

PHEASANT BROOD SURVEY REPORT – 2018



**Prepared by:
Travis J. Runia
Senior Upland Game Biologist**

**Department Secretary
Kelly Hepler**

**Division Director
Tony Leif**

**Terrestrial Wildlife Chief
Tom Kirschenmann**

**Terrestrial Wildlife Administrator
Chad Switzer**



**SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS
PIERRE, SOUTH DAKOTA
WILDLIFE SURVEY REPORT
August 27, 2018**

SOUTH DAKOTA PHEASANT BROOD SURVEY 2018 REPORT

SD Game, Fish and Parks conducts pheasant brood surveys each summer to evaluate the status of pheasant populations and predict pheasant population levels relative to previous years. This information, when combined with other factors such as status of the agricultural harvest and historical hunting pressure, can be used to predict hunter success and satisfaction for geographical areas of the state. Densities of pheasants alone do not infer high or low hunter success and satisfaction. Access to hunting opportunities is equally, if not more important to densities of pheasants in evaluating potential hunter success and ultimately, hunter satisfaction.

In 2018, survey indices were derived from 110, 30-mile pheasant brood routes that are distributed across South Dakota where pheasants are found in sufficient number for surveying. Routes are surveyed from 25 July through 15 August each year using standardized methods on mornings when weather conditions are optimal for observing pheasants. Also, pheasant brood members are opportunistically counted throughout the survey period to estimate an average number of young per brood. Pheasants per mile (PPM) estimates are calculated by summing the product of mean brood sizes and broods observed with numbers of cocks and hens observed on each route. PPM estimates for 2017 and the average of the previous 10 years are compared with the 2018 survey results. Results are compared within local areas with Wilcoxon signed-rank tests which take into account the direction (up or down) and magnitude of change for each route. Since PPM estimates are *relative* density estimates, comparisons are valid only between years within each local area.

County brood survey routes are allocated to local area analyses as follows:

- Chamberlain: Brule, Buffalo, Charles Mix (north route), Gregory (north route), Hyde, Lyman, Tripp (north route), and Aurora.
- Winner: Tripp, Gregory, Lyman (south route), Jones (south route), Mellette, and Todd.
- Pierre: Hughes, Jones, Lyman, Potter (south route), Stanley, Hand (south route only), Hyde, and Sully.
- Mobridge: Campbell, Corson, Dewey, Potter (north and central routes), and Walworth.
- Aberdeen: Brown, Marshall, Day, Edmunds, Faulk, Spink (north and central routes), and McPherson.
- Huron: Hand (north and central routes), Beadle, Jerauld, Kingsbury, Sanborn, Miner, Clark (south route only), and Spink (south and central routes).
- Mitchell: Davison, Hanson, Charles Mix (central route), Douglas, Aurora, Hutchinson (north and west routes), Jerauld, McCook, Miner, and Sanborn.
- Yankton: Yankton, Charles Mix (south route), Bon Homme, Clay, Turner/Hutchinson (west and south routes), and Union.
- Sioux Falls: Minnehaha, Turner/Hutchinson (north route), Lake, Lincoln, McCook, and Moody.
- Brookings: Brookings, Deuel (south route), and Hamlin (south and central routes), Kingsbury, Lake (north route), and Moody.
- Watertown: Codington, Clark, Deuel, Grant, and Hamlin.
- Sisseton: Grant, Day (north route), Marshall, and Roberts.
- Western SD: Bennett, Haakon, Perkins, Butte and Fall River.

SURVEY RESULTS

Overview

The statewide Pheasants Per Mile (PPM) index for the 2018 pheasant brood survey increased 47% (1.68 to 2.47) compared to 2017 (Table 1, Figure 1). This year's index is 41% lower than the 10-year average (2018 = 2.47, 10-year average = 4.20). More hens and broods were counted while roosters declined slightly throughout the 110 survey routes compared to last year. Statewide, 85 of the 110 survey routes had a higher PPM than 2017.

Adult Bird and Brood Data

The number of roosters declined 11% from last year (798 vs. 895). The number of hens increased 24% from last year (1,216 vs. 984). Total broods counted increased by 38% (1,009 vs. 730), while the statewide average brood size increased by 22% (6.08 vs. 4.99). Average brood sizes increased in all parts of the state (Figure 2). The statewide average brood size for 2018 (6.08) is similar to the 10-year average (5.93).

