CHAPTER 15

RING-NECKED PHEASANT (*Phasianus colchicus*)

Mark Zornes (introduction by the editor)

I. INTRODUCTION – Ring-necked pheasants were successfully introduced to the United States from an 1881 release in the Willamette Valley, Oregon. Since that time, pheasants have been transplanted throughout the United States, and reached their maximum densities in the upper Mid-west, central and northern plains states during the 1950s and 1960s. They remain the most popular upland game bird where they are still abundant.

Several state wildlife agencies continue to monitor pheasant populations within the species' primary range. The data obtained from these studies has limited practical utility for setting hunting seasons, primarily because harvest has little or no impact on carryover of pheasants to the subsequent breeding season. For the most part, population monitoring is done to provide status information to the public. In some cases, annual information about distribution and abundance is useful to evaluate effects of land use changes, management practices or habitat treatments. Since most pheasant habitat is private land where the dominant use is agriculture, the capability to influence land management practices is somewhat limited. Habitat assessments are potentially useful for recommending treatments and land management practices to improve pheasant habitat, for example, through extension services and habitat incentive programs.

This chapter discusses life history information and traditional monitoring techniques for reference purposes. Some techniques may have utility for research, development of localized habitat plans or to document trends for hunting forecasts. However, the Department has no plans to conduct pheasant population surveys for the purpose of setting hunting seasons.

II. STATUS –

A. Distribution – Wild populations of ring-necked pheasants are currently distributed throughout all suitable habitats in Wyoming. Pheasants were established in the State in 1937 using wild stock brought from Oregon. All suitable habitats were occupied within the state by the 1950s. Since then, pheasants have declined statewide, primarily due to changes in farming practices producing less optimal habitat conditions.

B. Principal Habitats – Ring-necked pheasants are predominantly associated with areas of small grain production. Waste grains are a principal component of a pheasant's diet. During winter, pheasants seek dense cover such as cattail patches for thermal protection. Close juxtaposition of winter cover, food sources, and nesting habitats is critical. Hens typically seek areas of dense cover, such as hay or alfalfa meadows for nesting, particularly in close proximity to winter cover. Water sources are also necessary for pheasant survival.

C. Recent, Statewide Population Trends and Studies – Pheasants have declined significantly in Wyoming since the 1950s and 60s. Populations appeared to rebound during a period of favorable moisture conditions in the 1980s to mid-1990s, but declined again during a protracted drought cycle that extended at least through 2004. The generally declining trend will likely continue unless large-scale efforts are made to improve quantity and quality of pheasant habitat.

D. Historic Data, Reliability of Historic Estimates – Local and statewide harvest statistics are the principal pheasant data we collect in Wyoming. This information is summarized each year in the Annual Report of Small and Upland Game Harvest. Population indices, including spring crow counts and brood surveys, have been collected locally in portions of the state since the 1960s. While these data are somewhat useful for predicting harvest success, they are of limited value in detecting changes in pheasant density. Crow counts and brood surveys are more useful when considered in conjunction with harvest trends.

III. CENSUS –

A. Winter/Spring Flock Surveys –

1. Rationale – Although Wooley et al. (1978) recommended winter/spring flock surveys as a means to predict pheasant harvest in the fall, the methodology provides little useful information about overall trends in abundance. Meaningful inferences are difficult to draw because the technique is sensitive to variations in weather conditions and is hard to standardize. In addition, correlations between winter and spring sex ratios are poor. Annual, site-specific density and sex ratio information may be obtained from the technique, but to be useful the information should be considered in combination with production data collected during the subsequent breeding season. Standardized protocol must be followed with regard to survey conditions, timing, and use of dogs to obtain useful results.

2. Application – Winter flock surveys should be conducted in a standardized manner throughout the survey area. Typically, the observer(s) drives no more than 15 mph along a specific survey route. Routes should be established to sample all potential wintering habitats. All pheasants observed along the route are counted and classified according to sex. Binoculars and spotting scopes are necessary to classify pheasants seen at a distance. Areas of dense cover along routes are systematically surveyed on foot with the aid of trained bird dogs. Observers position themselves to count and classify pheasants as they flush. Record all observations on Wildlife Observation forms (Appendix I - E) and submit these to the district wildlife biologist upon completion of the survey. Estimates and incomplete counts should be circled on the data sheets.

