

**PENNSYLVANIA GAME COMMISSION  
BUREAU OF WILDLIFE MANAGEMENT  
PROJECT ANNUAL JOB REPORT**

**PROJECT CODE NO.:** 06430

**TITLE:** Wild Ring-necked Pheasant Monitoring in Pennsylvania

**JOB CODE NO.:** 43001

**TITLE:** Wild Pheasant Population and Harvest Monitoring

**PERIOD COVERED:** 1 July 2019 through 30 June 2020

**COOPERATING AGENCIES:** Central Susquehanna Chapter of Pheasants Forever; Cumberland Valley Chapter of Pheasants Forever; and Pheasants Forever

**WORK LOCATION(S):** Central Susquehanna Wild Pheasant Recovery Area, Northumberland and Montour counties; and the Franklin Wild Pheasant Recovery Area, Franklin County

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**DATE:** 30 June 2020

**ABSTRACT:** The objective of this project is to monitor the status of Pennsylvania's remaining wild pheasant population and provide recommendations for management annually. Monitoring includes both annual flushing surveys and crowing counts. This data is then analyzed using a model developed specifically for the project that provides population density estimates. These estimates are used to both track population status and in the Central Susquehanna (CS) Wild Pheasant Recovery Area (WPRA), and make recommendations for harvest opportunities. The 2020 flushing survey in CS WPRA had 42 volunteers with 33 dogs searching 170 acres on 5 farms flushing 69 pheasants, 45 being male, 23 female, and 1 unknown sex bird. Thirteen volunteers and their 7 dogs in Franklin County (FC) WPRA flushed 10 pheasants, 7 of which were male and 3 females out of 66 acres on one farm. In spring of 2020, random point crowing count surveys were conducted by 1 observer at 51 points in the FC WPRA, detecting 9 males. The spring random point count survey within the CS WPRA had 2 observers complete 132 points and detect 68 males. Within the FC and CS WPRA, 3 roadside route crowing count surveys were completed in each by 2 observers detecting 7 and 41 males respectively. Population estimates derived from random point data indicated a 12.3% decrease within the entire CS WPRA and a 3.1% decrease in the Washingtonville West (WW) study area. The FC WPRA experienced a 51.5% increase. Route surveys indicated a 51.1% decrease within the WW study area and a 52% decrease within the South Franklin (SF) study area. In fall of 2019 during the CS WPRA hunt, 26 youth hunters flushed 177 pheasants, and of the 92 males flushed, 5 were harvested.

**OBJECTIVES**

1. To monitor pheasant populations using flushing and crowing surveys.
2. To monitor population trends through estimates and indices in order to provide management recommendations.
3. To provide a limited harvest opportunity within the Central Susquehanna Wild Pheasant Recovery Area (WPRA) to constituents.

## **STUDY AREAS**

The Central Susquehanna (CS) WPRA was established before the completion of the Ring-necked Pheasant Management Plan. This WPRA was officially designated by the Pennsylvania Game Commission Board of Commissioners in 2009 (Fig. 1). The Franklin County WPRA was approved in April 2011. Both WPRA's have seen boundary reductions since their inception.

In addition to designating official boundaries for these WPRA's, the Board of Commissioners established the following regulations: 1) It is unlawful to release pen-raised pheasants anytime within any area designated as a WPRA, 2) There is no open season for the taking of pheasants in any area designated as a WPRA unless by executive order from the Commission.

Wild Pheasant Recovery Area boundaries were designated for law enforcement purposes and to protect wild pheasant populations. Boundary lines follow roads and other easily identifiable boundaries. Within WPRA's, we established study area boundaries based on existing potential pheasant habitat. The Franklin County WPRA comprises 55.7 km<sup>2</sup> (13,760 acres) and represents the South Franklin study area which is the only remaining study area within the WPRA (Fig. 2). The Central Susquehanna WPRA comprises 126.3 km<sup>2</sup> (31,206 acres). One of the original 5 study areas within the CS WPRA has remained intact, that being Washingtonville West which comprises 80.6 km<sup>2</sup> (19,924 acres; Fig. 3).

## **METHODS**

### **Population Trend Surveys**

Pheasant population trends were monitored using late-winter flushing surveys and spring male crowing counts. Density estimates and indices were derived from these surveys.

*Flushing Surveys.*--Flushing counts were used to obtain late winter sex ratios. Areas of thick cover, which typically serve as winter flocking areas, are uniformly surveyed on foot and with bird dogs. Flushing counts were conducted in pheasant concentration areas, which were identified during telemetry fieldwork, roadside inspections, information from the public, and through interviews with landowners (Fig. 2, Fig. 3). Teams of 4-10 people with 2-8 dogs surveyed all available cover in a uniform manner. All pheasants observed were recorded by sex. Other data collected included weather, number of observers and dogs, and the survey location.

Assumptions made for the survey included the following: Each sex had equal observability (or flushing rate), each habitat had equal probability of containing both sexes, observers made no

errors identifying sex and number of pheasants flushed, and flushed birds were counted only once.

*Male Crowing Surveys-Roadside Routes.*--Pheasant crowing surveys were conducted on each study area in accordance with the guidelines established by the Midwest Pheasant Council (Farris 1974). Roadside survey routes were located within the study area boundaries where pheasants were released. Survey routes were selected at random using U.S. Geological Survey (USGS) topographic maps (Fig. 2, Fig. 3). Each survey route was 9 miles in length and had 10 stops 1 mile apart.

