

# Pheasant Brood Survey Report – 2010

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# SOUTH DAKOTA PHEASANT BROOD SURVEYS 2010 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.

Survey indices are derived from 110 30-mile pheasant brood routes that are distributed across South Dakota where pheasants are found in sufficient number for surveying. It should be noted that one route within the Mitchell and Huron local area was unable to be completed due to flooded roads. 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 2009 and the average of the previous 10 years are compared with the 2010 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 (south route), 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**

Results from the 2010 pheasant brood survey indicate the statewide Pheasants Per Mile (PPM) index increased slightly by 3% (6.26 to 6.45) compared to the 2009 index. In comparison to the 10-year average, this year's index is 13% higher (2010 = 6.45, 10-year ave. = 5.71) and the fourth highest statewide PPM since 1963 during the Soil Bank era. Compared to 2009, department staff counted fewer roosters and hens but more broods throughout the 109 survey routes, while the average brood size increased by 4%. Statewide, 51 routes of the 109 surveyed indicated an increase from 2010; with 58 routes showing a decrease. In respect to the 10-year average, 50 routes had a higher PPM value in 2010, whereas 59 were lower.

### **Adult Bird and Brood Data**

The total number of roosters counted during the 2010 survey was down 2% from the 2009 survey (2,045 vs. 2,078; Figure 1). In addition, the number of hens counted was down 4% from last year (3,037 vs. 3,170; Figure 1). Total broods counted increased by 1% (2,581 vs. 2,565; Figure 1), while the statewide average brood size increased by 4% (6.25 vs. 6.03). Average brood sizes increased in three GF&P administrative regions, except for Region 3 (southeastern South Dakota) where the average brood size decreased 11% from 2009 (Figure 2). The statewide average brood size for 2010 (6.25) is slightly lower (-4%) than the 10-year average (6.48).

### **Local Area**

#### **2010 vs. 2009**

Pierre, Mobridge, Aberdeen, Sisseton, Huron, Mitchell and Western SD local area PPM indices increased compared to 2009, however not statistically significant (Table 1). Sioux Falls and Winner local areas decreased significantly from 2009, while the Chamberlain, Brookings, Yankton and Watertown local areas showed non-significant declines.

#### **2010 vs. 10-Year Average**

Pierre, Mobridge, and Western SD local area PPM indices are significantly higher than respective 10-year averages (Table 1). Although not statistically higher, the PPM index for the Aberdeen, Chamberlain, Sisseton and Winner local areas are higher than its 10-year average. Brookings, Huron, Sioux Falls, and Watertown local areas were significantly lower than its 10-year average. The Mitchell and Yankton local areas were also lower than the 10-year average, however not statistically different.

## **INTERPRETATIONS & DISCUSSION**

An abundance of high quality habitat and favorable weather conditions have resulted in a very high pheasant population in recent years. Although weather has a substantial influence on reproductive success and winter survival of pheasants, the quality and quantity of habitat ultimately dictates the population potential.

After a series of mild winters, 2008-2009 brought back normal winter conditions to South Dakota. This active weather pattern continued into the fall of 2009 as unseasonably heavy rains fell over much of central and eastern South Dakota. The wet conditions slowed crop harvest and by the onset of winter, approximately 500,000 acres of cropland, mostly corn, went unharvested. These unharvested corn fields functioned as a critical food source for pheasants as South Dakota was blasted by its most severe winter in over a decade during 2009-2010.

By the first week of December 2009, most of South Dakota was covered with a light blanket of snow. Subsequent snow fall was light until the historic blizzard of Christmas day dumped 20 inches of snow over nearly the entire state. Field reports gathered from throughout the state indicated direct pheasant mortality from the blizzard was low, but winter habitat provided by cattail sloughs and wide shelterbelts was severely degraded. One week later another blizzard hit the northeastern portion of the state with 6 inches of snow along with extreme wind and cold temperatures statewide. Subsequent snow events, wind, and cold weather battered the state and by late February, 30-40 inches of snow blanketed most of the state. Although pheasants rarely starve to death, birds were showing signs of stress by early March. In certain parts of the state, winter mortality was estimated to be higher than in recent years due to increased exposure to predators, exposure to the weather elements, and isolated cases of starvation. Fortunately, unharvested corn fields served as critical food for pheasants and helped minimize pheasant losses in areas with snow filled and/or marginal winter habitat (e.g. areas lacking sufficient food plots, cattail wetlands, and high quality woody cover). Although temperatures were below normal in March, snowfall was light. A severe weather event in March would have certainly been disastrous to South Dakota's already stressed pheasants.

