Linzer biol. Beitr.	9/2	279-286	31.3.1978

A POPULATION STUDY OF CHUKARS (ALECTORIS CHUKAR) NEAR KARADJ - IRAN

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Introduction

Chukar partridge (Alectoris chukar) is the most important upland game bird in Iran. A study was made of chukar from February 10, 1973 to March 16, 1975 in which particular stress was laid on population, dynamics and movements.

A study area was selected between Karadj and Tehran on the southern slopes of the Alborz mountains. The topography of the study area is mountainous except for hills and alluvial fans near its southern limits.

The vegetation changes greatly with altitude. The lower elevations (1300-1550 m) are mainly covered by Artemisia herba-alba, which is heavily grazed by sheep in winter and spring.

Observed population structure

In Table No. 1 combined observations of single birds and of group sizes are given. During the study period once or

twice weekly visits has taken place, in which specific observation routes were followed. Single birds were observed throughout the year except for the month of July. The largest number of single birds was observed during the months of May and June. This is during the nesting seasen, and it seems likely that most of the birds that were observed singly were infact part of a pair whose mate was sitting on a clutch of eggs.

The largest number of pairs was observed during the months of April and May, when these were either getting ready to nest or already nesting.

Pair formations and spring dispersal of mated pairs starts in March and is completed in early April, as is indicated by observations made on April 10, 1973, when 8 pairs were observed in places where none were seen on the previous visit on March 26. Two pairs were seen at about 3000 m elevation on a nearby mountain on 6 May 1975, indicating spring dispersal to elevations which were still covered by snow in late April.

In order to arrive at a clearer analysis of group sizes, observed groups were arbitrialy grouped together in the following range classes. 3-5, 6-10, 11-20, 21-50, 51-100 and 101-300.

All these classes had a low frequency during the period April-August, namely when first of all mated pairs were most frequent, followed by a period when most of them were nesting. The August sample (2 visits only) may not adequate by reflect group sizes as they did actually occur.

Range classes 6-10, 11-20 and 21-50 reached their maximum numbers in the month of December. While range classes 3-5, 51-100 and 101-300 reached their peak numbers in respectively the months of January, February and March. These data indicate that the largest group sizes occur during the period December-March, which is the period of the greatest amount of snow accumulation, during which likely smaller

groups of Chukar aggregated into largest groups.

An analysis of the frequency off occurence of the different group sizes shows that group sizes 6-10 has by far the highest frequency, perhaps reflecting the average brood size.

Results of live-trapping and tagging

Live-trapping and tagging was started on September 15, 1973 and discontinued on January 1, 1974. A second trapping period lasted from September 4, 1974 until Jan. 1, 1975.

All captured birds were marked with a numbered plastic band on their right leg and a coloured plastic tageattached to their back.

The traps used were square (72 cm x 72 cm), welded-wire traps two funnels each, and were baited with wheat. They were located near springs, so that chukars, coming to drink would be attached by the wheat in and around the traps.

In both year 19 individuals were trapped, many of them being retrapped one or more times. One chukar was retrapped one or more times. One chukar was retrapped eight times during a period of 90 days. Obtained data suggests that at least the majority of trapped birds visited the same spring for drinking purposes. Evidence was also obtained that certain individuals adhere to the same group for an extended period of time.

Seasonal and altitudinal movements

Efforts were made to determine the influence by the amount of precipitations both rainfall and snowfall on chukar. In our study area chukars have been seen from 1330 m to 2550 m the highest elevation. After the first rain falls, chukars were observed in places where they were not seen

during the droughty season.

Analysis of a shot samples

In order to obtain information on sex and ageratios, weights, physiological dondition two samples of chukars were obtained, namely 45 specimens during the period 15/12.1973 to 10/2/1974 and 100 during the period 30/10/1974 to 5-3-1975.

The weights of shot birds

The weights of shot birds were determined to the nearest one tenth of gram. An analysis of these data shows that mean male weights are higher than mean female weights and that mean adult weights for both sexes are higher than mean immature weights.

Male and female weights for collection period 1973/74 were:
mean weight of 15 adult male was 528 gr.
" " " 10 immature male was 482 gr.
" " " 10 adult female was 442 gr.
" " " 20 immature female was 428 gr.

Sex and age ratios

The age ratios of shot birds were determined on the basis of criteria used by Weaver and Haskell (1968). As this criteria become gradually less reliable after Jan. 1, the sex ratios obtained were separated in two groups, namely of birds shot before Jan. 1, and those shot after that date (Table No. 2). The data obtained before Jan. 1 of both years indicated that the number of immatures is lower than would be expected in a normally successful reproductive year. The adult / young ratio (the number of young per 100 adults) was 67 and 113 respectively for 1973/74 and 1974/75 seasons.