Local Area

2018 vs. 2017 and 10-Year Average PPM

All local area PPM indices increased from 2017 except western SD, although the change was only significant for the Chamberlain, Huron, Mitchell, Sioux Falls, Brookings and Watertown local areas (Table 1, Figure 3). Most local areas are significantly below the 10-year average (Table 1, Figure 3). The Mitchell, Yankton, Brookings, Sioux Falls, and Sisseton local areas are not significantly different from the 10-year average.

Survey Weather Conditions

This survey relies on very specific weather conditions to maximize pheasant observability. Pheasants are most visible during mornings with clear skies, heavy dew, and light winds. Under these "prime" survey conditions, pheasants congregate in open areas such as roadways to dry their feathers in the warm morning sun. It is the goal to conduct all surveys under prime conditions so results are comparable from year to year. This year, 93 of the 110 survey routes were conducted at least one time during prime conditions compared to 96 last year. Many routes were surveyed more than once in an attempt to get at least one survey completed under primary conditions. Final results show 73 of the highest counts for the 110 routes coincided with prime conditions compared to 82 last year. As of August 1st, only about 5% of South Dakota was experiencing drought in 2018 versus 82% last year. Dry soil and vegetation associated with drought conditions could reduce dew development in comparison to non-drought conditions. Therefore, survey conditions may have been better this year than last year.

INTERPRETATIONS & DISCUSSION

A year after devastating drought took its toll on the pheasant population, a welcomed relief to drought and a widespread rebound in pheasant abundance occurred in 2018. Western SD was the only local area that did not post an increase, but survey conditions were particularly poor in that region. Although drought was far less prevalent, the amazing resilience of pheasants was still put on display as extreme environmental conditions occurred over much of the state, especially the southeast. Pheasant abundance has not fully recovered to 2016 levels, but the 47% improvement in the population index from last year should be noticeable by hunters.

A relatively favorable winter probably contributed to good pheasant overwinter survival. Most of the state received $\pm 25\%$ of normal snowfall (Figure 4, November–March), but intermittent thawing periods throughout the winter prevented excessive accumulation. Much of the state was snow free on Christmas and again February 1, even after receiving snowfall. Although the calendar showed spring, April featured record setting cold temperatures and snowfall which included a historic blizzard in the southeast. Very fortunately, the month of May was the 5th warmest on record with normal precipitation. May is a critical time period for pheasants as the proportion of hens incubating nests reaches its peak. There was concern that the record setting cold April could delay hen dispersal from winter habitat and ultimately shorten the nesting season. Late April represents the very beginning of the nesting season. However, it appears the well-timed temperature surge in early May set the stage for good reproductive success. There was likely some direct pheasant mortality caused by the April blizzard, but the overall impacts were probably mitigated by the otherwise favorable winter.

The Brookings, Sioux Falls, and Yankton local areas received up to double of normal precipitation in June which represents the early brood-rearing season. Excessive rainfall can reduce chick survival, but surprisingly the PPM index still increased in these areas. Some survey routes increased at a level of magnitude beyond realistic biological capacity. This suggests some of the observed increase in survey results could be contributed to more favorable survey conditions compared to last year. Specifically, dew conditions may have been inhibited by dry soil and vegetation last year when drought conditions were widespread.

A substantial inter-year increase in the PPM index is an exciting prospect for the 100th pheasant season. As we celebrate this important milestone, it is also important to acknowledge the steady decade-long decline in PPM is likely related to upland habitat loss. Lands enrolled in the Conservation Reserve Program (CRP) represent the premium nesting habitat in the state and have declined by 37% or 580,000 acres since 2007 (Figure 5). The combined availability of hayland, small grains, and CRP has declined by 47% or 5.5 million acres since 1990 (Figure 6). This represents an average daily loss of 535 acres for the past 28 years. During the 15-year period of 1982–1997, 1.82 million acres of grassland were converted to cropland (U.S. GAO 2007). A more recent study found 1.84 million acres of grassland were lost, primarily to conversion to cropland, from 2006–2012 (Reitsma et al. 2014). Environmental conditions will always contribute heavily to year to year changes in pheasant abundance, but the long term erosion of required habitat will undoubtedly result in lower lows and lower highs.