Surveys were conducted for a 3-minute period at each stop. Observers counted total number of individual males crowing. Surveys began 30 minutes before sunrise and were replicated 3 times between 11-24 April, 25 April-8 May, 9-22 May. Data collected also included weather conditions. Weather conditions for conducting surveys followed the Midwest Pheasant Council guidelines. These are air temperature  $\geq 32^{\circ}$  F, wind  $< 10$  mph, absence of or only patchy fog, and no precipitation.

The purpose of the spring crowing count routes was to establish relative population indices of males for each study area as 1 indication of population level. As boundaries have changed, certain routes have been excluded. Although routes have 10 survey stops, they must be analyzed as the route being a single replicate. This doesn't allow for substantial population estimates but does provide a great long-term trend overall. These have been continued because of the long-standing data set that exists, beginning as early as 2008 for CS WPRAs. For analysis purposes, we averaged the results from all survey windows within a year. This allows direct comparison with previous years where additional replications were completed. Assumptions made for the survey included the following: Weather conditions standardized the number and frequency of crowing males heard. Ambient noise did not affect males heard crowing. Males were heard from only one listening point. Males crowing  $> 1$  time in a survey period were counted as individuals only once.

*Male Crowing Surveys-Random Points.*--Random point crowing detection surveys provided a reliable population estimate for the entire area. Points were selected randomly throughout each study area, and regardless of boundary changes, points remaining within the boundary can continue to be surveyed and provide a reliable estimate. Random point crowing surveys were conducted on 44 and 17 randomly selected points throughout the CS and Franklin County (FC) WPRAs respectively in 2020 (Fig. 2, Fig. 3) using the same methodology for crowing survey points along roadside routes. Like route surveys, we conducted 3 replications at all random points in 2020: 11-24 April, 25 April-8 May, 9-22 May. Random points across all WPRAs were used to get a more accurate estimate of hen densities. Assumptions are the same as the roadside route surveys.

*Population Density Estimates.*--We estimated population abundance using data from random point crowing surveys and the winter flushing surveys. We estimated the number of males/km<sup>2</sup> at all random points within each study area. Population estimates are derived using the estimator model developed by Williamson et al. (2018) which takes into account the probability of detection. The probability of detection includes both crowing frequency or crowing probability (0.56) and the probability that an observer will detect a pheasant within a 0.436 km (0.41).

The female population is estimated by multiplying the male population by the female part of the sex ratio estimate. If male/female sex ratios were not significantly different than 1:1 or if sample sizes were too small, we assumed a sex ratio of 1:1.

The following assumptions are made to estimate population density: Males crowing >1 time were counted only once and flushing surveys provided adequate estimates of the true population sex ratio.

### **Wild Pheasant Harvest**

The third annual wild pheasant youth hunt within the CS WPRA was held in 2019. Game Commission and Pheasants Forever (PF) staff worked closely with landowners on 5 farms to provide specific hunt blocks. The limited draw youth hunt was held on 2 Saturdays in November (2 and 9 November 2019). To apply, hunters must be considered youth hunters (between the ages of 12-16 holding a youth license) and have purchased a current license and obtained a free pheasant permit. Hunters must enter an online permit application within the specified time period (15 July – 15 September 2019) in order to be considered, and the drawing took place 17 September. Winning applicants were notified on 20 September.

Thirty-eight permits were selected from 79 applicants in the drawing. Two additional permits were provided to the Central Susquehanna and Cumberland Valley chapters of Pheasants Forever. On the day of the hunt, 2 permitted youth were paired with a volunteer hunt mentor/dog handler. Each youth was permitted to harvest 1 male pheasant and could be accompanied by 1 adult. Hunters were provided a safety briefing by a Pennsylvania Game Commission game warden prior to heading afield. Hunters were required to check out once out of the field and report any harvest.

## **RESULTS**

### **Population Trend Surveys**

*Flushing Surveys.*--In February 2020, both the FC (9 February) and CS (23 February) WPRAs completed flushing surveys.

The FC WPRA saw 13 volunteers and 7 dogs flush 1 farm with 66 acres putting up 10 pheasants total (7 male and 3 female) for a sex ratio of 1M:0.43F. The majority of habitat that birds were flushed from was comprised of native warm season grass, and specifically switch grass. Other locations were low-lying wet areas with reed-canary grass or shrubby thickets. This flushing survey was completed in 4 hours.

The CS WPRA saw 42 volunteers with 33 dogs flush 5 farms with 170 acres putting up 69 pheasants (45 male, 23 female, 1 unknown) for a sex ratio of 1M:0.51F. The majority of habitat that birds were flushed from was also native warm season grass within this WPRA. In addition to the pheasants, 5 short-eared owls were flushed during the survey. This flushing survey was completed in 4 hours.

*Male Crowing Surveys – Roadside Routes.*--In spring of 2020, 2 observers completed 2 roadside routes, 1 within the South Franklin (SF) study area, what is now considered the FC

WPRA, and 1 within the Washingtonville West (WW) study area, a large part of the CS WPRA.

The FC WPRA route was completed 3 times within the periods stated above. A total of 7 males were heard during these surveys. Compared to the previous year, the indices present a 52% decrease and lowest count on record since beginning route surveying in 2015. It should be noted that surveys were not completed in 2018. This decrease reflects the overall downward trend since 2017 (Fig. 4).

