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# Assessment of behavioral study, human activities impacts and interaction with white cheeked bulbul (*Pycnonotus leucotis*) in district Bagh, Azad Jammu and Kashmir, Pakistan

Rahima Haider[1*], Muhammad Altaf[1], Zahid Rasheed[2], Kiran Rauf[1], Bushra Mumtaz[1], Mehwish Altaf[1], Sayeda Maria Bashir[1], Faiza Hakeem[1] and Ayesha Iftikhar[1]

1. Department of Zoology, Women University of Azad Jammu and Kashmir, Bagh-Pakistan
2. Statistical wing, Department of Mathematics, Women University of Azad Jammu and Kashmir, Bagh-Pakistan

***Corresponding author:** rahimahaiderkhan1@gmail.com

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## ABSTRACT

***Introduction:*** White cheeked bulbul (*Pyconotus leucotis*) is common bird and included in Least Concern by IUCN; has wide range of distribution. *P. leucotis* has reducing trend, but this trend is not rapid. This species having declining trend, therefore this study was planned to know the human interaction and impacts on this species and also assess the ecology of this bird.

***Materials and Methods:*** The surveys were conducted from November 2016 to February 2017. Linear count survey (LCS) was used; while direct and indirect survey methods were used during research.

***Results:*** White cheeked bulbul (*P. leucotis*) time budget was recorded in natural habitat. During the research noted that this bird used greater time in sitting, followed by stand (10.9%), flying (7.5%), preening (5.8%), Feeding and drinking (5.6%), walking (4.4%), invigilation time (3.9%), fight time (0.002%) and aggressive time (0.0003%). *P. leucotis* prefers to live near forest and slightly disturbed areas.

***Conclusion:*** It is concluded from this study that anthropogenic impact (i.e. intensive urbanization) has negatively impacts on this species.

***Key words*:** Forest, Urban, Time budget, Ecology

## INTRODUCTION

The *Pycnonotus leucotis* is 20 to 22 cm (length), wingspan of 8.0 to 9.3cm and 30g weight. *P. leucotis* crest, throat and head are black as well as white. The back sides and tail is grey, the vent is pale yellow. similar plumage is present in both (male and female) (Roberts, 1992; Fishpool and Tobias, 2017). Side of neck and lower cheeks bears squares, with white patch, whilst the tip of tail is white. The feathers of lower back is whole family are long and soft. In *leucotis* the crest is vestigial, while slight peak present on nape and crown is also entirely black. The under tail vent is yellow in the Himalayan population; sexes are similar in size. The bill is strongly down curved and is black (Christle and Svensson, 2009). The bill is short in *leucotis*. The feet and legs are bluish grey with short tarsus. In the Himalayan population has black feet and legs and dark brown irises (Roberts, 1992; Grimmett, 1998; Fishpool and Tobias, 2017).

*Pycnonotus leucotis* pair is monogamous. The nesting activity is started in late February and in most part of the plains areas, brood is reared after good monsoon rains (e.g. riverin forest, Thatha district and Margalla hills and Rawalpindi district); while in Himalayan region the breeding seasons started from April and end in June. Both (male and female) prepared nest, incubate eggs and nourished young one. While female has major role for incubation duty and nest preparation. The nest is a thin walled cup shaped. It is average 2 meter above from ground level. *P. leucotis* eggs are usually similar with hen egg but have small size with purple color patches (Roberts, 1992; Fishpool and Tobias, 2017).

This bird is native in Saudi Arabia, Pakistan, Kuwait, Iraq, Iran and India; as well as introduced in Bahrain, Oman, Qatar and United Arab Emirates (del Hoyo *et al.*, 2016). The global population size is not measured till now, but the species is common (del Hoyo *et al.*, 2016). The population is decline in irrigation of desert regions. This species prefers to live near

terrestrial and freshwater environmental (del Hoyo et al. 2005). The white checked bulbul is wide spread in the Indus plains and also distributed in cultivated areas of Baluchistan, but it is adapted to a dryer environment in Indus plains and usually recorded from uncultivated landscapes. In Pakistan it is recorded from Faisalabad, Sahiwal, Quetta, Bannu, Kohat and Peshawar, Muree, Margalla hill, Dirr, Sawat, Baltistan and Bagh. *P. leucotis* is recorded from gardens and forests. They mostly recorded in small groups or pairs (Roberts, 1992).

*P. leucotis* is recorded from large range, while population trend is declining and but this species is evaluated as Least Concern (del Hoyo *et al.*, 2016). This species is declining trend so this study was designed to know the behavior study, human activities impacts and interaction with this species and also assessment the ecology of this bird.

