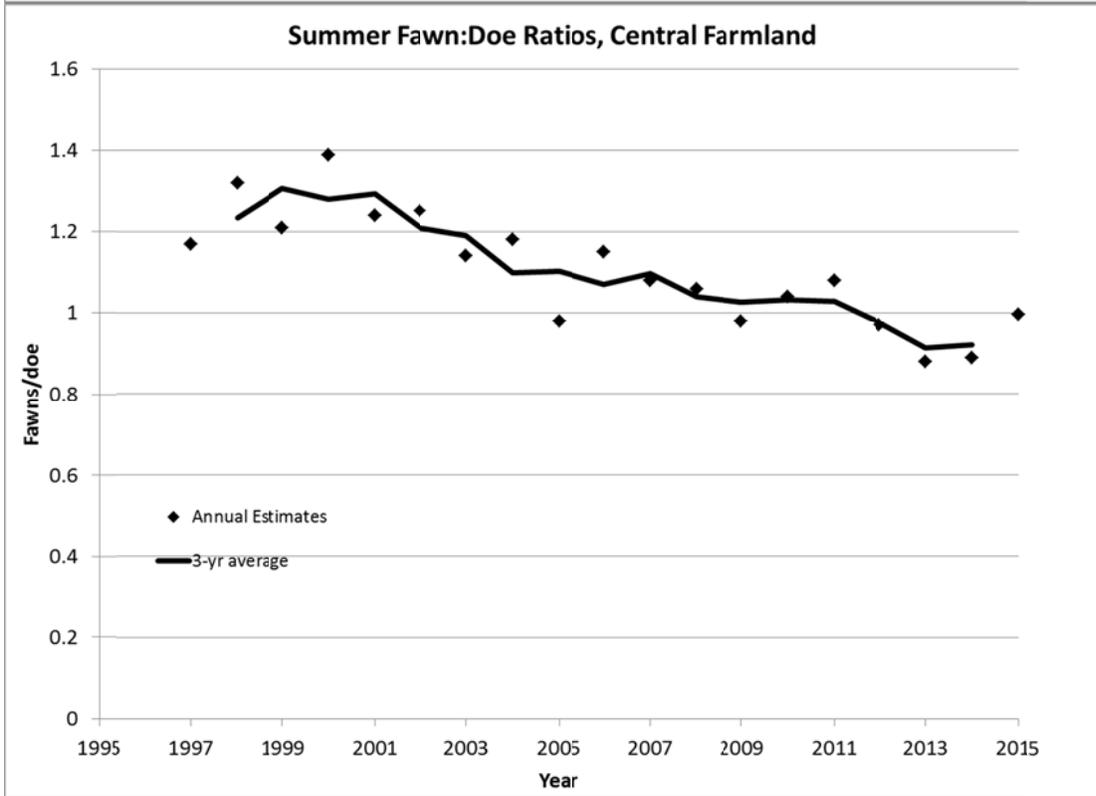
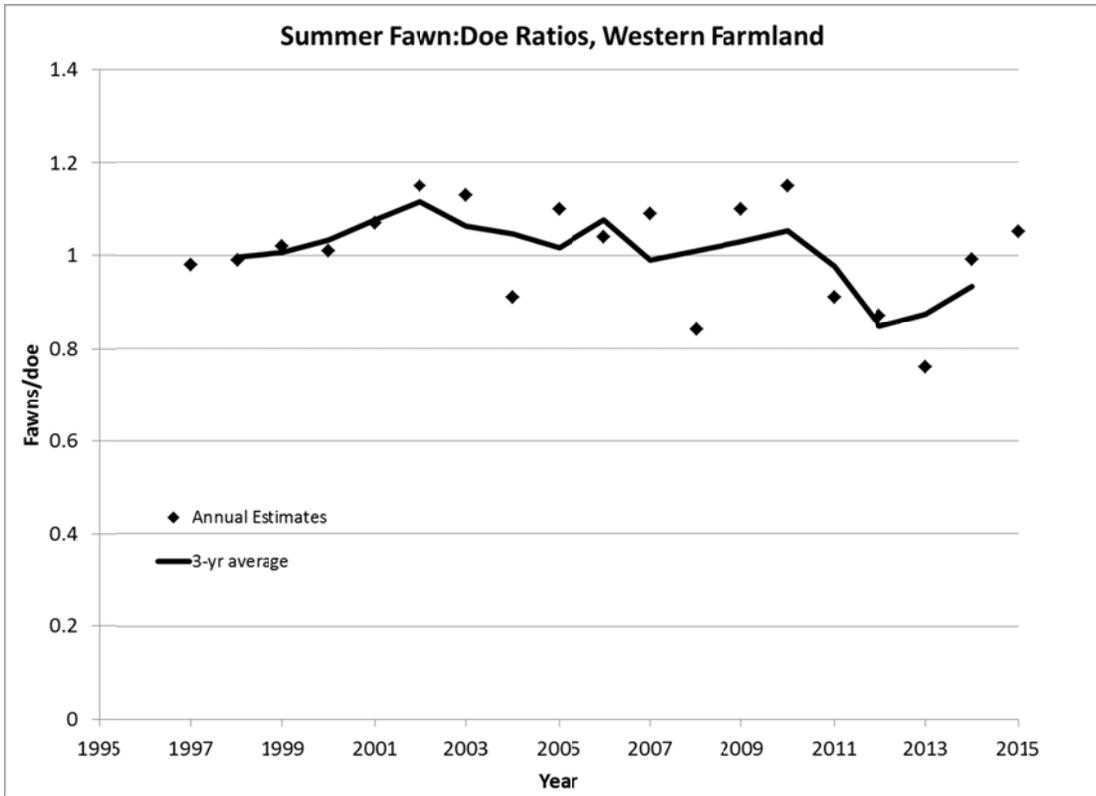


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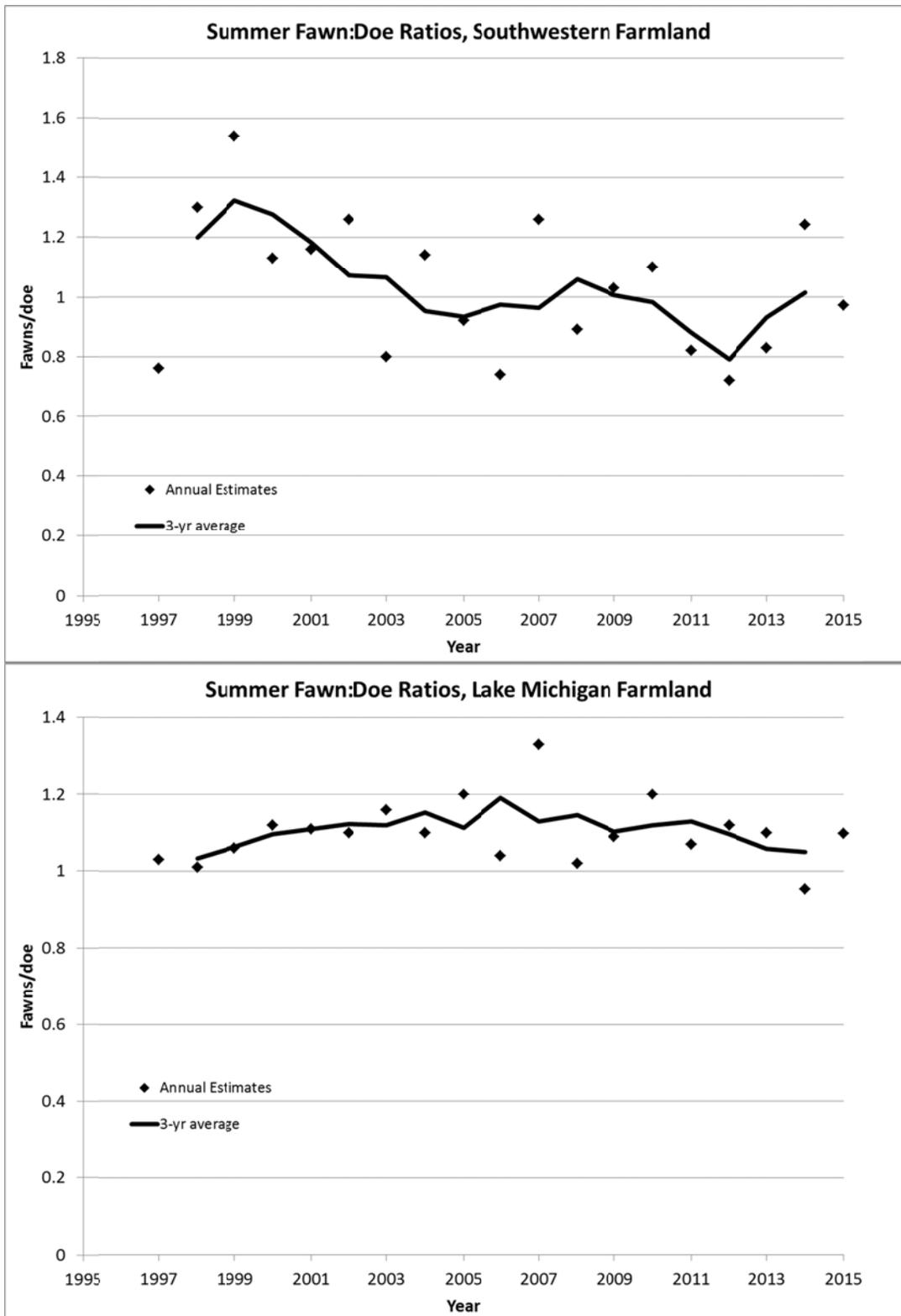