The CS WPRA route was completed 3 times within the survey windows detecting a total of 41 males. Comparing this to the previous year, the indices present a 51.1% decrease and are similar to 2008 numbers. The survey results also reflect the continuing downward trend for Central Susquehanna since its peak in 2013 (Fig. 4).

*Male Crowing Surveys – Random Points.*--In spring of 2020, random point crowing count surveys were conducted by 1 observer at 17 points in the FC WPRA, detecting 9 males through a total of 51 surveys. The spring random point count survey within the CS WPRA saw 2 observers complete 44 points and detect 68 males through a total of 132 surveys. Three survey replicates were completed within the designated survey windows. Other species of note detected were Eastern Meadowlark (27), Bobolink (3), Grasshopper sparrow (1), and Northern Harrier (1).

*Population Density Estimates.*--Estimates were calculated from both the 2020 winter flushing survey results as well as spring random point crowing count results. It should be noted that for FC WPRA, a sex ratio of 1:1 was assumed as flushing survey sample size was too small.

Franklin County WPRA density estimates for males was 0.525/km<sup>2</sup> and 0.525/km<sup>2</sup> for females. Extrapolated to population estimates for the area we see 29.2 males and 29.2 females with a total population estimate of 58.5 birds. Comparison with the previous year (38.6), we see a 51.5% increase in overall population. Compared to the 5-year average (81.68) we see a 28.5% decrease (Fig. 5).

Central Susquehanna WPRA density estimates for males was 1.533/km<sup>2</sup> and 0.781/km<sup>2</sup> for females. Extrapolated to population estimates for the area we see 193.6 males and 98.7 females with a total population estimate of 292.4 birds. Comparison with the previous year (333.5) shows a 12.3% decrease in overall population. Compared to the 3-year average (555.7; data has only been collected for 4 years) we see a 47.4% decrease (Fig 6).

Washingtonville West study area, the only intact study area with monitoring data collected since 2013, had density estimates of 2.09/km<sup>2</sup> for males and 1.066/km<sup>2</sup> for females. Extrapolated to population estimates for the area we see 168.5 males and 98.7 females with a total population estimate of 254.5 birds. Comparison with the previous year (262.6) shows a 3.1% decrease in overall population. Compared to the 5-year average (475.7) we see a 46.5% decrease (Fig. 7).

### **Wild Pheasant Harvest**

In November 2019, of 40 permits that were assigned, 26 permitted youth hunters participated in the third annual wild pheasant youth hunt within the CS WPRA. In a total of 8 hours between the 2 mornings on 4 farms, 177 birds were flushed (92 males). Hunters fired 62 shots

killing 5 male pheasants.

## **RECOMMENDATIONS**

1. Continue current monitoring levels within the two remaining WPRA's in order to track population trends.

2. Use current population estimates to provide recommendations on future habitat and harvest management within remaining WPRA's.

3. Continue limited harvest opportunities within the CS WPRA in coordination with Bureau of Information and Education and Pheasants Forever.

4. There is a direct correlation between Conservation Reserve Enhancement Program (CREP) acres within WPRA's and pheasant population trends. Since 2013 CREP acreage has had a declining trend (Fig. 8). We recommend that efforts continue in developing a plan specific to farmland wildlife on private lands that can be used within our targeted WPRA's.

5. The FC WPRA should remain closed to pheasant hunting until determined that it can support limited take similar to CS WPRA.

6. Both WPRA's should continue with current pen-reared stocking and hunting restrictions.

## **LITERATURE CITED**

Farris, A. L., editor. 1974. A review of pheasant census methods and suggested guidelines for standardization of census techniques. Midwest Pheasant Council committee report, Madison, Wisconsin, USA.

Keller, T. J. and S. R. Klinger. 2019. Pennsylvania wild pheasant recovery program recommendations for the future 2008-2019. Pennsylvania Game Commission, Harrisburg, Pennsylvania USA.

Klinger, S. R. and C. F. Riegner. 2008. Ring-necked pheasant management plan for Pennsylvania 2008-2017. Pennsylvania Game Commission, Harrisburg, Pennsylvania USA.

Williamson, L. T., W. D. Walter, S. R. Klinger, and D. R. Diefenbach. 2018. Incorporating detection probability to estimate pheasant density. *Journal of Wildlife Management*. 82:1680-1688.