Hunters will notice far fewer disturbed CRP fields compared to last year when emergency haying and grazing was authorized in response to severe drought conditions. Another bright spot is the addition of 39,000 acres to the Walk-in Area (WIA) program, much of which is prime pheasant habitat. In fact, approximately 20% of the state's CRP acreage is enrolled in the WIA program. With 1.1 million acres of public hunting land within the heart of SD's pheasant range, great opportunities remain for freelance pheasant hunting. The annual hunting atlas and a web-based interactive map of public lands and private lands leased for public hunting can be found at <https://gfp.sd.gov/hunting-areas/>. In addition to printed and interactive maps, hunters can utilize GPS downloads and smartphone applications to locate public hunting lands throughout the state. Hunters are again asked to hunt safely and ethically, respect private landowners and those public hunting areas scattered across the state, and enjoy the South Dakota tradition of hunting pheasants with family and friends this fall.

Table 1. Pheasants Per Mile index values comparing 2018 to 2017 and 10-year averages. Note: Comparisons are valid only between years within each local area.

Local Area	Routes	Pheasants Per Mile (PPM)			Difference of 2018 PPM with	
		2018	2017	10-yr ave	2017	10-year ave
Chamberlain	11	5.29	4.05	10.51	31%*	-50%*
Winner	8	2.71	2.52	6.41	7%	-58%*
Pierre	13	3.72	3.13	8.28	19%	-55%*
Mobridge	8	2.69	2.10	6.20	28%	-57%*
Aberdeen	14	1.35	1.02	3.79	32%	-64%*
Huron	17	3.61	1.85	4.63	95%*	-22%*
Mitchell	16	4.28	2.52	4.25	66%*	1%
Yankton	10	1.15	0.83	1.30	38%	-11%
Sioux Falls	13	1.39	0.80	1.42	73%*	-3%
Brookings	11	1.63	0.80	1.89	104%*	-14%
Watertown	12	1.55	0.81	2.29	91%*	-32%*
Sisseton	5	1.23	0.40	1.22	210%	1%
Western SD	5	1.30	1.37	2.46	-5%	-47%*
STATEWIDE	110	2.47	1.68	4.20	47%*	-41%*

* Results of Wilcoxon signed-rank test significant ($P < 0.10$)

Figure 1. Statewide Pheasants Per Mile index for South Dakota, 2004–2018.

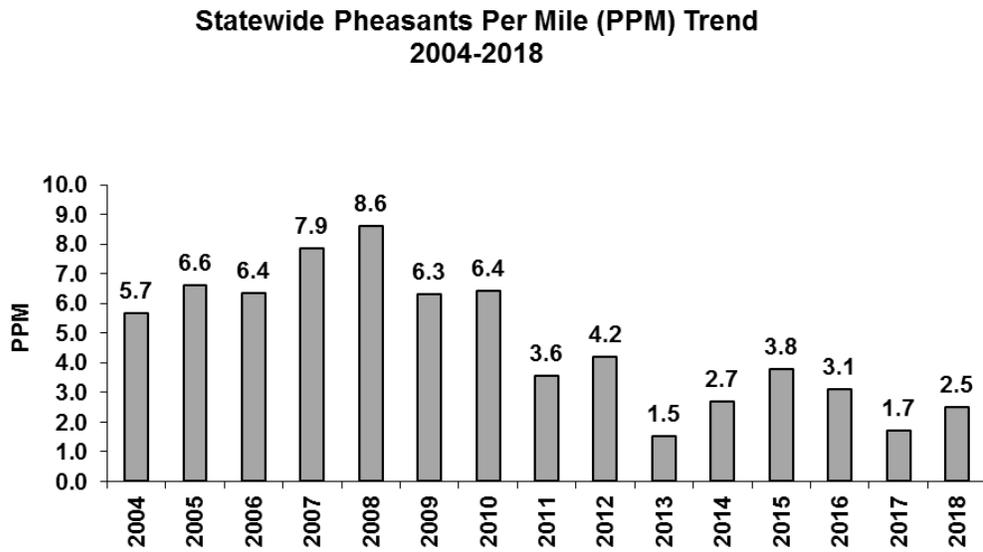


Figure 2. State map with brood size comparisons for 2017 and 2018.

