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GREATER PRAIRIE-CHICKEN HARVEST IN KANSAS: EARLY VS. REGULAR SEASONS

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ABSTRACT—Remnant populations of the greater prairie chicken (*Tympanuchus cupido pinnatus*) in Kansas are managed to maintain population size while providing recreational hunting potential. Our aim in this study was to evaluate the effect of adding an early hunting season (late September-October) to the regular season (November-late January). We compared the hunting methods used and the harvest of greater prairie chickens during early and regular hunting seasons for 1990-91 and 1991-92. The use of dogs and walkup hunting techniques were emphasized in early season, whereas pass shooting in feeding fields was emphasized in the regular season. During early season, the reported harvest was composed predominantly of males (55-74%) and juveniles (60-67%). During regular season, the harvest was also composed of more males than females (60% for both years), but it had a similar proportion of adults to juveniles (50-58%). The ratio of males:females varied between each seasons for the two years analyzed. However, the ratio of juveniles:adults was similar between years and larger during early season than during regular season. Juvenile survival is generally lower than adult survival; so, harvesting a larger proportion of juveniles during the early season may mitigate some of the effect of an extended hunting season.



Figure 1. Typical greater prairie-chicken in fall plumage. Photo by Roger Applegate.

Introduction

The greater prairie chicken (*Tympanuchus cupido pinnatus* L.) originally occurred throughout the North American grassland-oak (*Quercus* spp.) savanna, from Ohio westward to the eastern plains (Fig. 1). As the savanna was converted to farming, prairie chicken range moved further west, extending into eastern Colorado (Schroeder and Robb 1993). And, as the forests in the Great Lakes states and in Canada were cut, prairie chicken range expanded into the previously wooded areas (Ammann 1957). An eastern subspecies, the heath hen (*T. cupido cupido* L.), occurred in scrub oak woodlands on the east coast from Virginia to Maine (Schroeder and Robb 1993, Applegate 1993). The heath hen, now extinct, is believed to have been subsequently isolated from the main body of the species range after an earlier range expansion (Lumsden 1966). A third subspecies, the Attwater's prairie chicken (*T. cupido attwateri* L.), is a federally-listed, endangered species that occurs in the coastal prairies of Texas (Schroeder and Robb 1993).

Small remnant populations of the greater prairie-chicken occur in Oklahoma, Missouri, Colorado, Illinois, Wisconsin, Minnesota, North Dakota, and Iowa (Schroeder and Robb 1993; Moe and White 1995). Larger populations occur in Kansas, Nebraska, and South Dakota. These three states were the only ones offering a hunting season on prairie chickens in fall 1998.

The regular hunting season in Kansas, which has been taking place continuously since 1980, starts the first weekend of November and extends through the end of January. The primary hunting technique used for this regular fall/winter season consists of pass shooting birds as they enter or leave fields for feeding. During this time of the year, the birds commonly feed on agricultural lands containing waste grain (Baker 1953). Walking the prairies or using dogs to flush birds are usually ineffective at this time of year since the birds are in large winter groups and frequently flush early and so are out of gun range. This behavior has made greater prairie-chicken hunting difficult for hunters who work with dogs or who prefer to walk to flush coveys.

To increase the recreational potential of greater prairie chicken hunting for individuals using alternative hunting techniques, the Kansas Department of Wildlife and Parks (KDWP) established an early hunting season for the greater prairie-chicken in 1989. This early season begins the last week of September and continues through the third week of October. During this early hunting season the birds can still be found in small family groups (Robel et al. 1970; Bowman and Robel 1977). Dispersal of the greater prairie chicken broods, which begins from mid-August to early September, is not complete until late into fall. The small family groups do not flush as wildly as larger winter groups, so they provide an improved hunting opportunity for hunters walking to flush coveys or using dogs. This special early season is limited to the eastern third of Kansas, where greater prairie-chicken numbers are highest (Horak 1985). Some concern, however, has been expressed about the impact that early hunting on prairie chicken populations. Earlier, for example, Gross (1930) recommended the season open no earlier than the second week of October.

The purpose of our study was to examine baseline data on the number and type of greater prairie chickens harvested during the early and regular hunting seasons. We collated the numbers and proportion of males, females, adults, and juveniles harvested, as well as recorded the general characteristics of the harvest and the type of harvest techniques used during each hunting season. These baseline data are important since no recent harvest

data have been collected for greater prairie chicken in Kansas, and the outcome of the early hunting season had never been quantified in Kansas.

Methods

The age-stage, adult or juvenile, and sex of greater prairie chickens harvested during 1990-1991 and 1991-1992 were determined using wings and tail feathers collected from hunters (Thompson 1958). Wing and tail feather data were collected in the following ways:

- 1) before the 1991-1992 seasons began, self addressed and post-age paid wing envelopes were mailed to 773 greater prairie-chicken hunters identified in the "Small Game Hunter Survey" by the Department of Wildlife and Parks;
- 2) wing and tail feather counts were obtained from Fort Riley Military Reservation's Hunter Harvest Survey for 1990-91 and 1991-92 hunting seasons; and,
- 3) wings and tail feathers of birds harvested during the 1990-91 and 1991-92 hunting seasons were provided by friends.

