Pheasant Brood Survey Report – 2015

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SOUTH DAKOTA PHEASANT BROOD SURVEYS
2015 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 2015, survey indices were derived from 109, 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 2014 and the average of the previous 10 years are compared with the 2015 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), 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/Hyde (south route only), 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 2015 pheasant brood survey increased 42% (2.68 to 3.80) compared to the 2014 index (Table 1, Figure 1). In comparison to the 10-year average, this year's index is 30% lower (2015 = 3.80, 10-year average = 5.45). Compared to 2014, more roosters, hens and broods were counted throughout the 109 survey routes, while the average brood size increased by 3.5%. Statewide, 85 routes of the 109 surveyed showed an increase in PPM from 2014.

Adult Bird and Brood Data

The number of roosters counted increased 42% from last year (1,037 vs. 731). The number of hens counted increased 35% from last year (1,829 vs. 1,356). Total broods counted increased by 39% (1,548 vs. 1,116), while the statewide average brood size increased by 3.5% (6.17 vs. 5.96). Average brood sizes increased in all GF&P administrative regions (Figure 2). The statewide average brood size for 2015 (6.17) is equal to the 10-year average.

Local Area

2015 vs. 2014 PPM

All local area PPM indices increased from 2014 (Table 1, Figure 3). The increase was significant for the Winner, Pierre, Huron, Mitchell, Sioux Falls, Brookings, Watertown and Sisseton local areas (Table 1).

2015 vs. 10-Year Average PPM

The Yankton and Sioux Falls local areas are above the 10-year average, but not significantly. All other local areas are below the 10-year average (Table 1).

INTERPRETATIONS & DISCUSSION

For the second consecutive year, the PPM index has increased across all of South Dakota. The PPM index has surged 150% since pheasant abundance reached a recent low in 2013. All local areas are now well above 2013 levels, but many remain well below the 10-year average (Table 1, Figure 4). The 2015 survey index is similar to 2011 when hunters harvested 1.56 million roosters. However, the survey index still lags 56% below 2008 levels when hunters harvested nearly 2 million birds. Pheasant abundance is highest in the Missouri River valley with the Winner, Chamberlain, Pierre, and Mobridge local areas having the highest PPM values. The James River valley also boasts excellent numbers from the broad regions surrounding Mitchell, Huron, to Aberdeen. Eastern South Dakota will have respectable hunting where favorable habitat exists with the Sioux Falls and Yankton areas exceeding their 10-year averages.

The increase in pheasant abundance during the past two years is likely in response to mild winters and favorable spring weather for reproduction, but the decade-long downward trend suggests habitat loss is still a concern. The 2014-2015 winter was mild with most of the primary pheasant range receiving 20 – 30 inches of snow compared to 36 – 40 inches during a typical winter. Major winter storms were limited and several thawing events throughout the winter prevented a substantial snowpack from accumulating. Improved pheasant survival during mild winters results in more hens surviving to reproduction. Given the high reproductive potential of pheasants, mild winters can contribute to a strong increase in the pheasant population.

There was concern that the early spring drought may persist into the pheasant reproductive season and have negative impacts on reproductive success. Ideal spring weather includes adequate moisture to grow grasses and other plants which pheasants use to conceal nests and raise broods. Too much rain can inundate nests and cause hypothermia in young pheasants chicks. After very little measurable rain in April, state-wide rains in May and June resulted in quick growth of grasses and other nesting cover such as winter wheat. Some localized portions of north-central South Dakota between Mobridge and Aberdeen may have received detrimental amounts of rain in May (8+ inches).

A weather model has been developed using past survey data to assess the impacts of key weather parameters on the annual fluctuation in PPM. The model includes 3 parameters; winter snowfall, April-May precipitation, and April-May temperature. The change in PPM has been found to decrease with increased snowfall, increase with increasing spring temperature, and respond positively to an optimal amount of spring moisture. The model predicted modest increases in all four analysis regions where adequate weather and survey data exists which was consistent with the actual change from 2014 (Figure 5). The low snowfall during the past winter was a strong contributor to the predicted increase (Figure 6).