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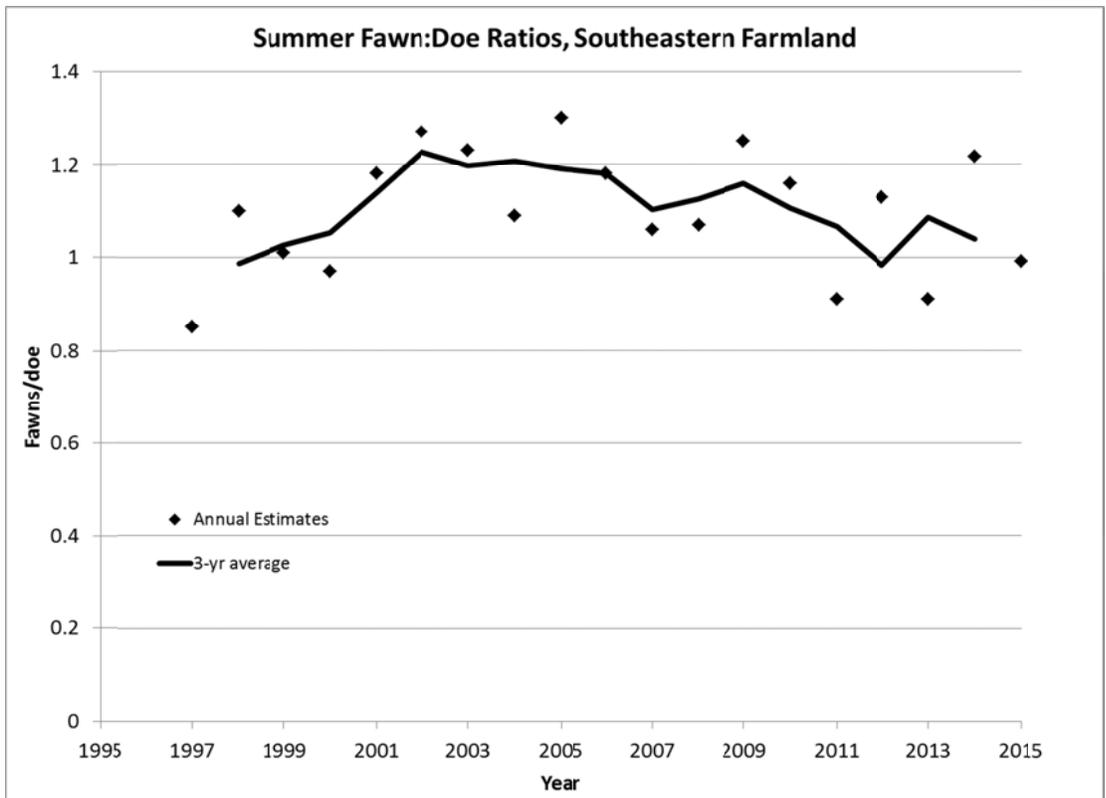
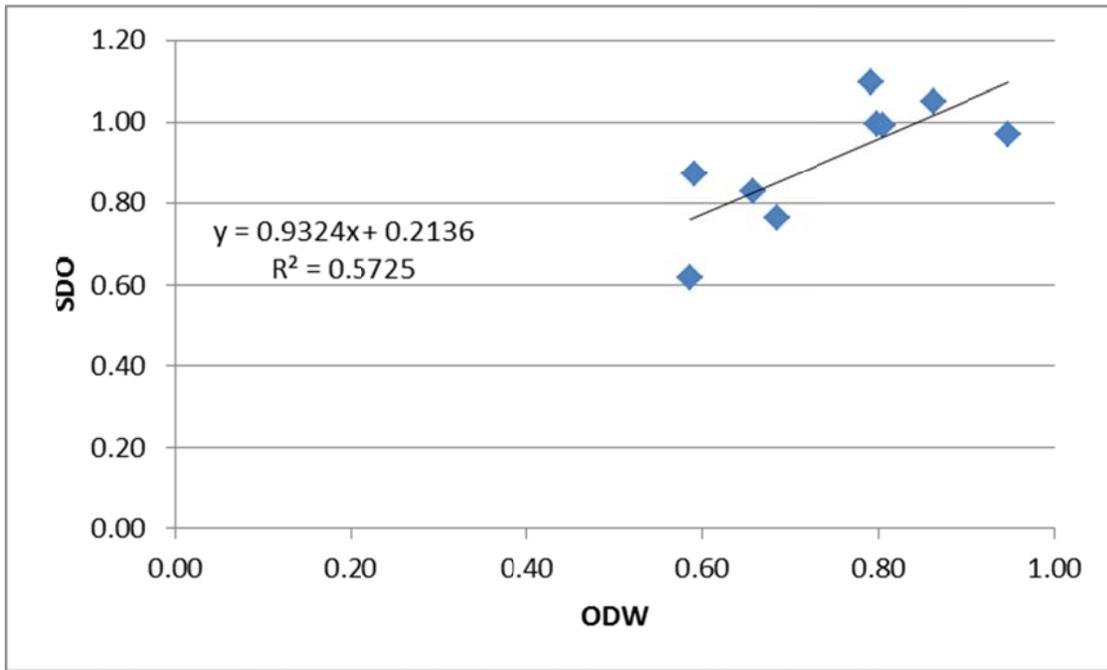


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**Figure 3.** Correlation between county-group fawn:doe observations from Summer Deer Observations and Operation Deer Watch, during 2015.