Management of Ring-necked Pheasants in South Dakota

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This plan is a product of hours of discussion, debate, effort, and input of many wildlife professionals. In addition, comments and suggestions received from outdoor enthusiasts, and those who recognize the value of ring-necked pheasants, and their associated habitats were also considered.

Management Plan Coordinator— Alex Solem, South Dakota Department of Game, Fish and Parks

South Dakota Department of Game, Fish and Parks staff that provided data, edits and reviews to the Management of Ring-necked Pheasants in South Dakota – Nathan Baker, Julie Lindstrom, Dan Sternhagen, Trenton Haffley, Corey Huxoll, Eric Magendanz, Ryan Wendinger, Jacob Wolfe, Mark Norton, John Kanta, and Andrew Norton.

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TABLE OF CONTENTS

Page

LIST OF APPENDICES

LIST OF APPENDIX TABLES

LIST OF APPENDIX FIGURES

LIST OF APPENDIX FIGURES (continued)

LIST OF ACRONYMS

ACEP	Agricultural Conservation Easement Program
ALE	Agricultural Land Easements
BSRW CREP	Big Sioux River Watershed Conservation Reserve Enhancement Program
CP	Conservation Practice
CRP	Conservation Reserve Program
CSP	Conservation Stewardship Program
DOT	Department of Transportation
DU	Ducks Unlimited
EQIP	Environmental Quality Incentives Program
FSA	Farm Service Agency
GIS	Geographic Information System
GPA	Game Production Area
GFP	South Dakota Department of Game, Fish and Parks
JRW CREP	James River Watershed Conservation Reserve Enhancement Program
NRCS	Natural Resources Conservation Service
PF	Pheasants Forever
PHWG	Pheasant Habitat Work Group
PPM	Pheasants Per Mile
SDSPL	South Dakota School and Public Lands
SAFE	State Acres for Wildlife Enhancement
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WIA	Walk-In Area
WRE	Wetland Reserve Easements

EXECUTIVE SUMMARY

Ring-necked pheasants (*Phasianus colchicus*), hereafter pheasants, and pheasant hunting are a significant part of South Dakota's culture. Like the bountiful crops produced in South Dakota, pheasants are a product of our landscape. The same weather that influences our everyday conversations also has a profound effect on pheasant populations. Pheasant populations also respond to land use and available habitat to meet their annual life cycle needs. As a result, much of this plan is focused on habitat development and management necessary to meet the seasonal and spatial requirements of our state bird.

The *"Management of Ring-necked Pheasants in South Dakota"* provides a concise, yet comprehensive overview of topics such as public attitudes related to wildlife and habitat; pheasant introductions and distribution; pheasant ecology and management; population and harvest trends; pheasant research; pheasant economics; and issues, challenges, and opportunities facing pheasants and wildlife managers. This plan also identifies and provides direction to help maintain South Dakota as a showcase for pheasant management and the premiere destination for pheasant hunters across the nation.

Objectives and strategies have been developed to help guide managers on pheasant management in conjunction with the implementation of the plan. These objectives and strategies are outlined in a smaller, more management focused document titled "South Dakota Ring-necked Pheasant Action Plan, 2024−2028" found here: https://gfp.sd.gov/management-plans/. This action plan outlines management objectives and associated strategies that are measurable, and time bound, thus requiring careful planning and consideration. The successful implementation of this action plan will require cooperation of the public stakeholders, private landowners, sportsmen and women, conservation partners, and businesses.

In response to declining pheasant abundance and habitat, historical statewide initiatives have been implemented to promote the enhancement and establishment of pheasant habitat in South Dakota. Historically, statewide initiatives including the Pheasant Habitat Summit (under direction from former Governor Dennis Daugaard) and Habitat Pays, a joint effort between GFP and South Dakota's Department of Agriculture and Natural Resources (formerly, the Department of Agriculture), were implemented to "focus on practical solutions for maintaining and improving pheasant habitat." More recently, under the direction of Governor Kristi Noem, the Second Century Initiative launched in 2019 to proactively enhance and establish habitat. As part of this plan, a $1 million state investment, approved by the South Dakota Legislature, was implemented to expand habitat and pheasant hunting opportunities. Additionally, programs such as the Nest Predator Bounty Program and Hunt for Habitat were implemented to increase the education, awareness in the activity of trapping, getting youth and families outside, and enhancing duck and pheasant nest success, as well as generating additional funds for habitat efforts for public lands.

This is a plan for all constituents interested in the conservation of pheasants and pheasant habitat in South Dakota. Wildlife managers are challenged to use the available tools for the benefit and well-being of pheasants. In addition, a wide variety of wildlife species will benefit from these actions. With careful coordination among all stakeholders, South Dakota's pheasant hunting heritage will be preserved for future generations.

INTRODUCTION

The diverse landscape of South Dakota is characterized by an array of habitats and abundant natural resources. For many outdoor enthusiasts, no other wildlife species in the state is as recognized or valued as the pheasant. Though the pheasant is not native to South Dakota, they have become naturalized to the mosaic of grassland and agricultural land habitat found in much of South Dakota.

From the first successful releases of pheasants in 1908 to the most recent estimated population of over 7.1 million birds in 2018, South Dakotans and our visitors have built a rich and deeply rooted tradition around pheasants and pheasant hunting. The opening weekend in October is an event anticipated not only by pheasant hunters, but also family and friends who are reunited during this social gathering.

With a high rate of annual mortality, pheasants are a short-lived bird with the capability of high reproductive rates. The quantity, quality, and distribution of season-specific habitats, and weather conditions are the primary factors that influence pheasant populations. As a result, wildlife managers focus on the development and management of suitable habitat to meet the needs of pheasants throughout their annual life cycle.

Since their introduction and expansion in areas of interspersed cropland, grassland and other habitats, pheasant populations have been notably high on 4 occasions: the early 1930s following the Great Depression and drought period when much farmland was idle; the mid-1940s during and just after World War II when again much habitat was unintentionally created on idled cropland; the early 1960s at the peak of the Soil Bank Program; and most recently, during the first 10 years of the 21st century, as a result of the Conservation Reserve Program (CRP) acres and favorable weather conditions. Periods between these population peaks experienced large scale declines in available upland habitat across much of the pheasant range (Switzer 2009).

Pheasant management in South Dakota historically consisted of conducting annual surveys under the management of South Dakota Game, Fish and Parks (GFP) to monitor population trends. August roadside surveys, otherwise known and pheasant brood surveys, were conducted to develop a population index and to assist in developing a fall pheasant hunting forecast. This survey was discontinued in 2020 to focus on a new department priority promoting habitat and access. Current pheasant management in South Dakota consists of the use of harvest surveys conducted by GFP to evaluate pheasant and pheasant hunter demographics, and significant efforts by wildlife managers and private landowners to develop and manage pheasant habitat on both public and private lands. In addition, a wealth of knowledge has been obtained through research on pheasant biology and their response to various habitat management techniques and land use changes.

While South Dakota historically and currently supports high pheasant populations, there are significant issues and challenges ahead for South Dakota's state bird. The recent and anticipated loss of high-quality habitat provided by CRP, accelerated conversion of native prairies and wetlands to cropland agriculture, reduction in acres and funding available for conservation programs in the federal Farm Bill, changing landowner demographics, budget and funding sources, and the need for additional public hunting access are issues that face wildlife managers today and will continue do so in the future.

The GFP is responsible for the conservation and management of pheasants and their associated habitats for the benefit of this wildlife resource and for the citizens and visitors of this state. Therefore, a proactive approach is necessary to address these emerging issues to ensure that abundant pheasant populations will be available to provide and support our hunting heritage for present and future generations.

In 2022, an estimated 54,000 residents and 74,000 non-residents, from all 50 states, harvested approximately 1,158,000 pheasants in South Dakota. Whatever their reasons, hunters target South Dakota as a primary destination for pheasant hunting and have a significant impact on local economies. In 2022, pheasant hunting, and its associated activities brought an estimated $257.3 million into the state's economy.

PUBLIC ATTITUDES RELATED TO WILDLIFE & HABITAT

According to the 2022 Economic Impact of Hunting, Fishing, Trapping Boating and Wildlife Viewing in South Dakota, South Dakota has 213,000 hunters, 225,000 anglers, and 196,000 wildlife watchers (Southwick Associates 2022).

Most South Dakota residents feel that it is very important (77%) or moderately important (17%) that South Dakota conserves or protects as much fish and wildlife as possible, and where appropriate. Most South Dakota residents feel that healthy fish and wildlife populations are very important (77%) or moderately important (20%) to the economy and well-being of South Dakota residents (Gigliotti 2012).

According to Gigliotti (2003), when hunters were asked to pick their top reason among eight possible reasons for why they like to hunt pheasants in South Dakota, the top reason (43%) for both residents and non-residents alike was the enjoyment of spending time with friends and family. The second most important reason for both residents (22%) and non-residents (15%) was to enjoy nature, the outdoors and the beauty of the area.

From the same public opinion survey conducted by Gigliotti (2004), pheasant hunters were asked to indicate their satisfaction while considering their total pheasant hunting experience in 2003. In summarizing their responses, 81% of resident and 92% of non-resident hunters reported that they were satisfied. In addition, both resident (67%) and non-resident (43%) hunters indicated they hunted "private land—no fees" during the 2003 regular pheasant season.

Efforts to communicate and understand the differences and similarities between public attitudes and values of all involved parties will strengthen and improve the effectiveness of GFP's pheasant management and its habitat and public access programs.

PHEASANT INTRODUCTIONS AND DISTRIBUTION

Records of initial pheasant introductions in South Dakota from the late 1800s and early 1900s are too vague or incomplete to provide accurate numbers, the origin, or the exact locations of releases. According to Trautman (1982), Dr. A. Zetlitz of Sioux Falls had several varieties shipped to South Dakota in 1891. These pheasants consisted of ringnecks (assumed to be of the English ringneck variety) and a few of the golden and

silver varieties. These birds, along with others hatched and reared at his home, were released at the junction of the Split Rock and Big Sioux rivers in Minnehaha County. It is reported that some of these birds were seen as far away as Yankton County by 1902, but the population eventually disappeared from uncontrolled hunting.

The first successful introductions occurred in 1908–1909 on farms found in Spink County. According to Trautman (1982), A. E. Cooper and E. L. Ebbert introduced several pairs from a Pennsylvania game farm in 1908. Although it is mentioned that all these birds were lost during the following winter, they again released a few dozen birds (origin unknown) that are believed to have helped establish the pheasant population in that local area.

H. P. Packard, H. J. Schalke and H. A. Hageman of Redfield released an unknown number of pheasants in 1908 on Bert Hageman's farm just north of Redfield along the James River. That same year, it is reported that A. C. Johnson released 25 pheasants south of Frankfort on a ranch owned by A. C. Johnson. In 1911, the Redfield Chamber of Commerce released another 30 pair of pheasants on the Bert Hageman farm (Trautman 1982).

While other private releases continued in the early 1900s to establish pheasant populations, the Department of Game and Fish (now GFP) began releasing pheasants in 1911 and continued until 1919. Records of these historic releases can be found in Trautman (1982). The first open season was held in South Dakota for one day in Spink County in 1919.

Once populations were established in central and eastern South Dakota, GFP trapped and transferred some 33,000 pheasants to Corson, Fall River, Lawrence, Meade, Perkins, Pennington, and Ziebach counties from 1926 through 1941. Trap and transfer projects continued to supplement areas of the state that experienced significant losses due to severe winter conditions and to fill unoccupied areas containing suitable pheasant habitat (Hipschman 1959).

Although trap and transfer projects were used to fill suitable pheasant habitat primarily in western South Dakota, this technique has not been utilized since the mid-1990s except for small stockings at the newly acquired Hill Ranch Game Production Area (GPA) in Fall River County. As a result of public pressure during periods of low pheasant densities, GFP has in the past paid landowners and other interested groups to raise and release pheasants. This state-sponsored program was discontinued in 1990 due to mounting evidence that this technique is ineffective.

After the success of initial stockings and the saturation of the state's traditional pheasant range, pheasant populations have been particularly high on 4 occasions: the early 1930s following the Great Depression and drought period when much farmland was idle; the mid-1940s during and just after World War II when again much habitat was unintentionally created on idled cropland; once more in the early 1960s at the peak of the Soil Bank Program; and more recently as a result of CRP acres.

It is not surprising that these periodic high pheasant numbers were the result of the widespread availability of high-quality pheasant habitat. Large scale declines in upland habitat across much of the pheasant range resulted in far fewer pheasants during the interim time periods.

PHEASANT ECOLOGY

The pheasant life cycle is usually split into 3 biological seasons: breeding, brood-rearing, and winter. Because of this, discussion of pheasant population dynamics and habitat requirements are often discussed in reference to one of these 3 seasons. An informative and in-depth overview of pheasant bioenergetics and life cycle is described by Solomon (1983, 1984*a*, 1984*b*, 1984*c*, 1984*d*, and 1984*e*), Flake et al. (2012), and in a more recent 6-part series within the South Dakota Conservation Digest (https://gfp.sd.gov/userdocs/docs/pheasant-ecology.pdf). The following is a summary of the ecology of pheasants in South Dakota, including annual life cycle, habitat requirements, and limiting factors. This is not intended to be an in-depth look at pheasant ecology, but instead a quick reference for the reader.

Quality nesting habitat is an important limiting factor for pheasants in South Dakota, with presence of winter cover being another essential habitat component. Research has indicated that idle, herbaceous grasslands are the most important habitats for nesting pheasants (Trautman 1965*b*, Fedeler 1973, Olson and Flake 1975, Craft 1986, Schilowsky 2007, Harsh 2021). While other habitats such as alfalfa, roadside ditches, and small grains are attractive to nesting pheasants, they generally do not produce many broods due to mowing and farming activities (Baskett 1947, Grode 1972, Hanson and Progulske 1973, Olson and Flake 1975, Craft 1986, Leif 2004, Pauly et al. 2017).

The breeding period begins when males begin their breeding displays in April and May. Male pheasants establish breeding territories during this time of year and attract females by crowing and flapping their wings rapidly. Males are capable of breeding with many (polygynous) female pheasants (Trautman 1982) and in captivity have been shown to breed with up to 50 females without loss of fertility (Shick 1947). Female pheasants can produce an entire clutch of eggs from a single copulation (Schick 1952).

After courtship, female pheasants begin developing eggs which they lay at a rate of approximately 1 egg per day (Baskett 1947, Trautman 1982). Clutch sizes range from 8-12 eggs, of which most are fertile (Trautman 1982). Once all eggs have been laid, females begin incubation which peaks in May and lasts 23 days (Baskett 1947, Trautman 1982). All fertile eggs hatch within 24 hours, after which the brood will leave the nest. If a nest is destroyed or abandoned, female pheasants will attempt to renest (Gates 1966) and have been shown to attempt up to 4 nests in a single season (Dumke and Pils 1979). Female pheasants are also well known for “dumping” their eggs in the nests of other pheasants (Baskett 1947, Trautman 1982) and other upland nesting birds, such as prairie grouse (Simpson and Westemeier 1987), turkeys (Schmutz 1988), and ducks (Bennett 1936).

Pheasant broods typically have an even sex ratio at the time of hatching (Rodgers 1984). After hatching, pheasant chicks are covered in down, but quickly begin growing feathers and are capable of short flights at 2 weeks of age (Trautman 1950*a*). Chicks remain with a hen for approximately 8 weeks (Trautman 1982) and are dependent upon insects for food during this time (Hill 1985). Because of this dependence upon insects, grassland habitats with a high proportion of forbs are important for pheasant chicks (Hill 1985, Riley et al. 1998). Typically, at least one-third of the brood will die during the first 8 weeks of life, with predators, farm machinery, and extreme weather being significant causes of mortality (Baskett 1947, Riley et al. 1998). During late summer, it is common to see several female pheasants with mixed broods of varying size and age.

By fall, summer-hatched pheasant chicks are the size of adult birds, with males being larger and more brightly colored than females. As weather turns colder, pheasants begin to concentrate in areas of preferred winter habitat such as cattail wetlands and dense shrubs or woodlands (Fedeler 1973, Craft 1986, Gabbert et al. 1999). High quality winter cover habitat is essential for pheasants to endure South Dakota's harsh winter winds and snow. Food plots of corn and sorghum are often planted near these winter habitats to help sustain pheasant populations through the season. Pheasants have been documented moving 1.9–2.1 miles (3–5 km) in winter months to take advantage of preferred winter habitats (Gabbert, unpublished data). Research has indicated that pheasants generally do not die from severe weather itself, but severe weather (e.g., deep snow) can make them more susceptible to predators (Dumke and Pils 1973, Perkins et al. 1997, Gabbert et al. 1999). Development of winter cover for pheasants has been a primary objective in South Dakota (Pheasants for Everyone 1988).

Late-fall also brings the much-anticipated pheasant hunting season, which results in approximately 45% mortality for male pheasants in eastern South Dakota (Leif 2003). In addition, approximately 3% of females are incidentally shot during the hunting season (Leif 1996). However, fall harvest rarely removes all the available "excess" males from the population and there are sufficient breeding males the following spring. Because of this, advocacy for season closures due to the perceived notion of low bird numbers is not warranted, especially in a male harvest only season structure.

GFP wildlife managers focus on the development and management of suitable habitat on public and private lands to meet the needs of pheasants during these biological seasons. Even with the best habitat management, weather is an uncontrollable factor that can jeopardize local pheasant populations. However, providing pheasants with these season-specific habitat requirements can greatly enhance survival and reproduction helping mitigate the effects weather.

PHEASANT MANAGEMENT

Pheasant management in South Dakota primarily involves working with cooperating agencies and landowners to develop and manage quality pheasant habitat, monitoring populations through estimating harvest and hunter satisfaction, and developing season structures that allow harvest of surplus roosters and maximum hunter participation.

SURVEYS

After the initial stocking efforts of pheasants during the early 20th century, pheasant management by GFP primarily included the trap and transfer of wild pheasants to fill pockets of suitable habitat void of pheasants. Management efforts continued to evolve through the years to monitor populations and strategic efforts were put in place to develop and manage pheasant habitat on public and private lands.

A long-term, historic record of pheasant population trends and statistics is necessary to measure the effects of various land-use changes, climatic conditions, harvest levels, and sociological changes on pheasant populations. Three methods have been used to collect this information: pheasant brood survey, winter sex ratio survey, and the hunter harvest survey.

The pheasant brood survey was conducted by GFP annually to determine pheasant reproductive success, population trends, relative densities of populations throughout the state, and to 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, was used to predict hunter success and satisfaction for specific geographic areas of the state.

Survey indices were derived from 110, 30-mile pheasant brood routes distributed across South Dakota where pheasants were found in sufficient numbers to survey (Appendix Figure 1). Routes were surveyed from 25 July–15 August each year using standardized methods on mornings when weather conditions are optimal for observing pheasants. These included mornings with vegetation along the routes saturated with heavy dew, winds ≤ 8 mph, and clear skies. Also, pheasant broods were opportunistically counted throughout the survey period to estimate an average number of young per brood. Pheasants per mile (PPM) estimates were calculated by summing the mean brood sizes and broods observed with numbers of cocks and hens observed on each route. PPM estimates for the prior year and the average of the previous 10 years were compared with the respective year survey results. Results were compared within local areas using Wilcoxon signed-rank tests which considered the direction (up or down) and magnitude of change for each route. Since PPM estimates were relative density estimates, comparisons were valid only between years within each local area. This survey was discontinued in 2020.

The pheasant winter sex ratio survey was conducted annually from the end of the hunting season through March 30th to estimate winter sex ratios of pheasant populations throughout the state. The winter sex ratio indicated the degree of rooster harvest during the previous hunting season compared to a pre-hunting season sex ratio of approximately 90 roosters per 100 hens. According to Trautman (1982), 10 roosters per 100 hens is an ample sex ratio for breeding purposes. Any roosters in excess of this winter sex ratio indicate an under-utilization of surplus roosters from the previous hunting season. This survey was discontinued in 2020.

The hunter harvest survey is conducted annually to obtain harvest-related statistics for pheasants. A total of 15,000 resident and 15,000 nonresidents, randomly selected small game license holders, are surveyed to derive these estimates. These statistics include number of residents and non-residents hunters, number of days hunted, number of pheasants harvested, and hunter satisfaction (Appendix Table 2). No shooting preserve license holders are surveyed for these estimates and none of their harvest is included in any data for estimates regarding wild pheasant harvest.

The pheasant brood survey, pheasant winter sex ratio survey, and the hunter harvest survey provided the information used in a pre-season (P_1) population estimate formula developed by Hickey (1955) and used first by Dahlgren (1963). Reliable estimates of pre-season populations were calculated with this formula since 1947 and used for evaluating density trends (Trautman 1982) until the brood survey and winter sex ratio survey were discontinued in 2020. The variables in the formula are defined as follows: P_1 = pre-season population estimate; f_1 = pre-season sex ratio; f_2 = post-season sex ratio; K_f = estimated hen harvest; and K_t = estimated total harvest.

$$P_1 = \frac{\left(f_2 K_t - K_f\right)}{\left(f_2 - f_1\right)}$$

Data collected from the hunter harvest surveys described above can be used to estimate average pheasant and hunter densities by county (Appendix Figures 2-4). In addition, a measure of hunter satisfaction is obtained through the hunter harvest survey, with 1 being least satisfied and 7 being most satisfied. During the past 10 years (2013-2022), resident hunters have reported an average satisfaction of 4.71, with a low of 4.11 and a high of 5.06. Nonresident hunters have reported an average satisfaction of 5.41, with a low of 4.95 and a high of 5.89 (Appendix Figure 5).

These surveys were discontinued in 2020 to focus on the new department's number one priority of wildlife habitat and hunter access. Current pheasant management in South Dakota consists of the use of harvest surveys conducted by GFP to evaluate pheasant and pheasant hunter demographics, and significant efforts by wildlife managers and private landowners to develop and manage pheasant habitat on both public and private lands.

SEASON STRUCTURE

During the past 100+ years, pheasant hunting regulations have fluctuated considerably. Regulations have varied from a 163-day season, 10-bird daily bag limit that included 5 hens in 1944, to a 10-day season and 2-rooster daily bag limit in 1950 (Trautman 1982). During the 1944–1945 pheasant season, the state included 11 units to manage pheasant harvest. More recently and until 2006, the season was structured around 2 units; Unit 1 included all of South Dakota except the area included in Unit 2, which included the counties of Butte, Meade, Lawrence, and Pennington west of the Cheyenne River. In 2007, these two units were merged into one statewide hunting unit, with certain restrictions applying to state and federal public lands.

The start date for the regular pheasant opener on the third Saturday of October is a tradition going back to 1958. Although the season length has varied, the current season starts the third Saturday of October and concludes on January 31. Rooster-only hunting seasons have been authorized since 1947 (Trautman 1982). The daily bag limit of 3 roosters has been in effect since 1964, except for 1976−1978, when the daily bag limit was reduced to 2 roosters. Biologically, a daily bag limit greater than 3 roosters could be implemented; however, pheasant hunters have become accustomed to the current bag limit, and many see no need for adjustment. Shooting hours from Noon to sunset were consistent from 1958−2019. In 2020, shooting hours were changed to 10:00 a.m. CST to sunset throughout the season. Since 1987, non-resident small game licenses allow for 2, 5-day hunting periods and hunters are allowed to buy multiple small game licenses for the season. Prior to 1987, non-resident small game licenses were 10-consecutive days.

In 1999, a youth-only pheasant season was incorporated into the season structure to encourage youth participation in pheasant hunting. This youth-only season was open statewide on private and public land for 5 consecutive days beginning on the first Saturday of October. In 2020, season structure changed to 9 consecutive days beginning 21 days prior to the third Saturday of October (Traditional Pheasant Season Opener). All public road rights-of-way are closed, except for the one-half of the road

rights-of-way next to and part of public hunting lands. All youth must be accompanied by an unarmed adult.

A mentored hunting program was introduced in 2008 to allow parents to decide when their children are ready to begin hunting. Until 2018, any resident youth, at least 10 years of age and less than 16 years of age, was not required to possess a hunting license if they are accompanied by a licensed hunting mentor at least 18 years of age in physical possession of their hunter education certificate. The minimum age for resident mentor hunters was removed in 2018. In 2021, the mentor hunting program was extended to non-resident youth. The one-on-one interaction in the field is intended to encourage hunter safety, hunter ethics, and respect for wildlife and their habitats. According to the latest hunter harvest survey, approximately 1,690 youth participated in the mentored hunting program during the 2022–2023 pheasant season.

In 2020, the South Dakota State Legislature created the habitat stamp which provides a funding mechanism for the protection and improvement of habitat and public accessibility while ensuring South Dakota's world-class outdoor resources are available for our next generation of outdoor enthusiast to enjoy. This annual habitat stamp is required for anyone 18 years of age or older who purchases a hunting, fishing, or furbearer license. This includes both residents ($10) and nonresidents ($25). The habitat stamp is not required for the one-day hunting or fishing license, youth hunting license, private shooting preserve license, hunt for habitat application fee, or landowner hunting license.

HABITAT & PUBLIC ACCESS

Since much of the land base in South Dakota is privately owned (80%), private landowners are the primary stewards of habitat and wildlife it supports. Recognizing that high quality habitat on private land is necessary to sustain good pheasant populations, GFP has focused much effort on agricultural land use issues (e.g., Federal Farm Bill and agriculture policy), as well as habitat development and management on private land. This collaborative approach between private landowners, GFP, and other conservation partners has been and will continue to be critical in providing for proper pheasant management and public hunting opportunities at a statewide level.

GFP delivers a comprehensive private lands habitat and access program, with numerous options available to private landowners for habitat management and development. Cost-share and incentive programs, as well as technical assistance, are available for food habitat plots, woody habitat, habitat fencing, grass seedings, grazing systems, wetland creations, wetland restorations, and riparian area enhancement. GFP added an additional eight private lands habitat biologists to the existing four in late 2021 to increase the delivery of these habitat programs to landowners across South Dakota.

To address the need for additional hunting access to areas with high quality habitat, GFP introduced the Walk-In Area (WIA) Program in 1988. This program has become an attractive alternative for private landowners to lease CRP and other quality habitat to GFP for public hunting access. Since its inception, the WIA Program has remained adaptive to accommodate private landowners and to address the needs of hunters across the state. One of those adaptions has been to offer up-front signing bonuses to secure multi-year WIA contracts to land enrolled in USDA conservation programs like CRP. Since 2011, GFP has been awarded $4.7 million in grants from the Voluntary

Public Access and Habitat Incentive Program administered by USDA to offer these signing bonuses.

The private lands habitat and access programs are described in greater detail on the Private Lands page of GFP's website (https://gfp.sd.gov/landowner-programs/).