### Current Wild Pheasant Recovery Area Locations & Boundaries

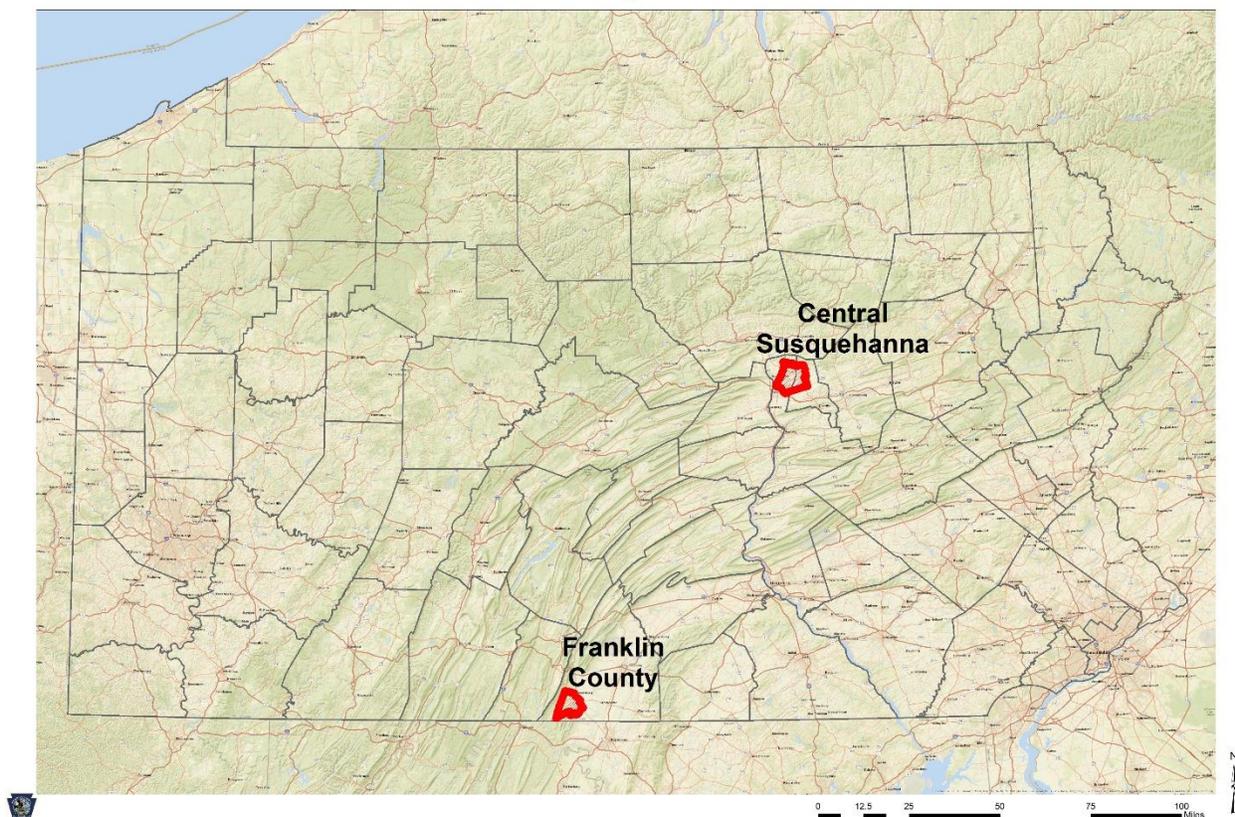


Figure 1 – Locations of wild pheasant recovery areas within Pennsylvania.

### Franklin County WPRA with Current Survey Locations

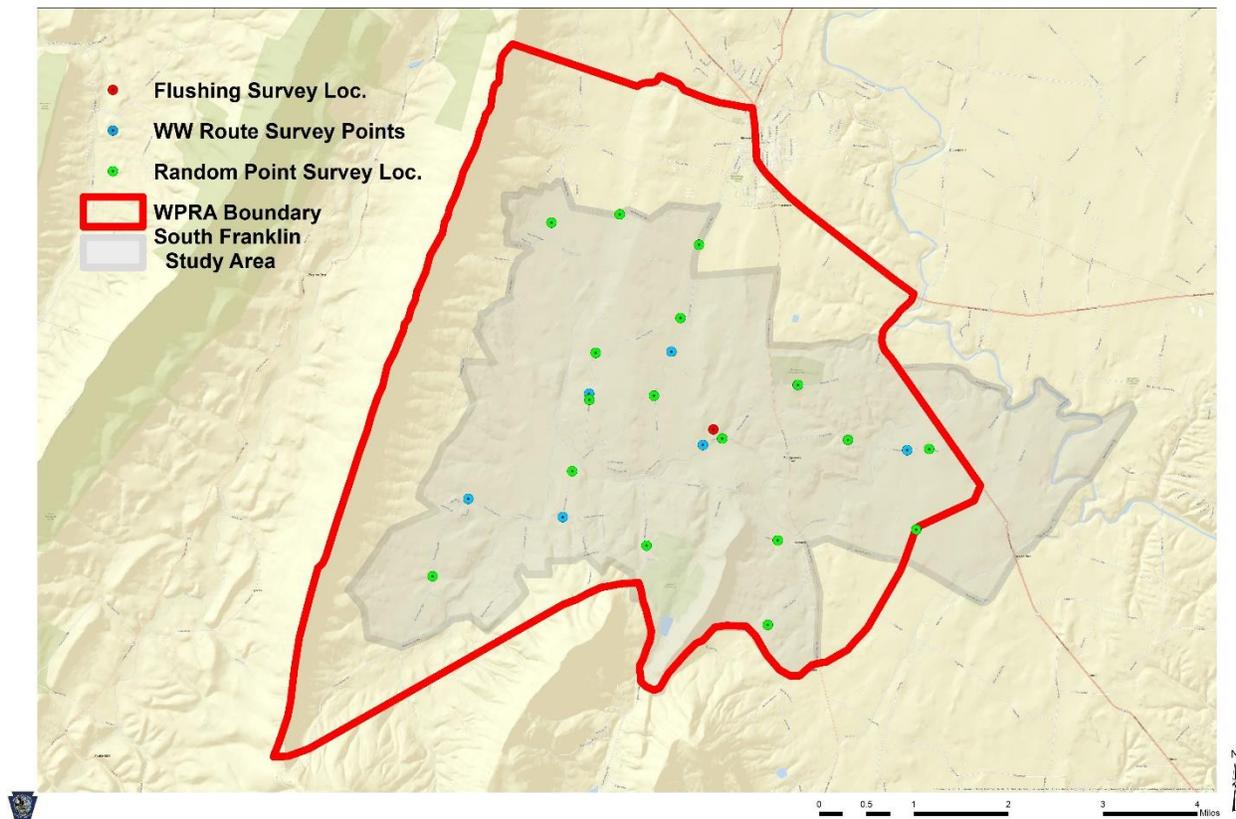


Figure 2. Monitoring locations for the Franklin County wild pheasant recovery area.