Long-term pheasant populations have trended with habitat availability, particularly idled uplands such as those provided by the Conservation Reserve Program (CRP), and its predecessor, the Soil Bank Program (Figure 7). Pheasant abundance and CRP acreage have declined since 2007 when over 1.5 million acres of the premier nesting habitat we available. During the past decade, there has been a decline in acreage of non-CRP grasslands which also likely contributed to the population decline. The future of CRP in South Dakota is uncertain with a declining national acreage cap that will inhibit, but not eliminate new enrollments and contract extensions. Without additional enrollments or reenrollments, CRP acreage is certain to decline as current contracts expire in coming years (Figure 8). While weather can have substantial impacts on annual pheasant population fluctuations, upland habitat availability is the key factor which influences populations in the long term.

With 1.1 million acres of public hunting land within the heart of SD's pheasant range, opportunities remain for high quality 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 http://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.

Pheasant abundance has sharply increased during the past two years which should provide improved hunting. Prairie grouse spring lek counts showed slight increases from last year and conditions have been favorable for reproduction. Prairie grouse hunting is expected to improve from last year which provides another unique upland game hunting experience. Hunters are reminded to review local area trends of their interest and to visit with those in their traditional hunting areas as local population levels and habitat conditions can vary. 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 (PPM) index values comparing 2015 to 2014 and 10-year averages. Note: Comparisons are valid only between years within each local area.

Local Area	Routes	Pheasants Per Mile (PPM) 2015	2014	10-yr ave	Difference of 2015 PPM with 2014	10-year ave
Chamberlain	10	8.84	6.55	13.32	35%[ns]	-34%*
Winner	8	5.97	3.78	7.01	58%*	-15%[ns]
Pierre	12	7.48	5.20	9.03	44%*	-17%[ns]
Mobridge	8	5.02	3.59	6.69	40%[ns]	-25%[ns]
Aberdeen	14	3.21	2.74	5.79	17%[ns]	-45%*
Huron	17	4.02	2.92	6.82	38%*	-41%*
Mitchell	16	4.55	3.04	5.58	49%*	-18%*
Yankton	10	2.06	1.36	1.41	52%[ns]	47%[ns]
Sioux Falls	13	2.11	1.06	1.97	100%*	7%[ns]
Brookings	11	1.70	1.16	3.60	46%*	-53%*
Watertown	12	2.01	1.21	4.35	67%*	-54%*
Sisseton	5	1.30	0.77	1.88	70%*	-31%*
Western SD	5	2.44	1.53	2.60	60%[ns]	-6%[ns]
STATEWIDE	**109**	**3.80**	**2.68**	**5.45**	42%*	-30%*

[ns] Results of Wilcoxon signed-rank test not significant ($P > 0.10$)
* Results of Wilcoxon signed-rank test significant ($P < 0.10$)

Figure 1. Statewide Pheasants Per Mile (PPM) index for South Dakota, 2001 – 2015.

