National Quail Symposium Proceedings

Volume 3 Article 20

1993

Scaled Quail Habitats Revisited - Oklahoma Panhandle

Sanford D. Schemnitz
New Mexico State University

SCALED QUAIL HABITATS REVISITED—OKLAHOMA PANHANDLE

SANFORD D. SCHEMNITZ, Department of Fishery and Wildlife Sciences, New Mexico State University
PO Box 4901, Las Cruces, NM 88003-0003

Abstract: Scaled quail (*Callipepla squamata*) populations declined 50% from 1954–56 to 1990–91 in a 125 km^2 study area. Food habits based on a sample of 150 quail crops remained unchanged. Abandonment of farms, land use, and climatic changes were hypothesized to be major factors responsible for the population decline.

Key words: *Callipepla squamata*, food habits, habitat, population, scaled quail.

Citation: Schemnitz, S. D. 1993. Scaled quail habitats revisited–Oklahoma panhandle. Pages 143-147 *in* K. E. Church and T. V. Dailey, eds. Quail III: national quail symposium. Kansas Dep. Wildl. and Parks, Pratt.

The idea for this paper was triggered by a similar effort by Leedy (1987), who returned after 45 years to his Ohio haunts and documented total disappearance of ring-necked pheasants (*Phasianus colchicus*) and most pheasant habitat. Leedy attributed the loss of pheasants primarily to deterioration in habitat because of changing agricultural land-use practices. I returned to Cimarron County, Oklahoma, after an absence of 34 years to evaluate possible changes in scaled quail populations and distribution since previously reported by Schemnitz (1961).

STUDY AREA

Cimarron County, the most westerly county in the Oklahoma Panhandle, is primarily grassland and agricultural farmland. The intensive main study area was in the sandsage (*Artemisia filifolia*)-grassland community. The area features rolling dune-like topography with calcareous, deep sandy, well-drained soils. Other common shrubs are soapweed (*Yucca glauca*), skunkbush (*Rhus trilobata*), and sand plum (*Prunus watsonii*). Sand bluestem (*Andropogon hallii*), big sandgrass (*Calamovilfa gigantea*), switchgrass (*Panicum virgatum*), and needle and thread grass (*Stipa comata*) are the principal tall grasses. Mid grasses include sand dropseed (*Sporobolus cryptandrus*) and field sandbur (*Cenchrus pauciflorus*). False buffalo grass (*Munroa squarrosa*), sand paspalum (*Paspalum stramineum*), and blue grama (*Bouteloua gracilis*) compose the main short grasses. Common forbs include western ragweed (*Ambrosia psilostachya*), Texas croton (*Croton texensis*), sand lily (*Mentzelia stricta*), buffalo-bur (*Solanum rostratum*), and Russian thistle (*Salsola kali*).

The climate is semiarid, characterized by hot summers and relatively mild winters. Average annual precipitation is 42.7 cm. The altitude is 1,281 m.

METHODS

Field reconnaissance of previously verified (1954-56) occupied home ranges was undertaken during late December of 1990 and 1991 on a 125-km^2 sandsage-grassland study area. Observations of scaled quail and their tracks in the sand and snow were used to determine presence of quail. Covey size was determined from direct observation. A thorough reconnaissance of the study area was made on foot with the assistance of a trained bird dog.

Scaled quail crops were collected from hunters to determine food habits during the early winter of 1990-91 and 1991-92. Every effort was made to contact active hunters via the local Boise City (a small town with a population of 1,509) "grapevine" and the game warden to maximize the quail crop collection total. Due to the small sample size, these data were pooled by vegetation type and year. I used the aggregate volume technique to measure foods as described by Martin et al. (1946). Statistical significance was accepted at $P < 0.05$.