### Central Susquehanna WPRA with Current Survey Locations

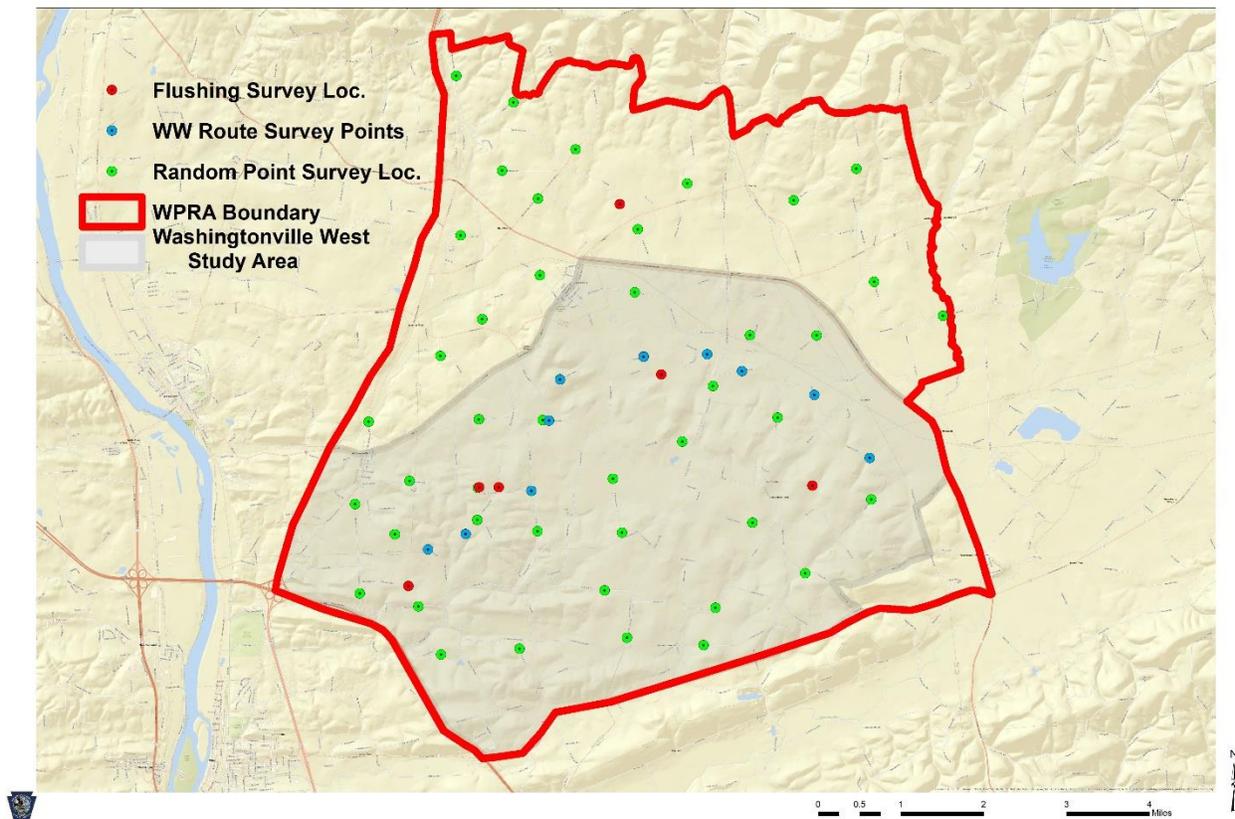


Figure 3. Monitoring locations for the Central Susquehanna wild pheasant recovery area.