   Winter flock surveys are conducted between December 15 and March 1, during the first and last 2 hours of daylight. Surveys should be conducted immediately after a major snow event or when intense cold and snow have concentrated wintering pheasants.

3. Analysis of Data – Submit Wildlife Observation forms containing pheasant data to the district wildlife biologist before the data are entered in the Wildlife Observation System. This affords the biologist an opportunity to analyze the information and discuss it in annual Job Completion Reports. If the data are to be used to detect annual trends, report observations per unit of effort (e.g., birds/mile or birds/hour surveyed). It is also important to accurately describe conditions under which the survey was conducted, because variability can significantly impact data consistency. Data should be collected annually for at least 5 years to allow meaningful assessment of pheasant abundance and sex ratio trends. Also refer to Chapter 12 (Sage-grouse), Section II.C. (Documentation of Winter Use Areas).

4. Disposition of Data – Forward all data records to the appropriate district wildlife biologist so the information can be analyzed and discussed in Annual Upland Game Reports (JCR) and entered in the Wildlife Observation System.

B. Spring Crow Count Surveys –

1. Rationale – Spring crow counts provide additional information about annual and long-term trends in the density of breeding pheasants, and can also provide an index of winter survival. Wooley et al. (1978) determined crow counts were correlated with fall harvest ($r = .60$, $P = .01$), but a more significant correlation existed between harvest and brood counts. Neither winter flock surveys nor spring crow counts should be interpreted without supplemental data from an August brood survey.

2. Application – Traditional survey routes are established through representative areas of occupied pheasant habitat. Each route begins at an identifiable starting point. At least 10, but not more than 15 listening stations are located at one-mile intervals along each route. The peak of spring crowing varies geographically, but is generally between April 25 and May 15 (Gates 1966). Counts in Wyoming have typically been done in May, however crowing intensity declines dramatically the last two weeks of May.

   Survey conditions and timing are important considerations (Gates 1966). Avoid surveying during high winds or cloud cover. High winds reduce hearing distances (Kimball 1949) and crowing intensity is lower on cloudy days (Taber 1949). Accordingly, select calm, cloudless days to run crow count routes. Begin surveys 50 minutes prior to official sunrise. Stop at each station, turn off the vehicle's engine, and record the number of calls heard during a timed two-minute period. Record data on crow count forms (Attachment 1).

3. Analysis of Data – Submit crow count forms and a map of survey routes to the appropriate district wildlife biologist before the data are entered in the Wildlife Observation System. Also include a description of actual survey conditions, as they can significantly affect results. The biologist will provide an analysis and summary of crow count data for inclusion in annual Job Completion Reports (JCRs). The data summary should include: 1) total calls heard, 2) total calls per route, 3) average calls per station

(all stations on all routes), and 4) average calls per station, calculated for each route. Also include a summary of data collected over the preceding 5 years if it is available.

4. Disposition of Data – Crow count data are entered in the Wildlife Observation System database, and data summaries/analyses are printed in Annual Upland Game Reports. District biologists should maintain file copies of data sheets and JCRs.

C. Production Surveys –

1. Rationale – August brood counts provide additional information regarding pheasant population trends and more importantly, can serve as a valuable forecast of fall harvest. Brood count data can also be used to identify important habitats that should be maintained or enhanced. Although various methods of collecting brood data are useful for predicting fall harvest, the number of broods observed along a 30-mile survey route appears to have the strongest correlation. However, 30-mile routes are somewhat costly to survey. An adequate sample can be obtained from a smaller area if it is searched intensively.

2. Application – Traditional survey routes are established within representative areas of occupied pheasant habitat. Run survey routes on cool days, during the first 3 weeks of August. Prior to this time, chicks are more difficult to observe and more susceptible to stress-related mortality. After this time, chicks are more difficult to distinguish from adults.

   Drive along survey routes at 15-20 mph during the first and last 3 hours of daylight. Count all hens and broods observed, including hens without broods. A trained bird dog can greatly assist with detecting additional broods. Stop at each location a brood is observed and use the dog to search the area immediately surrounding. A dog will enable the observer to detect multiple broods and hens that may be concealed in dense cover. Binoculars are also useful to detect pheasants from longer distances. Once a brood is located, flush the birds to ensure an accurate count is made. A well-controlled dog is essential for this purpose because young birds tend to hold tight in cover. If brood data will be used to estimate average brood size and production, all hen pheasants observed must be recorded, not just those with broods.