Since the quantity and quality of available habitat is such a vital component of pheasant management, wildlife managers must use every available resource to put habitat projects on the ground. Many of GFP's private lands programs are tailored to complement United States Department of Agriculture (USDA) conservation programs, such as CRP, Agricultural Conservation Easement Program (ACEP), Environmental Quality Incentives Program (EQIP), and the Conservation Stewardship Program (CSP). As these USDA conservation programs have the potential to impact thousands of acres, GFP Private Lands Biologists and a Farm Bill/Access Coordinator serve on the USDA Natural Resources Conservation Service (NRCS) state technical committee and sub-committees of Wetland Reserve Easement (WRE), Agricultural Land Easement (ALE), EQIP, and CSP. In addition, GFP staff serve on the USDA Farm Service Agency (FSA) CRP sub-committee. This allows for significant input from wildlife managers in establishing program goals and objectives at the state level, developing ranking criteria, and creates a communication connection with USDA.

Strong working relationships with conservation partners are essential in maximizing the implementation of habitat development and management on private land. Therefore, GFP partners at varying levels of participation and commitment with numerous local, county, state and federal government agencies and non-governmental organizations. For example, through a unique partnership with Pheasants Forever (PF) and USDA NRCS, Farm Bill Biologists are stationed in specific USDA Service Center offices in priority habitat areas throughout central and eastern South Dakota. PF Farm Bill Biologists have training and knowledge of local, state, and federal programs to assist landowners in meeting their personal habitat and land use goals. However, it is the cooperation of private landowners that allows for most habitat accomplishments.

GFP owns or manages approximately 723 GPAs across the state totaling over 285,000 acres (115,335 ha). Many GPAs located in central and eastern South Dakota are managed with a strong emphasis on pheasant habitat. With approximately 10% of South Dakota's land base under public ownership, GFP works closely with other public land agencies to incorporate habitat management for pheasants where feasible and appropriate with their land management objectives.

PHEASANT DEPREDATION

During the mid-2000s, GFP responded to approximately 75–125 different requests for service per year, primarily in eastern South Dakota. Most depredation occurs on planted and emerging corn, with requests for service varying with changes in pheasant densities across the state. Though requests for service with depredation have only been recorded for a relatively short period, it appears that landowners report more depredation complaints during years of increased agricultural inputs costs and commodity prices. Traditionally, GFP spread corn around the perimeter of fields experiencing pheasant depredation to reduce damage to planted crops. To identify more proactive means to address this emerging depredation issue, GFP funded a cooperative research project with South Dakota State University, which evaluated the use of anthraquinone (as a deterrent) to reduce pheasant depredation on corn (Hodne 2009). The seed treatment

was found to be an effective method to reduce pheasant depredation of planted and newly sprouted crops. Pheasant depredation is now effectively prevented using anthraquinone-treated seed in problem areas. Since 2011, GFP has received a total of 67 pheasant requests for service.

SHOOTING PRESERVES

GFP regulates and monitors licensed shooting preserves according to Administrative Rule 41:09:01, which allows for the hunting of released pheasants and other game birds. The number of shooting preserves approved for operation in South Dakota by the department has increased from 157 in 2001 to 234 in 2022 (Appendix Figure 6). All licensed shooting preserves are required to maintain accurate records of birds released and all birds harvested. The number of pen-raised pheasants released has increased from 219,869 in 2001 to 597,137 released in 2022, with the harvest ratio of pen-raised and wild pheasants remaining steady (Appendix Figure 7). It should be noted that no licensed shooting preserve statistics are used in the statewide population or harvest estimates.

PREDATOR CONTROL

Predator control is often suggested as a management tool to increase pheasant survival and increase nest success, both of which can increase population growth. Generally, mammalian predation is the primary cause of nest failure and pheasant mortality during the breeding season (Reviewed in Riley and Schulz 2001). Avian predation has been found to be the primary cause of mortality during the winter (Leif 2003, Leif 2004).

Several studies on mammalian predator control efforts have shown an increase in nesting success or found higher pheasant abundance when compared to non-removal sites (Reviewed in Riley and Schulz 2001, Frey et al. 2003). However, the most recent predator removal study in SD found minimal impact on pheasant nest success (Docken 2011). To achieve measurable, significant improvements in nest success, predator control efforts must be very intense which makes the process expensive and logistically difficult to implement at a large scale. Because new predators fill the void left by removed animals, the impact of predator control at relatively small geographical extents is short-lived. Habitat management efforts, such as, offering additional areas of large, blocky-shaped idle grasslands (i.e., CRP), can help reduce nest predator efficiency and subsequently improve nest success.

Predator control can also have unintended consequences. For instance, intense coyote removal can lead to increased abundance of meso-predators such as red fox and striped skunks (Fino 2023) which are disproportionately more detrimental to nesting pheasants. Additionally, all raptors are federally protected under the 1918 Migratory Bird Treaty Act, and eagles are further protected under the 1940 Bald and Golden Eagle Protection Act. Raptor control is not possible under current federal regulatory framework. Food plots also provide a secure feeding location for pheasants during winter when raptor mortalities are most common. Additional habitat management actions, such, as situating perennial winter cover (warm season grasses, emergent wetlands) near these high-quality food plots and removing tall trees which could serve as perch or nest sites, should be considered to reduce raptor predation.

Pheasant populations have risen and fallen in response to habitat availability, mostly grassland nesting habitat, in the absence of targeted predator control. For instance, the pheasant population reached extremely high levels in the mid- and late-2000s when

favorable weather conditions occurred, and abundant CRP grassland habitat was available, and targeted predator control was not used. We recommend that habitat management be used as the primary tool to encourage pheasant population growth (see pheasant habitat best management practices section of this plan). Predation likely has an exaggerated impact on pheasant populations where sub-optimal habitat exists. Where predator control may be considered as a management option, managers should be aware that cost, logistics, scale, and lack of effectiveness often limit success when compared to habitat management.

POPULATION AND HARVEST TRENDS

Several survey methods were utilized in South Dakota, beginning in 1946 when efforts to monitor pheasants became more extensive and standardized. The pheasant brood survey was conducted annually from 1949 to 2020, when it was discontinued to allocate resources to focus on habitat and access. The lowest statewide PPM of 1.03 was recorded in 1976 and the highest statewide PPM of 11.38 was recorded in 1961 (Appendix Table 2; Appendix Figure 8). The 10-year (2010–2019) average is 3.14 PPM (Appendix Figure 9). Pheasant brood sizes were documented from 1946 to 2019, with the highest of 7.89 recorded in 1952 and the lowest of 4.99 recorded in 2017 (Appendix Table 2; Appendix Figure 10). The 10-year (2010–2019) average is 5.92 chicks per brood (Appendix Figure 11).

The winter sex ratio survey was conducted annually from 1947-2019 to determine the ratio of roosters to hens observed in pheasant populations during winter months. The lowest ratio of 21 roosters per 100 hens recorded in 1980, 1981, and 1983, and the highest ratio of 88 roosters per 100 hens recorded in 2019 (Appendix Table 2; Appendix Figure 12). The 10-year (2010–2019) average is 56 roosters per 100 hens (Appendix Figure 13).

Pre-season pheasant population estimates have ranged from 100,000 pheasants in 1919 during the inaugural pheasant season to a staggering high estimate of 16 million pheasants in 1945 (Appendix Table 2; Appendix Figure 14). The 10-year (2009–2018) average pre-season population estimate is 7.38 million pheasants (Appendix Figure 15). With the suspension of the annual brood survey, pre-season population estimates were discontinued in 2018.

The first pheasant season held in 1919 included an estimated harvest of 200 pheasants, with approximately 7.5 million pheasants harvested in 1945 (Appendix Table 2; Appendix Figure 16). It should be noted that in 1945, the daily bag limit included 8 pheasants and allowed for 4 hens. The 10-year (2013–2022) average for pheasant harvest is 1.05 million rooster pheasants (Appendix Figure 17).

As expected, there is a correlation between pheasant populations, pheasant harvest, and the number of pheasant hunters. An estimated 1,000 hunters participated during the opening pheasant season in 1919, with approximately 212,000 hunters participating during the high pheasant year of 1963 (Appendix Table 2; Appendix Figure 18). During the past 10 years (2013–2022), the average number of residents, non-residents and total hunters are reported as 56,712, 72,843, and 129,555, respectively (Appendix Figure 19).

While season length and bag limits have changed throughout the years, the average reported pheasant harvest per hunter has ranged from 0.2 in 1919 to 54.1 in 1944 (Appendix Table 2; Appendix Figure 20). Since the change to a daily bag limit of 3 roosters (1979), an average harvest of 8.8 pheasants per hunter have been reported. The previous 10-year (2013–2022) average is 8.1 roosters per hunter (Appendix Figure 21).

A resident-only pheasant season has occurred the weekend prior to the opener of the regular pheasant season since 2001. From 2013–2022, an average of 12,749 hunters have participated, with an average total harvest of 19,779 pheasants, or an average bag of 1.59 pheasants (Appendix Figure 22).

Since 2001, the youth-only pheasant season has opened on the weekend prior to the resident-only season and currently is open for 5 days. In 2020, the season structure changed to 9 consecutive days beginning 21 days prior to the third Saturday of October (Traditional Pheasant opener). From 2012–2021, approximately 17.9% of eligible hunters who held a youth small game license and 4.3% of eligible hunters who held a junior combination license participated in this season (Appendix Figure 23). As of 2020, youth combination licenses are no longer available to participants because youth under the age of 18 are not required to possess a fishing license.

Since its inception, the length of the regular pheasant season has been adjusted many times (Trautman 1982). Nevertheless, the length of the hunting season and hunting in general has little, if any biological impact on pheasant populations in a rooster only harvest structure, which South Dakota currently has. Ring-necked pheasants are generally a short-lived species with lower annual survival rates with the capability of exhibiting high annual reproductive rates. Hunting removes the available surplus of roosters from the population which has little to no effect on pheasant reproduction and subsequent population levels (Trautman 1982). From a 1-day season held in 1919 to a 163-day season in 1944, the season length has been relatively stable during the past 30 years with only incremental increases (Appendix Table 1; Appendix Figure 24). During the 15 years between 2005–2019, the length of the regular pheasant season remained unchanged at 79 days. In 2019, the pheasant season was extended to a ~100-day season with the season start remaining the third Saturday of October and ending January 31.

HABITAT AND PUBLIC ACCESS TRENDS

Pheasants are a product of South Dakota's diverse agricultural landscape and pheasant populations are strongly associated with land use trends and farmland habitat. In addition to the effects of weather conditions, the quantity, quality, and interspersion of habitat types are major factors in the seasonal and annual survival and reproductive capability of pheasants. Monitoring agricultural statistics is necessary when determining available habitats and the response of pheasant populations, both at a landscape and local scale. The following South Dakota agricultural statistics were obtained from the USDA National Agricultural Statistics Service (2022).

The number of farms in South Dakota has decreased from a high of 84,300 farms in 1931 to 29,400 farms in 2022 (Appendix Figure 25). As a result, the average size of

farms in South Dakota has increased from 1,076 acres (435 ha) in 1976 to 1,469 (595 ha) acres in 2022 (Appendix Figure 26).

Corn production has historically been cyclic with producers responding to market prices and demand, USDA commodity program structure, and more recently to meet the need for corn-based ethanol production (Appendix Figure 27). The number of acres planted to soybeans has dramatically increased since the 1980s, with 500% increase in the number of acres planted in 2022 compared to 1980 (Appendix Figure 28). Herbicide and drought resistant genetics have allowed the range of both corn and soybeans to expand both north and west in South Dakota. Sunflowers, the other major row crop, overall have seen a general increase in production from just over 100,000 acres (40,400 ha) in 1977 to 652,000 acres (264,000 ha) planted in 2022 (Appendix Figure 29).

Depending on overall plant phenology and time of harvest, small grains have the potential to provide annual nesting and brood-rearing habitat for pheasants and other upland nesting birds. However, except for the number of acres planted to wheat (Appendix Figures 30-31), South Dakota has seen a dramatic decline in the number of acres planted to grain sorghum, barley, flaxseed, rye, and oats (Appendix Figures 32-36). For the first time since 1927, the number of acres planted to row crops exceeded that of all acres planted to small grains in 1994 (Appendix Figure 37).

Alfalfa harvest grew significantly during the 1940s and 1950s and has remained stable at 2.5 million acres (1.01 million ha) for the past 35 years (Appendix Figure 38). The number of hay acres has steadily declined during the past 50 years (Appendix Figure 39). Cattle production had significant increases from 1940–1975, with a small decline reported in all cattle numbers during the past 35 years (Appendix Figure 40).

Average cropland and pastureland values and rent prices differ across the state, with the highest values reported in the southeast portion of South Dakota. Land values and rent prices generally decrease as you move northwest across the state (Appendix Figures 41-42).

According to the U.S. Government Accountability Office (2007), an estimated 1.82 million acres (670,000 ha) of grassland was converted to cropland from 1982–1997. 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). Grassland loss continues to occur at an alarming rate and has resulted in widespread loss of available nesting and brood-rearing habitat for pheasants and other upland nesting birds.

Federal agricultural programs have historically and will continue to have a profound effect on the availability of habitat types and wildlife populations, in particular pheasants. No other collection of programs impacts the number of acres of quality habitat as significantly as the agricultural policies and conservation programs administered by the USDA. Recent federal Farm Bills have provided numerous conservation programs, such as CRP, and billions of dollars to address environmental issues on private land, and at the same time, create millions of acres of wildlife habitat.

Enacted in the 1985 Farm Bill, CRP is one of the most successful conservation programs for wildlife ever implemented across the nation and in South Dakota. Although the objectives of CRP were to address soil erosion and water quality, many wildlife species, in particular pheasants, rapidly responded to the undisturbed blocks of habitat

distributed across much of South Dakota's agricultural landscape. Landowners are attracted to CRP as a voluntary, incentive-based conservation program that meets the diverse land and risk management needs for many South Dakota producers. The enrollment of cropland into CRP grew rapidly during the late 1980s and CRP acres have remained relatively stable until large amounts of expiring CRP acres began reverting to crop production starting in 2007 and continuing today (general and continuous CRP practices; Appendix Figure 43).

The addition of grassland CRP as part of the CRP program in the 2014 Farm Bill has gained popularity throughout the nation, particularly in South Dakota. This voluntary working lands program emphasizes support for grazing operations, plant and animal biodiversity, and grassland under the threat of conversion to cropland by allowing producers to annually graze or hay acres enrolled. Although grassland CRP provides ecological and environmental benefits, it may not provide the same level of benefit more traditional CRP practices provide due to lower levels of residual cover available for the following nesting season. However, it is possible on certain years, these parcels could provide adequate nesting and brood rearing habitat under well managed grazing systems. As of July 2023, South Dakota had nearly 1.2 million acres (486,000 ha) enrolled in grassland CRP.

The previous 10-year average for CRP enrollment (excluding grassland CRP) in South Dakota is nearly 964,000 acres (390,000 ha) (Appendix Figure 44). As of October 1, 2022, there were 925,751 acres (375,000 ha) of CRP (excluding grassland CRP), with cropland being enrolled into numerous CRP conservation practices (CP). Approximately 101,098 acres (40,912 ha) (11%) of the total CRP acres currently in the program were enrolled under general CRP sign-ups (Appendix Figure 45).

The recent and future loss of expiring CRP acres is a major concern of wildlife managers in the Northern Great Plains. From 2007–2014, 556,209 acres (225,090 ha) of CRP expired in South Dakota, with many of these acres placed into row crop production. From federal fiscal years 2024–2028, an estimated 355,507 acres (143,868 ha) of CRP are scheduled to expire, thus having the potential to drastically affect pheasant and other wildlife populations (Appendix Figure 46).

In a study conducted by the Economics Department of South Dakota State University, current CRP contract holders were surveyed to estimate the number of CRP acres that are likely to revert to crop production and to determine the main factors that influence post-CRP land use decisions. According to Janssen et al. (2008), compared to all South Dakota producers, producers with CRP contracts are older, have more formal education, are less likely to have farming as their primary occupation, and have lower gross farm income. Over half of the CRP acres (57.8%) are held by either retirees or those who do not consider farming or ranching as their primary business or income. Most respondents indicated the re-enrollment options and market prices were the most important factors that will influence their decisions. In addition, CRP rental rates can play a significant role in landowner decisions. Current CRP County average soil rates can be found in Appendix Figure 47.

Based on respondent land use plans and re-enrollment preference and the amount of CRP acres held by each group, Janssen et al. (2008) project that 34.2% of respondent CRP acres are considered "very likely" to be enrolled, 28.8% of their CRP acres are

“somewhat likely” to be re-enrolled, and 37.0% of their CRP acres are “not likely” to be enrolled and would be converted.

Janssen et al. (2008) found that 94% of their respondents reported that CRP lands were used for hunting by themselves, their family and friends, or other hunters. Only 10% of respondents with 17% of CRP acres reported that fee hunting occurs on their land. In addition, approximately 60% of respondents consider wildlife and wildlife habitat as important factors in their decision of whether to re-enroll their CRP contracts.

Although pheasants will select and use other habitats, there is a strong connection between pheasants and CRP. Favorable weather conditions and habitat provided by CRP have allowed pheasant populations to reach levels not seen since the Soil Bank era of the mid-1960s. In 2008, the State Acres for Wildlife Enhancement (SAFE) was developed in cooperation with FSA and other conservation partners to provide a simple and attractive CRP practice with a focus on pheasants in South Dakota. As of April 2022, South Dakota had enrolled 107,000 acres (43,000 ha) of pheasant SAFE. SAFE is a great tool for landowners to enroll larger blocks of marginal cropland into continuous CRP and a method of re-enrolling expiring CRP acres.

For many decades, providing public pheasant hunting access has been an important component of GFP’s overall pheasant management plan. In 2022, 1.3 million acres (526,000 ha) of publicly accessible hunting land was enrolled in the WIA Program. While a large percentage of these acres are enrolled in western South Dakota, an estimated 400,000 (161,000 ha) acres are located within the core pheasant range. The number of acres enrolled in the program continues to remain steady (Appendix Figure 48) and an estimated 165,000 hunters per year have hunted pheasants on private land enrolled in the WIA Program from 1999–2008 and half of all hunters used this program in 2020. The WIA Program has strong ties to private land with CRP, as one of its founding purposes was to provide hunting access to land enrolled in CRP. Since 2004, a CRP retention bonus has been paid on WIA contracts to give landowners an incentive to keep their marginal cropland acres in CRP. In 2011, the amount of this retention bonus was increased from $1/acre/year to $5.00/acre/year in the SE part of the state and $2.50 in the rest of the state as the result of GFP receiving $1 million grant through USDA’s Voluntary Public Habitat Incentive Program. GFP was awarded another $1.5 million through the same program in 2015 to continue to offer this retention bonus on CRP as well as any other USDA conservation program that created undisturbed wildlife habitat on private land. In 2020, GFP was awarded another $2.175 million to continue to offer the retention bonus and in 2022 increased the retention bonus rate to $10/acre/year in much of the state.

The James River Watershed Conservation Reserve Enhancement Program (JRW CREP), a cooperative sponsored CRP practice with USDA, has enrolled as many as 82,000 acres (33,200 ha) within the JRW. This program allows landowners to voluntarily enroll cropland or re-enroll expiring CRP. The state provides an estimated 22% of the total program cost, which constitutes an incentive payment for providing mandatory public hunting access. In 2022, the Big Sioux Watershed Conservation Reserve Enhancement Program (BSRW CREP) was added as a cooperative sponsored CRP practice with the goal of enrolling 25,000 acres (10,100 ha) within the BSRW. Over 1,000 acres (400 ha) will be enrolled in BSRW by October 1, 2023.

Agricultural land use and CRP have the greatest impact on the availability and distribution of wildlife habitat in South Dakota. Additionally, GFP and other conservation partners provide an array of programs available to landowners to implement on-the-ground conservation practices. Extensive descriptions of these conservation programs can be found on the Private Lands page of GFP's website (https://gfp.sd.gov/landowner-programs/).

PHEASANT HABITAT BEST MANAGEMENT PRACTICES

As reviewed and described briefly above, pheasants thrive in landscapes with a mosaic of habitat types which meet their specific year-round life cycle needs. Pheasant populations are generally supported by a "three-legged stool" of habitat composed of nesting/brooding habitat, winter cover, and winter food. Within a landscape, the loss or degradation of only one of these habitat types can cause the population to decline or the three-legged stool to "tip over." Management of habitat for pheasants should strive to provide these three habitat types in favorable quantity, quality, and juxtaposition on the landscape. To maximize habitat management for pheasants, managers must determine what habitat is currently available and what is lacking. It is critical for managers to determine how existing habitat can be enhanced and what other habitat components can be added to improve on what is already there.

Provided below are broad recommended best management practices for pheasant habitat based on literature review and expert opinion which should be used to guide habitat management on private and public lands. For more in-depth information related to specific management practices, contact a local GFP private lands habitat biologist or PF Farm Bill biologist. More information is also available at https://gfp.sd.gov/landowner-programs/.

NESTING AND BROODING HABITAT

Although all habitat types are important, nesting/brooding habitat is considered the most limiting factor to pheasant populations. Grasslands, both managed (e.g., CRP, WPAs, GPAs) and working lands (grazing and hay lands) are the primary nesting habitat in South Dakota. Small grain fields, particularly winter wheat, also provide nesting habitat. Good nesting habitat is not necessarily good brooding habitat. Pheasant broods select for and are most successful in habitat which provides mobility at ground level, overhead concealment, and abundant insects. Grasslands in an early successional state have a diverse mixture of grass and broad-leafed plants such as wildflowers and "weeds"; these areas represent excellent brood rearing habitat. Aggressive management is often necessary to maintain early successional habitat. Early successional habitat is also excellent nesting habitat.

Nesting and Brooding Habitat Best Management Practices

- Provide blocks of nesting habitat with a minimum size of 40 acres (16 ha) with 80–160 (32–64 ha) acres or larger being ideal. Nesting hen pheasants select for and are most successful in large blocks of un-fragmented nesting habitat.

- Use high diversity of native species or non-invasive introduced grass species for upland habitat establishment. Make restorations as diverse as possible,

considering logistical and financial constraints, while containing native wildflowers and other native forbs.

- Manage existing upland habitat by haying, grazing, prescribed fire, disking, interseeding of forbs and chemical application to encourage early successional habitat and discourage invasion of exotic grasses (e.g., smooth brome and Kentucky bluegrass).

- Where brood habitat is thought to be limiting, establish "brood plots" containing predominantly broad-leafed plants, such as wildflowers.

- Control noxious weeds by spot treating infested areas in lieu of blanket spraying, when possible, to minimize loss of beneficial broad-leafed plants. Where applicable, use selective herbicides in lieu of broad-spectrum herbicides.

- As necessary, use 2–3 years of farming as seedbed preparation for grassland restoration efforts of non-native grasslands.

- Conduct haying operations after the primary nesting season (August 2 or later). In lieu of annual haying, nesting habitat could be enhanced by harvesting forage on every other year or longer rotation.

    - When authorization of emergency haying and grazing of CRP occurs, it is recommended haying occurs on only 50 percent of the field over a 2-year period in fields 30 acres (16 ha) or larger. This is intended to maintain some nesting and winter cover on most CRP contracts every year.

- Remove non-beneficial woody habitat (not providing adequate thermal cover) from uplands to reduce available perching/nest sites for raptors and to reduce nest depredation from edge-oriented mammalian predators. When non-beneficial woody habitat is removed, replace with a high diversity native, or non-invasive introduced grasses, and forbs.

- Remove abandoned buildings within and near nesting habitat to reduce mammalian predator habitat.

- Include small grains, particularly winter wheat, in cropping rotations to provide alternative nesting habitat.

Roadside Grassland Best Management Practices

- Use high diversity native or non-invasive introduced grass species mixes containing native wildflowers and other native forbs when re-establishing roadside vegetation after surface disturbing activities.

- Conduct haying operations after the primary nesting season (August 2 or later)

    - Pheasant production from otherwise annually hayed roadside habitat could be enhanced by harvesting forage on every other year or longer

rotation with a harvest date of August 2 or later. This harvest regime would provide residual cover during the year of harvest to encourage pheasant nesting earlier in the season.

WINTER COVER

Pheasants require shelter from the elements during winter which can be severe in South Dakota. Substantial pheasant mortality caused by exposure to the elements has been documented during harsh winter storms. Providing adequate winter cover such as high-quality woody habitat, emergent wetland vegetation (cattail sloughs), or tall warm season grasses can improve pheasant winter survival. Pheasants have been found to move 5–10 miles (8–16 km) from summer ranges to high quality winter cover. Prioritizing the retention of emergent wetland vegetation should be of utmost importance to promote the winter survival of pheasants.

Winter Cover Best Management Practices

- Establish and maintain woody habitat comprised of 8–16 rows composed of primarily low growing trees and shrubs. Narrow woody habitat (< 8 rows) may be attractive to pheasants, but they may not provide adequate protection during harsh winter storms and may contribute to pheasant mortality.

- Prioritize new woody habitat plantings to areas where current winter cover is lacking within 5 miles, or current woody species are nearing the end of their lifespan.

- Renovate or replace existing woody habitat, through the addition of low growing trees and shrub rows, that does not meet the appropriate number of rows and configuration to provide thermal cover.

- Locate new woody habitat plantings in a manner that does not fragment existing uplands and does not circumvent potential for establishment and management of large blocks of intact upland nesting cover or wetland/grassland complexes. Refrain from locating new woody habitat plantings adjacent to emergent wetland vegetation.

- Preserve wetland hydrology and retain emergent wetland vegetation that provide important winter cover to pheasants.

- Where high quality winter cover such as emergent wetlands (cattail sloughs) and woody habitats are lacking, 40 acre (16 ha) or larger blocks of warm season grasses, such as switchgrass, big bluestem, and Indiangrass can provide marginal winter cover.

WINTER FOOD

Pheasants primarily rely on waste grain such as corn, wheat, and sorghum for winter food. Pheasants also utilize food plots of un-harvested crops when available. Pheasants rarely starve to death, but management for winter food can increase over winter survival of pheasants by reducing predation rates. Pheasants using food plots

have also been found to have improved body condition. Food plots can function as marginal winter cover when certain forage species are used.

Winter Food Best Management Practices

- Provide food plots of un-harvested corn, sorghum, millet, sunflowers, or similar forage crop. Soybeans provide minimal nutritional value to birds and are not recommended for use in food plots.

- Food plots should be of adequate size to provide food throughout the winter. Where use by deer is expected to be low, food plots of 1-3 acres (0.4 – 1.2 ha) may be all that is necessary.

- Establish food plots near and preferably on the southeast side of existing winter cover. Food plot use by pheasants is increased when located near winter cover and when the surrounding landscape contains pheasant nesting/brooding habitat.

- Avoid planting small linear food plots if they are not adjacent to adequate winter cover.

- Locate food plots in a manner that does not fragment existing uplands and does not circumvent potential for establishment and management of large blocks of intact upland nesting cover or wetland/grassland complexes.

- Where noxious weeds are not a historical problem, food plots may be replanted on every other year rotation, thus encouraging the growth of beneficial broad-leafed plants during the second growing season after planting. This provides both winter foods from leftover forage and “weed” seeds as well as providing brooding habitat.