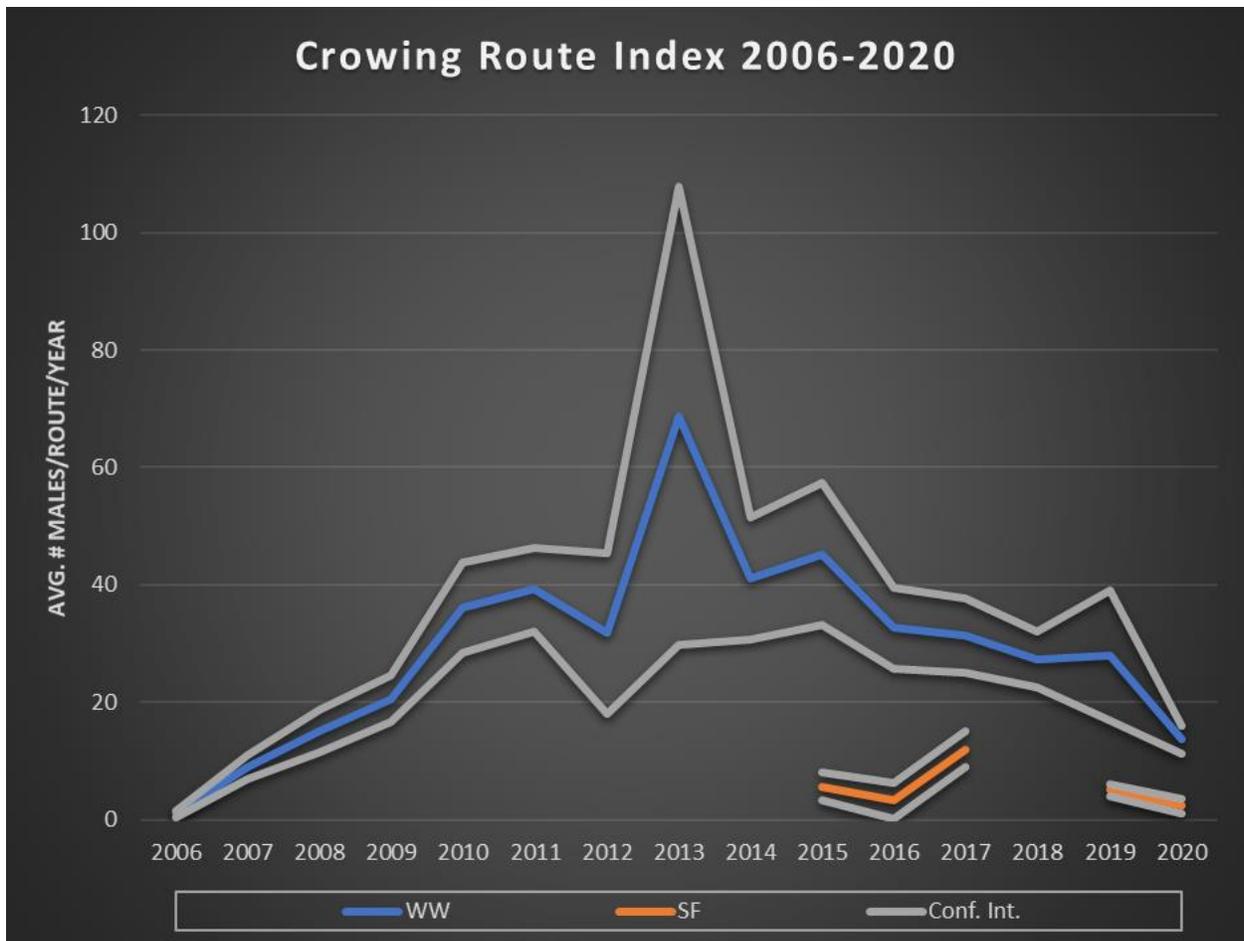


Figure 4. Route survey trends for both the South Franklin (SF) study area (Franklin County Wild Pheasant Recovery Area) and Washingtonville West (WW) study area (Central Susquehanna Wild Pheasant Recovery Area). This data represents the average number of males detected per route in the given year.

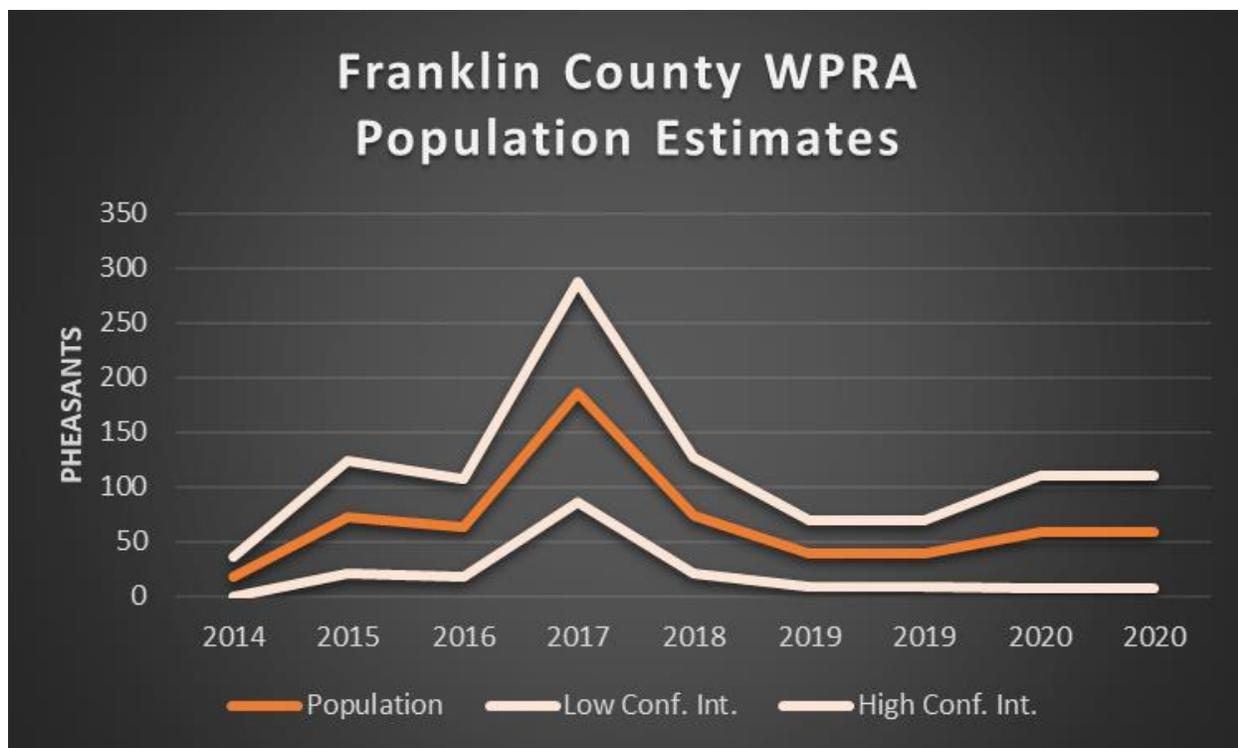


Figure 5. Population estimates for Franklin County Wild Pheasant Recovery Area (WPRA).