RESULTS

Population Changes

A population decline from 587 (SE = 26) quail (mean for 1954-56) to 293 (SE = 21) in 1990-91 was noted, which represents a decrease of 50% (Fig. 1). Six of 17 previously occupied home ranges

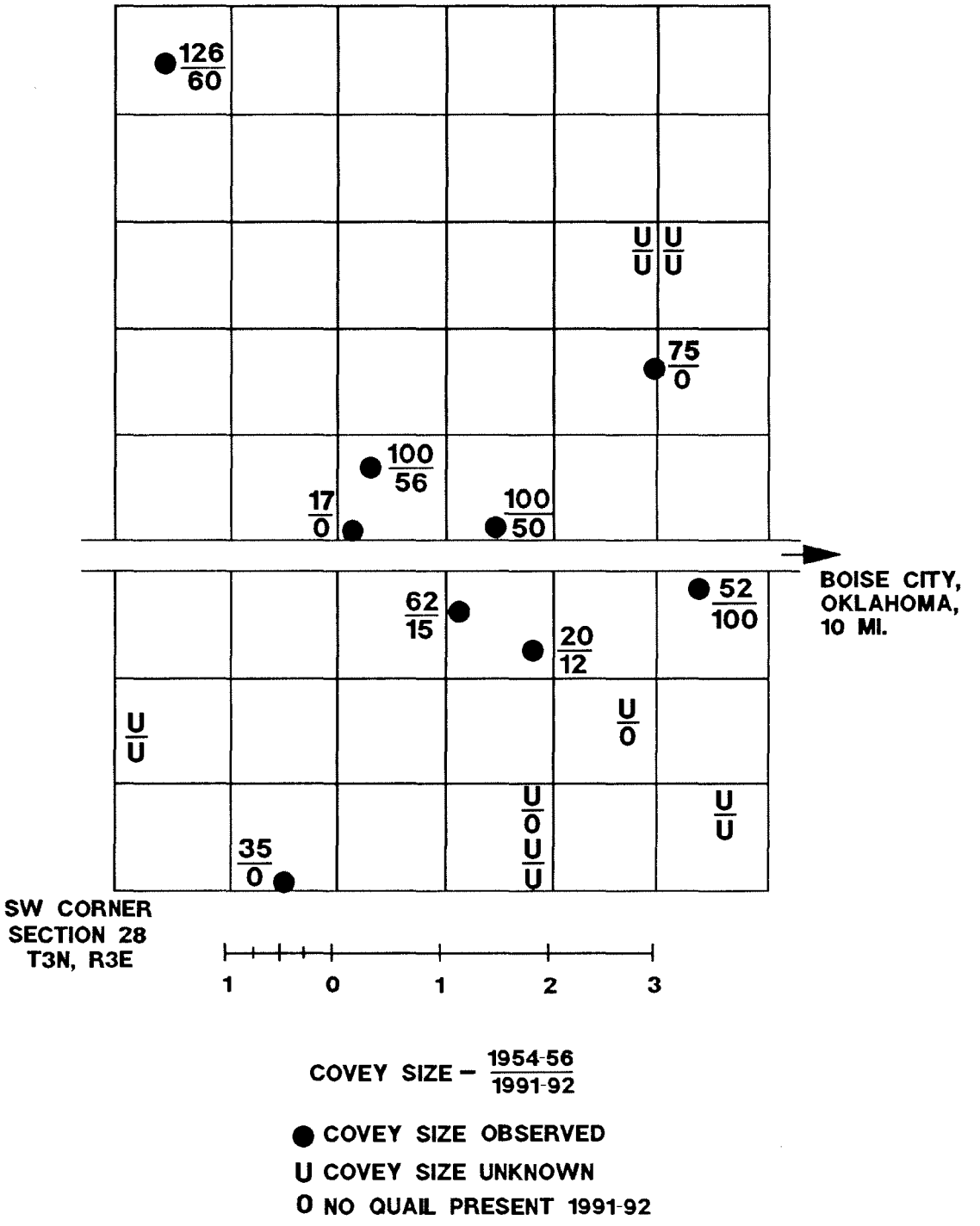

Fig. 1. Comparison of scaled quail winter coveys on a 125-km^2 sandsage grassland study area 1954-56 (Schemnitz 1961) and 1990-91.

(35%) were vacant in 1990-91. Average covey size declined from 65 in 1954-56 to 49 in 1990-91. A thorough search of the 125-km^2 area in 1990-91 did not reveal additional quail. This suggested that quail had not shifted their home ranges.

An additional 6 winter home ranges occupied in 1954-55 in the short-grass-high plains and pinyon-juniper habitat types not on the intensive study area were revisited. Four of the 6 were still occupied in 1990-91, but average covey size had

declined from 45 to 13 ($t = 1.75$, $P = 0.18$, df = 3). One of the abandoned home ranges around some occupied buildings had several house cats (*Felis domesticus*) present. The other range, formerly in farmland, was now a housing development on the edge of Boise City.