- Food plots established with annual cover crop type plantings should be considered as they can provide winter food in addition to brood habitat. Cover crop food plots should be planted in conjunction with tall forage crops, like corn and sorghum because they may not provide adequate food in a severe winter.

THE IMPORTANCE OF CRP

The CRP represents one the most successful conservation programs ever implemented in the United States offering private landowners the opportunity and incentive to enroll cropland into perennial cover. Particularly, the success of the program in the Midwest stems from the landscape-level implementation of grassland establishment. This grassland habitat offers essential nesting, brood-rearing, and winter habitat for pheasants. Pheasant and other upland nesting bird populations have thrived in response to the CRP and other cropland retirement programs. Historic population indices shed light on this correlation with historically high enrollments of CRP and other cropland retirement programs where pheasants are located on the landscape (Appendix Figure 49). An increase in pheasant abundance was not witnessed when the CRP was first implemented due to the location of these acres in respect to existing pheasant range. Many of the early CRP acres were in western South Dakota where existing

pheasant densities were relatively low. When CRP shifted to eastern South Dakota, the traditional stronghold for pheasants, a substantial increase in pheasant abundance occurred. This habitat type established on the landscape is the cornerstone for supporting good reproduction and impressive pheasant numbers.

Since authorized in 1985, the CRP has undergone many policy changes and modifications to address specific resource needs and program limitations. While we still recognize the CRP as the most important conservation program for pheasants in South Dakota, GFP believe changes to program policies could always benefit an already strong program. To ensure the CRP is providing the greatest potential benefit to wildlife in addition to natural resource concerns GFP is committed to participating in state and national technical committees related to CRP policy.

STATEWIDE PHEASANT INITIATIVES

PHEASANT HABITAT SUMMIT

On December 6, 2013, former South Dakota Governor, Dennis Daugaard, hosted the Governor's Pheasant Habitat Summit in Huron to help identify causes for the decline and discuss potential solutions. More than 400 people attended and offered hundreds of suggestions for addressing pheasant habitat. An additional 1,000 people from around the country participated in the live video webcast. Following the Summit, on January 7, 2014, former Governor Daugaard announced the formation of the Pheasant Habitat Work Group (PHWG). A complete list of this working group is found in Appendix 1. To view the full report and more information related to former Governor Daugaard's Pheasant Habitat Summit including updates on the progress of each recommendation, visit: http://habitat.sd.gov/resources/habitatsummit.aspx

HABITAT PAYS INITIATIVE

Habitat Pays is an initiative administered by South Dakota Departments of Game, Fish and Parks, and Natural and Environmental Resources to connect farmers and ranchers to the appropriate habitat resources and help them implement wildlife habitat where it makes the most sense to do so. Habitat Pays is a direct result of former Governor Daugaard's 2013 Habitat Summit. Habitat Pays is designed to provide more information and education to assist landowners in designing, developing, and funding habitat on their land, and has continued this vision to date. Working directly with habitat advisors who possess the knowledge of federal, state and local programs, landowners can find the right programs to meet their personal habitat and land use goals. To view the Habitat Pays website, visit: http://habitat.sd.gov/.

SECOND CENTURY INITIATIVE

Pheasant hunting in South Dakota is a major economic source for South Dakota, as well as a significant contributor to tourism. Money that is spent on this activity makes a difference in many rural communities for families and small businesses. The heritage associated with pheasant hunting is deeply engrained in South Dakota's culture. To ensure this heritage lives on, Governor Kristi Noem committed to conserving South Dakota's natural resources by proactively enhancing and establishing habitat through the Second Century Initiative, which launched in 2019.

This initiative is a strategy to increase resources for habitat management. As part of this plan, a $1 million state investment was implemented to expand habitat and pheasant hunting opportunities. The South Dakota Legislature approved this bill so these dollars can be used to leverage additional funds from private donations and federal conservation programs. For more information about this initiative, visit: https://gfp.sd.gov/second-century-initiative/.

Additionally, on April 1, 2019, the South Dakota Game, Fish and Parks launched the Nest Predator Bounty Program. The primary goals of this program were to help increase education, awareness in the activity of trapping, getting youth and families outside, and enhancing duck and pheasant nest success. Participation is open from March 1 to July 1 for resident youth under 18 and April 1 to July 1 for all South Dakota residents, or until the maximum annual payout of $500,000 is reached. Eligible species to be taken include raccoon, striped skunk, badger, opossum, and red fox. For more information about this program, visit: https://gfp.sd.gov/bounty-program/.

A Hunt for Habitat was also established under the Second Century Initiative to raise money for habitat efforts across South Dakota through raffle licenses. To learn more, visit https://gfp.sd.gov/hunt-for-habitat/. A crowdsourcing effort for habitat solutions launched in February 2019 and sparked a conversation that led to over 750 emails and an online dialogue that had over 300 group members thinking, talking, and exploring habitat solutions. Results of this effort can be found here: https://gfp.sd.gov/news/detail/1458/.

PHEASANT RESEARCH

The following is a summary of past pheasant research trends, major highlights or findings conducted in South Dakota. This is by no means an exhaustive review of past research but does include an extensive list of references of pheasant research in South Dakota in the Literature Cited & Publications Related to Ring-necked Pheasants in South Dakota section found on page 29. Some of these publications can be found at the GFP website http://gfp.sd.gov/wildlife/management/research-projects/default.aspx and at the South Dakota State University, Department of Natural Resource Management website https://www.sdstate.edu/natural-resource-management/research-publications-books-theses-dissertations.

Research on pheasants in South Dakota began full swing in the 1940s and 1950s with the primary concerns being survey techniques (Banko 1948; Dahlgren 1956, 1959; Kimball 1949; Nelson 1949; Smith 1949, 1950, 1951, 1952; Trautman 1950*a*, 1952a, 1955) and winter habitat requirements (Bue and Nelson 1948, Bue 1949*a*, 1949*b*; Kirsch 1950*b*; Nelson 1950*a*; Norstog 1948). By the 1970s, biologists were concentrating more on reproduction and nesting ecology (Kuck et al. 1970, Olson and Flake 1975) and habitat use and selection (Grode 1972, Linder 1972, Fedeler 1973). By this time, managers had realized that pheasants were truly a product of their environment, more specifically, habitat. Therefore, research continued to focus on influences of habitat (Craft 1986, Gabbert et al. 1999, Eggebo et al. 2003, Leif 2005, Schilowsky 2007) and land management programs on pheasants over the past 20–30 years (Trautman 1965c, Keyser 1986, Eggebo et al. 2003).

Many different survey techniques have been used in South Dakota, including crowing counts, rural mail carrier surveys, brood surveys, sex ratio counts, hunter questionnaires

and hunter bag checks (Trautman 1982). Pre- and post-hunt population estimates in South Dakota were largely determined through August Roadside brood surveys, winter sex-ratio counts, and hunter questionnaires using a formula presented by Hickey (1955) and first used by Dahlgren (1963) in South Dakota.

Nesting habitat selection has also been well documented in South Dakota with most studies indicating that pheasants select idle, herbaceous grassland cover for nesting (Trautman 1965b, Fedeler 1973, Olson and Flake 1975, Craft 1986, Schilowsky 2007). Olson and Flake (1975), Craft (1986), and Leif (2004) documented the importance of roadside ditches as pheasant nesting cover and Hanson and Progulske (1973) stated that roadsides were ranked as the second most important habitat to female pheasants during all months of the year. Elliott and Linder (1972) found that undisturbed uplands and wetlands provided by state-owned lands produced 50% of all pheasant chicks in northeastern South Dakota. They also found that late-mowed alfalfa and small grains were important nesting habitats on private lands. Grode (1972) monitored penned female pheasants and discovered they selected alfalfa over warm season grasses as nesting cover. Similarly, Hanson and Progulske (1973) concluded that alfalfa was the most preferred habitat of female pheasants. Eggebo (2003) documented higher numbers of broods in idle cool-season grasses than in idle warm-season grasses. Additionally, the importance of set-aside land programs as nesting habitat has been documented by Trautman (1965b; Soil Bank Cropland Retirement Program), Keyser (1986; Pheasant Restoration Program), and Eggebo et al. (2003; Conservation Reserve Program). Pauly (2014) investigated the use of winter wheat by nesting hen pheasants. Pheasants selected CRP grassland at a higher rate than winter wheat, but nest success was similar. Pauly (2014) concluded winter wheat is an important pheasant nesting habitat.

CRP is an important habitat source for pheasants. CRP's size and configuration on the landscape are important components of managing for quality nesting/brood rearing habitat (Clark et al. 1999). Harsh (2021) found pheasant abundance was correlated by landscape configuration indicating managers should focus on providing a heterogenous landscape of CRP, small grains, and a contiguity of grassland patches to improve nest survival. Solem and Runia (2020) investigated how patch size of CRP (~ 8 ha vs ~32 ha) and landscape configuration influenced survival of artificial nests. Their findings indicated both patch sizes provided adequate levels of nest survival, but nest survival was positively related to an increasing distance to the edge of the patch. A greater distance to the edge of the patch provided higher nest survival indicating the interior portions of the larger patches enhanced nest survival compared to the smaller patches strengthening the notion that managers should continue to advocate for large patches of undisturbed nesting cover to reduce predation risks (Solem and Runia 2022).

In South Dakota where winter weather can often be severe, researchers have found that having available winter habitat may be just as important as quality nesting habitat. Leif (2005) found that male pheasants selected for idle herbaceous habitats followed by woody cover. Similarly, Schilowsky (2007) found that female pheasants selected for idle herbaceous and woody habitats more than they were available during late winter. Craft (1986) found that female pheasants selected for wetlands in the fall and woody cover in the winter. Fedeler (1973) found male pheasants selected for areas of harvested corn and woody cover in the winter. Schneider (1984) found that wetlands did the best job of reducing wind velocity at roost sites and that coniferous shelterbelts provided more favorable roost sites than deciduous shelterbelts due to higher temperatures and

decreased wind velocity. Kauth (2020) also found perennial vegetation, such as wetlands, were critical to overwinter survival. Pheasant survival was also negatively associated with other land use types than perennial cover with mortality declining as a function of distance to potential raptor perch (Kauth et al. 2022).

Pheasants are short-lived species (Bever 1962) with high annual turnover and reproductive rates. Predators have the most profound effect on pheasants by destroying nests (Olson and Flake 1975, Leif 2004) and killing adult birds (Gabbert et al. 1999, Leif 1996, Leif 2003). Leif (1996) recorded a 46% mean annual survival of female pheasants with survival being the lowest during May. Leif (1996) also found no significant difference in survival between incubating and non-incubating females or females with broods and females without broods. Leif (2003) documented a 31% mean annual survival of male pheasants with predators being the primary cause of mortality. In addition, he determined that although mammalian predators killed most pheasants during the breeding season, avian predators were the main predators during the winter. Researchers have found that severe winters often lower survival not by the weather conditions themselves, but by causing greater exposure of pheasants to predators (Gabbert et al. 1999). However, Bue and Nelson (1948) concluded that if winter storms occur at night while pheasants are roosting, losses could be severe.

Food plots are often planted for pheasants in South Dakota, with the majority of these being corn and sorghum. Crookston (1991) and Larsen et al. (1994) found that pheasant selected for food plots adjacent to dense wetland habitats. Bogenschutz (1992) found that wild foods and soybeans provided lower quality diets than corn or sorghum based on fat reserves and gut size of female pheasants. In addition, he found that female pheasants in areas without food plots were in poorer physical condition than those found in areas with food plots. Gabbert et al. (2001) documented higher survival of female pheasants whose home ranges contained a food plot compared to females whose home ranges did not contain a food plot.

Pheasants typically spend most of their lives in a relatively small area but can move long distances when needed (e.g., disperse to better winter habitat during severe winters). Bue and Nelson (1948) found that pheasants seldom traveled farther than 1,475 feet (450 m) from loafing cover in the winter, and daily movements seldom exceeded 900 feet (275 m). Ruth (1972) found no significant effect of weather, including precipitation, wind, and barometric pressure, on daily movements of pheasants. Mean annual home range of female pheasants studied by Hanson and Progulske (1973) was 89 acres (36 ha). Gabbert et al. (2001) estimated a 52 acre (21 ha) median winter home range and Kuck et al. (1970) reported a mean home range of 29 acres (12 ha) during the nesting season for female pheasants. Fedeler (1973) studied male pheasants using radiotelemetry and discovered that individuals used less than 98 acres (40 ha) annually. He also found that they made shifts in their center of activity throughout the year, but the location of their home ranges seldom shifted. Leif (2003) found that the home range of male pheasants averaged 44 acres (18 ha) for breeding males and 11 acres (45 ha) for males without established territories. Additionally, Leif (2003) discovered that male pheasants dispersed a mean distance of 1.9 miles (3 km) from winter capture locations to the center of their breeding season home ranges.

Research conducted in South Dakota comparing wild pheasants to pen-raised pheasants indicate stocking of pen-raised pheasants is neither economical nor recommended. Grode (1972) discovered that raising pheasants by allowing wild males to breed with pen-raised females resulted in low rates of reproduction. Leif (1994)

documented significantly lower survival, nest success, and brood rearing success of pen-reared females compared to wild females.

Runia and Solem (2014, 2016, 2017, 2020) investigated spent lead shot availability, ingestion, and acute effects on pheasants. Within licensed shooting preserves, spent lead shot was most abundant where shooting was concentrated at the end of linear habitats. About 4% of wild pheasants harvested on licensed shooting preserves had ingested lead pellet(s) and only 1% of wild pheasants harvested from non-preserve areas had ingested lead pellet(s). When captive pheasants were gavage-fed 1 and 3 lead pellets, no mortalities were observed during a 21-day experiment. An additional study involving captive pheasants was completed gavage feeding 5, 10, 20, and 40 lead pellets. No mortalities were documented in this 21-day experiment even though liver-lead accumulation levels associated with acute lead toxicosis and death for a variety of avian guilds were observed. Although wild pheasants ingest spent lead pellets, it appears they are less susceptible to the acute effects of lead poisoning in comparison to mourning doves and waterfowl.

Sundall (2020) investigated the effects of the neonicotinoid, Clothianidin, on pheasant survival and reproduction in a pen trial setting. Pheasants were gavage fed 2, 15, and 75 treated corn seeds. Avoidance of treated seed, lower survival probability, lower chick survival, and lower nest initiation were observed for higher levels of Clothianidin.

PHEASANT ECONOMICS

According to a survey of resident and non-resident hunters by Gigliotti (2004), hunters reported that “time spent with friends and family, and the overall outdoor experience”, were the top reasons why they enjoyed pheasant hunting in South Dakota. Whatever their reasons, the activities and expenditures associated with pheasant hunting have a significant impact on local economies across the state.

For motels, restaurants, convenience stores and other businesses, the annual pheasant season has a profound impact on local communities. Using survey statistics from the Economic impact of hunting, fishing, trapping, boating, and wildlife viewing in South Dakota (Southwick Associates 2017) and an annual inflation rate (U.S. Bureau of Labor Statistics 2022), the estimated economic impact attributed to pheasant hunting was $257.3 million in 2022. The 10-year average (2013-2022) for total pheasant hunting related expenditures was $206.5 million (Appendix Figure 50).

Resident and non-resident license sales have remained relatively steady during the past 10 years (Appendix Table 2). The revenue generated through license sales provides income for GFP to develop and manage wildlife habitat and to provide public access opportunities for hunters. The relationship between pheasant populations and license sales is obvious; therefore, high pheasant populations generally indicate strong license sales, thus a budget that allows GFP to invest in habitat and public access for pheasant hunters and to meet the goals of other conservation efforts.

The annual Governor’s Pheasant Hunt markets the quality of life and economic opportunities available in South Dakota to business leaders from across the nation. Habitat development for pheasants has other indirect economic benefits, such as expanded opportunities for bird watching and the reduction in flooding and soil erosion. In addition, revenue generated from the sales of small game licenses is used to work

with private landowners in developing and managing wildlife habitat and to provide and improve upon lands available for public hunting opportunities.

ISSUES, CHALLENGES AND OPPORTUNITIES

The management of pheasants in a dynamic agricultural environment creates numerous challenges for wildlife managers. While not an exclusive list, the most important issues are described below. They are the foundation for the objectives, and strategies articulated in the South Dakota Ring-necked Pheasant Action Plan and must be addressed for the plan to be successfully implemented.

LOSS OF HABITAT

The increasing loss of habitat has the potential to adversely affect pheasants and other wildlife populations in South Dakota. According to Wright and Wimberly (2013), approximately 1.3 million acres (526,000 ha) of grassland was converted to cropland across the Western Corn Belt from 2006–2011. Reitsma et al. (2014) reported a 1.84-million-acre loss of grassland from 2006–2012, mostly in the pheasant belt of eastern South Dakota. Wildlife managers, in close cooperation with outdoor enthusiasts and the public, need to find solutions to address the recent and anticipated loss of CRP, conversion of native grassland to cropland, wetland drainage, and other issues adversely affecting our natural resources and wildlife habitat.

FEDERAL FARM BILL PROGRAMS

The farm bill provides a variety of conservation programs with CRP being the most important to pheasant habitat in South Dakota. The 2018 farm bill increased the national acreage enrollment cap from 24 million to 27 million acres, however continuous and general CRP acreage enrollment in South Dakota declined by about 100,000 acres from 2018 to 2023 from just over 1 million acres to a little more than 900,000 acres. A third type of CRP was created in the 2014 farm bill for existing working grasslands, and it has become very popular in South Dakota with over 1.2 million acres enrolled in 2023. These acres can provide pheasant habitat as well, but do not offer the same level of benefit to pheasants as acreage enrolled through continuous or general CRP. A new farm bill will need to be passed to reauthorize CRP enrollment for another 5 years after September 30th, 2023. There will be changes to CRP in a new farm bill that hopefully make it more appealing for landowners and ag producers to enroll more land in general and continuous CRP. In addition, the use of EQIP and ACEP should be promoted to address other resource concerns while also providing pheasant habitat.

To maximize the impact of federal conservation programs, GFP should continue to complement CRP and other programs by providing additional incentives where appropriate and designing other habitat programs to increase the wildlife habitat value of selected federal Farm Bill programs. GFP providing technical assistance to not only producers/landowners implementing conservation, but to State Technical sub-committees that recommend/develop guidance and policy to USDA is critical to the continued success of CRP. GFP should continue to advocate for proper management and implementation CRP and provide input on proposed policies for future Farm Bills.

LANDOWNER DEMOGRAPHICS

South Dakota landowner demographics are changing and have the potential to impact private lands management and consequently could influence wildlife habitat and populations. The number of farms in the state has declined in half since 1960 while the

size of farms has increased, although this trend has flattened over the last decade (USDA NASS 2022). In many areas, smaller "traditional family farms" are being replaced by agri-business where more intensive farming practices may result in decreased habitat. In addition, South Dakota has seen an increase in recreational or non-traditional land buyers seeking a place to hunt or otherwise enjoy the outdoors. This surge in recreational landowners has created thousands of acres of quality wildlife habitat but has the potential to reduce traditional access to wildlife populations by the public.

BUDGET AND FUNDING SOURCES

The primary funding source for the GFP's private land habitat programs is from hunting licenses and Wildlife Restoration (Pittman-Robertson) funds. Conservation programs available through federal farm programs have placed numerous acres of habitat on marginal cropland acres. As a result of prospering wildlife populations, in particular pheasants, hunting license sales have provided adequate funding to support habitat and public access programs that complement CRP and other habitat programs. While traditional funding sources has provided a reliable source for private lands project funding, in recent years GFP is working on expanding its habitat funding by working collaboratively with conservation entities and organizations through a variety of funding mechanisms such as the North American Wetlands Conservation Act (NAWCA), National Fish and Wildlife Foundation (NFWF), and the Regional Conservation Partnership Program (RCPP).

ALTERNATIVE NESTING SOURCES

Although undisturbed grassland, such as CRP, has been shown to be the most beneficial to pheasant production, winter wheat has been shown to provide important nesting habitat in cropped landscapes (Pauly 2014). Winter wheat remains relatively undisturbed during the nesting season and offers overhead concealment like perennial grasses. Programs or initiatives that promote the use of winter wheat in cropping rotations could increase the availability of this alternative nesting habitat.

Spring- and fall-seeded cover crops as part of a cropping rotation were investigated as potential sources for alternative nesting cover for pheasants within predominately agricultural landscapes (Annis 2019, Shirley and Janke 2023). Limited residual and concealment cover, and timing of termination to plant row crops were some of the limiting factors associated with pheasant nesting use. Although cover crops have benefits to many biological aspects, it was not a tangible nesting source for pheasants and not a likely solution to reduce long-term population declines (Annis 2019, Shirley and Janke 2023). Their utility could be beneficial to pheasants as pseudo-brood habitat or food plots if certain species are planted in them.

CONSERVATION PARTNERS

To complete habitat projects on private lands and make recommendations for federal agricultural policies, GFP participates with other conservation partners on numerous habitat-based initiatives and projects. It is important that GFP continues to maintain existing partnerships and seek new conservation partners to meet the challenges and opportunities of working with private landowners.

PUBLIC HUNTING ACCESS

The availability of public hunting opportunities is another significant priority for GFP wildlife managers and pheasant hunters. South Dakota's WIA Program has been very successful for hunters and landowners alike. The WIA Program has been attractive to

private landowners, and efforts continue to improve the availability and quality of private land enrolled into the program. Keeping program guidelines adaptive to meet the needs of landowners will be important for future growth of this program.

OUTREACH & EDUCATION

Efforts to inform the public and landowners on the proper management of pheasant habitat and available programs are critical to maintaining desired pheasant populations. Increased collaboration between private, state, federal, and non-governmental agencies is essential, along with the dissemination of important information through public meetings, workshops, and other media outlets.

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APPENDIX

Appendix 1. Pheasant Habitat Summit Work Group Members and Recommendations.

COMMITTEE MEMBERS:

Pam Roberts, Pierre (Chair) - retired Secretary of Department of Labor and Regulation

Barry Dunn, Brookings - Dean, College of Agriculture and Biological Sciences, SDSU

Tim Kessler, Aberdeen - Pheasants Forever National Board Vice Chair

Mary Duvall, Pierre - District 24 State Representative

Jason Frerichs, Wilmot - Farmer, Senate Minority Leader, District 1 State Senator

John Cooper, Pierre - GFP Commission Chair, former GFP Secretary

Jan Nicolay, Chester - former State Representative, conservation advocate

Jeff Zimprich, Huron - USDA-NRCS State Conservationist

Doug Deiter, Faulkton - Farmer

Jeff Vonk, Pierre - GFP Secretary

Lucas Lentsch, Pierre - SD Secretary of Agriculture

Nathan Sanderson, Pierre – Governor Daugaard's Policy Advisor for Agriculture and GFP

RECOMMENDATION # 1: Facilitate greater collaboration among conservation partners to better utilize available resources for improving habitat management.

There are many conservation partners operating programs that benefit wildlife habitat. However, based on feedback received from the public before, during, and after the Pheasant Habitat Summit, these varying entities have efforts that are not coordinated. As a result, implementation of current programs is inconsistent and inefficient.

To improve visibility of the available programs and make it easier for landowners to understand the full suite of available options, we recommend that GFP host a meeting of the various conservation partners to establish a statewide action plan for coordinated implementation of existing programs. The initial meeting should be followed by annual meetings to facilitate a long-term shift toward better coordination and delivery of conservation efforts on public and private lands. This collaboration should improve efficiency and result in more marginal acres put into existing habitat programs.

One key outcome of this collaboration should be the development of a "Habitat Central" website that includes a complete summary of available programs. This website should be a standalone entity similar to boards and commissions, not a subset of any state

department's website. It could feature information on practical measures landowners can implement – planting cover crops, utilizing flush bars for mowers and stripper heads for combines, integrating winter wheat into crop rotations, and others – as well as contact information for Farm Bill biologists, conservation districts, and other resources for implementing those measures on the land. The website may also feature success stories and testimonials from landowners who have applied these measures and participated in the various programs.

A second outcome could be the development of a digital mapping tool, like the one created by the South Dakota Department of Environment and Natural Resources as part of its Oil & Gas Initiative (http://www.sdgs.usd.edu/sdoil/). This digital mapping tool would show landowners which acres on their farms would be best suited for habitat development. The goal of the tool would be to help farmers examine their farm's topography and geography, while incorporating production history and input costs to determine the net financial outcomes for each acre.

Pheasant habitat would be better served if each producer had access to a tool allowing them to analyze farm-specific data that clearly demonstrated the financial implications of implementing conservation practices on marginal acres, which exist on almost all farms. This "farm the best, conserve the rest" principle can best be implemented when producers have information on all the options, and the financial implications of those options, readily available.

During the PHWG's discussions, many noted the need to update and modernize the delivery of habitat programs, so they are financially competitive, voluntary, and easy for the public and landowners to understand. One initial way to begin this collaboration is through the newly established USDA-NRCS Regional Conservation Partnership Program in the Prairie Grasslands Region "Critical Conservation Area."

The Regional Conservation Partnership Program (RCPP) promotes regional coordination among NRCS and its partners to deliver targeted conservation assistance to landowners. In April, the PHWG recommended that Governor Daugaard submit a letter to USDA Secretary Tom Vilsack, requesting that the Prairie Pothole Region be designated as a "Critical Conservation Area." He did so and Secretary Vilsack made the requested designation.

As a result, additional funding opportunities become available through the RCPP. In mid-July, a collaborative group of conservation partners applied for a landscape-scale "Critical Conservation Area" habitat program to benefit pheasants and a variety of other prairie wildlife. Opportunities to utilize RCPP should be available in future years as well. We encourage the groups collaborating on RCPP to focus additional funding requests on Farm Bill biologists, conservation district technical assistance, the one-stop-shop website, the digital mapping tool, and innovative financial assistance programs – all of which provide direct assistance to implementing conservation practices on the ground.

The RCPP holds great promise for delivering a wide array of incentive-based, conservation programs to private landowners and public land managers. These types of efforts provide a mechanism for bringing all entities together to achieve common habitat goals and we strongly encourage further collaboration in this area.

RECOMMENDATION #2: Establish a long-term, dedicated conservation fund and appropriate $1 million in one-time funds to bolster private fundraising efforts.

Perhaps the most common recommendation from the public has been to increase dedicated funding for conservation. It's an obvious suggestion and one the PHWG discussed at every meeting. It is also the simplest; many would contend that the most effective way to improve pheasant habitat would be to expand the suite of current conservation programs with an ongoing funding source. This approach has merit because there is, and likely will always be, far more demand for conservation programs than available funding.

The difficulty lies in the obvious: where does the money come from? The public offered numerous suggestions and PHWG members debated them at length. Some of the options included: sales tax increases, additional support by agricultural commodity checkoff organizations, expanding the tourism tax and dedicating a portion to habitat, creating a specialty license plate for conservation, removing current agricultural sales tax exemptions, increasing hunting license fees, changing the way property taxes are assessed on grasslands and shelterbelts, and many others.