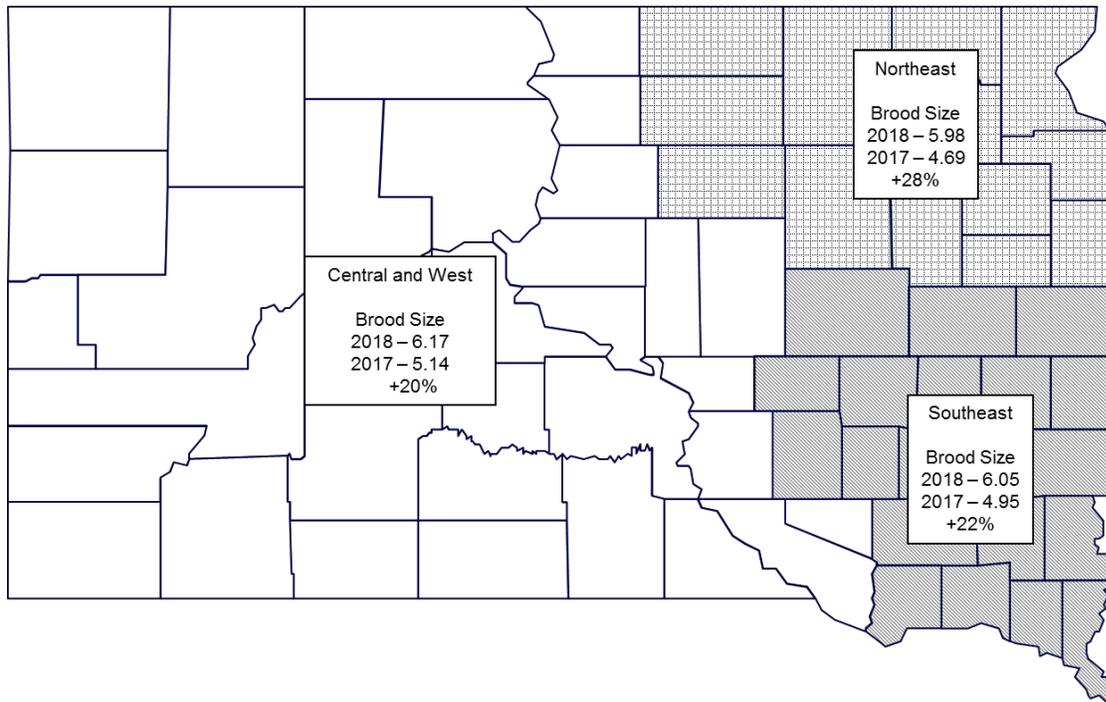


Figure 3. Local area Pheasants Per Mile indices over the past 10 years.