## MATERIALS AND METHODS

***Study area****:* Bagh is present 80 km distance from the district Muzaffarabad, Azad Jammu and Kashmir; and 160 km from the district Islamabad. The district Bagh has mountainous landscape, has slope from northeast toward south-west. This region present in the lesser Himalayas. The elevation is from 1500 to 2500 m above sea level. The mountains are covered with coniferous forests. Nala Mahl and Betar Nala are two main streams. However, many other rivulets flow are present in this district (DRU, 2007).

***Methodology:*** The data were collected November 2016 to February 2017. Linear count survey (LCS) was used; which consists of 3 transect lines (one from each i.e. urban, rural and forest), while each selected transect line consists of 1 km long (Figure 1 and Table 1). Both direct and indirect methods (i.e. nests, carcasses, eggs and body parts) were used for the observation of behavior, distribution, ecology and cultural study of *P. leucotis*. Roberts (1992) were used for identification of *P. leucotis.*

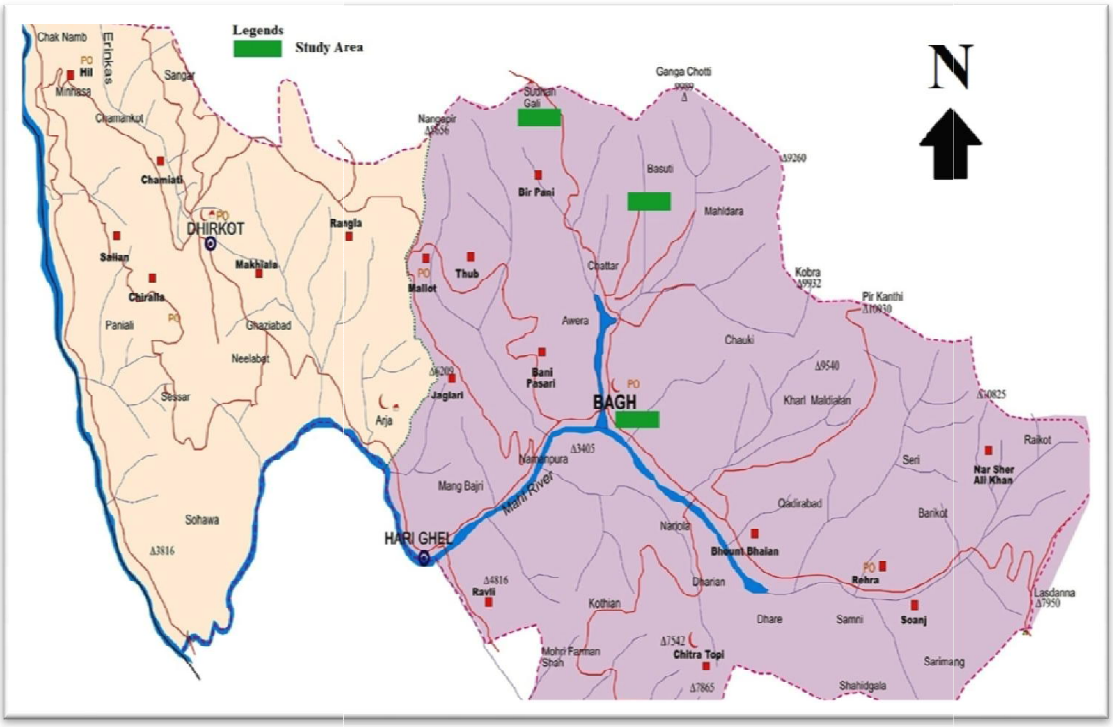


**Figure 1: The map of the selected sites of district Bagh.**

**Table 1: Coordinates of the selected sites of district Bagh.**

| Sub areas | North | East | Elevation (ft) |
|---|---|---|---|
| Forest | 34°04'30.57" | 73°47'11.39" | 8680 |
| Rural | 34°03'33.78" | 73°47'41'11" | 8875 |
| Urban | 33°58'53.08" | 73°46'35'81" | 3510 |

For the behavioral study, following characteristics were noted for one hundred hours i.e. invigilation, feeding, flaying time, sitting time, stand time, preening, fight time, aggressive time and walking. Random of birds of this species were selected each time. Anthropogenic impacts i.e. deforestation and urbanization impacts are noted. For the ecological study following points

are noted as; nesting, breeding period, clutch size and broad size. Cultural study consists of following points which were noted; hunting, food, product use and entertainment.