Overall, additional funding will likely be the main driver for improved conservation efforts. Because most conservation activities are readily scalable, a broad range of funding amounts could be utilized effectively. We encourage the Governor and the Legislature to evaluate these and other suggestions during the 2015 Legislative Session to explore the potential for establishing an ongoing, dedicated funding source targeted at wildlife conservation and pheasant habitat on public and private lands.

In the interim, we recommend establishing a dedicated conservation fund that can be a repository for financial contributions from all sources, public and private, while also overseeing the distribution of funds solely for conservation purposes. The fund must be independent of other funds and able to accept tax-deductible contributions from any and all willing entities. In addition, the fund should focus on enhancing existing conservation programs on public and private lands, not purchasing land.

One option could be to coordinate with the South Dakota Community Foundation to establish the "South Dakota Conservation Fund," dedicated to providing financial resources directly to conservation efforts, including pheasant habitat. The South Dakota Conservation Fund should be managed by an executive director charged with leading the fundraising efforts and overseen by a board of directors tasked with distributing the funds to conservation activities.

Except for the Coordinated Natural Resources Conservation Fund, which offers competitive grants to conservation districts, there is no dedicated fund providing broad support to conservation efforts in South Dakota. While many conservation partners have their own funding sources, it seems clear that individuals, agriculture organizations, companies, main street businesses, and others do not have a single entity to which they could provide funding support to directly benefit broad-ranging conservation efforts.

To launch the fund and bolster related private-sector fundraising efforts, we further recommend that the Governor and Legislature appropriate at least $1 million in onetime funds to conservation in 2015. Additional one-time funds could also be added in future years, as available. This appropriation could be used to match private donations

collected through an aggressive private-sector fundraising campaign. Private-sector funding could come from a variety of sources, including agricultural seed, chemical, and manufacturing companies; sporting goods stores; ammunition and arms manufacturers; hunting preserves; tourism businesses; and others.

RECOMMENDATION #3: Develop and implement the South Dakota Conservation Certification Program.

Conservation practices benefit soil health, improve, and protect water quality, and provide habitat for all species of wildlife, including pheasants. Conservation practices can also provide economic benefits for farmers and ranchers by reducing inputs on marginally productive cropland and managing livestock use on grazing land.

We recommend that the South Dakota Department of Agriculture, in cooperation with South Dakota State University and NRCS, establish the Conservation Certification Program to reward producers who maintain a certain base-line level of conservation. The certification could also recognize individuals, businesses, and other conservation champions using the Nebraska Master Conservationist program as a model. http://owh.com/community/master-conservationist-awards/

The program must be voluntary and designed in a manner that respects producer property rights. The program should also be created in close collaboration with a wide variety of stakeholders, including conservation partners and landowners, who would provide direct input into the guidelines, criteria, and scope of the program. This greater level of grassroots input should lead to more ownership by producers and thus, a higher level of adoption.

The program would “certify” that a producer is operating in such a manner that provides certain public environmental benefits and may be used to provide pre-defined benefits for producers enrolling in conservation programs. For example, producers could earn pre-qualification in specific programs if certain existing conservation practices are met, ideally in programs developed through the conservation partners’ statewide action plan.

In developing this program, SDSU and SDDA should collaborate with the NRCS State Technical Committee to establish the means for Conservation Certified farmers and ranchers to receive priority ranking points for USDA conservation programs. Farmers and ranchers receiving Conservation Certified status could receive a preferred position when applying for conservation incentives through programs like the Environmental Quality Incentive Program (EQIP) and the Conservation Stewardship Program (CSP). In addition to demonstrating real value to producers who participate, the Conservation Certified program could result in more habitat on all acres, stemming the conversion of grasslands to other uses.

One of the best ways to promote conservation practices is to provide real life examples. South Dakota has several individual award programs that recognize good land stewardship; however, these award programs often only recognize the “winners,” not all who should be acknowledged for their efforts. Additionally, the recognition is often a one-time event with no future follow-ups. The South Dakota Conservation Certification program could change that approach.

RECOMMENDATION #4: Create a multi-part "Habitat Pays" education and promotion series for inclusion in a variety of existing publications.

Many of the comments submitted to the PHWG refer to the economic benefits of pheasant hunting, particularly in rural areas. While agricultural production remains the key economic driver in many South Dakota communities, pheasant hunting plays an important role in the economic health of small-town businesses, especially motels, convenience stores, and cafes.

While many South Dakotans appreciate the social, cultural, and economic benefits of pheasant hunting, the importance of high-quality habitat for pheasant production and the associated impact its loss has on all citizens is much less understood. As a result, many individuals and entities that directly benefit from pheasant habitat are not actively engaged in ensuring its long-term viability.

To educate all South Dakotans about the benefits of pheasant habitat and begin to generate additional financial resources to support it, we recommend that the South Dakota departments of Game, Fish and Parks; Tourism; Agriculture; Education; and the Governor's Office of Economic Development collaborate with SDSU Extension, Ag in the Classroom, and others to produce a multi-part "Habitat Pays" educational and promotional media series.

This series should be designed for insertion into existing publications—newspapers, magazines, trade publications, agriculture commodity newsletters, industry member outreach letters, and others—to educate and advocate the various ways (economic, social, and cultural) wildlife habitat benefits all South Dakotans.

The "Habitat Pays" series could also be targeted at farmers, agriculture lenders, and out-of-state landowners whose production and management decisions directly impact pheasant habitat. It could be utilized in print and digital media with the goal of communicating the benefits a conservation ethic provides for our state. One further option could be to implement informational materials from the "Habitat Pays" series into curriculum for K-12 students. The series could be incorporated into handouts for every South Dakota student to build grassroots support; the South Dakota Department of Education could assist by ensuring materials fit into existing content standards and through promotional efforts to teachers and administrators.

RECOMMENDATION #5: Revisit the current practices pertaining to mowing public rights-of-way.

Just over 80 percent of South Dakota's land is privately owned. More than 17 percent is owned by the federal government and tribes, and less than 3 percent is owned by the state. As a result, most efforts to improve pheasant habitat must be connected to private land. However, public land offers a variety of possibilities; one area that may be available for improved pheasant habitat is public road rights-of-way.

The timeframe and frequency with which road ditches are mowed for public safety and haying purposes can have an impact on pheasant production. Public suggestions for ways to enhance the ability of ditches to produce higher pheasant populations abound and are summarized near the end of this report.

One factor to consider for “road ditch habitat” is the length and distribution of our public highway system. The state-owned highway system includes about 7,800 miles, while the county and township road system encompass 22,000 miles. Currently, the state Department of Transportation (DOT) mows an approximately 15-foot buffer area along state roadways to improve visibility and reduce wildlife bedding adjacent to moving traffic. This buffer is an important safety feature for motorists and should be maintained.

The start date for mowing state highway rights-of-way for the West River counties of Tripp, Lyman, and Gregory is June 15. No other West River counties have a mowing start date. The June 15 date was implemented in 2004 because mowing impacts pheasant production in these three important pheasant-producing areas. For all East River counties, the mowing start date is July 10. A violation is a Class II misdemeanor and local law enforcement has jurisdiction. DOT crews can mow medians and other areas for noxious weed control and public safety purposes prior to July 10.

The administrative rule outlining this process, ARSD 70:04:06:06, is the result of a compromise between farmers and ranchers who desire access to the high-quality forage in many road ditches and the habitat needs of pheasants and other ground nesting birds. The compromise is not perfect for pheasant habitat but represents a compromise between varying interests. These administrative rules govern the state highway system only, so the date restrictions for mowing and haying do not apply to public rights-of-way on county or township roads. The differences between units of government, the variation in mowing start dates for producers East River and West River, inconsistent safety buffer widths, and other discrepancies has led to much confusion.
To address this, the PHWG recommends that the state Transportation Commission revisit the current practices pertaining to mowing public rights of way. This action could include a discussion of the current mowing start dates, including scientific data related to pheasant nesting in road ditches; the counties included in the mowing start dates and the difference in timing between East River and West River; the establishment of consistent widths for safety buffer strips and communication of those recommendations to counties and townships to encourage uniformity; the consideration of pheasant nesting schedules and weather cycles in determining highway mowing schedules; a meeting with state, county, and township governments, as well as other entities, to determine the value of uniformity in mowing start dates; the types of grass seeded in public rights of way; and other topics.

The PHWG recognizes the value landowners derive from haying and grazing public rights-of-way. Through greater uniformity in mowing implementation, better education, and greater awareness of pheasant nesting timing, this resource may be more effectively utilized to the benefit of landowners and pheasants.

Recommendation #6: Petition the U.S. Department of Agriculture’s Risk Management Agency (USDA-RMA) to include all South Dakota counties as eligible for crop insurance coverage on winter wheat.

Wheat is one of South Dakota’s most common crops. In 2013, South Dakota farmers ranked 7th in the nation in total wheat production, raising more than 77.5 million bushels. Because wheat is a grass, during its growing season it provides habitat for a variety of upland birds, including pheasants. While pheasants prefer native grass prairie, among field crops wheat – particularly winter wheat because it is more developed during the nesting season – provides the best habitat.

Wheat has two distinct growing seasons. Winter wheat is planted in the fall and harvested the following summer; spring wheat is planted in the spring and harvested later that same year. In South Dakota, farmers plant spring wheat on approximately 1.1 million acres and winter wheat on about 1.3 million acres each year. Winter wheat is often used as a cover crop following corn or soybean harvest because it can reduce soil erosion while providing a saleable cash crop the following year.

In recent years wheat production has fallen as many acres have been replaced with corn, due to high prices for that commodity. One further limitation to wheat plantings is the inability for South Dakota farmers in 24 East River counties to get crop insurance on winter wheat guaranteed through USDA-RMA, even though it is available in many other counties in the region, including all but two counties in Montana.

South Dakota farmers purchase crop insurance through private agents and have their policies backed by USDA-RMA. Currently, those 24 counties are not eligible for crop insurance on winter wheat due to insurance guidelines established decades ago when winter wheat varieties were more susceptible to winterkill. With advances in seed technology and agronomy practices, however, many winter wheat varieties consistently produce a viable crop in counties where coverage is currently unavailable.

The PHWG recommends that Governor Daugaard write to USDA-RMA, requesting a reevaluation to determine if all South Dakota counties may be eligible for winter wheat insurance. In spring 2015 all Montana counties will be winter wheat insurance eligible, demonstrating that sufficient cold tolerant varieties exist. By expanding winter wheat insurance in South Dakota, farmers will have greater incentive to plant a crop that provides valuable nesting habitat for pheasants.

Recommendation #7: Encourage the South Dakota Office of School and Public Lands to include a land management plan as a condition for securing a lease.

The South Dakota Office of School and Public Lands (SPL) manages 760,000 acres of state-owned land. SPL once managed more than two million acres, but many of these lands have been sold and the funds placed into trust. SPL manages its lands primarily for grazing and farming leases and mineral production. While much SPL-managed land lies West River outside of South Dakota's primary pheasant production range, opportunities exist to improve pheasant habitat.

The South Dakota Constitution requires SPL to manage its lands to "benefit the public schools of the state," so revenue generation is the primary goal. As a result, management decisions are up to the lessee, though public recreation, including hunting, is an allowable secondary use of these lands. The leases are sold at public auction, at a rate set in a formula that considers many factors, including livestock and land prices. The lessee pays all local property taxes; as a result, very little land is left "vacant" because SPL would be required to pay the property taxes.

The PHWG received many comments on ways to improve habitat on the public lands managed by SPL, which are summarized at the end of this report. Based on these suggestions, we recommend that SPL include a land management plan document as a condition for securing a lease.

Currently, all leased lands have an established stocking rate, though rotations and other management decisions are up to the lessee. At times, this autonomy can lead to overgrazing and less-than-ideal stewardship of state-owned lands. Because SPL has limited staff to physically check each of its parcels every year, requiring a lessee to submit a management plan will provide a valuable reference, should issues arise. Because good land management can improve long-term revenue generation, in addition to leading landowners to be more diligent stewards of lands that can provide valuable pheasant habitat, utilizing management plans may increase revenues as well.

The PHWG also recommends that SPL maintain its current no-sale land policy. After the legislature discontinued its former practice of requiring SPL to sell a set number of parcels per year, SPL established an internal land sale moratorium. Because state-owned lands offer a variety of options for conservation practices and recreation, retaining SPL management of its current acreage should benefit pheasant habitat.

The current SPL policy of not allowing lessees to convert grassland acres to cropland should continue as well. In the past seven years, SPL has begun converting tilled land back to grass, where applicable, a practice that benefits pheasant habitat, reduces soil erosion, and improves water quality.

Recommendation #8: Support Congressional efforts to raise the federal Duck Stamp from $15 to $25.

The Duck Stamp is a federal license required for sportsmen over age 16 who hunt migratory waterfowl. Since Congress passed the Migratory Bird Hunting and Conservation Stamp Act (the “Duck Stamp”) in 1934 to attempt to offset the habitat damage created during the Dust Bowl, the Duck Stamp program has proven one of the nation’s greatest conservation success stories.

Since its enactment, the Duck stamp program has generated more than $800 million to conserve nearly 6 million acres of wetland and wetland associated grassland in all 50 states. A model of conservation efficiency, 98 cents of every dollar go directly to acquire or lease lands.

In South Dakota, this program is a key component for long-term conservation of our best pheasant and waterfowl habitats. More than 165,000 acres of National Wildlife Refuge and Waterfowl Production Areas have been purchased through the Migratory Bird Conservation Fund, which is supported primarily by the Duck Stamp. In addition, Duck Stamp funds have been used to secure 1.34 million acres of conservation easements in South Dakota.

The price of the Duck Stamp has been $15 since 1991. This 23-year span is the longest the Duck Stamp has gone without an increase to keep pace with inflation. When combined with much higher land values, the federal Duck Stamp has fallen behind in its ability to provide resources for wetlands conservation. The PHWG recommends that Governor Daugaard support efforts to raise the federal Duck Stamp from $15 to $25. We further recommend that the South Dakota Legislature pass a resolution during the 2015 legislative session supporting Congressional action on the federal Duck Stamp.

Appendix Table 1. Ring-necked pheasant statistics for South Dakota,1919–2022.

Season Structure				Licensed Hunters			Population Estimates			Survey Indices		
Year	Length (days)	Opening Day	Bag limit	Residents	Nonresidents	Total	Harvest	Pheasants harvested per hunter	Preseason Population	Preseason pheasants per mile	Average brood size	Postseason cocks per 100 hens
1919	1	30-Oct	2	500	500	1,000	200	0.2	100,000			
1920	2	04-Nov	2	1,000	1,000	2,000	1,000	0.5	200,000			
1921	7	21-Nov	2	10,000	1,000	11,000	7,000	0.6	300,000			
1922	20	09-Nov	2	30,000	1,500	31,500	15,000	0.5	500,000			
1923	6	19-Nov	3	40,000	1,500	41,500	25,000	0.6	700,000			
1924	15	07-Nov	3	50,000	2,100	52,100	250,000	4.8	1,000,000			
1925	15	30-Oct	3	75,000	1,100	76,100	500,000	6.6	2,000,000			
1926	52	15-Oct	7	82,000	1,400	83,400	1,000,000	12.0	4,000,000			
1927	90	07-Oct	7	90,000	2,600	92,600	1,500,000	16.2	6,000,000			
1928	40	25-Oct	5	100,000	2,800	102,800	1,250,000	12.2	5,000,000			
1929	16	29-Oct	5	95,000	2,700	97,700	1,000,000	10.2	4,000,000			
1930	46	16-Oct	7	96,000	2,600	98,600	1,500,000	15.2	7,000,000			
1931	12	15-Oct	3	61,000	700	61,700	1,000,000	16.2	5,000,000			
1932	30	20-Oct	4	62,000	700	62,700	1,000,000	15.9	5,000,000			
1933	30	10-Oct	5	63,000	600	63,600	2,000,000	31.4	8,000,000			
1934	30	21-Oct	5	53,000	400	53,400	1,500,000	28.1	7,000,000			
1935	37	21-Oct	6	57,000	1,900	58,900	1,500,000	25.5	12,000,000			
1936	20	10-Oct	4	61,000	1,600	62,600	1,750,000	28.0	12,000,000			
1937	4	09-Oct	4	25,000	800	25,800	75,000	2.9	3,000,000			
1938	14	01-Oct	4	44,000	1,800	45,800	1,500,000	32.8	6,000,000			
1939	29	14-Oct	4	63,000	2,800	65,800	1,500,000	22.8	6,000,000			
1940	40	01-Oct	5	73,000	6,200	79,200	2,500,000	31.6	8,000,000			
1941	50	01-Oct	5	83,000	11,000	94,000	3,125,000	33.2	11,000,000			
1942	120	26-Sep	7	80,000	16,000	96,000	4,500,000	46.9	15,000,000			
1943	159	25-Sep	7	60,000	18,000	78,000	3,168,000	40.6	11,000,000			
1944	163	20-Sep	10	77,000	42,000	119,000	6,439,000	54.1	15,000,000			
1945	153	29-Sep	8	88,000	87,000	175,000	7,507,000	42.9	16,000,000			
1946	88	15-Oct	5	103,000	84,000	187,000	3,550,000	19.0	11,000,000		6.57	
1947	45	11-Oct	3	103,000	13,000	116,000	1,496,000	12.9	7,000,000		7.15	60
1948	55	09-Oct	4	123,000	26,000	149,000	2,148,000	14.4	9,600,000		7.63	53
1949	45	15-Oct	4	121,000	22,000	143,000	1,864,000	13.0	8,100,000	3.10	7.15	45
1950	10	04-Nov	2	88,000	2,000	90,000	507,000	5.6	3,200,000	1.99	6.79	63
1951	25	20-Oct	3	95,000	10,000	105,000	1,184,000	11.3	6,000,000	3.69	7.13	55
1952	30	18-Oct	3	107,000	13,000	120,000	1,490,000	12.4	6,100,000	5.62	7.89	43
1953	30	17-Oct	3	100,000	17,000	117,000	1,210,000	10.3	4,900,000	4.27	6.89	41
1954	30	23-Oct	3	105,000	17,000	122,000	1,672,000	13.7	6,200,000	4.84	6.92	37
1955	40	22-Oct	3	111,000	19,000	130,000	1,608,000	12.4	6,300,000	6.72	6.90	39
1956	35	27-Oct	3	102,000	20,000	122,000	1,221,000	10.0	4,300,000	6.46	6.88	34
1957	37	26-Oct	3	102,000	20,000	122,000	1,339,000	11.0	5,900,000	7.31	5.90	43
1958	51	18-Oct	4	125,000	36,000	161,000	2,635,000	16.4	11,100,000	11.03	6.80	40
1959	58	17-Oct	5	117,000	45,000	162,000	2,212,000	13.7	7,500,000	7.64	5.70	22
1960	42	22-Oct	4	130,000	28,000	158,000	2,574,000	16.3	9,500,000	6.73	6.23	28
1961	58	21-Oct	4	141,000	51,000	192,000	3,247,000	16.9	11,000,000	11.38	6.34	26

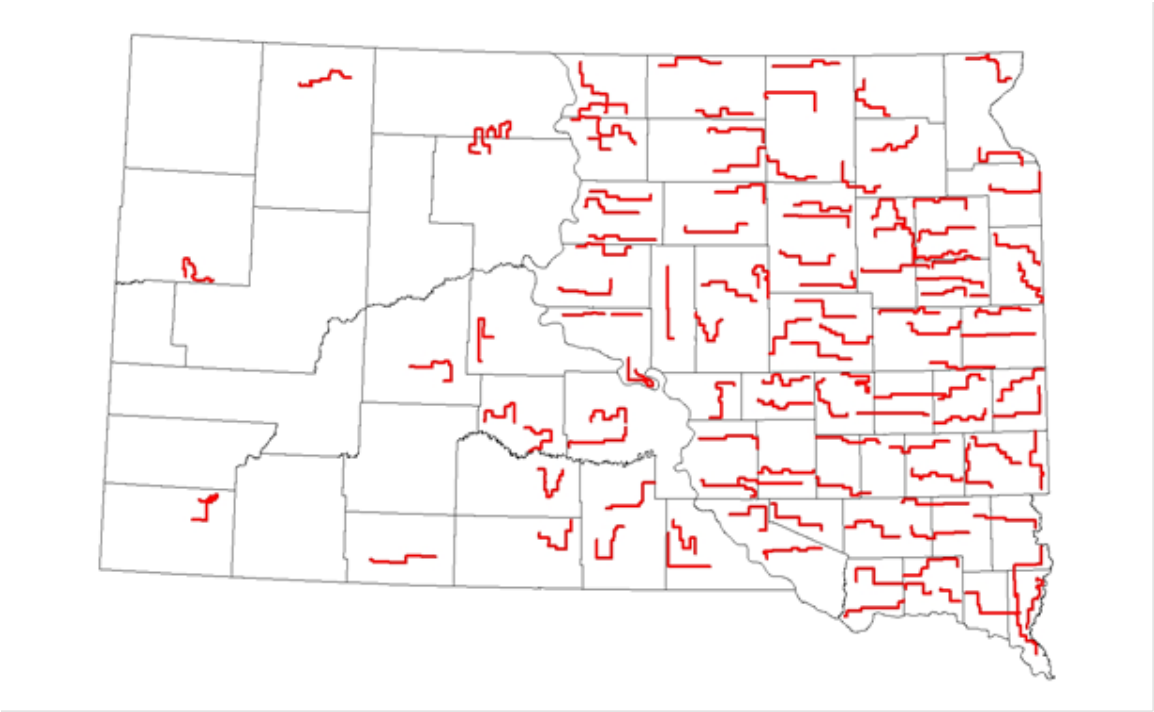
Appendix Table 1 (cont.). Ring-necked pheasant statistics for South Dakota, 1919–2022.

Season Structure				Licensed Hunters			Population Estimates			Survey Indices		
Year	Length (days)	Opening Day	Bag limit	Residents	Nonresidents	Total	Harvest	Pheasants harvested per hunter	Preseason Population	Preseason pheasants per mile	Average brood size	Postseason cocks per 100 hens
1962	61	20-Oct	4	138,000	57,000	195,000	2,790,000	14.3	10,200,000	6.52	5.80	44
1963	74	19-Oct	4	144,000	68,000	212,000	3,095,000	14.6	10,000,000	11.24	6.50	23
1964	60	17-Oct	3	124,000	23,000	147,000	1,474,000	10.0	5,100,000	3.74	5.91	24
1965	44	16-Oct	3	102,000	14,000	116,000	797,000	6.9	3,300,000	2.55	6.28	37
1966	16	15-Oct	3	82,000	6,000	88,000	409,000	4.6	2,200,000	2.23	6.30	56
1967	37	21-Oct	3	111,000	15,000	126,000	908,000	7.2	2,900,000	2.42	6.30	39
1968	37	19-Oct	3	117,000	19,000	136,000	880,000	6.5	3,300,000	2.08	7.17	37
1969	30	18-Oct	3	96,000	14,000	110,000	622,000	5.7	2,700,000	1.91	7.60	48
1970	37	17-Oct	3	108,000	18,000	126,000	901,000	7.2	3,500,000	2.73	7.50	40
1971	42	16-Oct	3	117,000	25,000	142,000	1,106,000	7.8	3,700,000	2.45	7.22	32
1972	49	21-Oct	3	120,000	28,000	148,000	1,201,000	8.1	4,100,000	2.75	7.64	39
1973	64	20-Oct	3	127,000	37,000	164,000	1,283,000	7.8	4,200,000	3.51	7.04	29
1974	49	19-Oct	3	126,000	25,000	151,000	1,071,000	7.1	3,000,000	2.64	7.08	25
1975	23	18-Oct	2	100,000	12,000	112,000	497,500	4.4	2,100,000	1.53	7.08	42
1976	30	16-Oct	2	89,000	8,000	97,000	372,500	3.8	1,400,000	1.03	6.30	35
1977	44	15-Oct	2	90,000	10,000	100,000	518,600	5.2	2,300,000	1.62	7.33	43
1978	44	21-Oct	2	82,000	13,000	95,000	558,300	5.9	2,100,000	1.38	7.14	38
1979	51	20-Oct	3	105,000	18,700	123,700	934,000	7.6	3,600,000	3.20	7.50	39
1980	53	18-Oct	3	107,500	28,500	136,000	1,158,700	8.5	4,200,000	3.70	7.80	21
1981	51	17-Oct	3	106,300	33,000	139,300	1,299,100	9.3	4,200,000	3.60	6.84	21
1982	51	16-Oct	3	95,300	31,800	127,100	1,070,500	8.4	4,200,000	3.37	6.53	34
1983	51	15-Oct	3	102,300	36,400	138,700	1,416,600	10.2	4,800,000	3.80	6.66	21
1984	51	20-Oct	3	91,290	35,170	126,460	962,700	7.6	3,300,000	2.23	6.20	28
1985	51	19-Oct	3	85,500	34,700	120,200	801,700	6.7	3,200,000	2.27	6.19	31
1986	51	18-Oct	3	70,850	24,000	94,850	627,300	6.6	2,100,000	1.81	7.04	34
1987	51	18-Oct	3	83,000	31,900	114,900	929,700	8.1	3,800,000	2.58	7.01	34
1988	51	15-Oct	3	79,800	30,000	109,800	782,700	7.1	3,100,000	2.22	6.23	29
1989	51	21-Oct	3	71,700	26,100	97,800	687,000	7.0	2,700,000	2.08	6.54	27
1990	51	20-Oct	3	71,300	26,501	97,801	777,300	7.9	3,700,000	2.09	6.86	38
1991	65	19-Oct	3	91,200	32,127	123,327	1,222,600	9.9	5,000,000	3.25	6.63	31
1992	65	17-Oct	3	83,400	42,900	126,300	969,000	7.7	4,200,000	2.77	6.04	35
1993	65	16-Oct	3	78,900	45,500	124,400	1,213,800	9.8	5,500,000	2.83	6.33	36
1994	65	15-Oct	3	78,800	65,200	144,000	1,370,600	9.5	5,400,000	4.13	6.48	29
1995	65	21-Oct	3	75,286	65,361	140,647	1,292,400	9.2	4,900,000	2.68	6.22	26
1996	65	19-Oct	3	77,932	65,602	143,534	1,191,700	8.3	4,800,000	2.67	6.86	31
1997	65	18-Oct	3	70,573	42,808	113,381	920,700	8.1	3,600,000	2.66	7.63	32
1998	65	17-Oct	3	75,083	60,364	135,447	1,186,700	8.8	5,000,000	5.08	7.20	33
1999	65	16-Oct	3	84,342	71,956	156,298	1,464,200	9.4	6,100,000	4.53	7.07	32
2000	72	21-Oct	3	79,790	70,182	149,972	1,447,700	9.7	6,700,000	4.22	6.31	37
2001	73	20-Oct	3	76,772	73,425	150,197	1,361,300	9.1	6,000,000	3.30	6.76	38
2002	74	19-Oct	3	70,821	74,873	145,694	1,261,700	8.7	5,500,000	2.64	6.25	37
2003	75	18-Oct	3	78,394	83,544	161,938	1,815,000	11.2	8,700,000	6.20	7.55	40

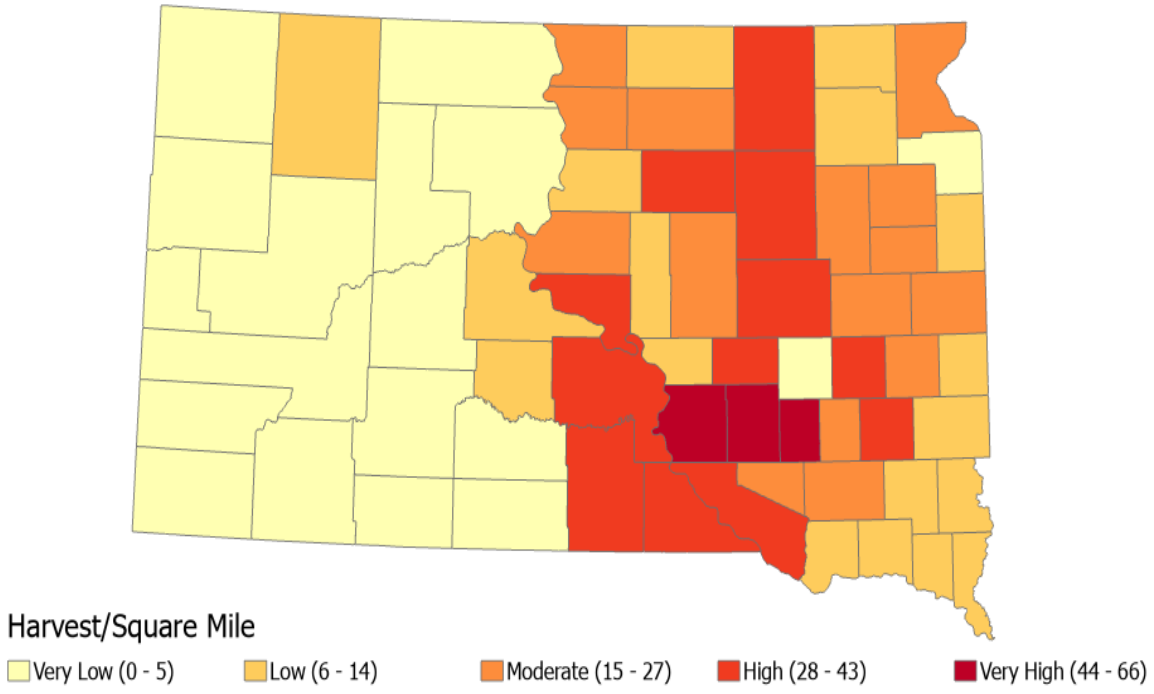
Appendix Table 1 (cont.). Ring-necked pheasant statistics for South Dakota, 1919–2022.