   Record observations on Wildlife Observation forms (Appendix I). Note the location and numbers of all hens and chicks observed. Estimate and record the ages (reported as size, e.g. ¼ grown, ½ grown) of chicks in each brood. Also note weather conditions during the survey. Estimates or incomplete counts should be circled on the data forms.

3. Analysis of Data – Data should be submitted on Wildlife Observation forms to the district wildlife biologist prior to inclusion in the Wildlife Observation System. This provides the biologist with an opportunity for analysis and inclusion in annual Job Completion Reports. The following information should be summarized: 1) the number of hens observed, 2) number of chicks observed, 3) total number of broods observed, and

4) average chicks per hen. These data should be compared to data from the previous 5 years if it is available.

4. Disposition of Data – All data are forwarded to the district wildlife biologist for inclusion in Annual Upland Game Job Completion Reports (JCRs) and the Wildlife Observation System.

D. Harvest Surveys –

1. Rationale – Pheasant harvest data are used as an index to gauge population trends, hunting pressure changes, public interest, and survival of young to fall. This information is used to answer public questions, assess responses to potential habitat alteration projects, and to some degree in making hunting season recommendations.

2. Application –

a. Harvest Questionnaire Survey – Harvest surveys are the best method for obtaining comparable annual harvest information over large areas on a consistent basis. Refer to Appendix III-A.

b. Field Checks – Hunter field checks have traditionally used to obtain preliminary harvest information based largely on incomplete data. Field checks provide an opportunity for law enforcement and may yield limited biological information. However, most of the data that are obtained from field checks (with the exception of law enforcement) can be collected much more efficiently with questionnaires, wing barrels, and at established check stations. Field checks should be used to collect information that would otherwise be unattainable, for example hunter distribution, evaluation of crippling loss, access problems, property damage, and hunter attitudes and perceptions. While no standardized technique exists for field checks, they can be valuable from a standpoint of making hunter contacts, assessing attitudes, conveying educational information, and obtaining a general index of hunter success. All pheasant field checks should be recorded on Wildlife Observation Forms.

c. Check Stations – Check stations are set up at fixed locations that most hunters must pass, usually along major egress routes. Harvest data are recorded on check station sheets or Wildlife Observation Forms. Although it is generally possible to collect more data at check stations than during field checks, the data represent a very small portion of the total harvest. Check stations are most effectively deployed to collect data for special projects or to gauge hunter success on a localized basis. Data on the age composition of the harvest may also be collected, although sample sizes are usually small.

E. Age and Sex Determinations –

1. Aging – It is typically more difficult to determine age of pheasants, once they acquire their adult plumage, than many other upland game birds. The most accurate method of

aging pheasants (adult versus juvenile) is by measuring the bursa of fabricus. The bursa is a thin-walled, sac-like structure lying dorsal to and at the extreme posterior end of the large intestine. Age determination is accomplished by probing the bursa through its opening, which is located on the dorsal median surface of the cloaca. An eight-penny nail with a rounded tip works well as a probing instrument. A permanent mark should be made on the nail, eight mm from the rounded tip. When measured in November, a bursa eight mm or deeper indicates an immature pheasant, while one that is less than eight mm or absent indicates an adult. The bursa is absent in ***most*** pheasants that are a year or more of age.

Ages of juvenile pheasants can be determined based on stage and pattern of primary feather replacement (Table 1).

2. Sexing – Once pheasants reach 7-8 weeks of age, sex can be determined easily based on plumage dimorphism.

Table 1. Length criteria used to determine ages of juvenile pheasants based on certain primary feathers. [1]

	PRIMARY FEATHER					
AGE (weeks)	1	2	3	4	5	8
1				15-28 mm 100%		
2				29-47 mm 94%		
3				48-68 mm 93%		
4	6-25 mm 87%					
5	26-50 mm 87%					
6	51-73 mm 88%					Molt
7						33-81 mm 94%
8						82-117 mm 91%
9					Molt	118-144 mm 90%
10				Molt	31-76 mm 76%	
11					77-113 mm 67%	
12			Molt		114-142 mm 63%	
13			55-87 mm 62%			
14		Molt	88-121 mm 67%			

15			122-147 mm 55%			
16	Molt	77-107 mm 61%				
17		108-123 mm 55%				
18		124-150 mm 73%				
19	92-112 mm 50%					
20	113-129 mm 37%					
21	130-145 mm 41%					
22	146-159 mm 58%					

[1] Percent accuracy (%) based on pen-reared birds.