As the historic snow pack slowly melted over an already saturated landscape, concerns of flooding and subsequent effects on upland nesting pheasants arose. A substantial amount of important upland nesting cover undoubtedly became inundated and unavailable to nesting pheasants. However, early season grasses flourished under above normal precipitation and seasonal temperatures which set the stage for excellent nesting habitat conditions. In addition, approximately 1 million acres of key Conservation Reserve Program (CRP) grassland habitat were available to nesting pheasants. Although nesting cover is greatly enhanced with abundant spring moisture, some portions of SD received 200-300% of normal precipitation in May, June, and/or July. If these heavy rain events, particularly during the peak hatch period of early June, would have been coupled with cold temperatures, chick survival could have been greatly reduced. However, seasonal spring temperatures likely enhanced chick survival as pheasant production appeared strong in 2010. Unseasonably wet weather also delayed haying operations over much of the state which may have also boosted pheasant production by increasing nest success and reducing mortalities caused by haying activities.

Strong pheasant production likely mitigated winter loss as the 2010 statewide PPM index remained nearly unchanged from 2009. The 2010 PPM index of 6.45 is 13% higher than the 10-year average and the fourth highest in the last 47 years. Fewer roosters and hens were detected than in 2009, but the number of broods was higher which suggests higher reproductive success than last year. Although the statewide PPM index went nearly unchanged, significant changes in regional abundance was detected in several city areas. It should be noted that variation of population levels can and will likely occur among locations within local city areas.

Central South Dakota and the James River Valley region will again remain the stronghold for high pheasant densities, with many routes within these areas having medium to high PPM index values (Figure 5). Local city areas of southeastern South Dakota saw a PPM decrease for the third consecutive year. This portion of South Dakota has lost 26% of its vital CRP acreage since 2007 and lacks expanses of pastureland to buffer the pheasant population against these losses of nesting habitat provided by CRP. Additionally, extreme June precipitation likely reduced pheasant production in portions of southeastern South Dakota. However, quality hunting opportunities still exist in this area where adequate habitat remains.

It is well documented that undisturbed grasslands such as lands enrolled in the CRP are major driving forces for pheasant populations. South Dakota's pheasant population boomed in the mid 2000's with favorable weather conditions and 1.5 million acres of quality nesting habitat provided by CRP. As CRP acreage continues to decline (Figure 6), pheasant numbers will likely follow. Substantial declines from the 10-year PPM average in the Yankton, Sioux Falls, Brookings, and Watertown city areas may be partially explained by loss of CRP as landscapes in these regions lack substantial amounts of other grasslands pheasants could use for nesting and brood rearing. PPM indices are well above the 10-year mean within city areas in the central portion of the state where pheasant production is likely boosted by abundant native grasslands and small grains (e.g. winter wheat), especially during non drought years.

With pheasant abundance expected to be similar to 2009 when sportsmen harvested over 1.6 million roosters, expect 2010 to be another banner year for pheasant hunting in South Dakota. With 700,000 acres of prime public hunting land within the heart of South Dakota's pheasant range, opportunities again exist for quality pheasant hunting. As enrollment is now open for the new James River Conservation Reserve Enhancement Program, hunters will find additional CRP lands available for public hunting this fall in east-central South Dakota. 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>.

Hunters are reminded to review local area trends of their interest and to visit with those in their traditional hunting areas on local population levels and habitat conditions. 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 2010 to 2009 and 10-year averages.