Season Structure				Licensed Hunters			Population Estimates			Survey Indices		
Year	Length (days)	Opening Day	Bag limit	Residents	Nonresidents	Total	Harvest	Pheasants harvested per hunter	Preseason Population	Preseason pheasants per mile	Average brood size	Postseason cocks per 100 hens
2004	79	16-Oct	3	78,984	91,948	170,932	1,653,000	9.7	8,100,000	5.66	6.39	38
2005	79	15-Oct	3	79,359	94,959	174,318	1,960,000	11.2	9,200,000	6.63	6.72	39
2006	79	21-Oct	3	79,953	98,212	178,165	1,846,400	10.4	8,400,000	6.36	6.06	38
2007	79	20-Oct	3	77,879	103,231	181,110	2,122,700	11.7	11,900,000	7.85	6.71	48
2008	79	18-Oct	3	75,831	100,349	176,180	1,933,200	11.0	10,300,000	8.56	6.38	47
2009	79	17-Oct	3	69,941	97,347	167,288	1,648,000	9.6	8,520,000	6.31	6.03	47
2010	79	16-Oct	3	72,465	100,189	172,654	1,831,576	10.6	9,840,000	6.45	6.25	50
2011	79	15-Oct	3	69,120	95,077	164,197	1,555,307	9.5	6,600,000	3.55	5.80	41
2012	79	20-Oct	3	69,240	93,801	163,041	1,428,873	8.9	7,600,000	4.19	6.26	50
2013	79	19-Oct	3	57,677	74,424	132,101	982,679	7.4	6,160,000	1.52	5.50	59
2014	79	18-Oct	3	63,704	79,636	143,340	1,233,738	8.6	7,524,228	2.68	5.96	52
2015	79	17-Oct	3	65,135	84,901	150,036	1,255,878	8.4	7,700,000	3.80	6.17	52
2016	79	15-Oct	3	61,746	81,141	142,887	1,170,596	8.2	8,200,000	3.05	5.91	58
2017	79	21-Oct	3	52,538	67,232	119,770	828,709	6.9	4,600,000	1.68	4.99	56
2018	79	20-Oct	3	53,577	69,018	122,595	950,883	7.8	7,100,000	2.47	6.08	62
2019	79	19-Oct	3	47,403	63,801	111,204	829,495	7.5	-	2.04	6.24	88
2020	107	17-Oct	3	59,042	62,289	121,331	1,108,420	9.1	-	-	-	-
2021	108	16-Oct	3	54,411	72,550	126,961	1,067,423	8.4	-	-	-	-
2022	109	15-Oct	3	53,846	73,887	127,733	1,158,716	9.1	-	-	-	-

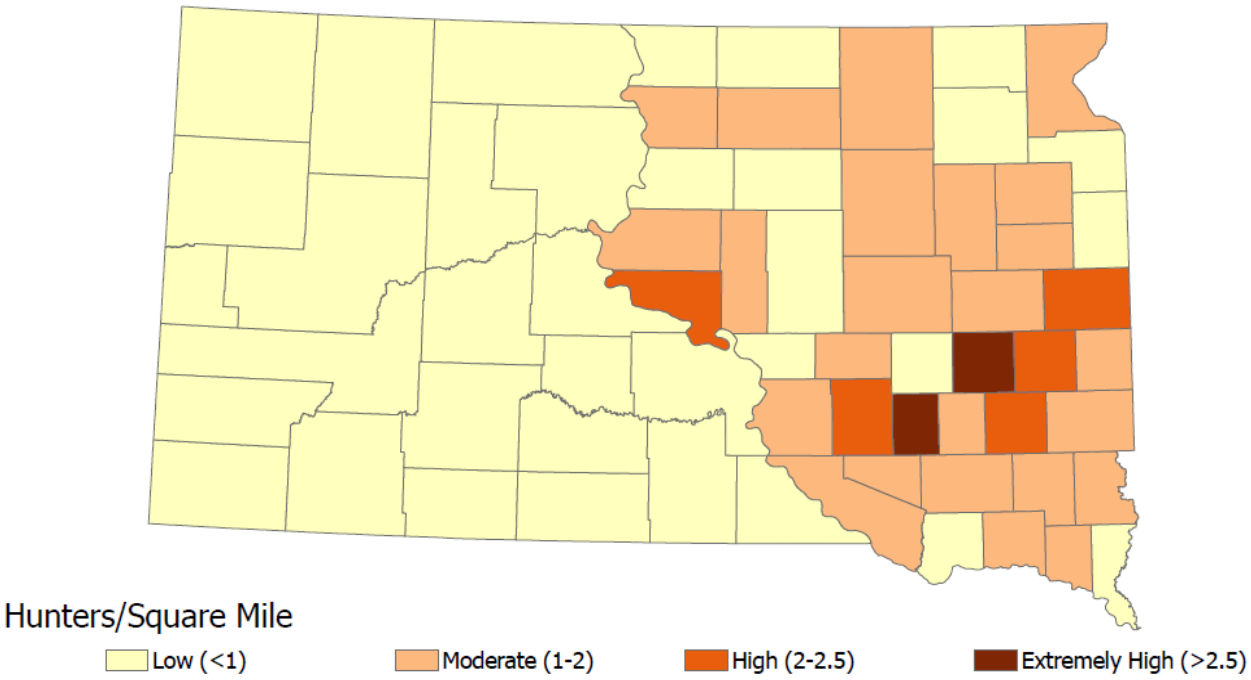
Appendix Figure 1. Statewide pheasant brood survey routes.



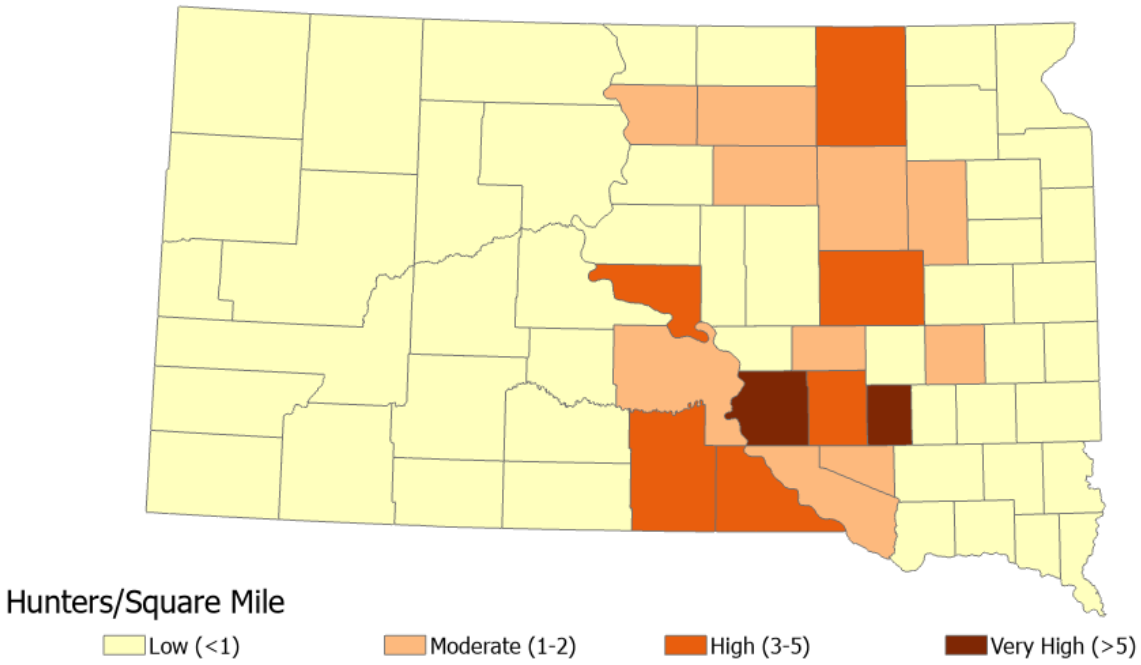
Appendix Figure 2. Average pheasant harvest/miles^2 estimates during past 10 years, 2013–2022.



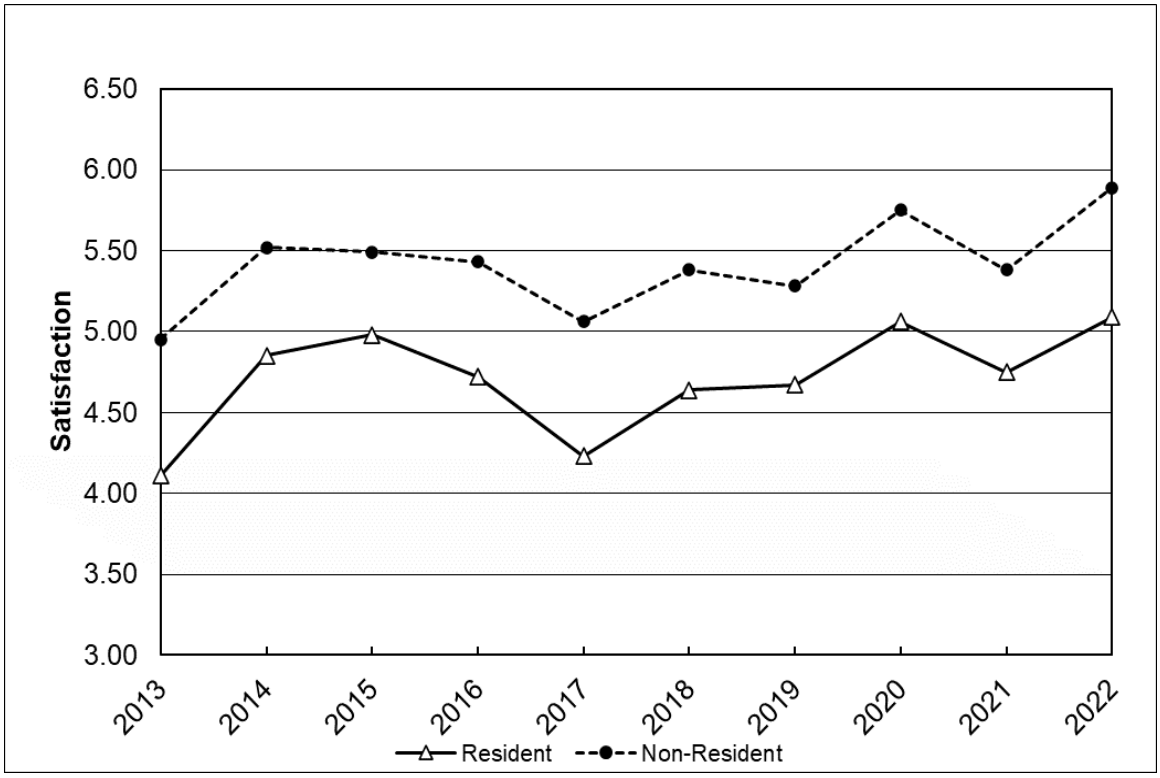
Appendix Figure 3. Average resident hunter density/miles^2 estimates during past 10 years, 2013–2022.



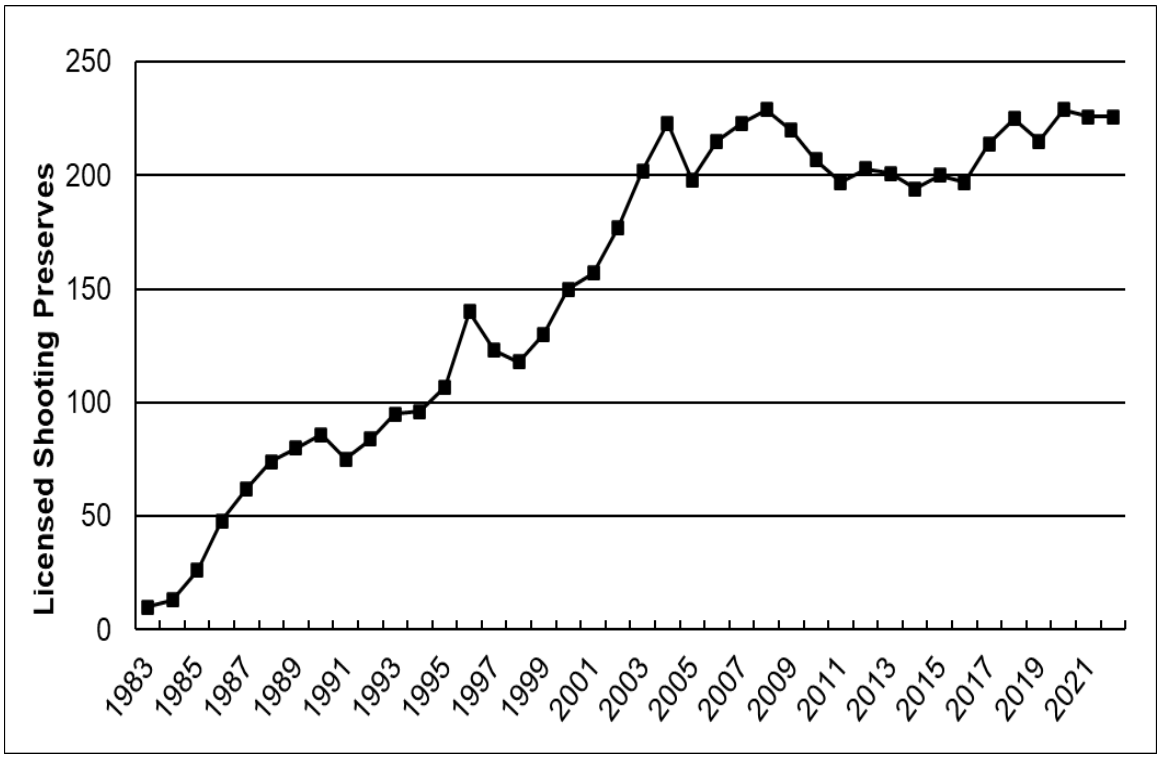
Appendix Figure 4. Average non-resident hunter density/miles^2 estimates during past 10 years, 2013–2022.



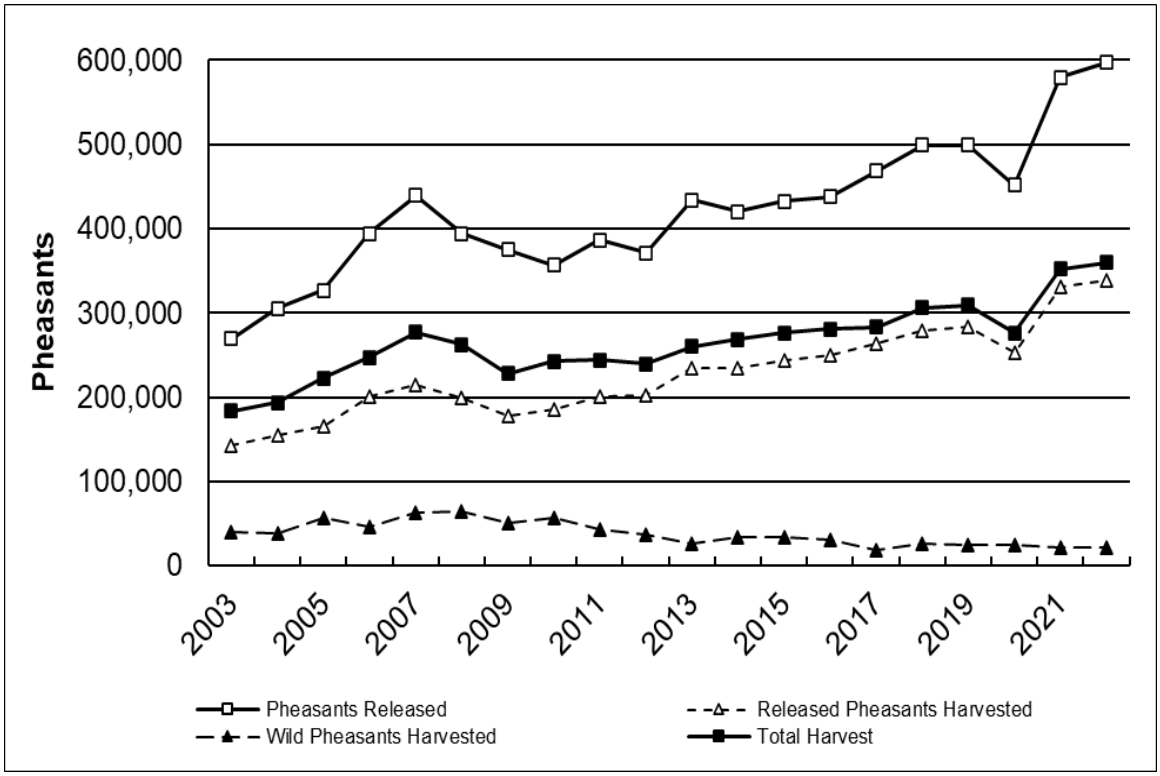
Appendix Figure 5. Resident and non-resident hunter satisfaction during past 10 years, 2013–2022.



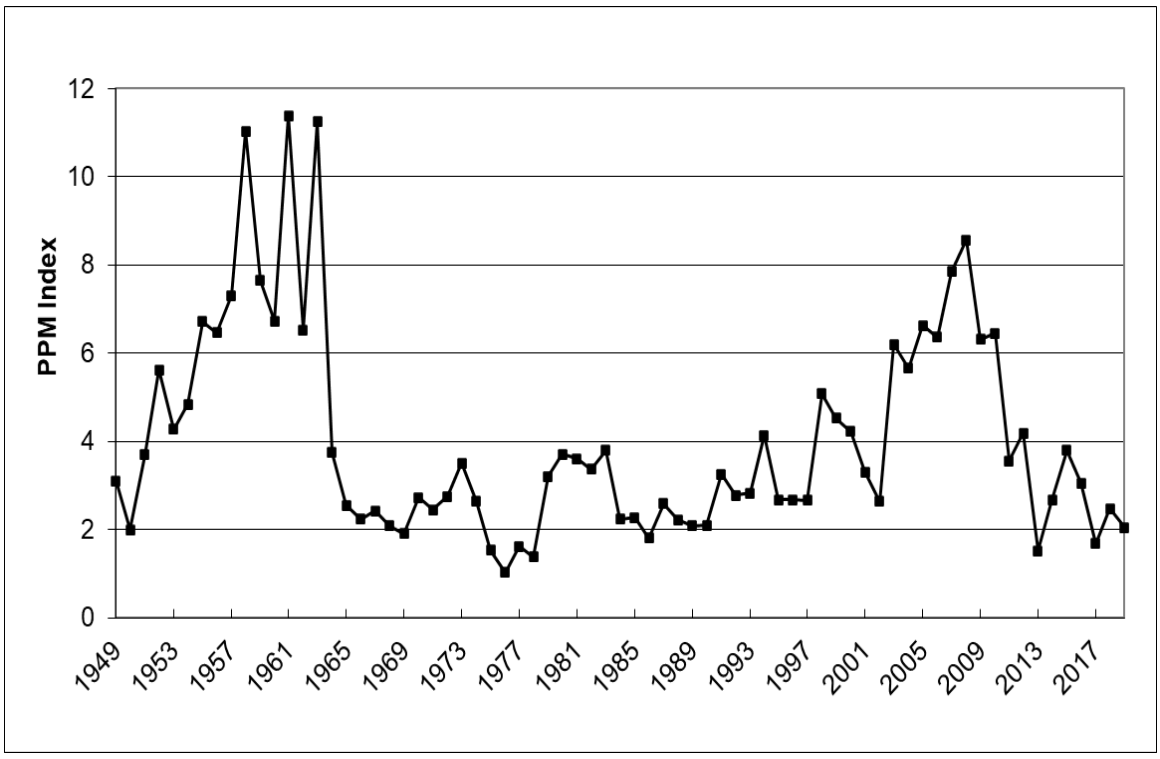
Appendix Figure 6. Number of licensed shooting preserves, 1983–2022.



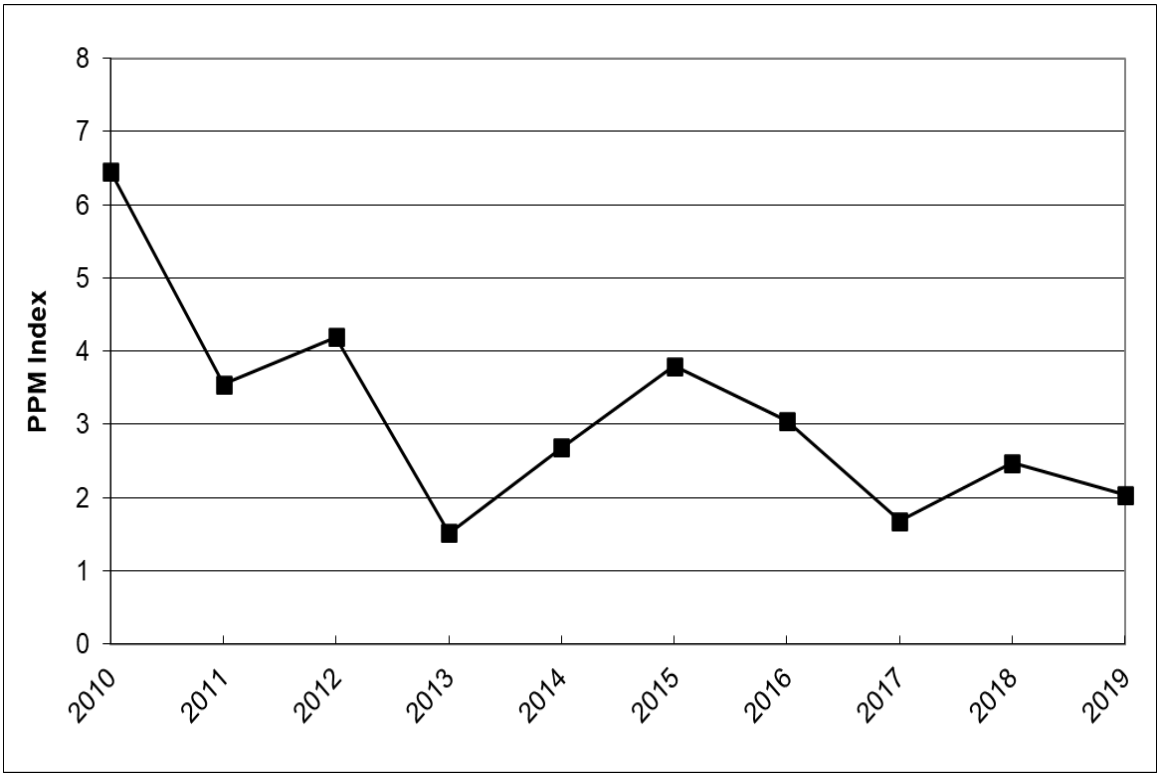
Appendix Figure 7. License shooting preserves release and harvest records, 2003−2022.