***Statistical Analysis****:* For the statistical analysis PAST version 2.17C was used to find out the Dominance, Evenness (E), Margalef (R), Shannon diversity (H) and Simpson diversity (Hammert *et al.*, 2001).

## RESULTS AND DISCUSSION

Time budget of White cheeked bulbul (*Pycnonotus leucotis*) in natural habitat was recorded. Throughout the study period White cheeked bulbul used greater time in sitting (62.0%) followed by stand (10.9%), flying (7.5%), preening (5.8%), Feeding and drinking (5.6%), walking (4.4%), invigilation time (3.9%), fight time (0.002%) and aggressive time (0.0003%) (Table 2).

**Table 2: Behavioral study of White cheeked bulbul from the selected sites of district Bagh.**

| Behavior | Time Budget (%) |
|---|---|
| Invigilation time | 3.9 |
| Feeding and drinking | 5.6 |
| Flaying time | 7.5 |
| Sitting time | 62.0 |
| Stand time | 10.9 |
| Preening time | 5.8 |
| Aggressive time | 0.002 |
| Fight time | 0.0003 |
| Walking | 4.4 |

**Table 3: Distribution of White cheeked bulbul from the selected sites of district Bagh.**

| Sub areas | Population |
|---|---|
| Forest | 10 |
| Rural | 50 |
| Urban | 2 |

During the research noted that intensive urbanization is created a negative impact on the species population and while moderate urbanization has enhanced the population of this species (Table 3). During study noted that this species only recorded from the green land (i.e. forest, rural and ecotone). IUCN (2016) noted that trend in population of *P. leucotis* appears to be declining. The decrease is not rapid and high. Altaf (2016) also noted that intensive urbanization and loss of vegetation have negative impact on the *P. leucotis* population. During the survey noted that *P. leucotis* seen only from forest and orchard land; they like to prefer in forest and near slightly disturbed landscape. Roberts (1992) noted that *P. leucotis* seen in groups or couples in the forest.

These bulbuls recorded from household with plants; however their main nourishing is seed. The white checked bulbul (*P. leucotis*) is highly distributed in Indus regions and also in Baluchistan; however it is adapted to a dryer habitation in Indus plains as well as in uncultured areas. In Pakistan, it is also seen in disturbed landscape in Sahwai, Quetta, Faisalabad, Zhob, Kohat, Bannu, Peshawar, Margalla, Dirr, Muree, Sawat, Baltistan and Himalayan region (Roberts, 1992; Fishpool and Tobias, 2017). This bird is native in Iraq, India, Pakistan, Kuwait, Saudi Arabia, Oman, Bahrain, United Arab Emirates and Qatar (del Hoyo *et al.*, 2016). The population is assumed to decline due to the irrigation (del Hoyo et al. 2005).

The nesting time recorded from February to March; while breeding season is noted as from April to June. Clutch is noted as 3 to 4 egg and brood size observed as 3 chicks (Table 4).

**Table 4: The ecological study of the white cheeked bulbul from study area.**

| **Ecology** | **Description** |
|---|---|
| Nesting | The nesting time is from February to March. |
| Breeding season | Breeding started from April to June. |
| Clutch size | 3 to 4 eggs. |
| Broad size | 3 chicks. |

During the research noted that white cheeked bulbul is beautiful birds; is stuffed for decoration and used for practical purposes in laboratory; while also used for decoration and making toys; feathers are used for pillow. This species is hunted for entertainment (Table 5).

**Table 5: Ethnozoological uses of white cheeked bulbul from the study area.**

| Cultural uses | Description |
|---|---|
| Product use | This species feathers are used in pillow, decoration, toys; and body is used as taxidermy. |
| Entertainment | White cheeked bulbul is charming and beautiful bird and is a beauty for nature. |
| Hunting | This species is hunted for entertainment. |

***Conclusion:*** It is concluded from this study that the white cheeked bulbul spent greater time in sitting (62.0%) followed by stand (10.9%), flying (7.5%). Anthropogenic impact (i.e. intensive urbanization) has negatively impacts on this species.

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***Availability of data:*** The authors have included all the relevant data in research paper that were collected during the research.

***Authors' contributions:*** The study was designed and data collected by Haider; while Rauf, Mumtaz, Altaf, Bashir, Hakeem and Iftikhar helped in data collection. Altaf helped in manuscript write up and statistical analysis and finally Rasheed critically analysis the manuscript.

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