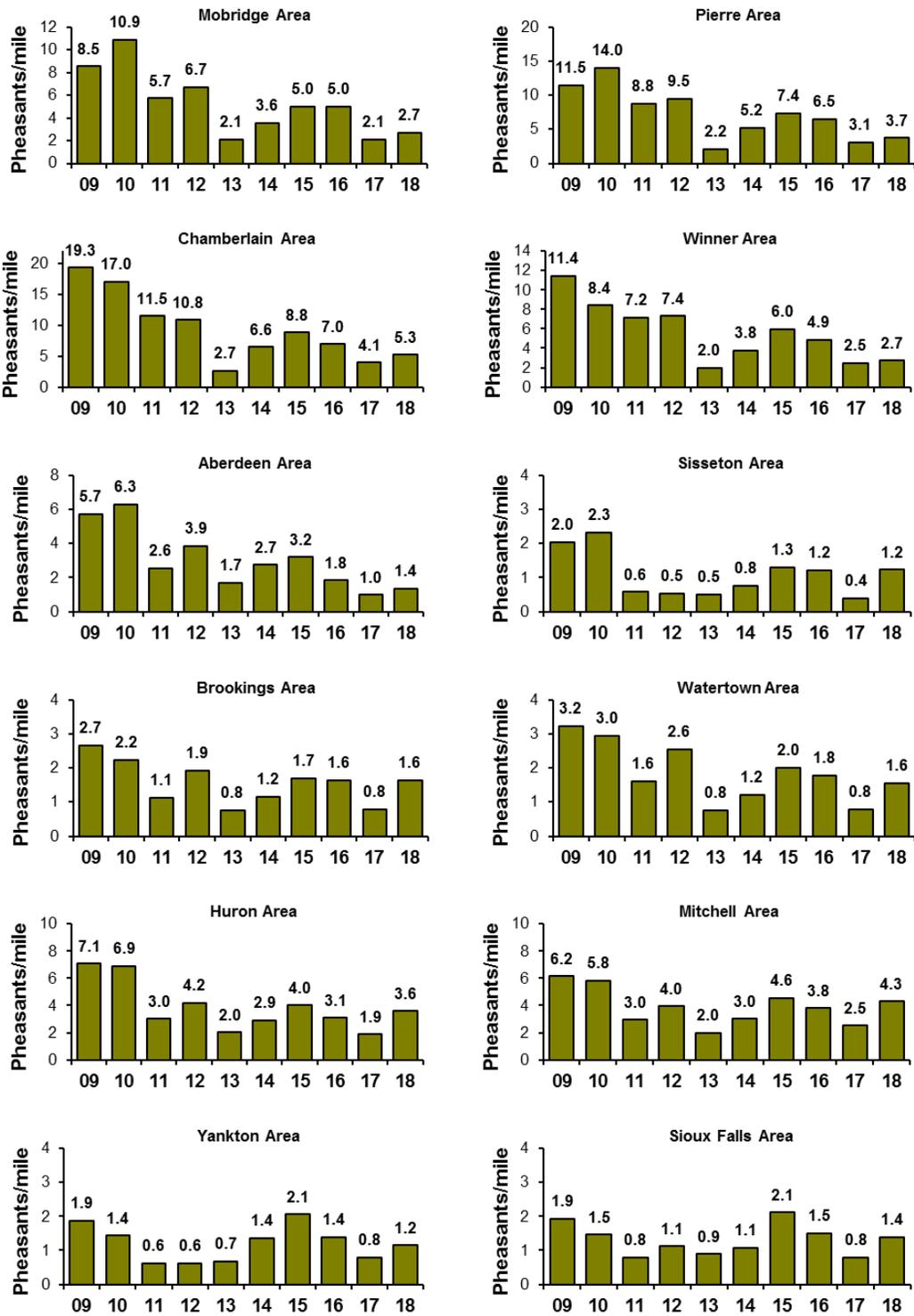


Figure 4. Maps of accumulated snowfall and accumulated snowfall as a percent of normal for South Dakota, November 1, 2017 to March 31, 2018.