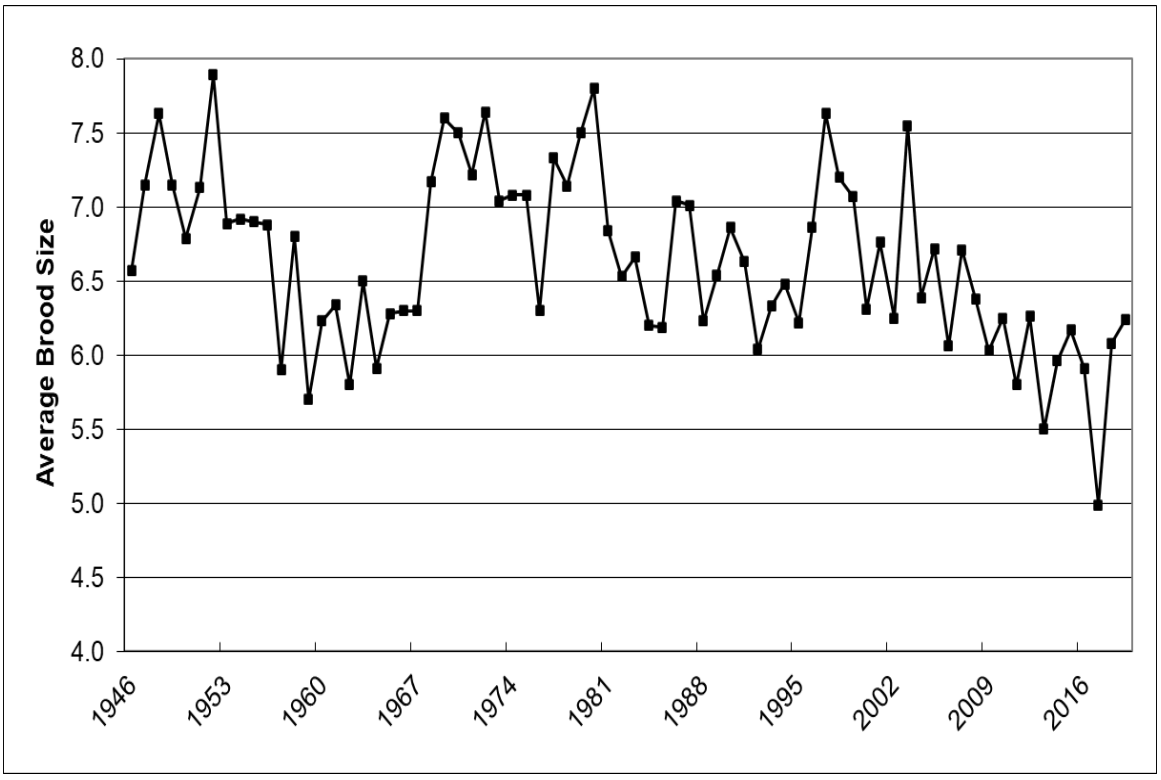
Appendix Figure 8. Statewide pheasants per mile index, 1949–2019.



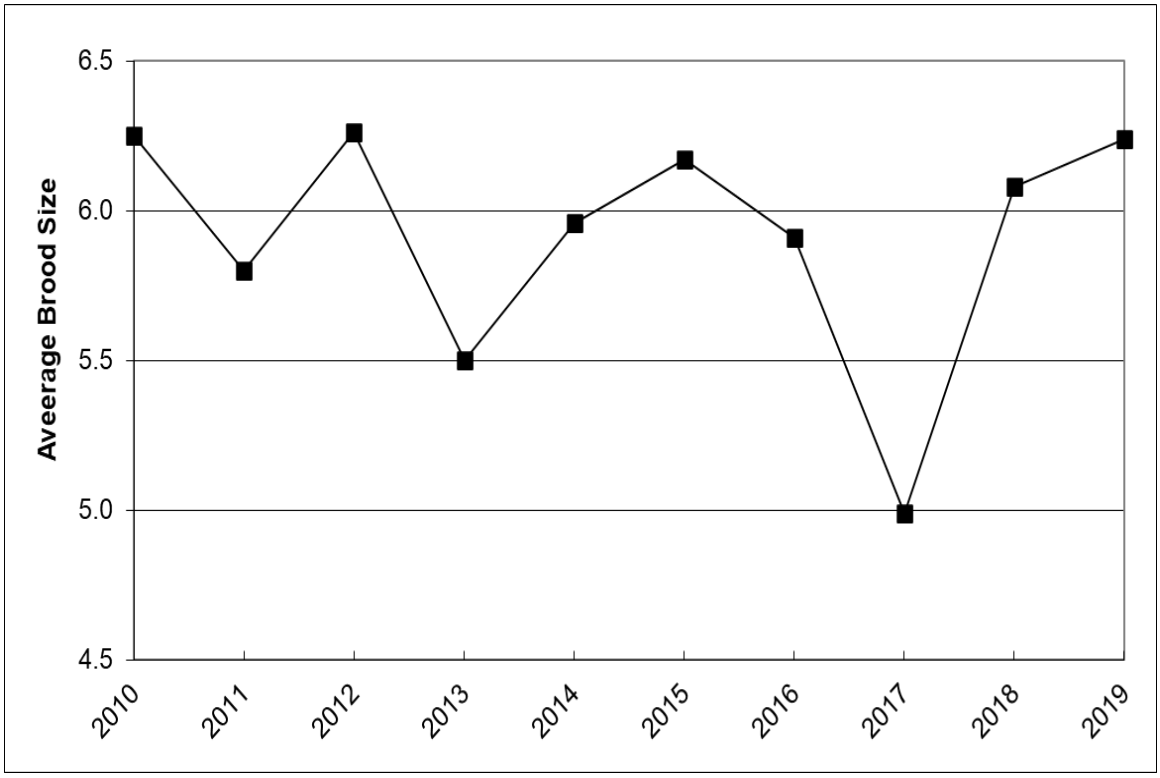
Appendix Figure 9. Statewide pheasants per mile index, 2010–2019.



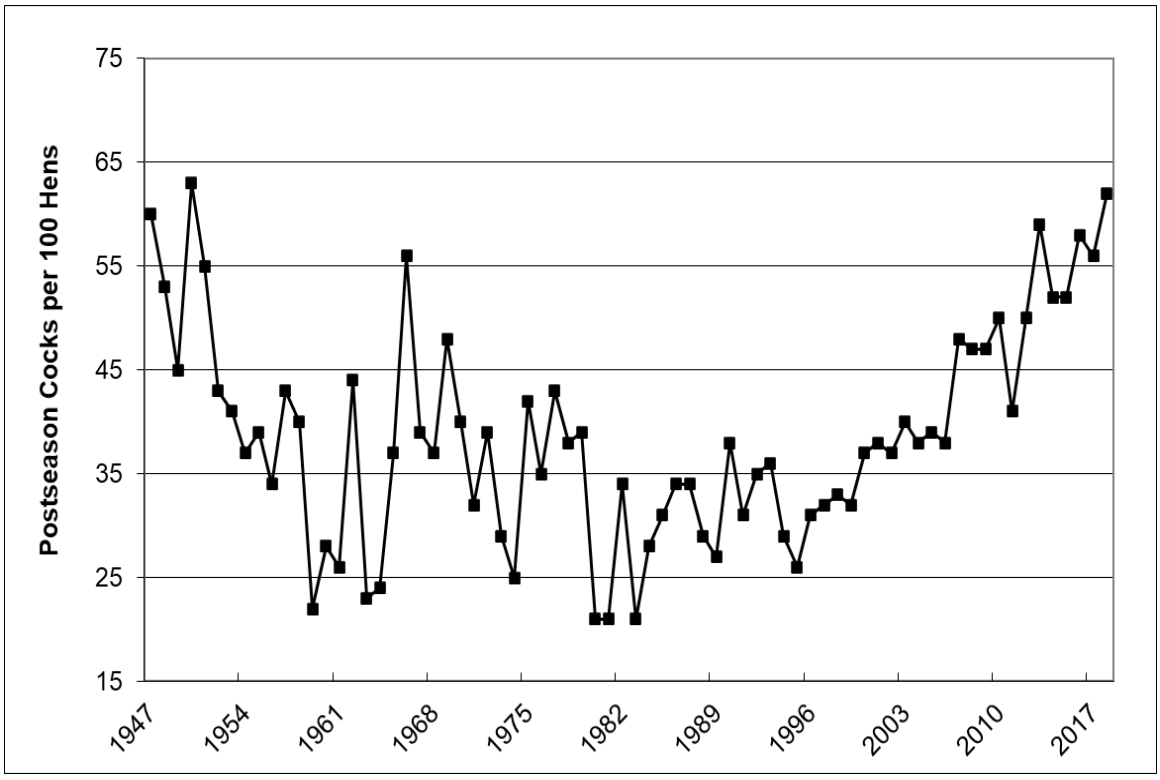
Appendix Figure 10. Statewide average brood size, 1946–2019.



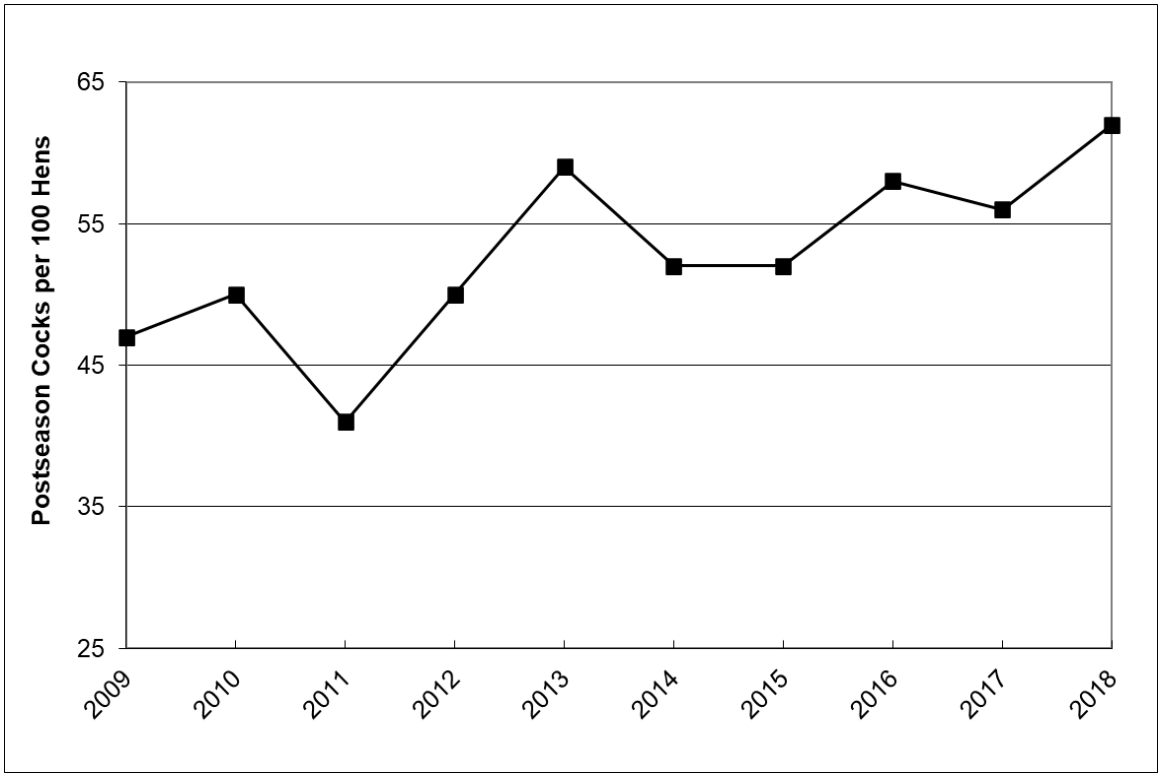
Appendix Figure 11. Statewide average brood size, 2010–2019.



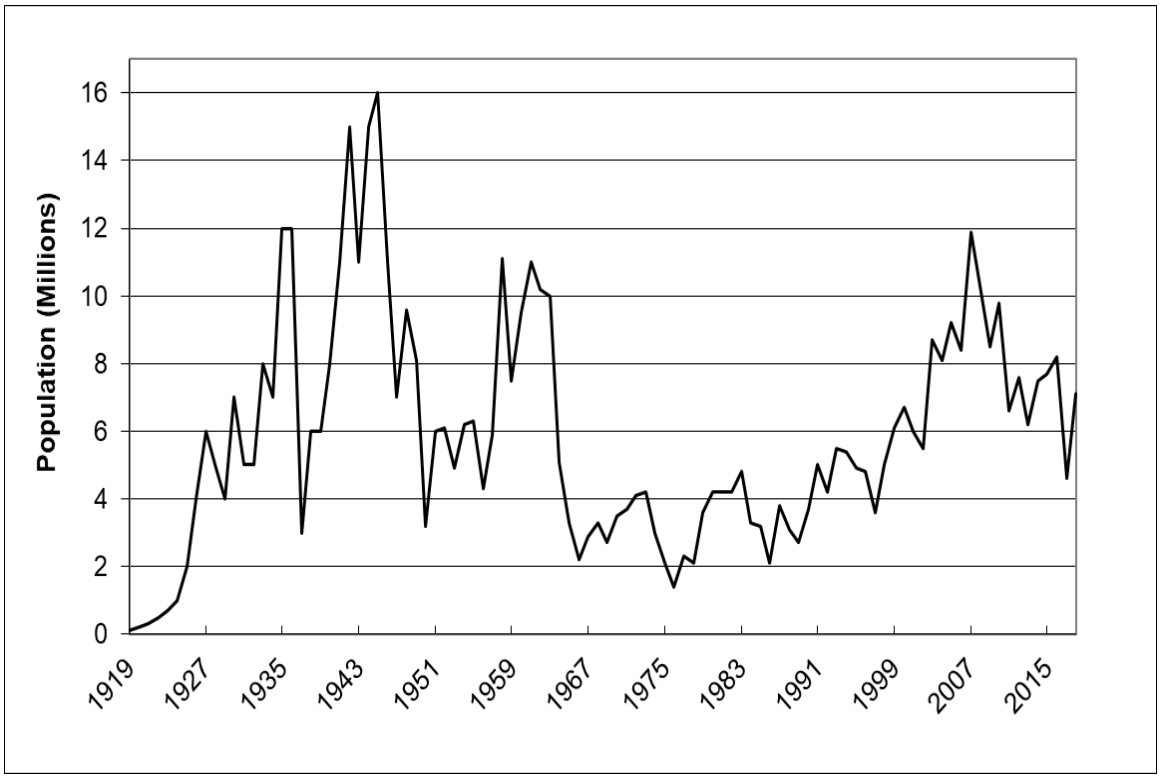
Appendix Figure 12. Statewide winter sex ratio, 1947–2018.



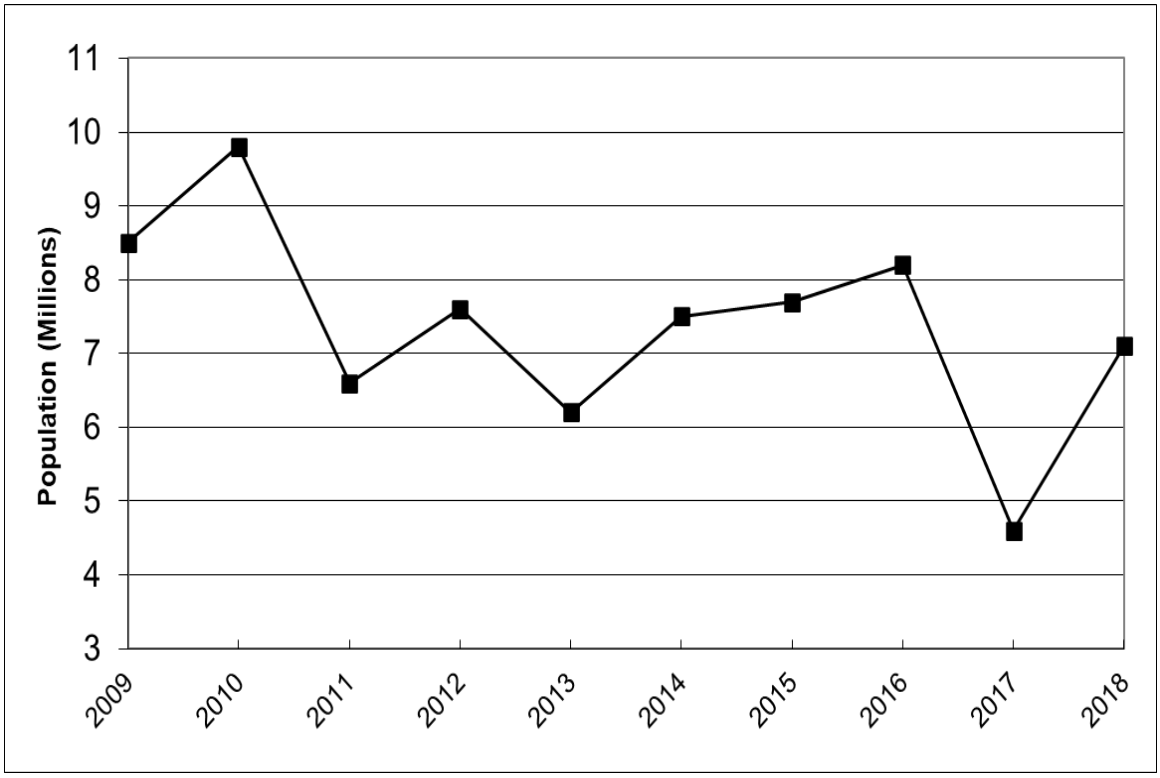
Appendix Figure 13. Average statewide winter sex ratio, 2009–2018.



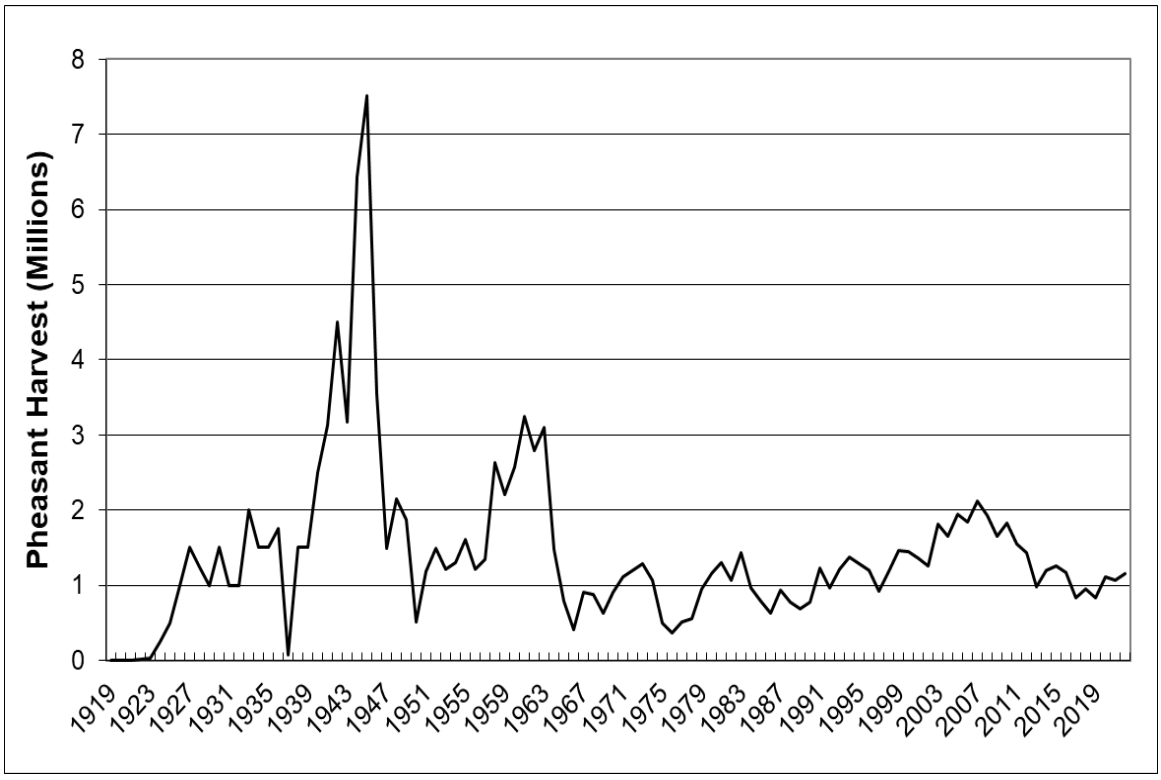
Appendix Figure 14. Pre-season pheasant population, 1919–2018.



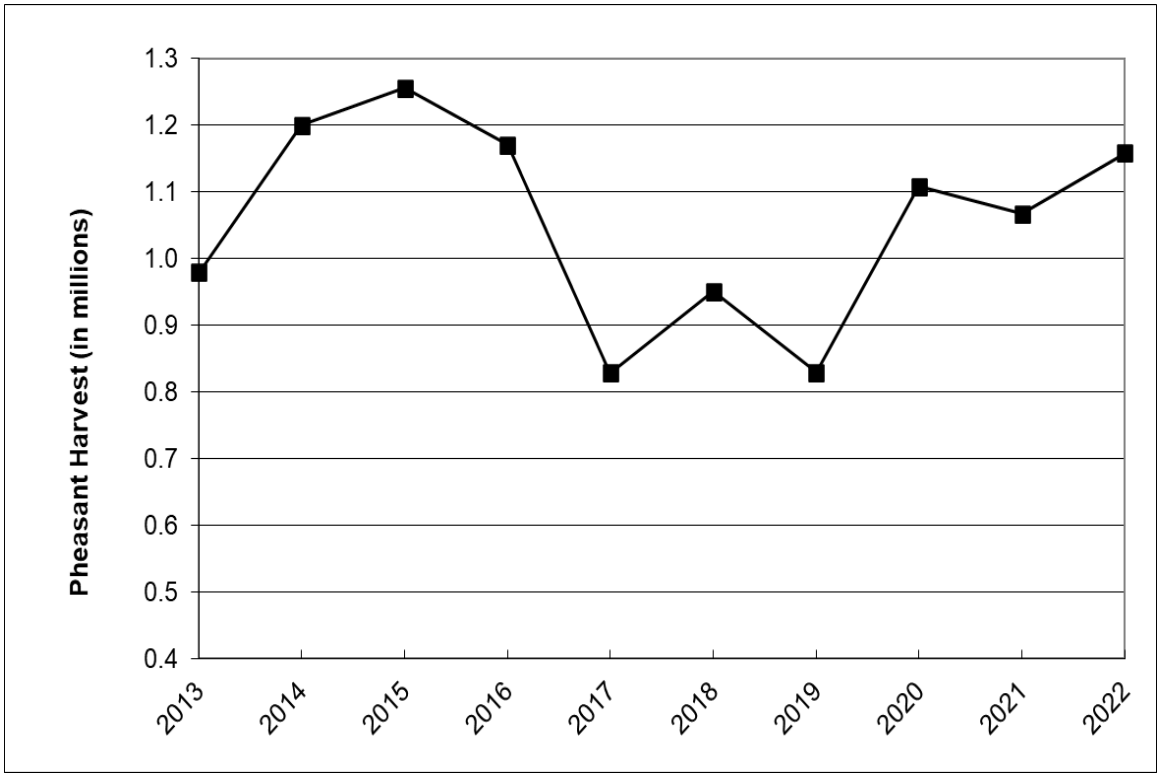
Appendix Figure 15. Pre-season pheasant population, 2009–2018.



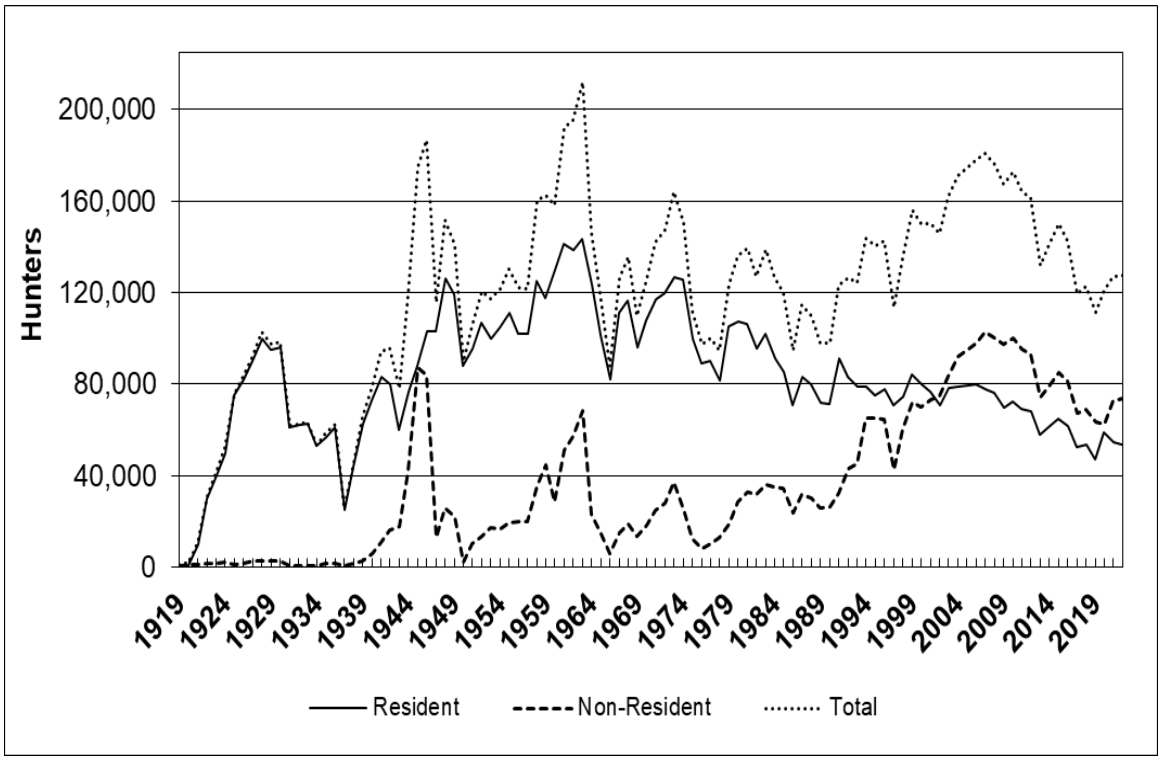
Appendix Figure 16. Pheasant harvest, 1919–2022.



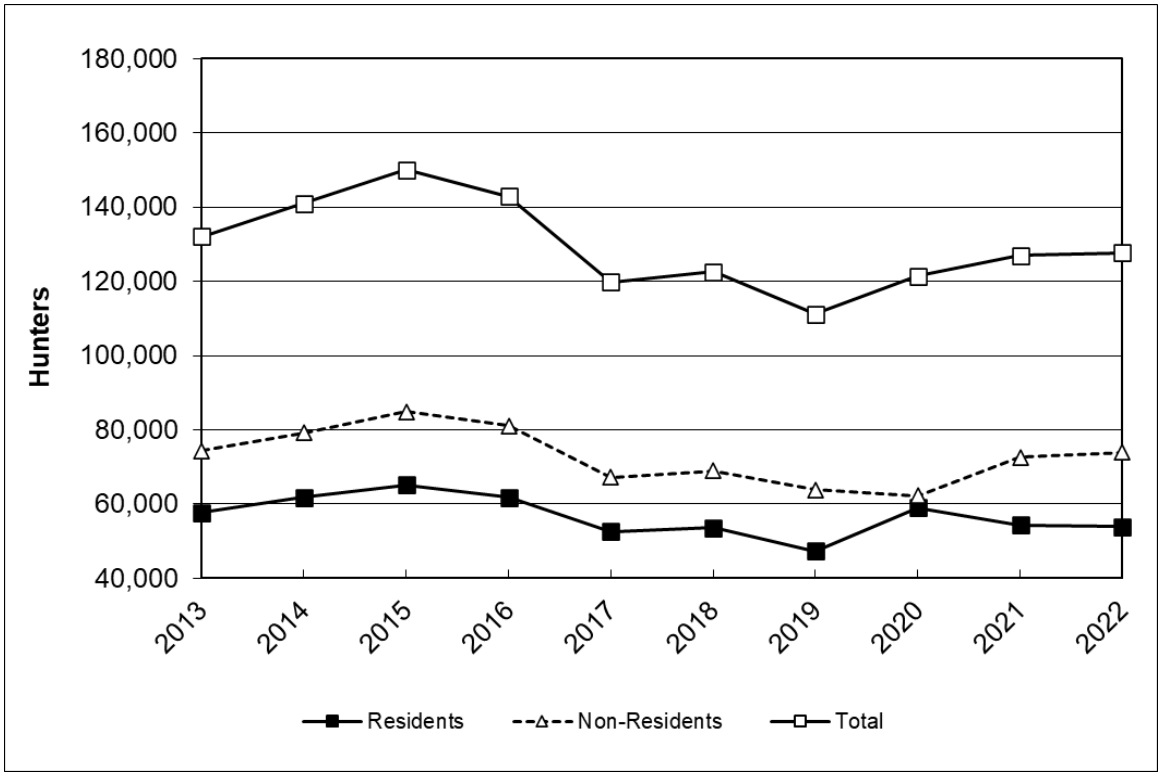
Appendix Figure 17. Pheasant harvest during past 10 years, 2013–2022.