Although the data obtained after January 1 are less reliable it is believed that the error made in aging was not very great, because it is still generally possible to separate adults from Juveniles based on the criteria outlined by

Weaver and Haskell (1968).

Assuming a reasonable accuracy for these data, it appears that the sex ratio of birds shot after Jan. 1, 1975, was lower for immatures than normal, while this did not appear to be the case for those killed after Jan. 1, 1974. Also, the age ratio for the winter 1974/75 was lower than for the winter 1973/74.

Fat deposit

Generally adult gallinaceous birds have more fat deposits when shot during the autumn and winter than immatures. This was also the case for the samples obtained in this study. Using the more reliable sample for age ratios (birds shot before Jan. 1), and combining the sample of the two years to obtain a larger sample size, the following results were obtained (Table No. 3). It can be seen from this table that adults generally have higher fat deposits in the fall of the year than immatures.

Discussion and conclusions

As was discussed under sex and age ratios, the adult/young ratios for both years indicate a low replacement rate, which was lower for 1974/75 than for 1973/74, suggesting a lower reproductive success for 1974/75, which may be related to a generally poorer physiological conditions of the birds.

The weights of shot birds were on the average decidedly lower in 1974/75 than in 1973/74.

Among the various factors that may have played a role in causing the poorer physiological condition of chukars in 1974/75, the amount and temporal distribution of precipitation comes to mind as an important one. A comparison between the precipication rates 1973 and 1974 indicates that there was not only more precipitation in the latter year, but also that some rainfall took place during the months

July-Sept. which were dry in the previous year precipitation in November and December was also higher for 1974. As higher precipitation rate is generally considered to be beneficial for reproductive success and physiological condition, it seems that the differences in precipitation does not account for the poorer physiological condition observed for 1974.

References

1. Glen C. Christensen (1971): The Chukar Partridge, its introduction, life history and management.

2. Harold R. Weaver and William L. Haskell (1969): Age and sex determination of Chukar Partridge. Jour.Wildl.Mngt. 32 (1), 46-50.

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Table No.1: Total observations of single birds and group sizes of Chukars for 1973-74 and 1974-75 combined

Months	Single birds	GROUP SIZES 2	3-5	6-10	11-20	21-50	51-100	101-300	Total & of bird observations	& of monthly observations
Jan	9	5	24	23	18	-	3	-	774	8
Feb	7	8	36	36	14	6	1	1	1276	11
March	4	12	14	11	6	-	-	1	441	8
April	8	34	5	1	1	-	-	-	105	9
May	19	50	4	-	-	-	-	-	134	13
June	14	17	3	5	2	-	-	-	131	8
July	-	2	8	3	3	-	-	-	98	4
August	6	1	3	3	2	2	-	-	121	2
Sept.	4	2	-	9	8	1	-	-	216	7
Oct.	10	7	13	23	14	3	-	-	525	16
Nov.	5	3	14	14	18	12	-	-	837	9
Dec.	9	6	14	48	36	12	-	1	1590	10
Total No. of group sizes	95	147	148	176	122	35	4	4		

Table No. 2; Percentage of Sex and Age Ratios of Shot Chukars

Shooting Periods	Ad. No.	M. %	Imm. No.	M. %	Ad. No.	F. %	Imm. No.	F. %	Total No. Of Adults	Total No. of Immat.	Adult/ Young Ratio
15.12.73-1.1.74	3	20	2	13.3	6	40	4	26.7	9	6	67
1.1.74-10.2. 74	5	16.7	5	16.7	2	6.6	18	60	7	23	-
30.10.74-1.1.75	15	27.7	9	16.7	11	20,4	19	35.2	26	28	113
1.1.75 - 5.3.75	10	21.7	10	21.7	11	23.9	15	32.7	21	25	-

Table No. 3; The relationship between fat deposits and age

Shooting Periods — F A T D E P O S I T S

	Adults				Immatures			
	H	M	L	0	H	M	L	0
15.12.73-1.1.74 combined With 30.10.74-1.1.75	12	4	8	11	6	6	5	17
In percentages	34.4	11.4	22.9	31.4	17.6	17.6	14.7	50

H = Heavy fat deposit, M = Obvious fat deposit around gizzard, elsewhere in the abdominal cawity and around the crop,