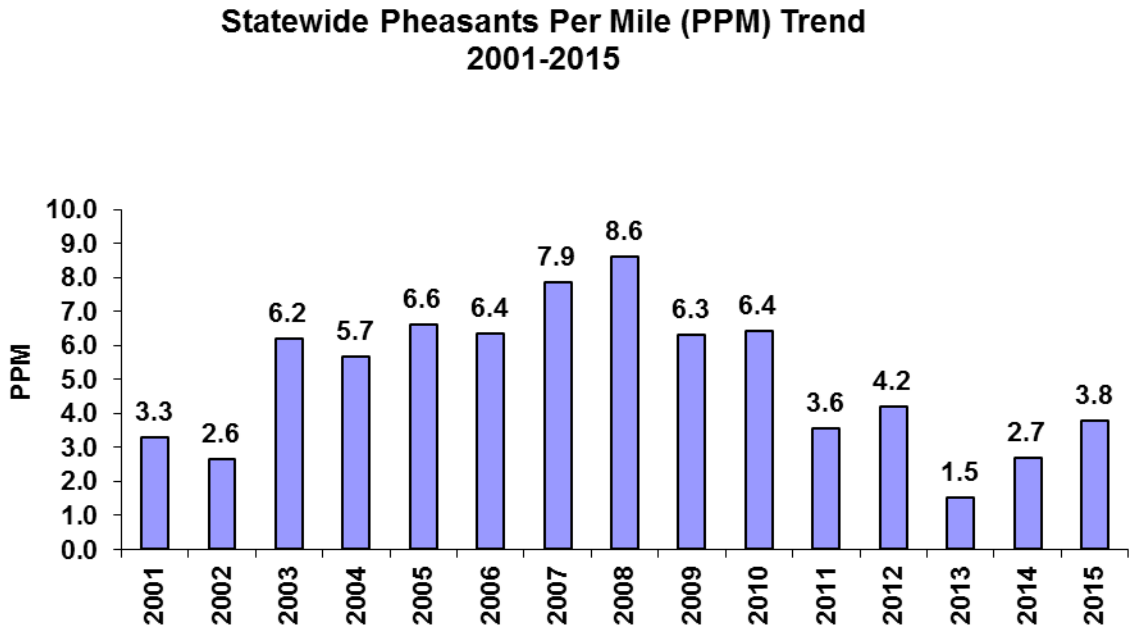

Figure 2. State map with GF&P administrative regions and brood size comparisons for 2014 and 2015.

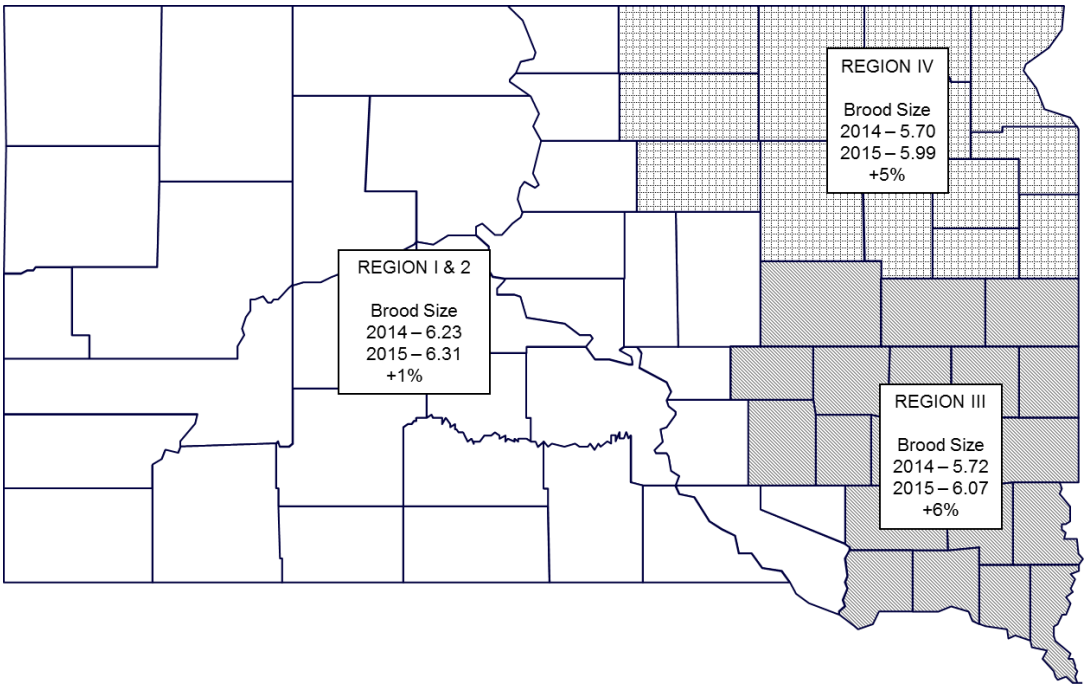

Figure 3. City area Pheasant Per Mile (PPM) indices over the past 10 years.