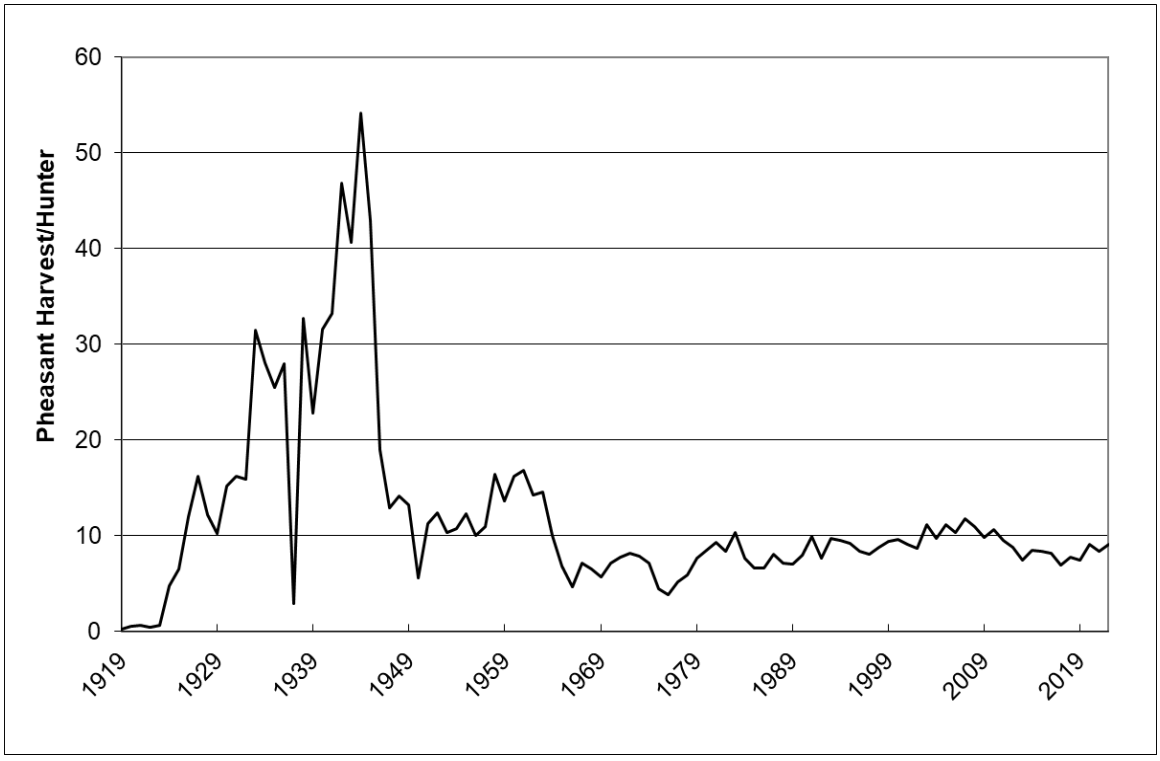
Appendix Figure 18. Resident and non-resident pheasant hunters, 1919–2022.



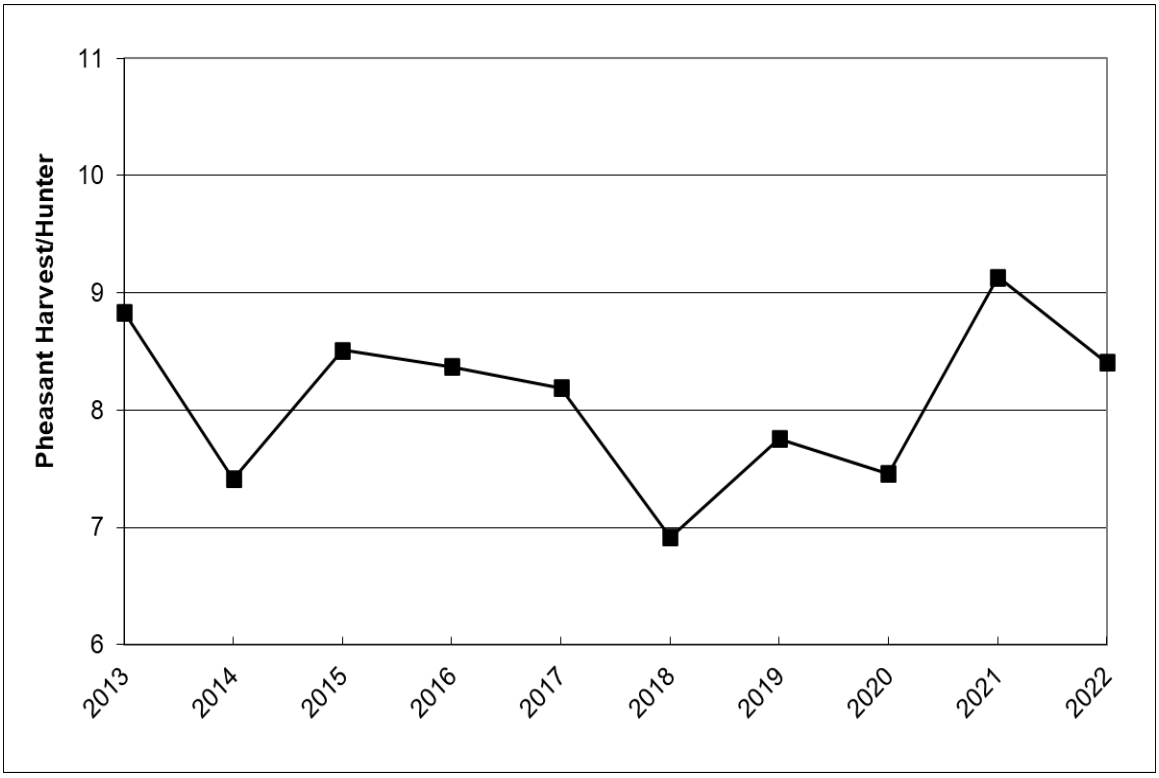
Appendix Figure 19. Resident and non-resident pheasant hunters during past 10 years, 2013–2022.



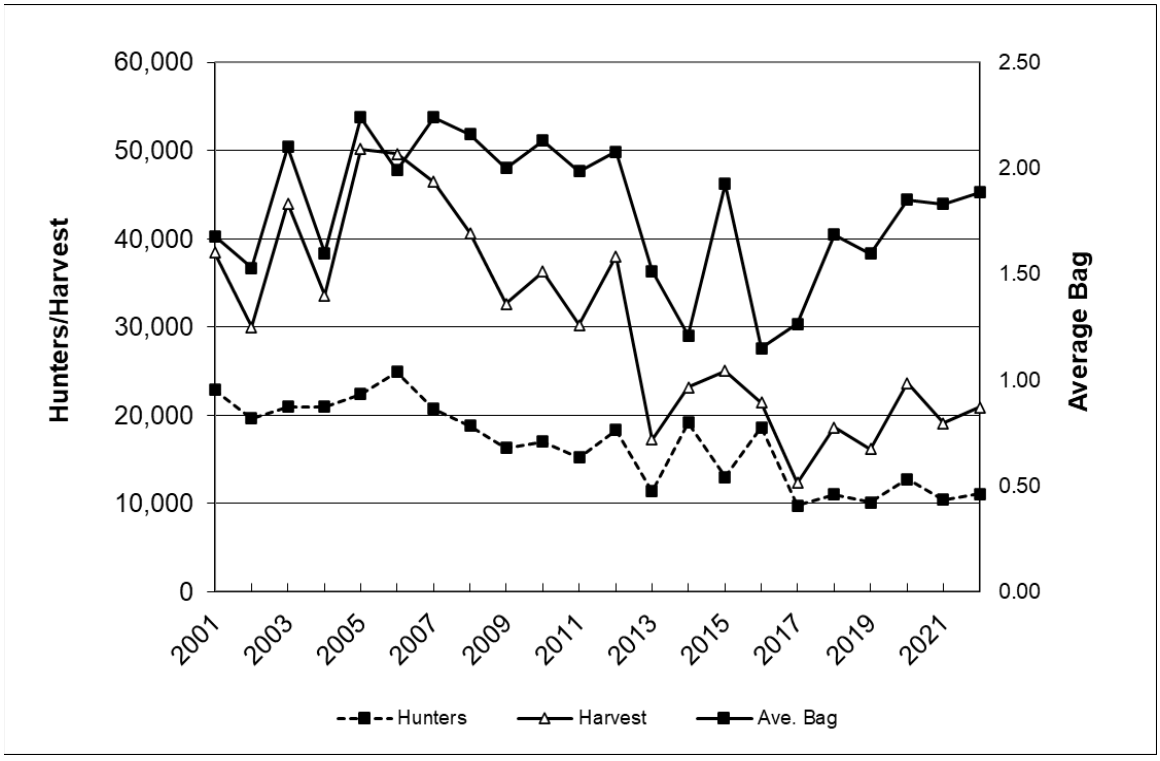
Appendix Figure 20. Pheasant harvest per hunter, 1919–2022.



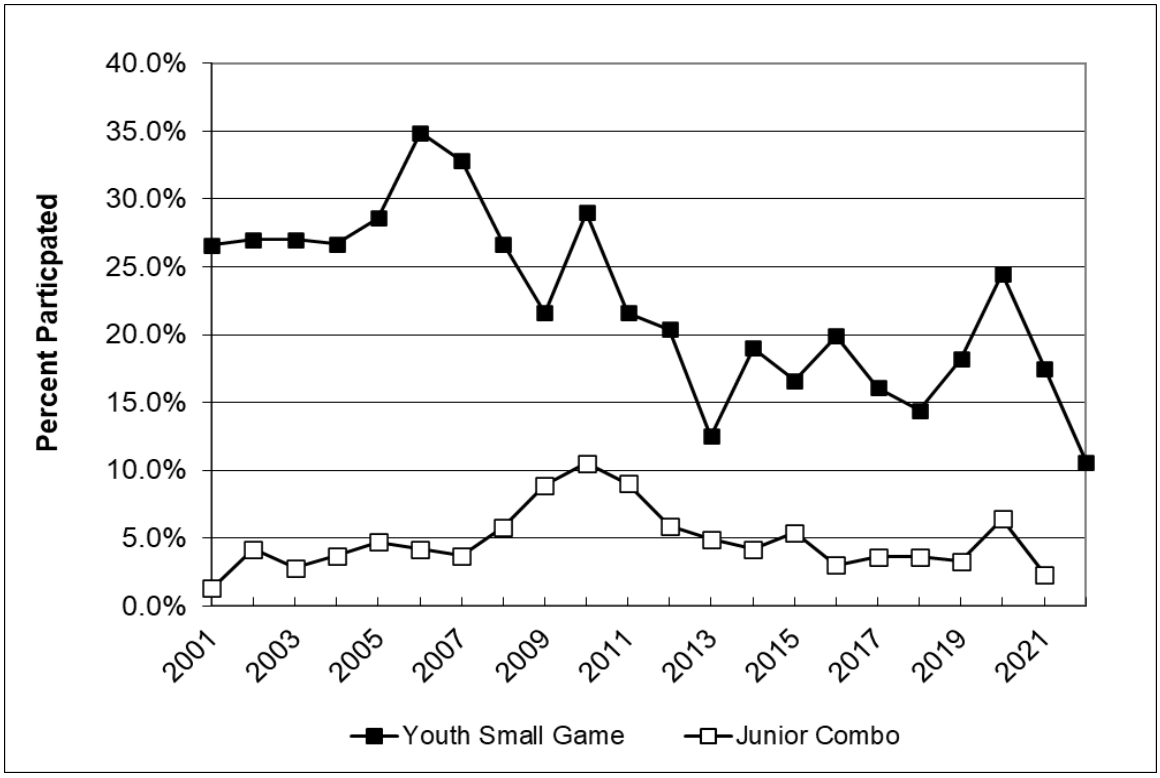
Appendix Figure 21. Pheasant harvest per hunter during past 10 years, 2013–2022.



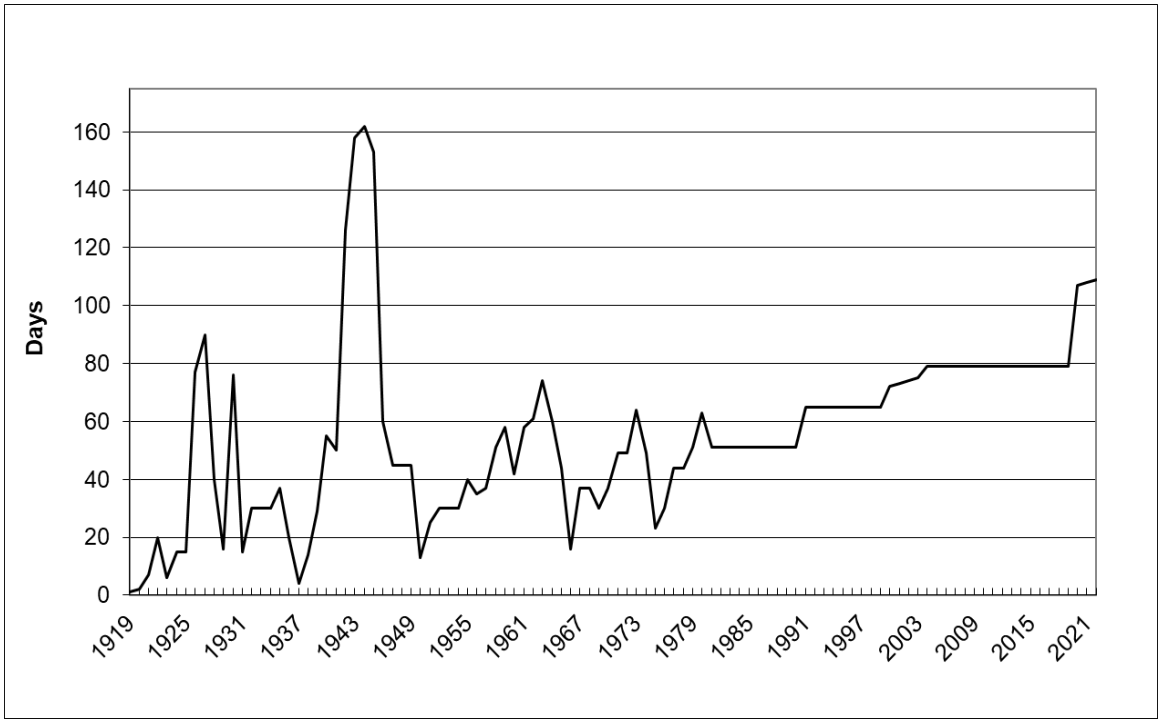
Appendix Figure 22. Resident hunters, pheasants harvested and average bag during the resident-only pheasant season, 2001–2022.



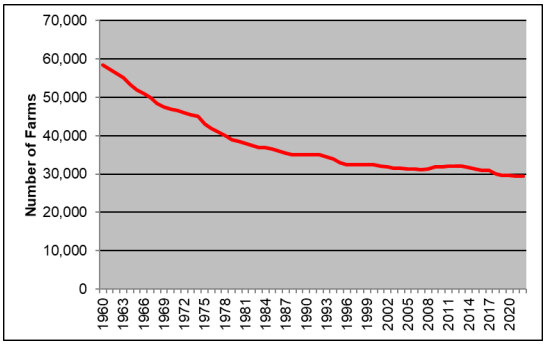
Appendix Figure 23. Percentage of youth license and junior combination license holders that participated in the youth pheasant season, 2001–2022.



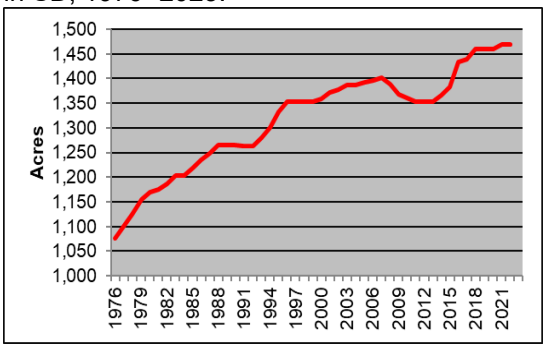
Appendix Figure 24. Number of days in traditional pheasant hunting season, 1919–2022.



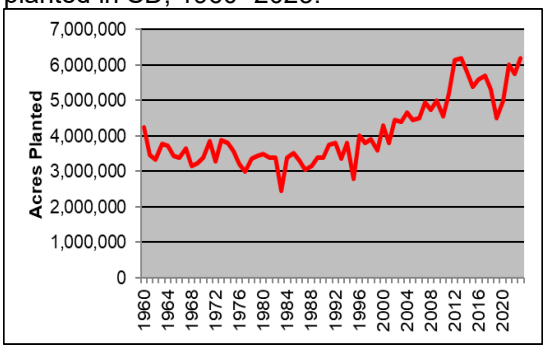
Appendix Figure 25. Number of farms in SD, 1960–2023.



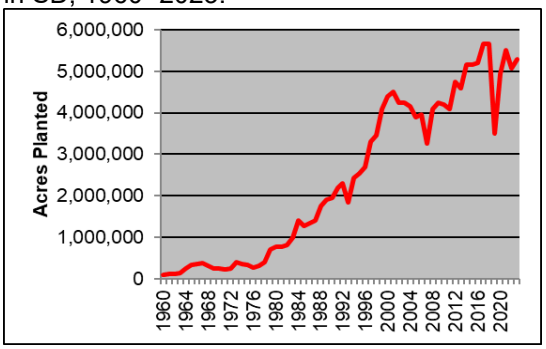
Appendix Figure 26. Average farm size (acres) in SD, 1976–2023.



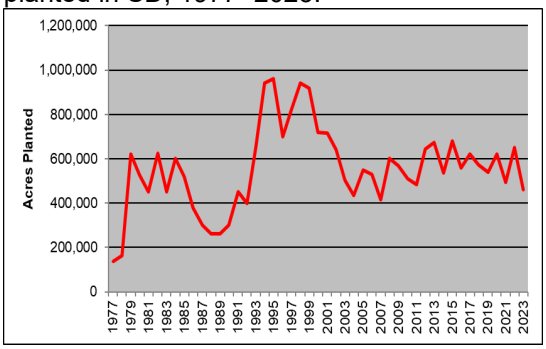
Appendix Figure 27. Acres of corn planted in planted in SD, 1960–2023.



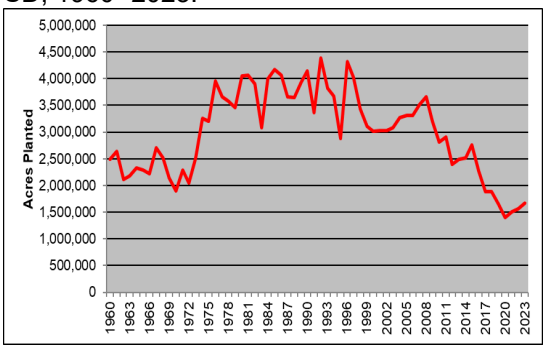
Appendix Figure 28. Acres of soybeans in SD, 1960–2023.



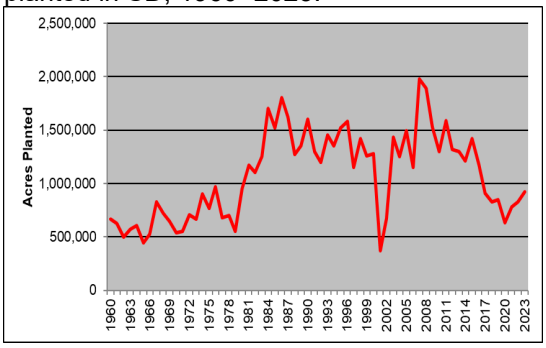
Appendix Figure 29. Acres of sunflowers planted in SD, 1977–2023.



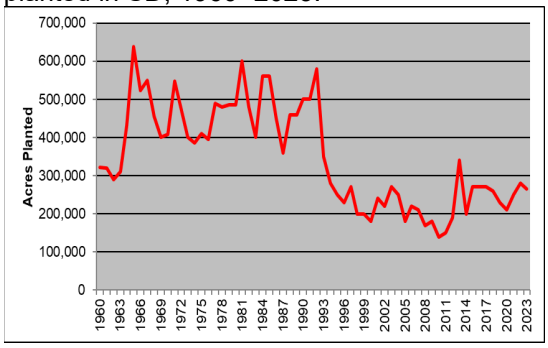
Appendix Figure 30. Acres of wheat planted in SD, 1960–2023.



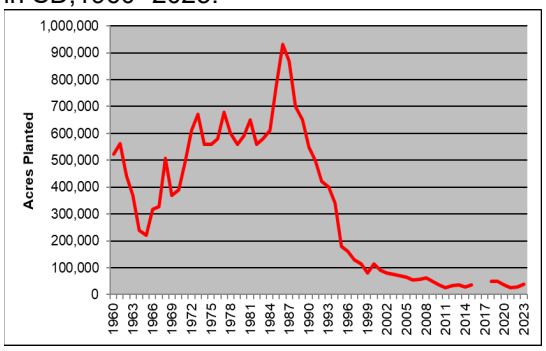
Appendix Figure 31. Acres of winter wheat planted in SD, 1960–2023.



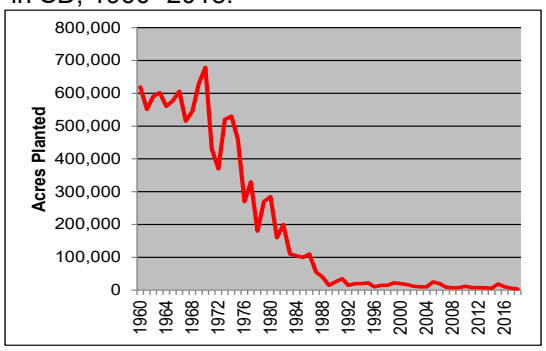
Appendix Figure 32. Acres of grain sorghum planted in SD, 1960–2023.



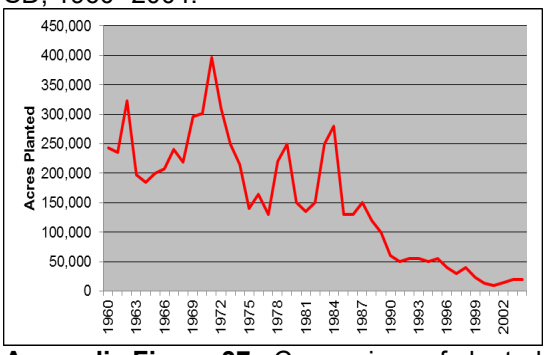
Appendix Figure 33. Acres of barley planted in SD,1960–2023.



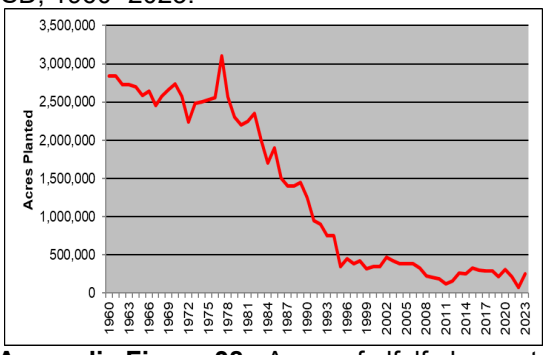
Appendix Figure 34. Acres of flaxseed planted in SD, 1960–2018.



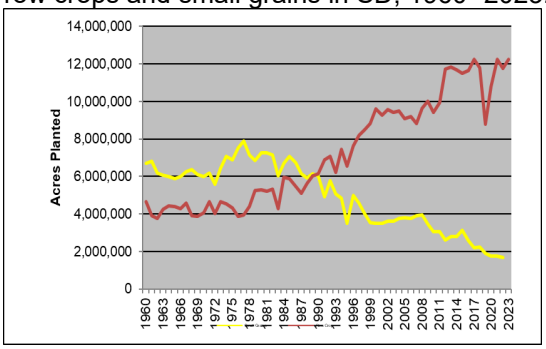
Appendix Figure 35. Acres of rye planted in SD, 1960–2004.



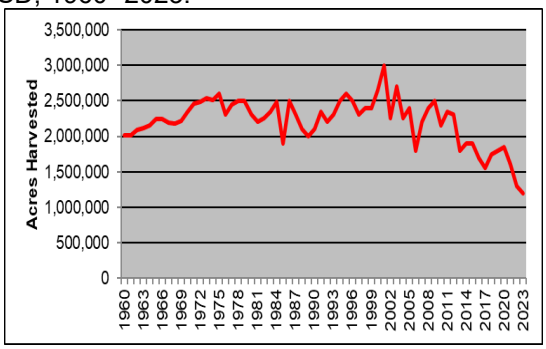
Appendix Figure 36. Acres of oats planted in SD, 1960–2023.



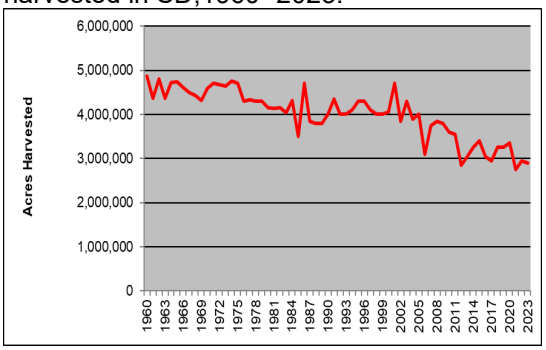
Appendix Figure 37. Comparison of planted row crops and small grains in SD, 1960–2023.



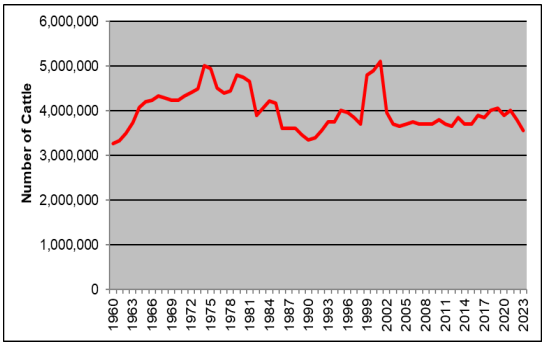
Appendix Figure 38. Acres of alfalfa harvest in SD, 1960–2023.