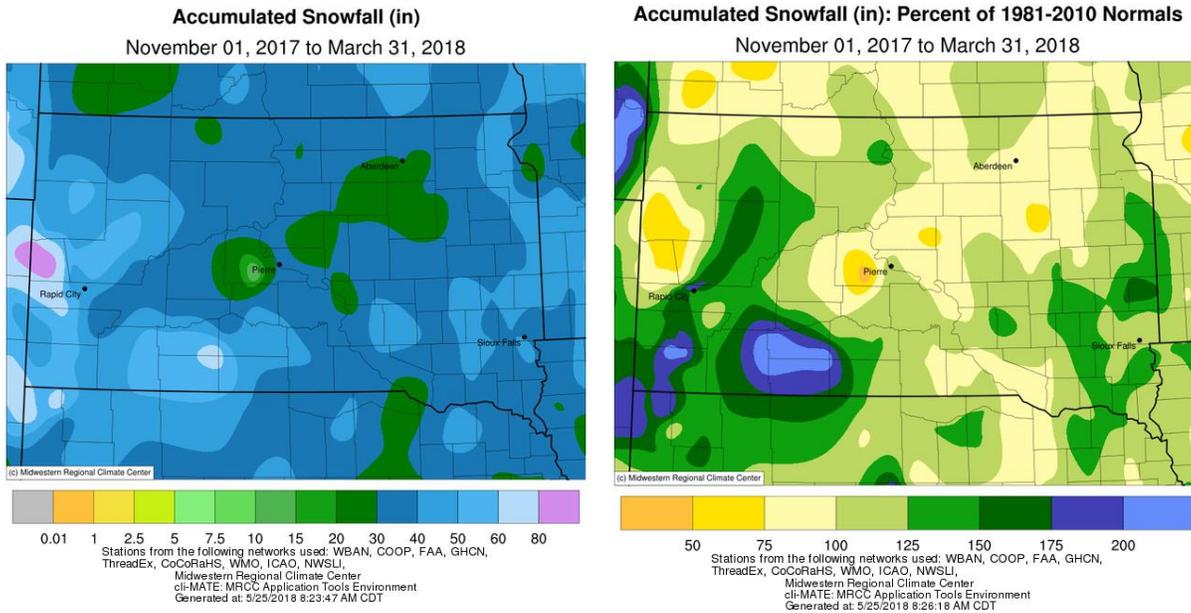
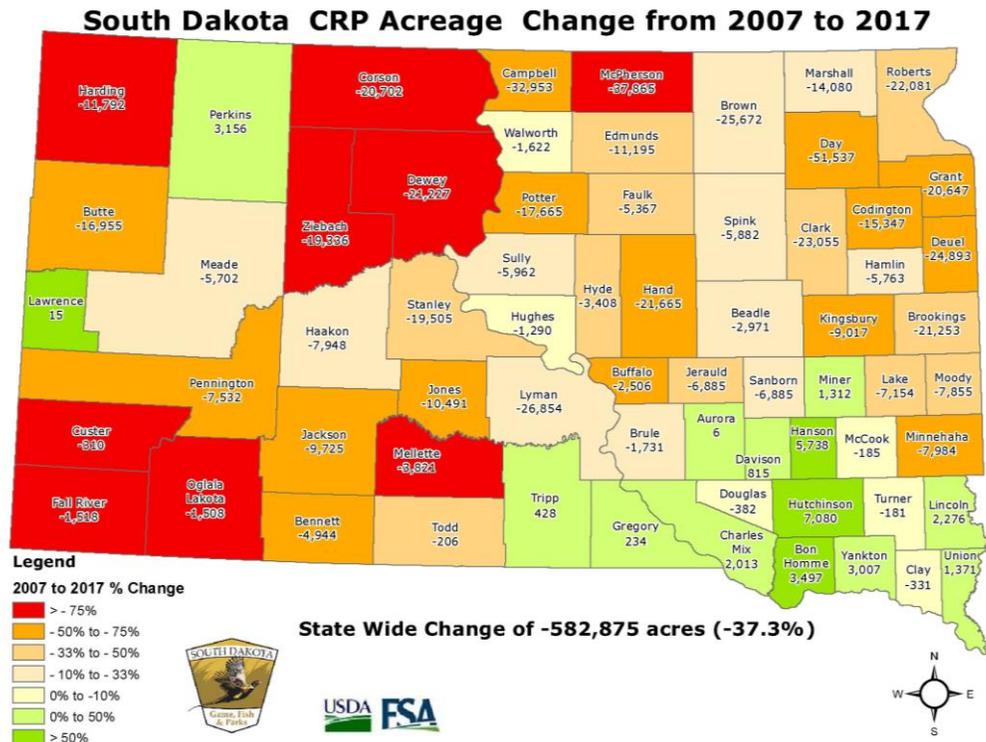
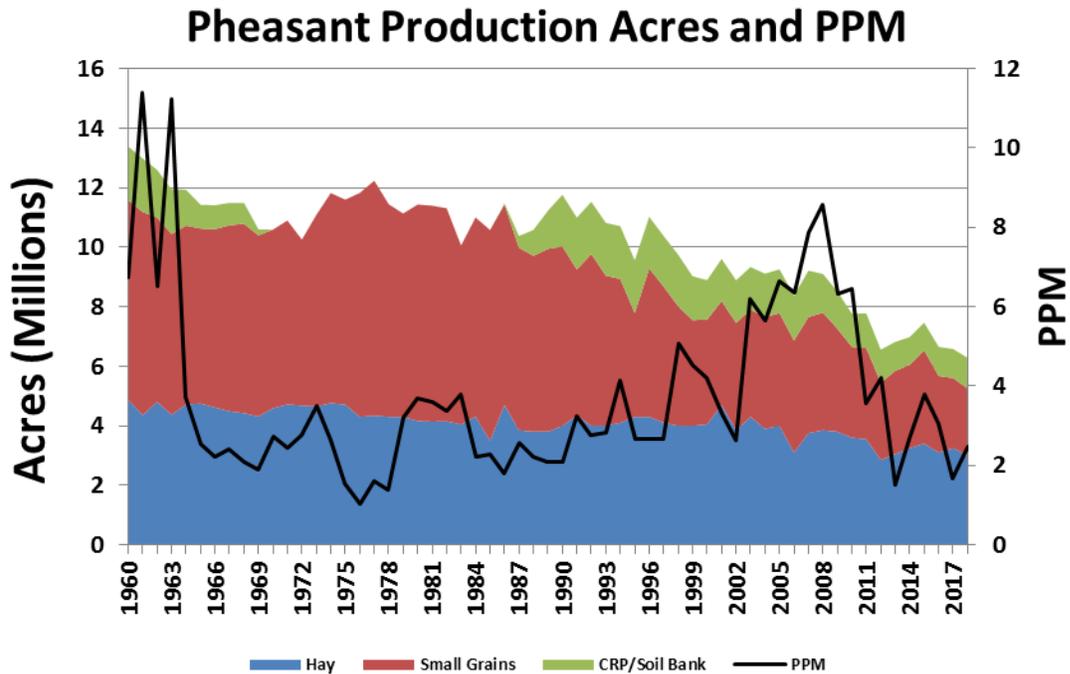