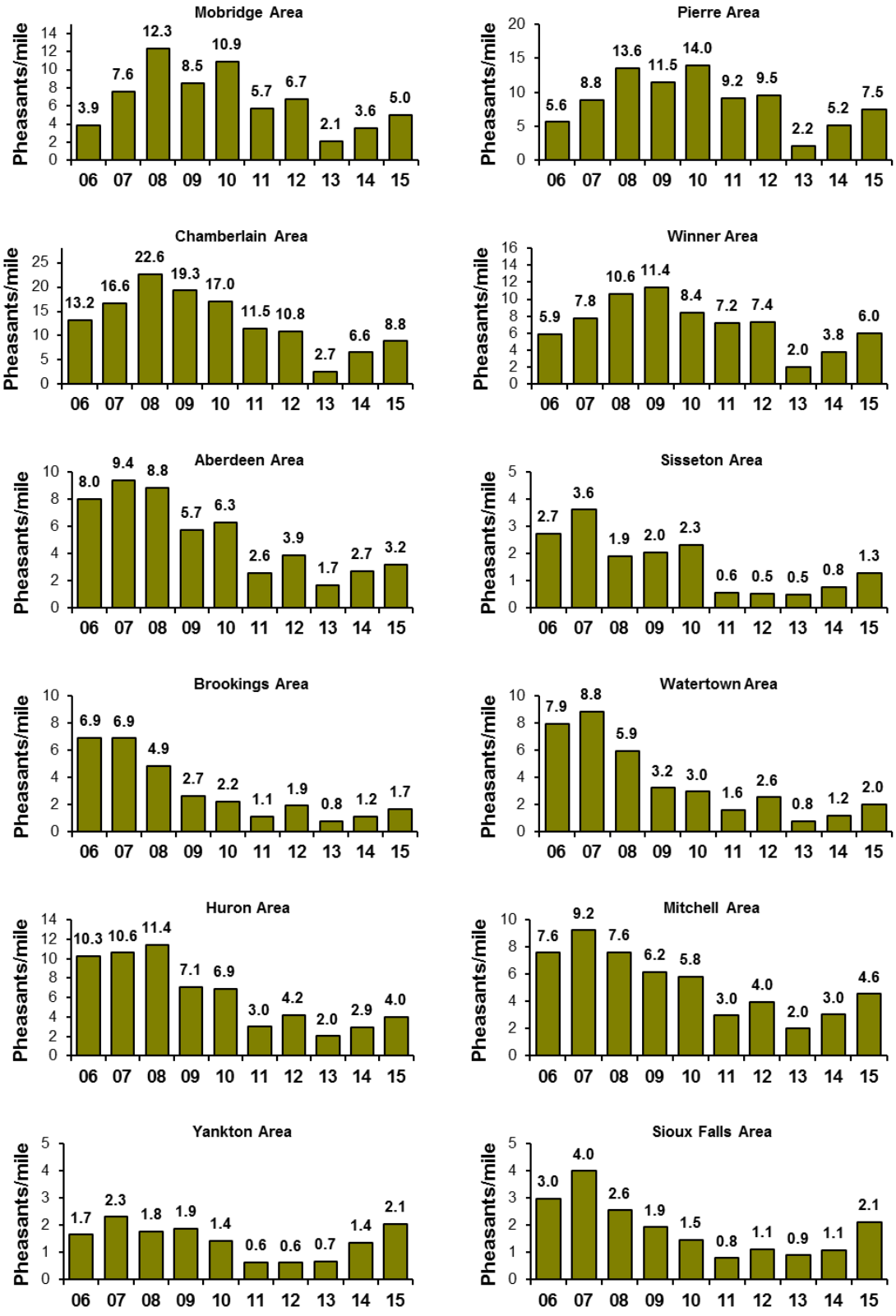

Figure 4. Pheasants Per Mile comparison among local areas for 2015, 2013, and the ten-year average.