Foods

I found little change in the main foods of scaled quail between the 2 study periods (Table 1). Twelve of the top 20 foods in the 1954-56 sample also were in the top 20 of the 1990-91 sample (Schemnitz 1961). The top 5 foods in 1954-56 comprised 56.5% of the diet by volume while these same 5 foods totaled 46.4% in the 1990-91 sample. Insect volumes of 4.8 (1954-56) and 4.2% (1990-91) remained similar ($P > 0.05$). Forb seeds totaled 62.4 (1954-56) and 57.6% (1990-91) of the diet and showed little difference between sample periods. Grain (sorghum, corn, wheat) which made up 24.7% of the 1954-56 sample and 33.9% of the 1990-91 diet did not differ ($P > 0.05$). Only 3 of 50 foods, (0.6%) in 1990-91 were not found in the 1954-56 crop samples, and they were all in trace amounts. The major difference was the low use of Russian thistle, 1.6% volume in 1990-91 versus 15.1% in 1954-56. The average number of food items per crop in 1990-91 of 7.1 was nearly identical to the 7.0 for 1954-56 ($P > 0.05$).

DISCUSSION

Habitat Changes

A notable difference in habitat conditions in recent years is the retirement of cultivated land under the Conservation Reserve Program (CRP) in Cimarron County. Farmlands in the CRP totaled 59,896 ha during 1990 (Soil Conservation Service, pers. commun.); this represents more than double those in 1987 (28,653 ha in the CRP). In contrast, only 7 farms had 621 ha in unharvested cover crops in 1959. Active farmland acreage declined 33.8% between the past, 1954-56, and present, 1990-91, periods of this study.

Most CRP fields were revegetated with dense weeping lovegrass (*Eragrostis curvula*) with some old world (*Bothriochloa* sp.) and little bluestem (*Schizachyrium scoparius*), Indian (*Sorghastrum nutans*), and switchgrass. These grasses provide some quail cover, but little food. Scaled quail nest in a large variety of habitats (17 total, Schemnitz 1961). In 1954-56, only 1 nest of 50 was found in a dense grass habitat similar to the CRP. In contrast to pheasants, scaled quail may derive few benefits from CRP retired fields.

Table 1. Summary of 20 main foods eaten by scaled quail based on the analysis of 150 crops collected December 1990 and 1991, Cimarron County, OK.

Food	Freq.	% freq.	Volume (cc)	% volume
Triticum aestivum	35	23	82.8	20.2
Helianthus sp.	120	80	62.3	15.2
Amaranthus sp.	121	81	59.8	14.6
Mentzelia stricta	101	67	52.4	12.8
Sorghum vulgare (milo)	97	65	41.3	10.8
Insects	28	19	17.4	4.2
Ambrosia psilostachya	73	48	16.1	3.9
Croton sp.	51	34	13.1	3.2
Zea mays	17	11	12.3	2.9
Heterotheca subaxillaris	58	39	8.6	2.1
Salsola kali	45	30	6.5	1.6
Polanisia trachysperma	16	10	6.5	1.6
Sorghum halepense	66	44	4.3	1.1
Green herbaceous vegetation	30	20	4.0	1.0
Grindelia squarrosa	9	6	3.6	0.9
Paspalum stramineum	31	21	3.0	0.7
Solanum rostratum	12	8	2.7	0.6
Kochia scoparia	6	4	2.6	0.6
Psoralea tenuiflora	4	3	2.2	0.5
Cenchrus sp.	7	5	1.2	0.3
Total			402.7	98.8

Comparative acreage of total cropland (including CRP) and rangeland in Cimarron County have not changed (Table 2). Also, average farm size has increased only slightly. Cropland patterns have varied, with less acreage in sorghum while wheat acreage has remained the same (USDC 1954, 1987).

Number of farms decreased from 616 in 1950, to 559 in 1954, and to 448 in 1987. Many active farmsteads occupied in the 1950's have been abandoned, thus livestock and grain feeding no longer occur. Sasser (1991) documented the decline of bobwhite with the disappearance of small farms in east Texas.