Local Area	Routes	Pheasants per mile (PPM)			Difference of 2010 PPM with	
		2010	2009	10-yr ave	2009	10-year ave
Chamberlain	10	17.00	19.26	14.98	-12% <sup>ns</sup>	13% <sup>ns</sup>
Winner	8	8.42	11.43	7.26	-26%*	16% <sup>ns</sup>
Pierre	13	13.95	11.48	6.96	22% <sup>ns</sup>	101%*
Mobridge	8	10.85	8.54	5.66	27% <sup>ns</sup>	92%*
Aberdeen	14	6.48	5.74	6.44	13% <sup>ns</sup>	1% <sup>ns</sup>
Huron	16	6.88	6.80	7.91	1% <sup>ns</sup>	-13%*
Mitchell	15	5.84	5.27	6.44	11% <sup>ns</sup>	-9% <sup>ns</sup>
Yankton	10	1.45	1.87	1.49	-23% <sup>ns</sup>	-3% <sup>ns</sup>
Sioux Falls	13	1.45	1.93	2.46	-25%*	-41%*
Brookings	11	2.25	2.67	4.52	-16% <sup>ns</sup>	-50%*
Watertown	12	2.99	3.24	4.75	-8% <sup>ns</sup>	-37%*
Sisseton	5	2.33	2.04	1.83	14% <sup>ns</sup>	28% <sup>ns</sup>
Western SD	5	4.27	3.84	2.56	11% <sup>ns</sup>	67%*
STATEWIDE	109	6.45	6.26	5.71	3% <sup>ns</sup>	13% <sup>ns</sup>

<sup>ns</sup> Results of Wilcoxon signed-rank test not significant ( $P > 0.10$ )

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

**NOTE: Comparisons are valid only between years within each local area.**

Figure 1. Number of roosters, hens, and broods counted during annual pheasant brood surveys, 2001-2010. The dashed line illustrates the trend over the past 10 years.