F. Mortality Surveys –

1. Rationale – Populations of pheasants are limited or impacted by many of the same factors as other upland species. The factors principally affecting pheasants in Wyoming include: 1) quality and juxtaposition of winter cover and nesting habitat; 2) weather events after broods have hatched; 3) farming practices (particularly the cutting of hay); and 4) availability and quality of brood rearing habitat. Predators, disease and accidents impact pheasants, as well. As with other ground-nesting species, predation on hens, eggs and young chicks can be substantial and is related to the quality of nesting habitat.

   In portions of Wyoming, hay harvest typically coincides with the peak pheasant hatching. Second cuttings of hay can also impact success of renesting attempts. This practice is probably the most significant cause of mortality to hens and young birds in Wyoming.

2. Application – When mortalities of pheasants are encountered in the field, they should be recorded on Wildlife Observation forms. Include the location, age, sex, apparent cause of death, number of birds found dead and disposition of carcass(es). If the cause of death cannot be determined or is unique, take a photograph to document the mortality. If the cause of death is inexplicable and the carcass is fresh enough, immediately deliver it to the Department laboratory for post-mortem examination.

3. Analysis of Data – Incidental observations of pheasant mortalities have little value for population analysis; however, analysis of the relative importance of various mortality factors may suggest areas where research of special management measures is needed.

4. Disposition of Data – It is the responsibility of field personnel to record pheasant mortalities on Wildlife Observation forms and to submit the forms for entry into the

Wildlife Observation System. If patterns of significant mortality are detected, field personnel should recommend measures to alleviate the cause.

IV. DISTRIBUTION AND MOVEMENT –

A. Field Observations –

1. Rationale – Data that describe pheasant distribution and movements can help managers identify critical habitats. Although pheasants typically do not move long distances between seasonal habitats, documentation of year-round use and movements to wintering areas is useful for developing management plans and recommendations.

2. Application – Record data pheasant observation data on Wildlife Observation forms (Appendix I). Observations of dead pheasants can also be useful sources of distribution data (refer to Section II.F, Mortality). In addition, pheasant mortalities provide opportunities to collect age and sex data and food habits information (through crop analysis). Tracks, feathers, crowing, and other sign can be recorded as "indirect observations" when such information is useful (e.g., fills in gaps in distribution records).

3. Analysis of Data – Seasonal observation data can be queried and loaded into GIS layers, which can then be superimposed onto cover types and other land use classifications to identify important habitats or to track changes in distribution over time. This type of analysis can be useful to identify factors impacting pheasant distribution, or to provide supporting documentation for management plans and recommendations.

4. Disposition of Data – Field personnel should forward records of pheasant observations monthly to the responsible wildlife biologist. The district biologist should maintain a permanent file of pheasant distribution records and should summarize and report the information annually.

V. TRAPPING, MARKING AND TRANSPLANTING –

A. Trapping – Pheasants have been captured using funnel traps, swinging wire traps, and at night, using hand nets (Day et al. 1980). Cannon nets have also been used, but the technique produces fairly high mortality of captured pheasants.

B. Marking – Pheasants are most commonly marked with aluminum butt-end or colored plastic leg bands (refer to Appendix VII, Marking Techniques). Some researchers have used patagial markers successfully on upland birds.

C. Transplanting – Varying densities of pheasants currently occupy the areas of Wyoming that are considered suitable pheasant habitat. The species has a high reproductive potential and populations respond rapidly when environmental conditions are favorable. No additional transplants of wild ring-necked pheasants are needed at this time. If suitable habitat, distant from wild pheasant populations, should be developed in the future, birds could potentially be transplanted into the vacant habitats.