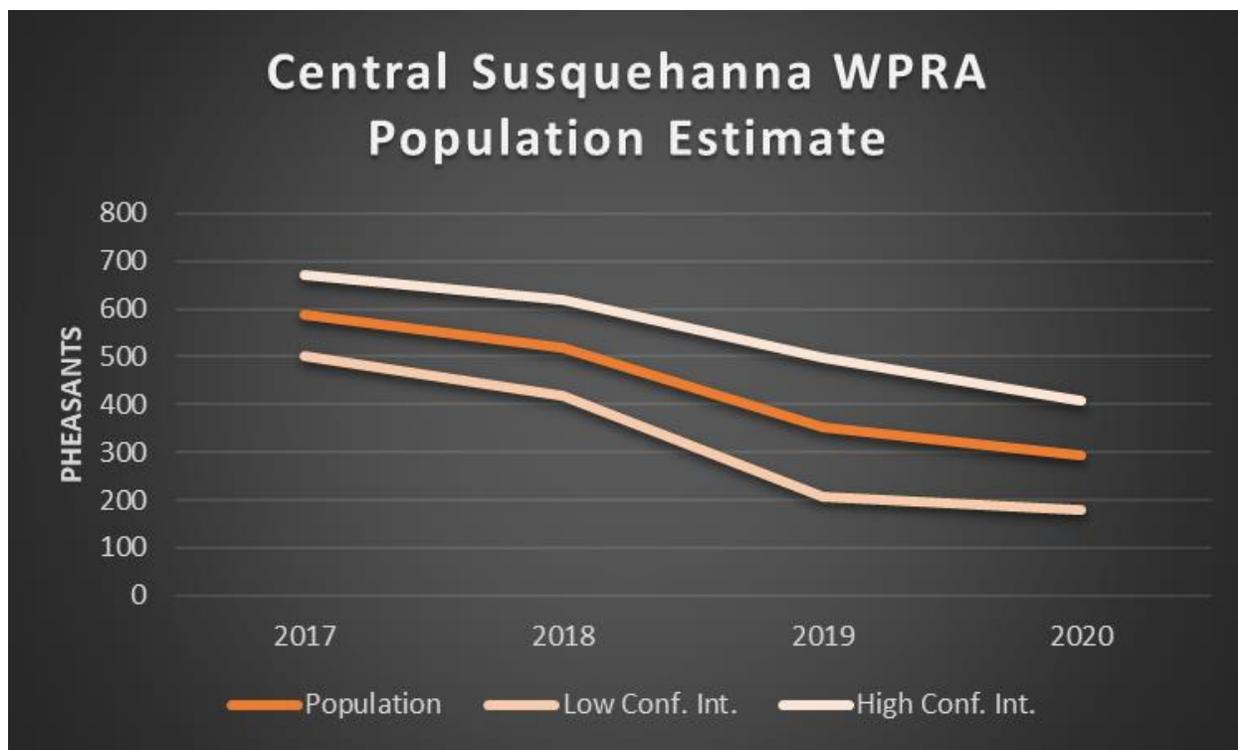


Figure 6. Population estimates for Central Susquehanna Wild Pheasant Recovery Area (WPRA) as well as the Washingtonville West study area.