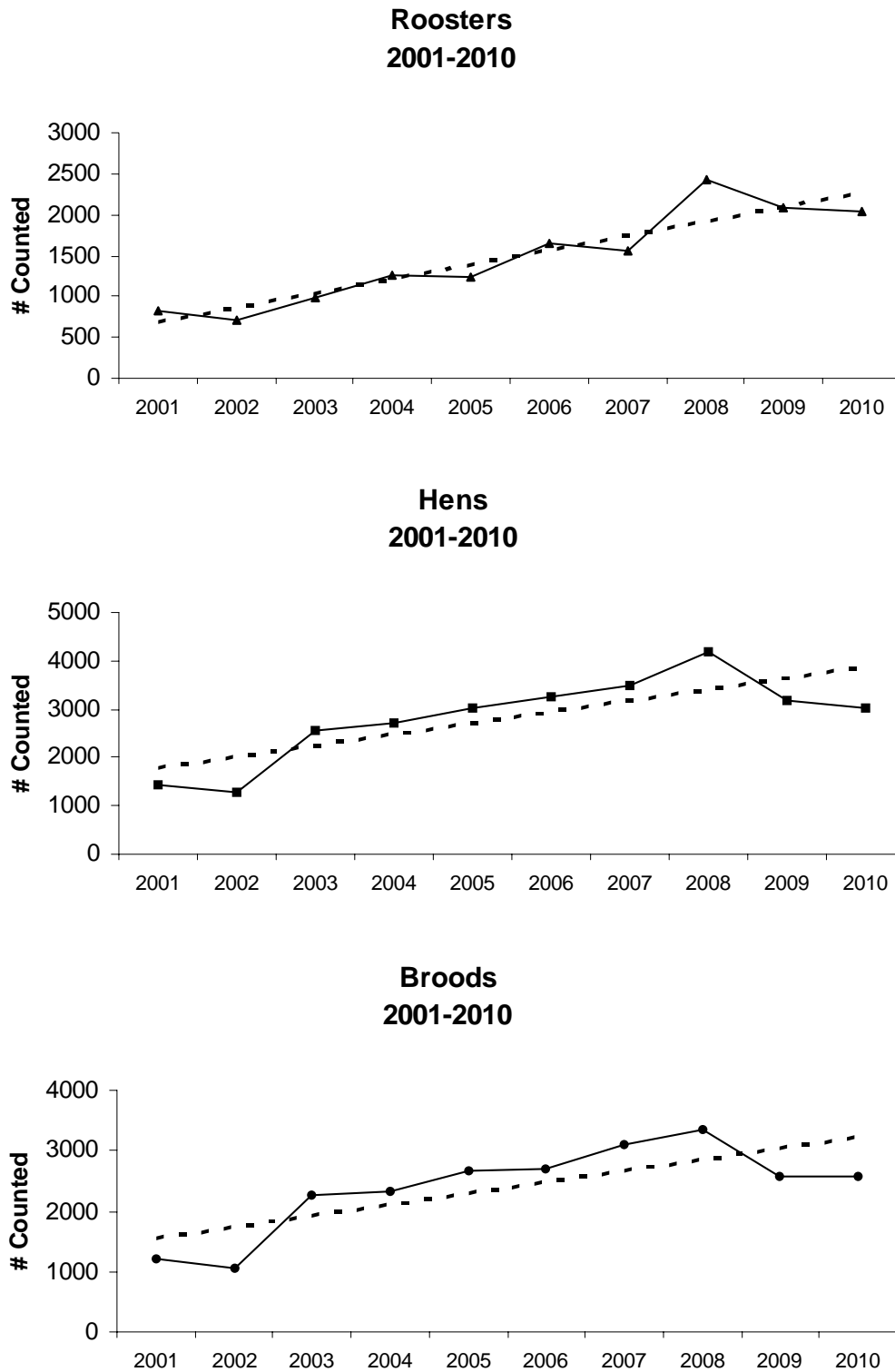


Figure 2. State map with GF&P administrative regions and brood size comparisons for 2009 and 2010.

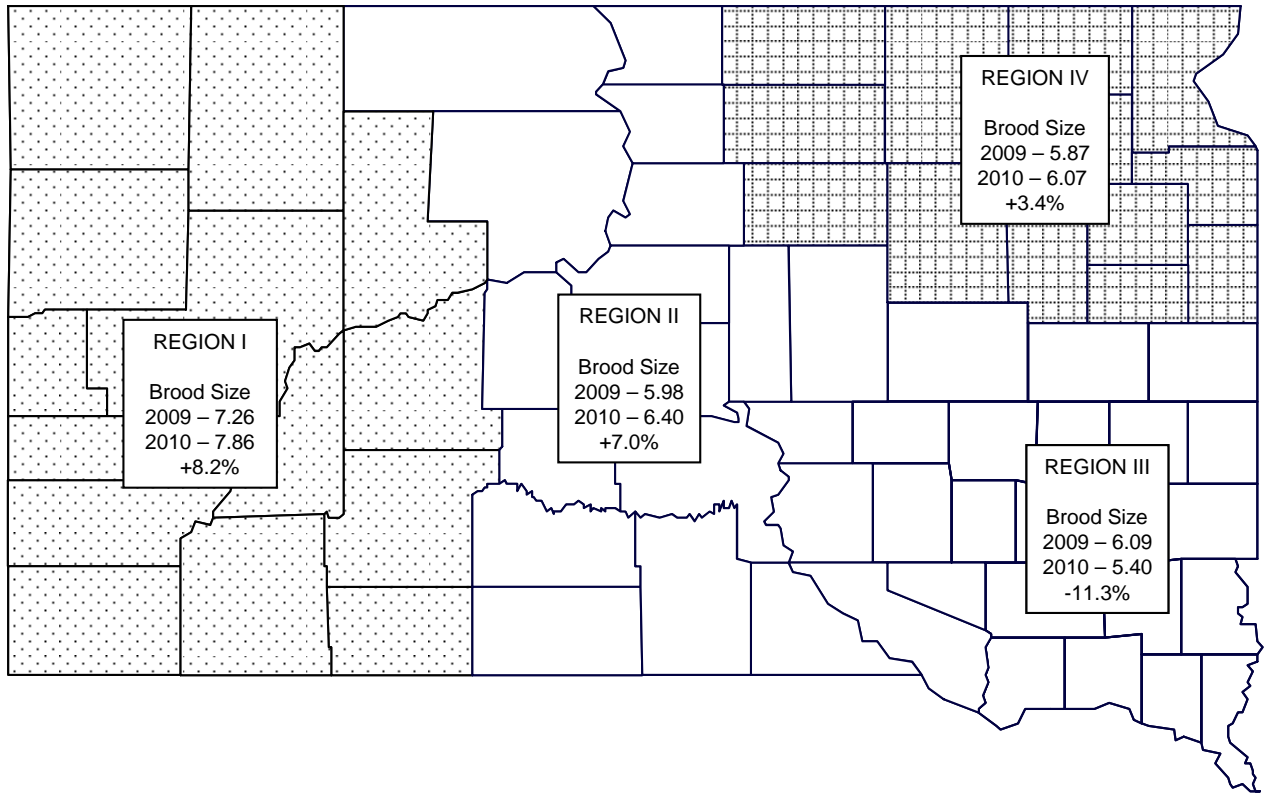


Figure 3. City area pheasant per mile (PPM) indices over the past 10 years.