Hunters who received the wing envelopes also received a questionnaire with some basic questions about their greater prairie-chicken hunting experience. The information requested for each harvest included: date, county, time of day, technique used (pass shooting or dog/walk up), number of hours hunted, number of birds shot, total harvest for the day, and number of birds shot but not retrieved.

Data from 97 birds were received for the 1990-91 hunting season (97 were aged, 55 were sexed) and from 181 birds for the 1991-1992 hunting season (172 were aged, 121 were sexed). Since tail feathers and wings were not available for all individuals, there were differences in the number of birds sexed and aged.

Sex and age data collected from the 1990-91 and 1991-92 hunting seasons were pooled for analysis. Chi-square goodness of fit tests were used to test the H_0 : that there was no difference in the sex and age of birds harvested during the early and late hunting seasons (Zar 1984). A test of proportions was used to test the H_0 : that there are no differences in proportion of sex and age groups between birds harvested in the early vs. late hunting seasons (Zar 1984). The nature of the questionnaire enclosed with the wing envelopes did not allow analysis of the correlation between the sex and age of birds and hunting technique.

Results

The hunter harvest questionnaire indicated that more birds were harvested, using the walking and flushing, during the early seasons. In early season, almost half (47.4%) of the birds were harvested by walking and flushing. During the regular season only 8.7% of the birds were harvested walking and flushing. The traditional pass shooting technique was also used to a large extent (52.6%) during the early season, and it was the dominant technique (91.3%) during the regular seasons. Thus, as expected, the early season was being used, by hunters who walked or used dogs to flush small coveys of birds.

During the two early seasons, 39.3% of the birds harvested were killed in the morning (before 12:00 PM). Hunters harvested an average of 0.71 birds for each hour hunted, and 0.02 birds were shot and not retrieved for every bird shot and retrieved. During the two regular seasons, 55.2% of the birds harvested were killed in the morning. Hunters also harvested 0.71 birds for each hour hunted, and 0.06 were shot but not retrieved for every bird shot and retrieved.

During the two early seasons combined, more males than females were harvested (Table 1; $X_1^2 = 4.26$, $P < 0.05$). And, more juveniles than adults were reported (Table 1; $X_1^2 = 9.99$, $P < 0.05$). Similarly, during the regular season more males than females were harvested overall (Table 1; $X_1^2 = 4.00$, $P < 0.05$), even though the proportion male in the small sample for 1990-91 looked lower.. During the regular season, however, equal numbers of adults and juveniles were harvested (Table 1; $X_1^2 = 0.03$, $P > 0.05$).

There was no significant difference in the proportion of males harvested during the early (66.2%) and regular seasons (60.0%) for both years combined (Table 1; $Z = 0.254$, $N = 2$, $P > 0.05$). However, more juveniles than adults (63.5%) were harvested during the early season than during the regular season (52.2%) (Table 1; $Z = 2.016$, $N = 2$, $P < 0.05$).

Discussion

Hunting success was comparable in early and late seasons. The number of birds harvested per hour hunted was identical between seasons. Both hunting techniques—pass shooting, with or without a dog or walking to flush birds—were used in both seasons for harvesting greater prairie chicken. However, as expected, pass shooting was used less in early season. A smaller number of birds was lost for every bird harvested during the early season than in the regular season. This suggests that pass shooting, the dominant

TABLE 1
Sex and age of greater prairie-chickens harvested during early and regular
hunting seasons, 1990-91 and 1991-92

	<u>Harvest Reported</u>		<u>Sex Reported</u>	
	Total	% Juvenile	Total	% Male
Early season hunt				
1990-91	64	67.2	42	73.8
		63.5%		66.2%
1991-92	<u>73</u>	60.3	<u>29</u>	55.2
	137		71	
Regular season hunt				
1990-91	33	57.6	8	37.5
		52.2%		60.0%
1991-92	<u>101</u>	50.5	<u>92</u>	62.0
	134		100	

hunting technique during the regular season, may result in more crippling losses of individuals.

Significantly more males than females were harvested during both early and regular seasons overall. The proportion of males to females harvested was similar in both the early and regular seasons when years were combined (Table 1). Male greater prairie-chickens may be more susceptible to hunting than females, perhaps due to the lekking behavior of these birds (Schroeder and Robb 1993). Higher harvest of males than females may help buffer the impact of hunting on this species.

More juveniles than adults were harvested during the early season, while equal numbers of juveniles and adults were harvested during the regular season (Table 1). Coveys of birds generally contain more juveniles during the early season than in the regular season (Bowman & Robel 1977), since juvenile birds are still found in small family units early in the fall. Also, lack of experience may make juveniles more susceptible to hunters.

The higher harvest of juveniles during the early season should reduce the effect of added season length and increased total harvest, because juvenile prairie chickens have a lower probability of breeding the next spring than do adult birds. Ellison (1991) suggested the same effect in grouse (Tetraonidae) populations that have high juvenile over-winter mortality, a delay in age of first reproduction, or lower juvenile breeding success. So, we hypothesize that early season harvest of greater prairie chicken juveniles may not influence the long term population dynamics significantly. However, this harvest and population size should be monitored to verify both the rate of successful hunting and the population consequences. More data are required to insure that early season mortality is not negatively impacting the long-term population trends for the greater prairie chicken in Kansas.

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