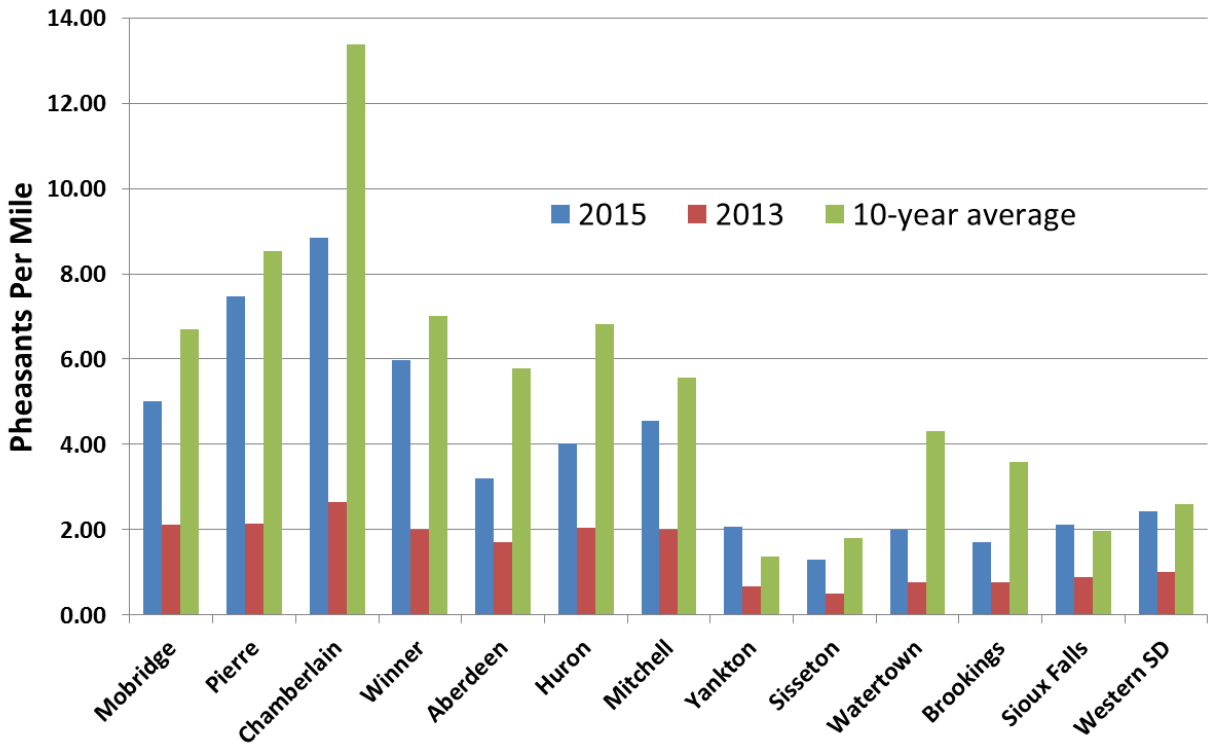

Figure 5. Results of a weather model used to predict annual change in Pheasants Per Mile (PPM) population index based on winter snowfall, April-May precipitation, and April-May temperature compared to the actual change in PPM (weather data source - http://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/global-historical-climatology-network-ghcn).

Analysis Region	Nov-Mar Inches Snow	Apr-May Inches Precip.	Apr-May Average Temp.	PPM Predicted % Change from 2014	PPM Actual % Change from 2014
1	26.9	5.4	51.2	20	27
2	21.9	6.0	50.9	25	46
3	27.2	5.0	52.7	30	38
4	23.5	5.4	54.4	43	62
Combined	24.9	5.4	52.3	30	43

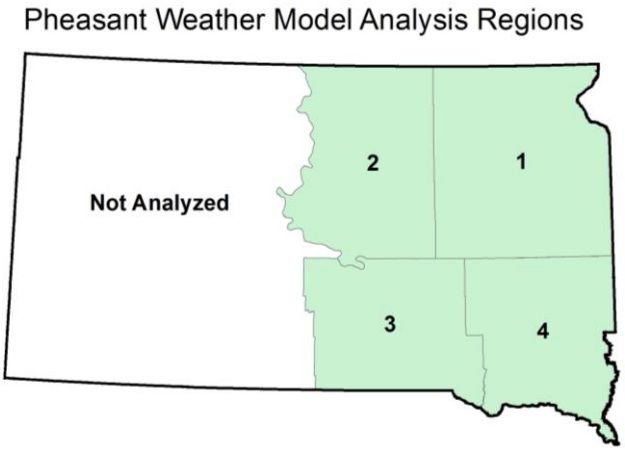

Figure 6. Average predicted percent change in pheasants per mile population index in response to November - March snowfall, given normal April – May temperature and precipitation.