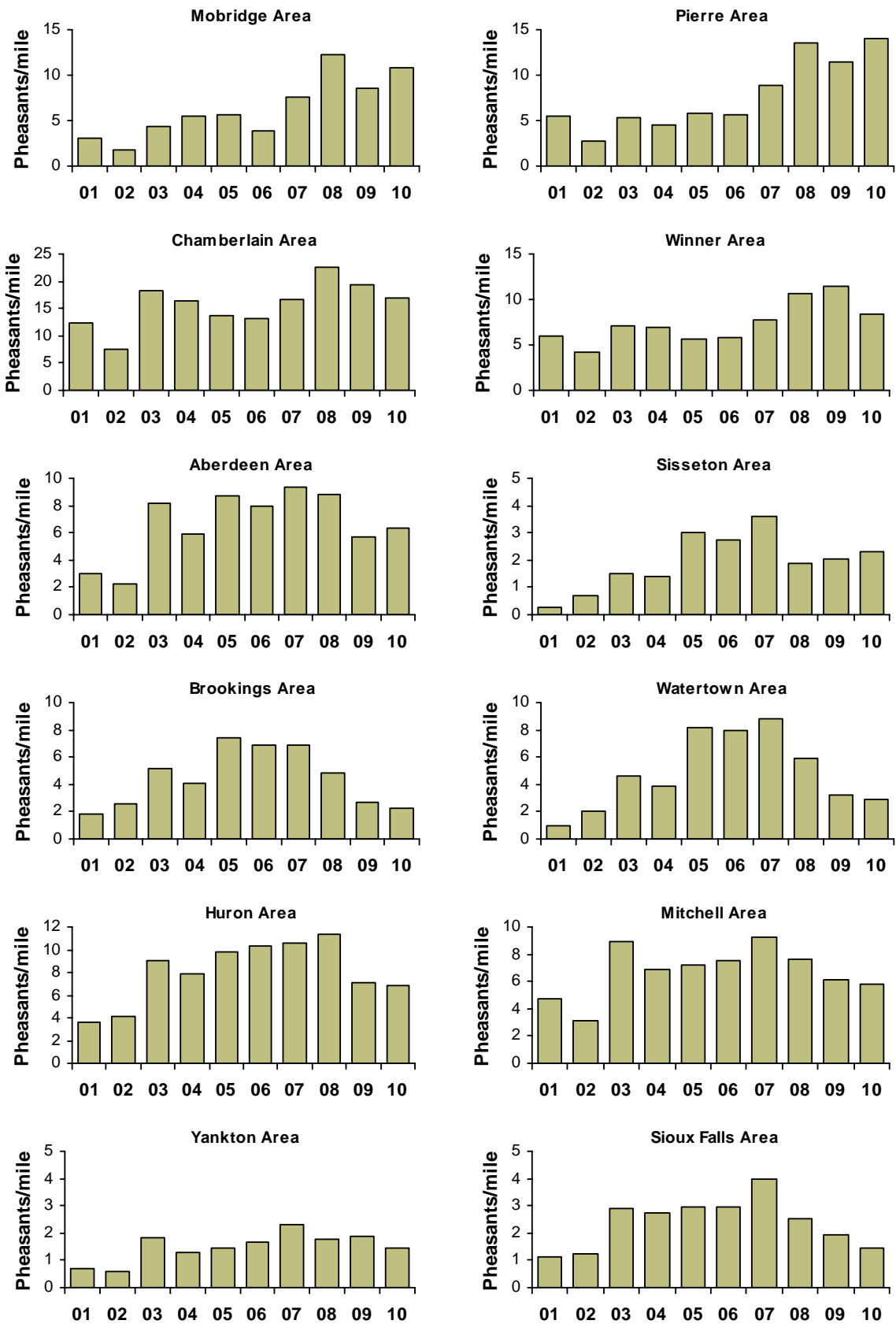


Figure 4. Statewide Pheasants Per Mile (PPM) index for South Dakota, 2001-2010. Dashed line illustrates the trend over the past 10 years.