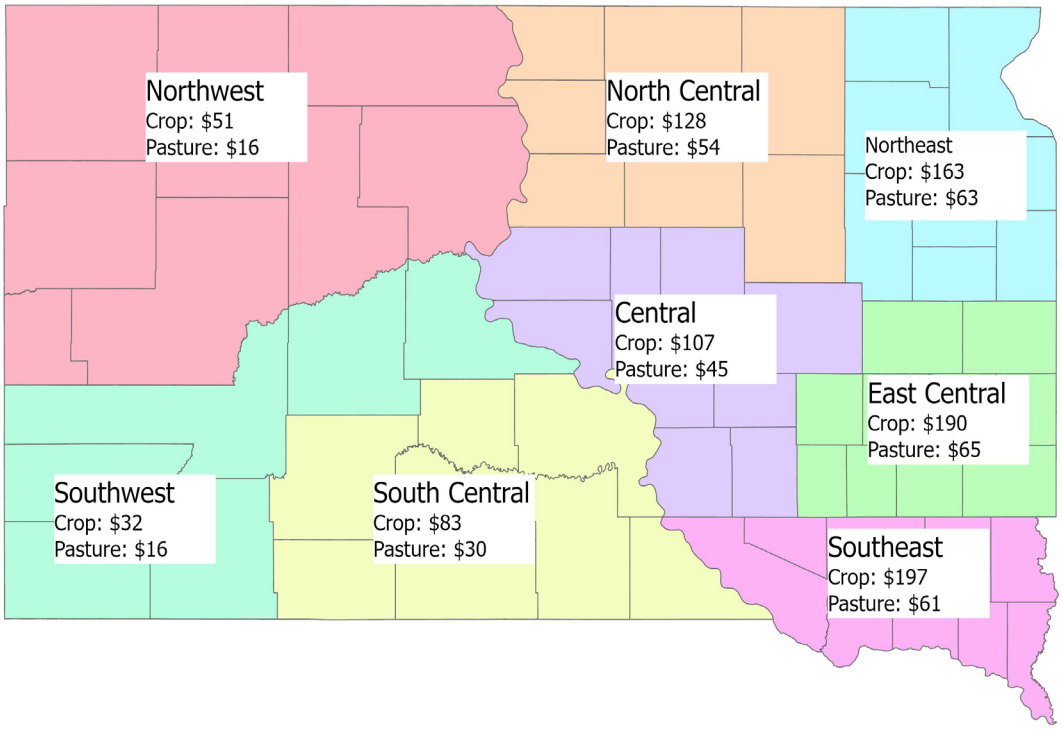
Appendix Figure 39. Acres of all hay harvested in SD,1960–2023.



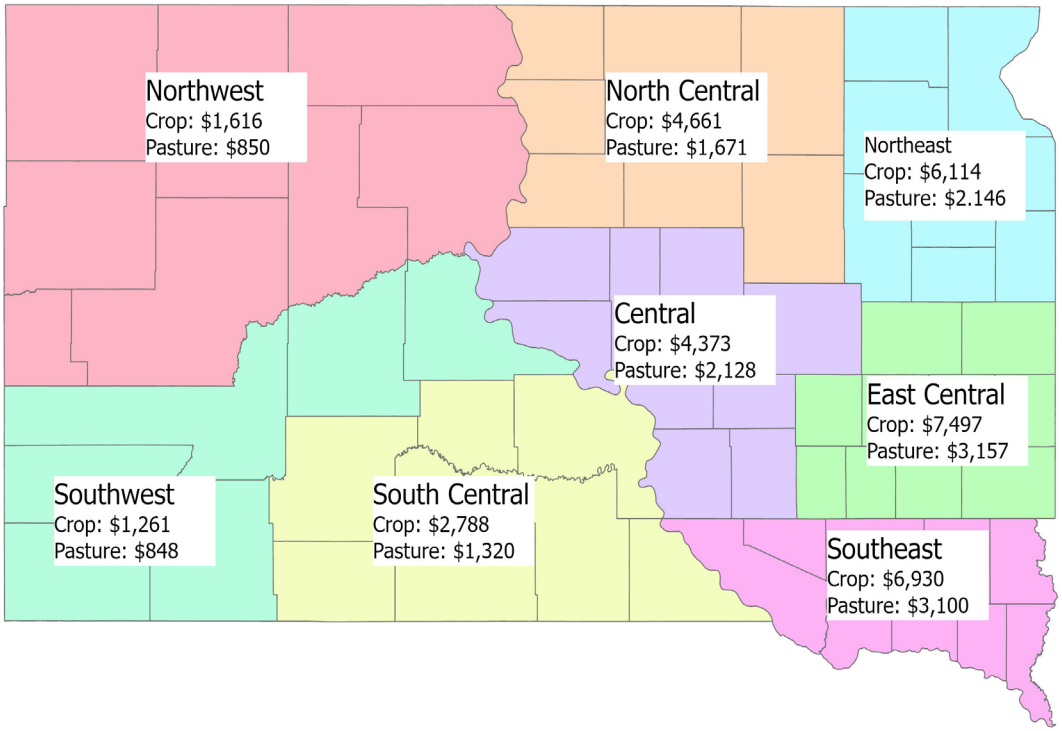
Appendix Figure 40. Number of cattle in SD, 1960–2023.



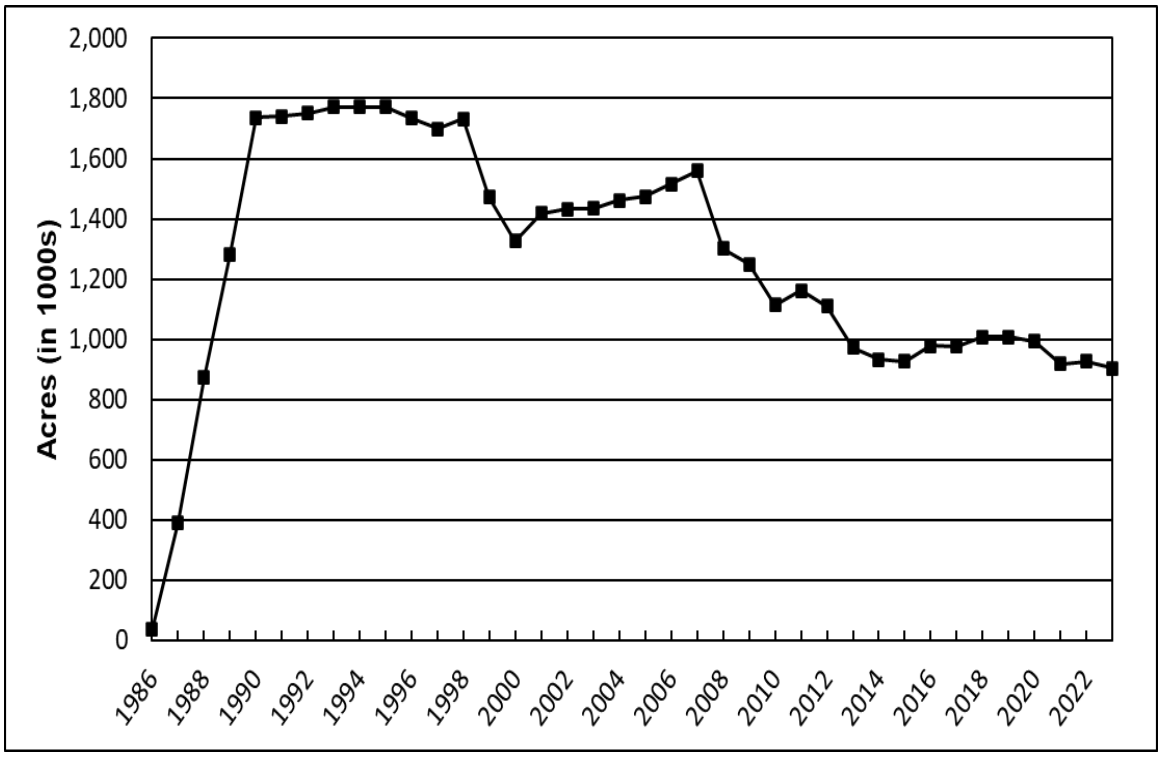
Appendix Figure 41. Average non-irrigated cropland and range (rangeland/pasture) rent (dollars per acre [Davis 2022]), 2022.



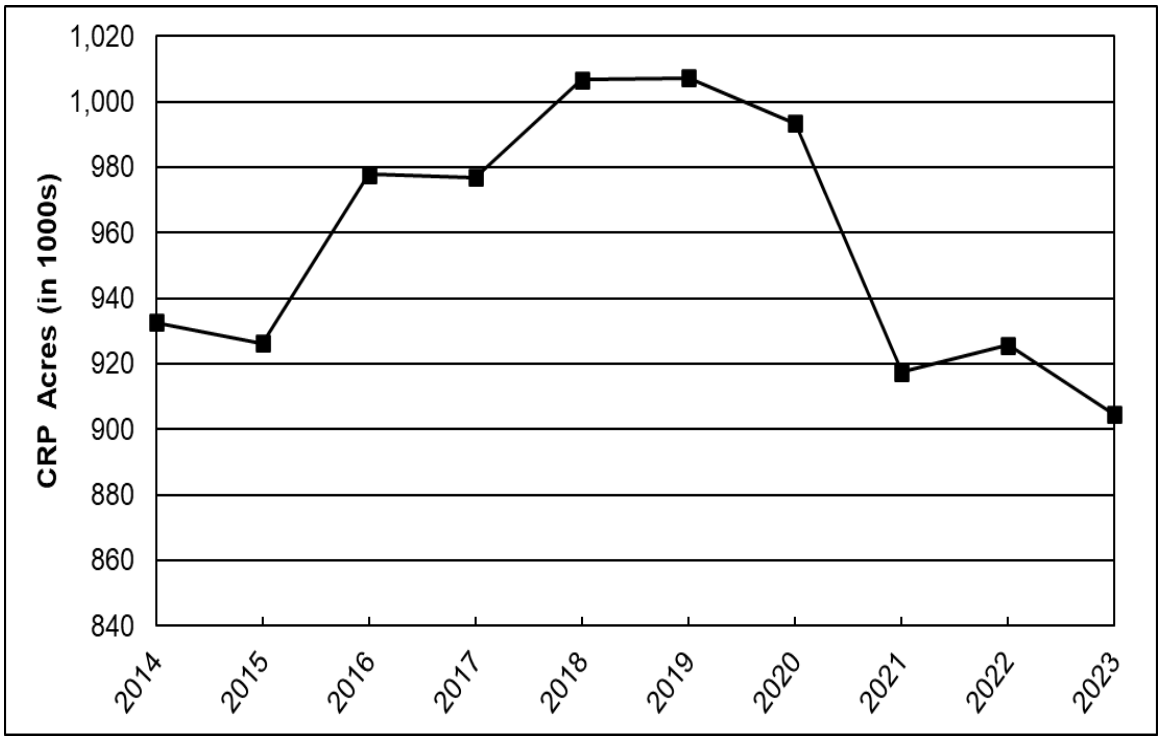
Appendix Figure 42. Average non-irrigated cropland and range (rangeland/pasture) value (dollars per acre [Davis 2022]), 2022.



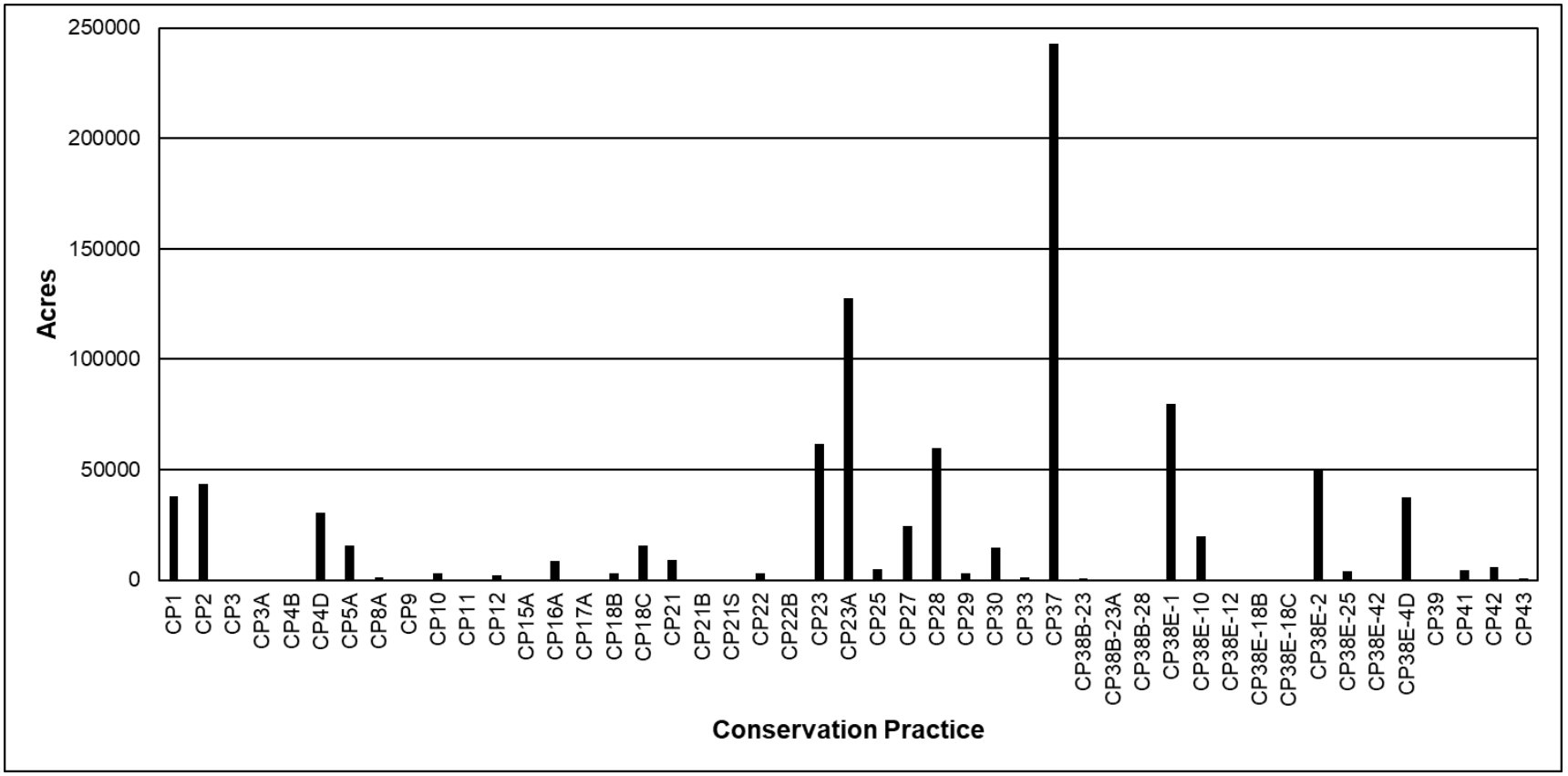
Appendix Figure 43. South Dakota CRP enrollment (excluding grassland CRP), 1986–2023.



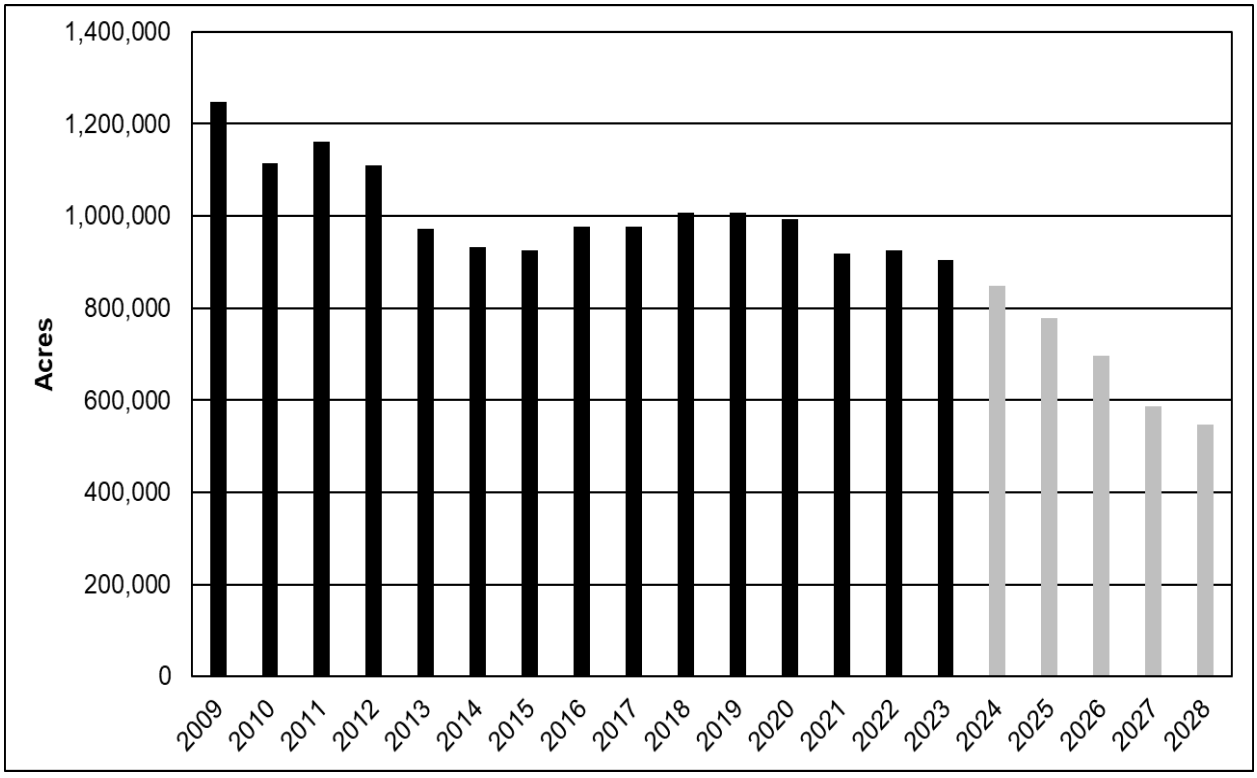
Appendix Figure 44. South Dakota CRP enrollment (excluding grassland CRP) during past 10 years, 2014–2023.



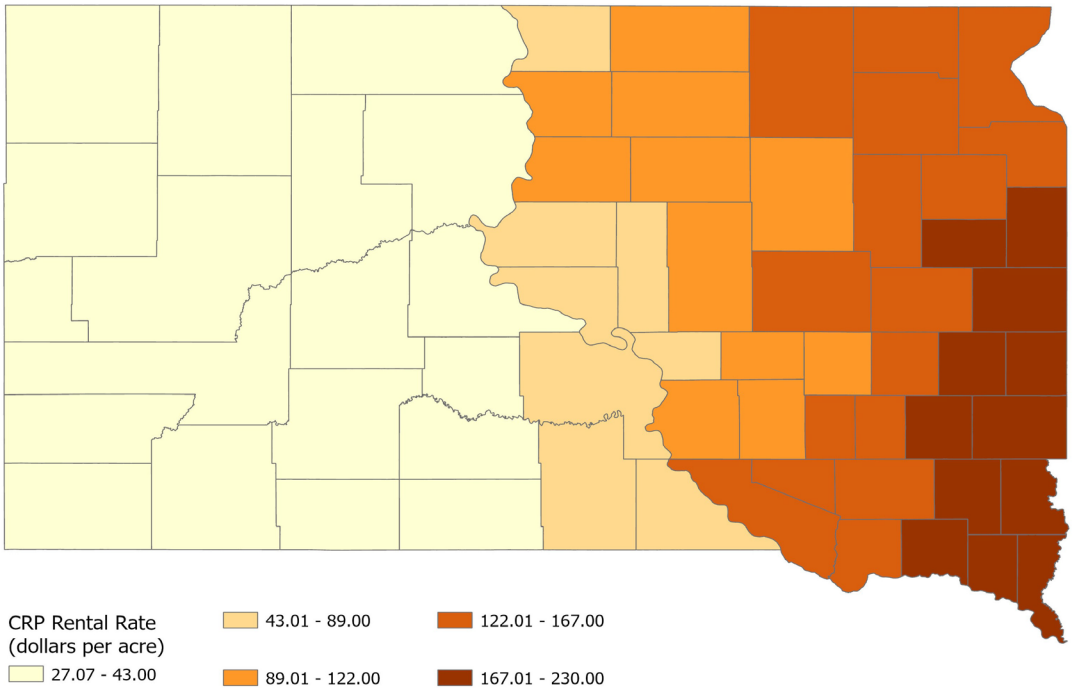
Appendix Figure 45. South Dakota CRP acres by conservation practice type as of January 13, 2023.



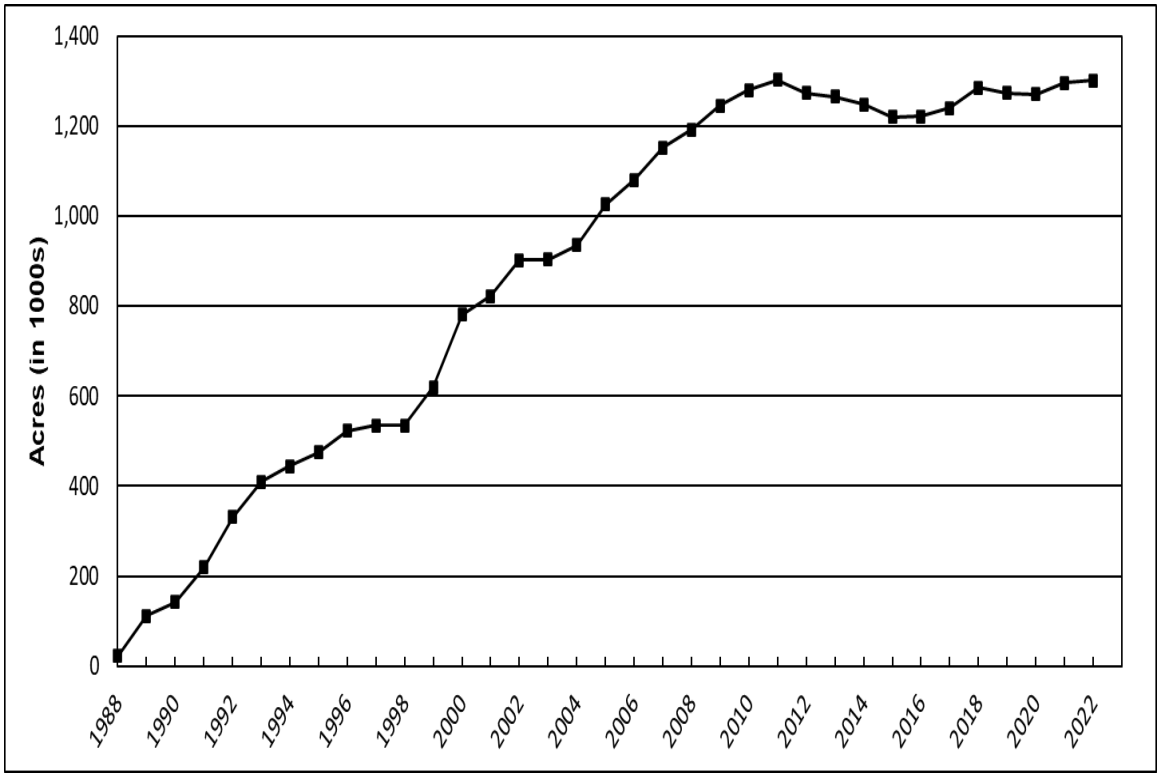
Appendix Figure 46. Historic enrollment (dark bars) and future expiration (light grey bars) of CRP (general and continuous) acres in South Dakota.



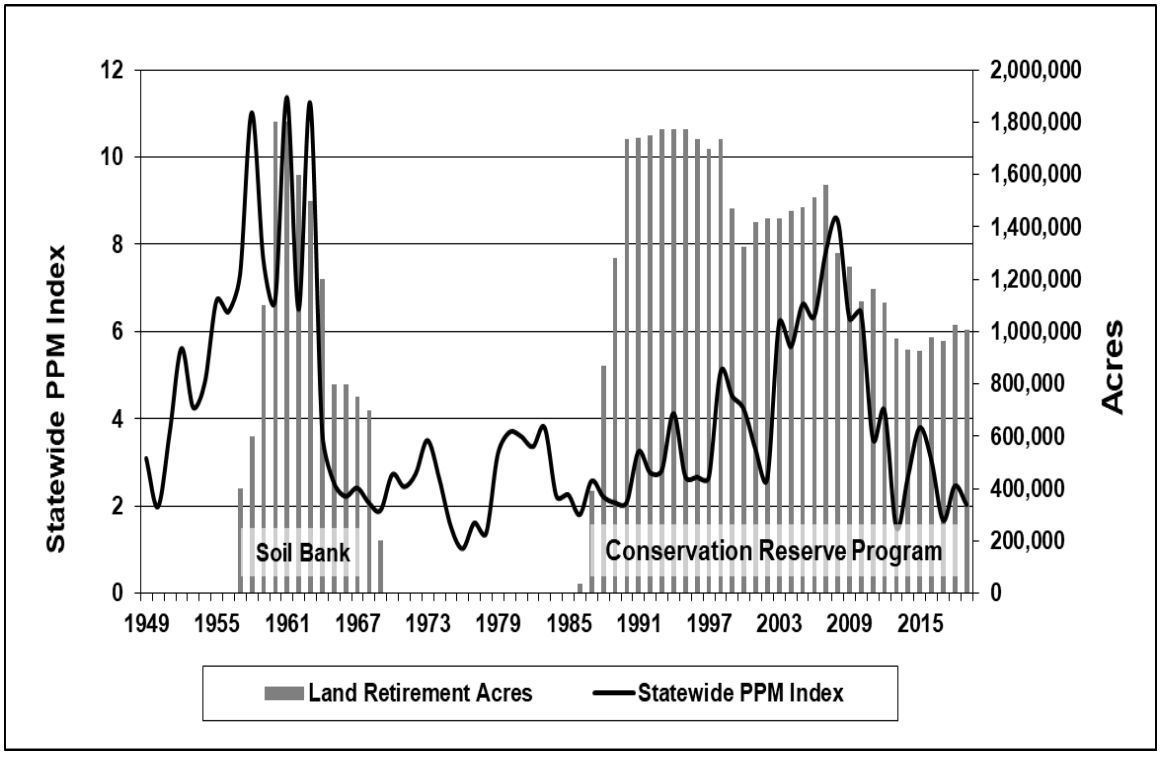
Appendix Figure 47. 2022 CRP county average soil rental rates (dollars per acre).



Appendix Figure 48. Walk-In Area enrollment, 1986–2022.



Appendix Figure 49. Pheasant population indices and cropland retirement acres in South Dakota, 1949−2019.



Appendix Figure 50. South Dakota pheasant economics during past 10 years, 2013–2022.