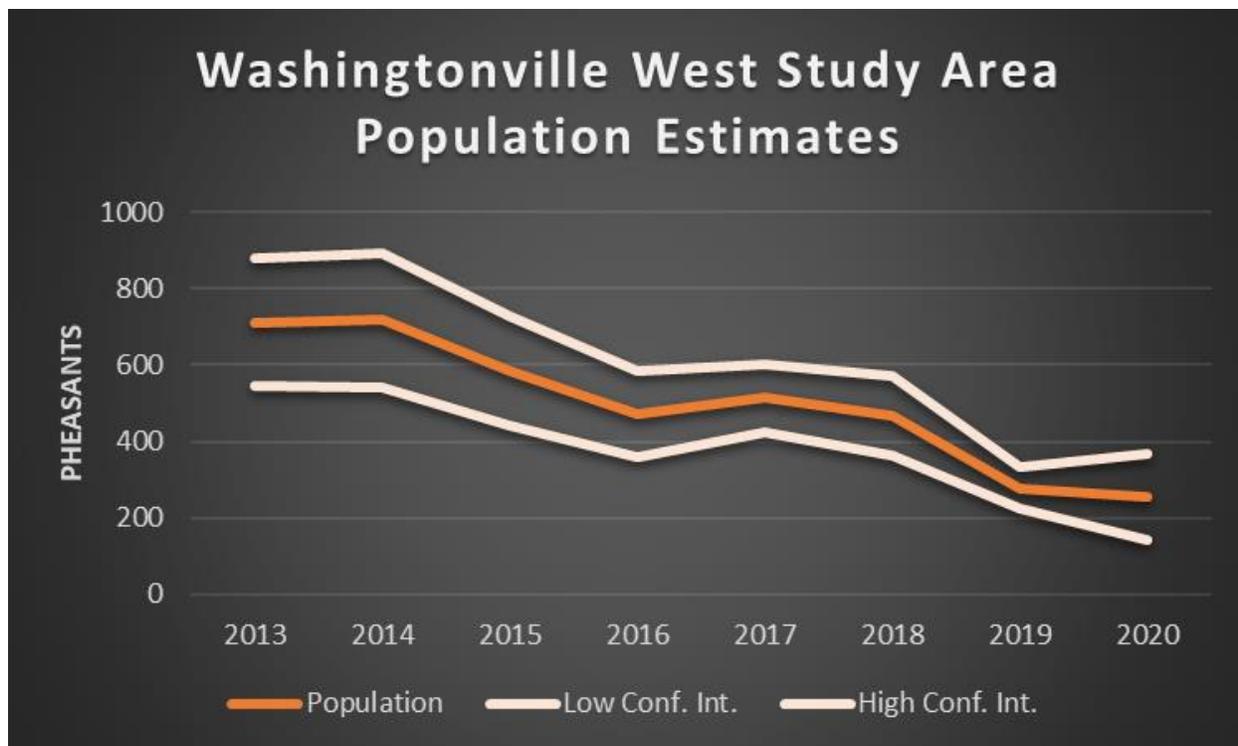


Figure 7. Population estimates for the Washingtonville West study area, part of the Central Susquehanna Wildlife Pheasant Recovery Area.

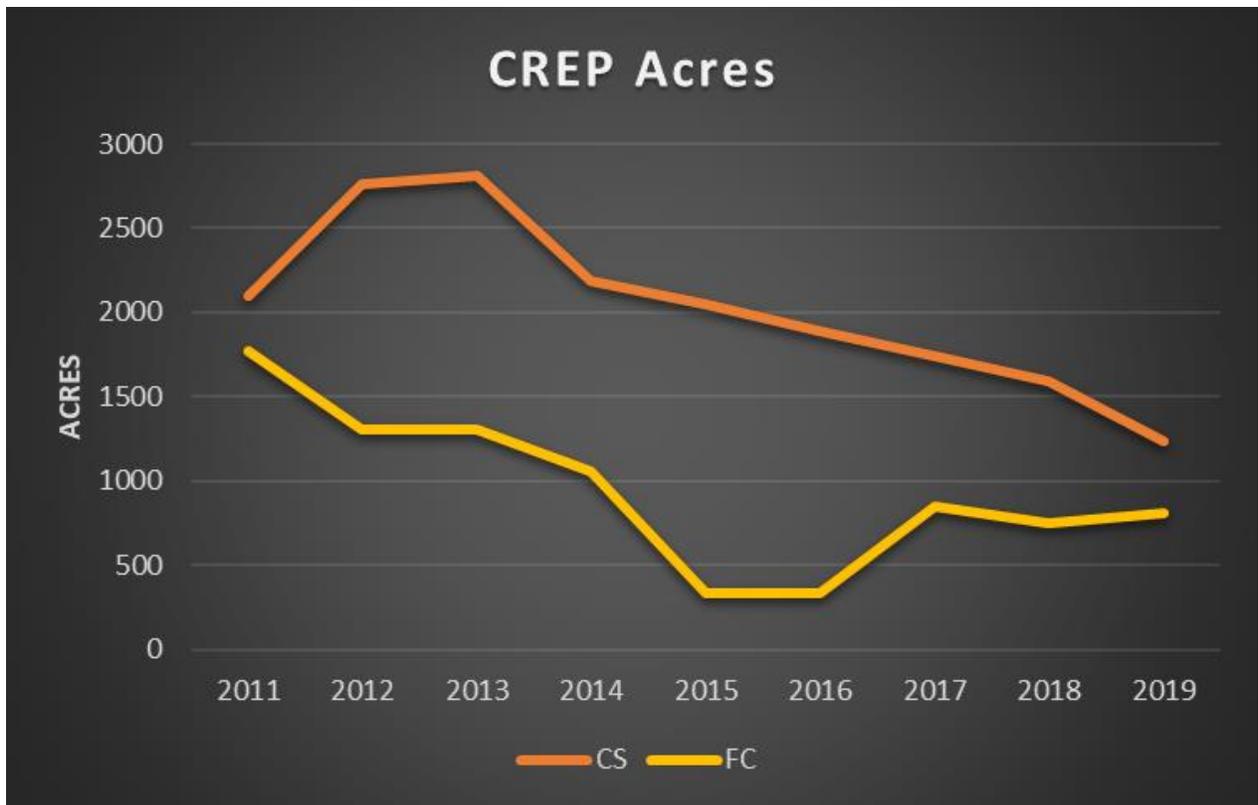


Figure 8. Conservation Reserve Enhancement Program (CREP) acreages from 2011-2019 within both the Central Susquehanna (CS) and Franklin County (FC) Wild Pheasant Recovery Area's (WPRA's). For this analysis, WPRA boundaries prior to 2019 were used for comparison between years.