Food Habits

Scaled quail consume a more diverse diet than northern bobwhite (*Colinus virginianus*) (Campbell-Kissock et al. 1985, Rollins 1981, Schemnitz 1964). Scaled quail in the winter in western Oklahoma continue to use agricultural grains and forbs that thrive under livestock grazing conditions. They showed high energy utilization and weight maintenance when fed sorghum, sunflower, and amaranth seeds (Saunders and Parrish 1987). All of these are important quail foods.

Hunting Pressure

Hunting mortality does not seem to be a major factor in the scaled quail population decline in this area. Empirical data on numbers of active local quail hunters suggest a decline in quail hunting. Availability of crops from hunters is a rough index of hunting pressure and success. During the 1954 and 1955 hunting seasons 9 hunters contributed 50 or more scaled quail crops (minimum 450). During the recent study 150 crops were contributed by 4 hunters.

Hunting interest and pressure seem to have switched from scaled quail to pheasants. While quail populations have declined, pheasant numbers have increased as exemplified by season lengths. During 1954 and 1955 pheasant hunting seasons were 2 days in length, while the 1956 hunting season lasted 3 days. In contrast the pheasant hunting season length was 32 days in Cimarron County in 1991-92.

Climate Change

Climatic factors influence quail populations by affecting vegetative vigor, composition, growth, and reproductive success (Campbell et al. 1973).

Table 2. Changes in land-use practices, Cimarron County, OK.

	Time period	
Land use	1954	1987
Farmland (ha)	179,345	178,534[a]
No. of farms	559	448
Average farm size (ha)	794	889
Cows and calves	39,323	90,756
Acres planted sorghum	48,554 (391)[b]	32,217 (247)
Acres planted wheat	37,270 (339)	39,909 (300)

[a]Includes Conservation Reserve Program acreage.
[b]Number of farms (USDC 1954, 1987).

During the period of my original study, a severe drought existed (-42.5% deviation from mean annual precipitation). Despite seemingly adverse climatic conditions, scaled quail populations thrived (Schemnitz 1961). In contrast, climatic data for 1981-91 at Boise City, Oklahoma, showed a mesic trend with precipitation 19% above normal ($\bar{x}$ = 50.8 cm 1981-91). In only 1 year, 1983, was precipitation slightly below the norm of 42.7 cm.

Scaled quail are a xeric-adapted species. They thrive in the vicinity of Las Cruces, New Mexico, with an average annual precipitation of 21.6 cm (N.M. Dep. Game and Fish 1967). Perhaps in western Oklahoma they do not thrive under the mesic conditions that occurred in 1981-91.

LITERATURE CITED

Campbell, H., D. K. Martin, P. E. Ferkovich and B. K. Harris. 1973. Effects of hunting and some other environmental factors on scaled quail in New Mexico. Wildl. Monogr. 34. 49pp.

Campbell-Kissock, L., L. H. Blankenship and J. W. Stewart. 1985. Plant and animal foods of bobwhite and scaled quail in southwest Texas. Southwest. Nat. 30:543-553.

Leedy, D. L. 1987. The Ohio pheasant range revisited. Ohio Dep. Nat. Resour., Div. Wildl., Columbus. 70pp.

Martin, A. C., R. H. Gensch and C. P. Brown. 1946. Alternative methods in upland gamebird food analysis. J. Wildl. Manage. 10:8-12.

New Mexico Department of Game and Fish. 1967. New Mexico wildlife management. Santa Fe. 250pp.

Rollins, D. 1981. Diets of sympatric bobwhite and scaled quail in Oklahoma. Proc. Annu. Conf. Southeast Fish Wildl. Agencies 35:239-248.

Sasser, R. 1991. Where did the quail go? Texas Parks Wildl. 49(8):24-27.

Saunders, D. K. and J. W. Parrish. 1987. Assimilated energy of seeds consumed by scaled quail in Kansas. J. Wildl. Manage. 51:787-790.

Schemnitz, S. D. 1961. Ecology of the scaled quail in the Oklahoma panhandle. Wildl. Monogr. 8. 47pp.

_____. 1964. Comparative ecology of bobwhite and scaled quail in the Oklahoma panhandle. Am. Midl. Nat. 71:429-433.

United States Department of Commerce. 1954. Agricultural census. Bureau of Census.

_____. 1987. Agricultural census. Bureau of Census.