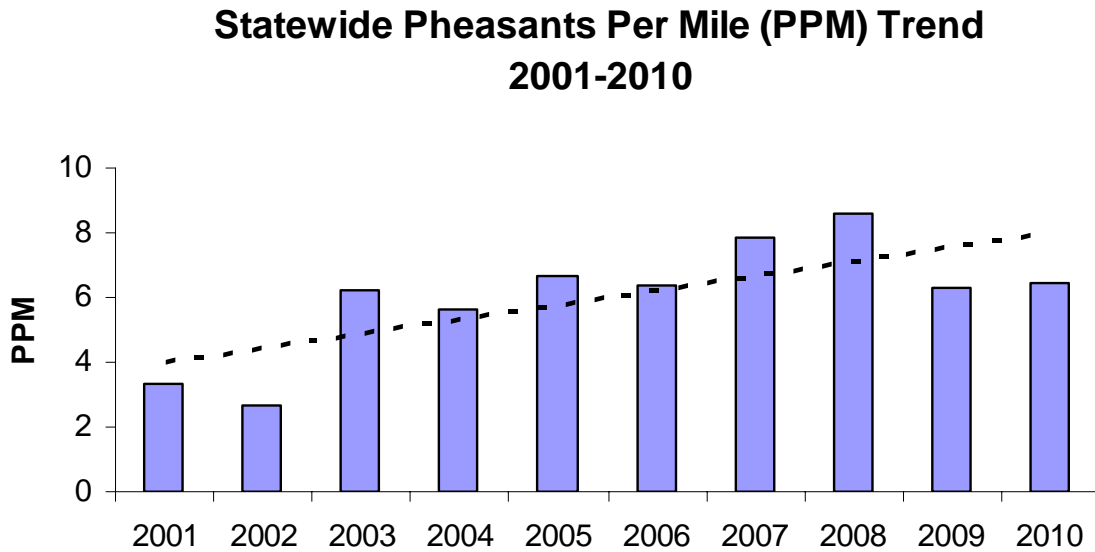


Figure 5. The number of routes in each GF&P administrative region based on PPM index values within the ranges of 0.00-4.99, 5.00-9.99, and 10.00+.

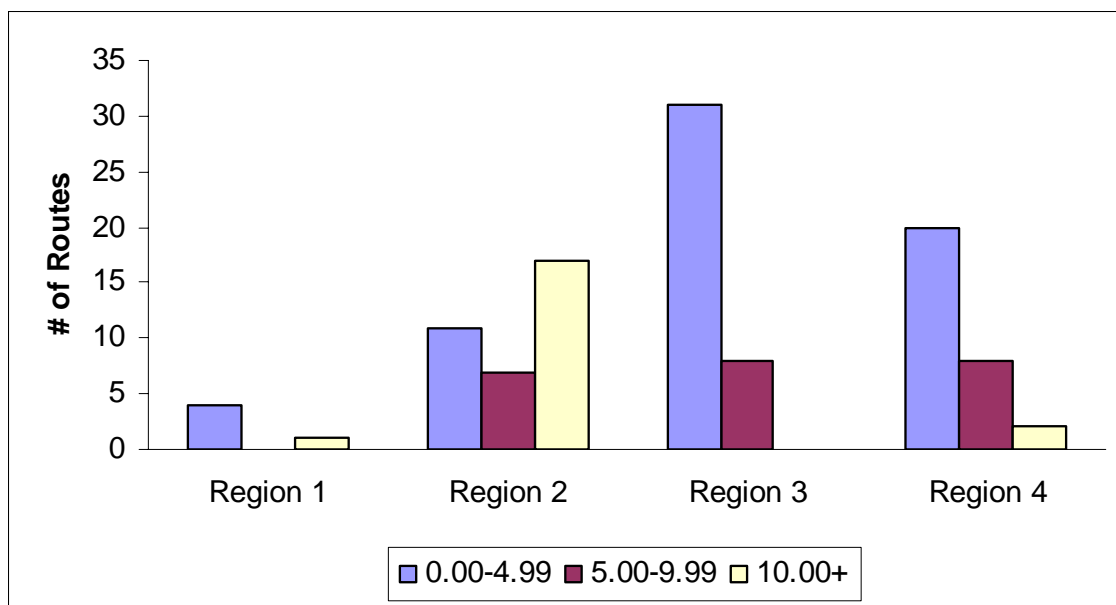


Figure 6. GF&P administrative regions and CRP acreage comparisons between July 2009 and July 2010.

