Home Range and Distance Covered of Chukar Partridge Alectoris Chukar at Mandal Valley, Garhwal Himalaya, India

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ABSTRACT
Present paper reports Home range and distance covered of Chukar partridge at mandal valley, Garhwal Himalaya from November 2018 to October 2019. During the study period, average home range (altitude M) of Chukar was 1756.75±7.75 and average distance covered from water source 69.52±6.76 (M), maximum range observed in month of June (1812±8.0) while minimum range observed in November month (1708±5.0) respectively. Maximum distance covered observed in August month (99.04±11.42) and minimum distance covered recorded in month of May (41.10±4.83). Seasonal variation was also observed, Maximum range in Summer season (1803±10.33) and minimum observed in winter season (1713.33±8.0), seasonal variation also observed in monsoon and post monsoon season (84.85±8.77) while minimum value was observed in summer season (47.77±6.44) respectively.

KEY WORDS: Home range, distance cover, Chukar, Garhwal Himalaya

INTRODUCTION
Knowledge on the home range and distance cover of Chukar partridge is vital to identify the appropriate scale at which to explore ecological relationship. The home range and distance cover is the area in which an individual’s live and moves in a defined time period and is related to the concept of species territories that is an actively defended. Chukar partridge Alectoris chukar (Gary) is a bird of open semi arid wasteland near crop fields of the hill villages (Ali, 1983, Hume and Marshall, 1879, Chirstensen, 1996). Information on home range and distance covered of chukar is completely lacking especially in the Indian context. Based on long-term studies on home range and distance covered in different altitude were described in this paper.

STUDY SITE AND METHODS
Long term study for one year (November 2018 to October 2019) was conducted at mandal valley; district Chamoli (30°24´ N and 79°19´E, 1850M). The study site was spread over 4.5 km² area on the east facing slopes. In every month, camping was made for 10-15 days in the study area. Few vantage points commanding view of all habitats was selected at different altitude to monitor the bird. For down (30minutes before sunrise) to dusk (till setting of dark), Chukar were monitored and data collected on home range, range of altitude and approximate distance covered by partridges from a permanent water source used every day for drinking water was measured. Area was calculated from toposheet map. The data was analyzed by standared statistical methods, viz.’t’ test and ANOVA, wherever required (Fisher, 1963, Snedecor, 1956).

RESULT
Monthly data on Home range (altitude) and distance covered from permanent water source (used every day for drinking water) by Chukar partridge every day/month reveal seasonal variation in home range. Monthly data shows that highest range of altitude 1812±8.0 M. was covered June and minimum 1708±5.0 M in January (Table 1).Average distance covered by Chukar ranged from 99.04±11.42 (Maximum in August) to 41.10±4.83 (minimum in June) respectively. Seasonal variations was also recorded in range of altitude and distance covered (Table 2). Highest altitude covered by Chukar was 1803±10.33 in breeding season (May-June) and minimum 1713.33±8.0 in winter season (December-January).Maximum distance cover 84.85±8.77 m. was observed in monsoon and post monsoon season (August, September and October) and minimum 47.77±6.44 in breeding season (May-June) respectively.

DISCUSSION
At the intensive study site Mandal valley, Garhwal Himalaya, the altitude and average distance covered from a perennial stream (used daily from drinking water) every day; suggest seasonal variation in home range of Chukar partridge. During monsoon and...
post monsoon season, chukars were observed covering high range of altitude and distance, whereas birds found restricted to low altitude during winter (September to February) and smaller area in spring and summer (March to June). Dispersal of Chukars in large area during monsoon period is understandable, because during this phase of life cycle, growing juveniles and sub-adults need more food as observed in Gary partridge *Perdix perdix* (Smith et al 1980). Therefore, birds cover large area in search of insect, seeds, leaves etc. In spring and summer seasons (breeding period), birds restrict themselves in narrow range of habitat. During this time, two factors could be restricting home range of Chukar partridge. First reason is that the water source is very close to crop fields, which were used both for feeding and for breeding purposes, second reason is involvement of birds in breeding activates. Therefore, lacking of enough of time compels birds to restrict their habitat range. Dispersal of home range has many advantages (Middleton, 1936, Southwood and Cross, 1969, Weigand, 1980). Large habitat reduce, competition, provides more food and natural resources, give an opportunities for inhabiting in new habitats.

CONCLUSION
Based on above discussion it can be concluded that wide range of altitude and distance covered is one of the reasons for its common occurrence in spite of hunting and habitat loss. The scrub habitats on steep semi arid slopes which are on large part of the hills of Uttarakhand, could be used for management of Chukar partridge. Especially shrubs like *Rhus, Rubus, Berberis, Rosa* provide protection cover and food for partridge. These Perennial shrubs along with long gresses would certainly helpful in conservation of partridge diversity.

ACKNOWLEDGEMENT
Thanks to principal, Government P.G. College Gopeshwar to permit me lab facility during study period, is great fully acknowledged. We have thankful to local people for providing secondary information on occurrence of Chukar Partridge in the study area.

REFERENCES

Table 1: Home range and distance covered by Chukar Partridge *Alectoris Chukar* at Mandal Valley, Garhwal Himalaya, U.K.

<table>
<thead>
<tr>
<th>Month</th>
<th>Altitude Covered (m)</th>
<th>Distance covered from water source (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 2018</td>
<td>1720±8.0</td>
<td>74.12±4.77</td>
</tr>
<tr>
<td>December</td>
<td>1712±11.00</td>
<td>81.31±5.70</td>
</tr>
<tr>
<td>January 2019</td>
<td>1708±5.00</td>
<td>86.66±6.72</td>
</tr>
</tbody>
</table>

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## Table 2: Seasonal Variation in Home range and distance covered by Chukar Partridge *Alectoris Chukar* at Mandal Valley, Garhwal Himalaya, U.K.

<table>
<thead>
<tr>
<th>Season</th>
<th>Altitude Covered (m)</th>
<th>Distance covered from water source (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter (November to January)</td>
<td>1713.33±8.0</td>
<td>80.69±5.73</td>
</tr>
<tr>
<td>Spring (February to April)</td>
<td>1743.33±7.33</td>
<td>64.75±6.12</td>
</tr>
<tr>
<td>Breeding (Summer)</td>
<td>1803±10.33</td>
<td>47.77±6.44</td>
</tr>
<tr>
<td>Monsoon and Post Monsoon (August to October)</td>
<td>1767.33±5.33</td>
<td>84.85±8.77</td>
</tr>
</tbody>
</table>