D. Stocking for "Put-and-take" Hunting – Each year, the Wyoming Game and Fish Department releases over 20,000 pheasants for "put-and-take" hunting on Department-managed lands, some public lands, and walk-in areas enrolled in the Department's "Private Lands Public Wildlife" program. Pheasants for these releases are provided from 2 state-operated bird farms. The stocking program provides additional recreation for bird hunters within a state with limited opportunity to hunt wild pheasants. In some cases, the program also provides incentive to maintain additional habitat and cover on private lands. There is very limited carryover of stocked birds that survive until the subsequent breeding season. The primary objective is to produce birds to be harvested in an intensive "put-and-take" hunting program.

VI. HABITAT MANAGEMENT –

Characteristics of pheasant habitat have been well documented throughout the United States. The most thorough references available for managers in Wyoming include work by Koerner (1992) relative to pheasant habitat management and enhancement in Wyoming, and recommendations by Baxter (1974) regarding pheasant habitat management in Nebraska. Most literature describes seasonal habitats, but does not provide specific insight about the juxtaposition of those habitats to one another. Changes in farming practices have impacted habitat juxtaposition, causing declines in pheasants throughout their range in North America. In Wyoming, removal of brushy and weedy field edges and fences row habitats, burning of irrigation ditches, timing of hay harvest, crop selection, fall plowing, and increased use of corn stubble fields as livestock forage have drastically reduced pheasant carrying capacity.

Although limited in area, Department lands on which pheasant management is emphasized have increased local populations of the species. However, most pheasant habitat is on private land. The Department, through landowner contacts and extension services, encourages landowners to maintain and enhance pheasant habitats. A variety of federally funded conservation programs are available to assist with habitat restoration and improvement on private lands. Several programs associated with the Farm Bill are administered through local NRCS offices. Local chapters of Pheasants Forever have successfully implement many privately funded and cost-shared habitat improvements in cooperation with private landowners. The Conservation Reserve Program (CRP) has had tremendous benefits for pheasants in some regions of Wyoming, particularly areas with interspersed small grain production.

Pheasant habitats should be managed on a landscape scale. The most important factor limiting pheasant populations in Wyoming is availability of permanent nesting and winter cover associated with agricultural lands and water sources. Where appropriate, farmers should be encouraged to leave vegetative cover on unused corners near center pivots, and along fencerows and ditch banks. Mowing or haying along road ditches and at least in portions of hay fields should be delayed until July 1. Field mowing should be done in a pattern (e.g., progressive strips from edge to edge) that avoids "trapping" pheasants in remaining patches of cover just before they are mowed. Only the shoulder vegetation along roads should be removed. Water sources should be at least partially fenced to prevent grazing and trampling by domestic livestock and to enhance vegetation that provides nesting and escape cover, and sources of food. Livestock use should be excluded from all cattail habitat as well as corn stubble fields. Managers should encourage landowners to plant food plots, shelterbelts, and dense nesting

cover. Many of these plantings can be implemented through cost share agreements at little or no expense to the landowner.

VII. FOOD HABITS –

Food habits of wild pheasants have been well documented throughout the United States. Further studies are of doubtful value unless new crop varieties are introduced or mortality that appears linked to agricultural or industrial practices is documented. The Department's Laboratory should be involved with all phases of a food habits investigation other than sample collection and gross analysis. Two standard techniques are suitable to determine food habits of pheasants:

1. Crop analysis
2. Fecal analysis

Various adaptations of these techniques are described in Litvaitis et al. (1994:266) and the references they cite. If an investigation of food habits is planned, the project should last at least three years and should employ both of the aforementioned techniques. Habitats, including agricultural crop types, should be accurately mapped each year of the study. A seasonal voucher collection of available plant species is also necessary. Finally, an accurate map and record of sample locations should be maintained.

VIII. DEPREDATION CONTROL –

Although pheasants normally cause little agricultural damage, they can harm sprouting corn. Typically the damage involves plants less than 6 inches. Pheasants dig young corn sprouts from the ground and eat the kernel. Pheasant-caused damage is easily distinguished from cutworm damage wherein only the shoot (not the kernel) is removed. Pheasants actively feed during early morning and evening hours, consequently most damage happens at these times. Birds can be discouraged using Zon-guns, Ca-Ca rope with cherry bombs, bird bombs, and Avalarms until corn is past the vulnerable stage. Pheasants can also be lured away from growing crops by spreading whole kernel corn near cover.

IX. LITERATURE CITED –

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