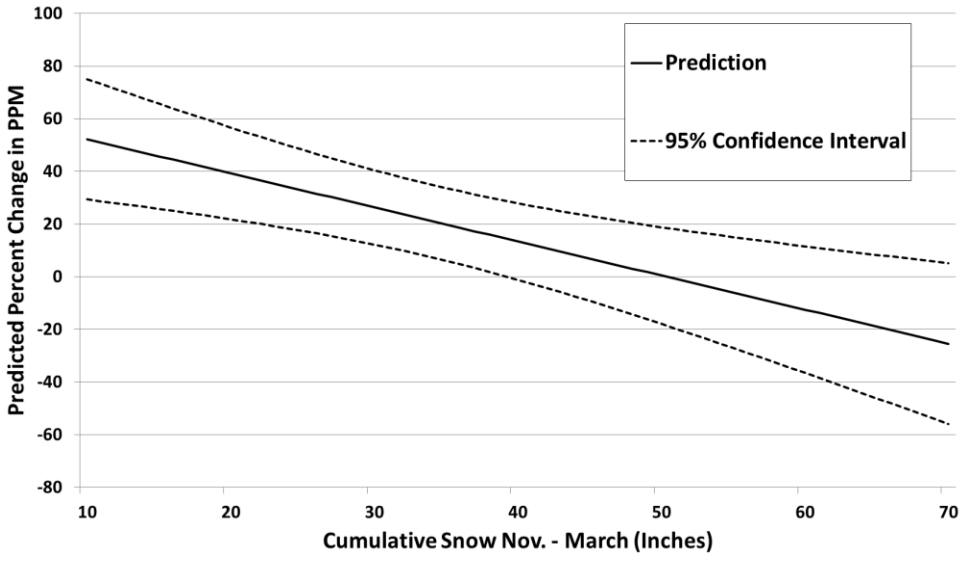

Figure 7. Statewide Pheasants Per Mile index in relation to Conservation Reserve Program and Soil Bank Program enrollment 1953 - 2015.

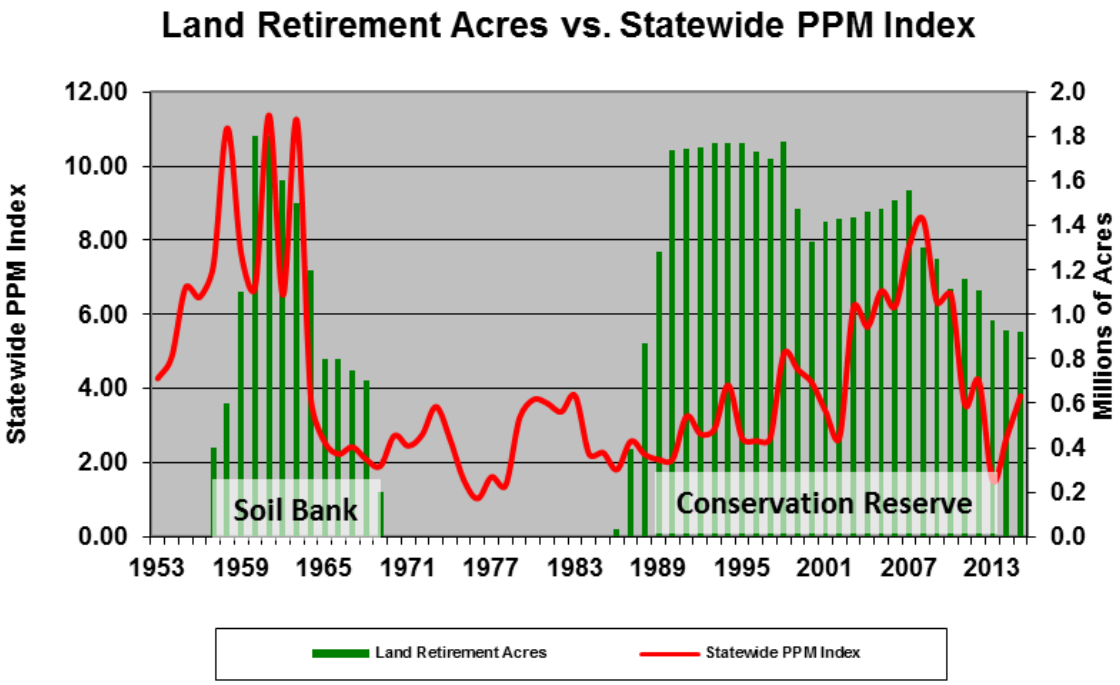

Figure 8. Conservation Reserve Program acreage 2004 - 2015 with maximum projected loss 2016 – 2020 (red bars).