Figure 5. Change in Conservation Reserve Program lands from 2007–2017.



County	Acreage Change (2007-2017)
Harding	-11,792
Perkins	3,156
Gross	-80,702
Campbell	-32,953
McPherson	-87,863
Marshall	-14,080
Roberts	-22,081
Walworth	-1,622
Edmunds	-11,195
Brown	-25,672
Day	-51,537
Butte	-16,955
Potter	-17,665
Faulk	-5,367
Spink	-5,882
Grant	-20,647
Meade	-5,702
Ziebach	-19,386
Sully	-5,962
Hyde	-3,408
Hand	-21,665
Clark	-23,055
Godington	-15,347
Deuel	-24,893
Lawrence	15
Stanley	-19,505
Hughes	-1,290
Beadle	-2,971
Kingsbury	-9,017
Brookings	-21,253
Haakon	-7,948
Lyman	-26,854
Buffalo	-2,506
Jerauld	-6,885
Sanborn	-6,885
Miner	1,312
Lake	-7,154
Moody	-7,855
Pennington	-7,532
Jones	-10,491
Lyman	-26,854
Brule	-1,731
Aurora	6
Hanson	5738
McCook	-185
Minnehaha	-7,984
Guster	-610
Jackson	-9,725
Mellette	-8,821
Davison	815
Douglas	-382
Hutchinson	7,080
Turner	-181
Lincoln	2,276
Fall River	-4,318
Cotulla Lakota	-1,308
Bennett	-4,944
Todd	-206
Tripp	428
Gregory	234
Charles Mix	2,013
Bon Homme	3,497
Yankton	3,007
Clay	-331
Union	1,371

Figure 6. Pheasants per mile index in relation to selected statewide nesting habitat acreage 1960–2018. (<https://www.nass.usda.gov/>)



Literature Cited

Reitsma, K. D., D. E. Clay, C. G. Carlson, B. H. Dunn, A. J. Smart, D. L. Wright, and S. A. Clay. 2014. Estimated South Dakota Land Use Change from 2006 to 2012. iGrow Publication 03-2001-2014, A service of SDSU extension. South Dakota State University Department of Plant Science, Brookings.

U.S. Governmental Accountability Office [U.S. GAO]. 2007. Farm program payments are an important consideration in landowners' decisions to convert grassland to cropland. GAO report number 07-1054. Washington D. C. Available from <http://www.gao.gov/products/A76147>