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# Distribution of avian species in Mandakini River Valley in Rudraprayag district, Uttarakhand (Western Himalaya), India

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**ABSTRACT**

Mandakini Valley in Western Himalaya, Uttarakhand, India harbors a total of 215 bird species belonging to 37 families. This is the first systematic inventory of birds for this valley. Muscicapidae emerges as the largest family in the valley including six subfamilies (Turdinae, Timaliinae, Sylviinae, Musscicapinae, Monarchinae and Rhipidurinae) and 72 species. Out of the 215 species four (*Garrulux variegates, Dendroscopos nanus, Stachyris pyrrhops, Psittacula cyanocephala*) are endemic to the Indian subcontinent and two, Red Headed Vulture (*Sarcogyps calvus*) and White Rumped Vulture (*Gyps bangalensis*), are globally threatened.

***Key words:*** *Northern Himalayan, Garhwal Himalaya, Ganges, Physiognomic, Kakragad, Guptkashi, Kedarnath Wildlife Sanctuary*

## Introduction

The Himalayan range pertains around 979 bird species of which 15 are considered to be endemic to the area, including Himalayan Quail (*Ophrysia superiliosa)*, which has not been reported since 1876. Birdlife International has identified six centers of endemism (endemic bird areas) in India (Stattersfield *et al.,* 1998), Western Himalayas (Birdlife's EBA No. 128 by Stattersfield *et al.*, 1998) is one of them. Scientific descriptions of Western Himalayan bird species are available in several valuable contributions by the most experienced field ornithologists such as Jerdon (1862-64); Hudson (1930); Baker (1922-31); Ali and Ripley (1968-78). However, all these studies were conducted about 30 to 60 years ago, during this period many developments have occurred and besides this specific listing of Mandakini Valley have never been made, except few (Sultana and Khan, 2000). Here we present the first inventory of avian species in Mandakini Valley (Garhwal Himalaya).

## Materials and Methods

**Study Site:** The Mandakini Valley (Rudraprayag, 30° 17' 16.22" N, 78° 58' 44.74" E, to Gaurikund, 30° 39' 10.14" N, 78° 01' 33.20" E) is located in the western Himalayan region (Garhwal Himalaya) in the Rudraprayag district, in the Uttrakhand state, India. The length of the river is about 76 km and it divides the district in two parts (Figure 1). The climate of valley varies from sub-tropical monsoon type (mild winter, hot summer) to tropical upland type (mild

winter, dry winter, short warm summer). The present inventory of avian species has been carried out in the forest and urbanized habitats along the different elevational sites in the Mandakini Valley. It is reported that the presence of birds is influenced not only by the physiognomic structure and complexity of the vegetation but also by the flora diversity of the forests (James and Wamer, 1982; Terborgh, 1985; Terborgh and Petron, 1991; Sherry and Holmes, 1996; Chettri *et al.,* 2001). The study was conducted at different elevation zones in the Mandakini Valley. The study sites were: A). Rudraprayag (700 m ASL). Forest: The forest of this site is under Rudraprayag Forest Division. The most common tree species of this zone comprises *Pinus* spp., *Acacia catechu, Acacia farnesiana, Aegle marmelos, Anogeissus latifolius*. B). Kakragad (1000 m ASL). The forest habitat at this zone harbors a mixed forest which comprises mainly *Anogessius latifolius, Haldiana cordifolia, Anogessius latifolius, Mallotus phillippensis.* C). Guptkashi (1300 m ASL). Forest: Among the tree species *Quercus leucotrichophora* dominates the forest, followed by *Rhododendron arboretum, Cupressus torulosa*, and *Lyonia ovalifolia*. D). Phata (1600 m ASL). Forest: The forest of this area is a mixed forest of *Quercus leucotrichophora, Rhododendron arboreum, Myrica esculanta, Lyonia ovalifolia,* and *Benthamedia capitata*. E). Gaurikund (2000 m ASL). Forest*:* The forest area of this zone is a reserve forest under Kedarnath Wildlife Sanctuary which is now part of Nanda Devi Biosphere Reserve (NDBR). The forest in this area is dominated by *Quercus leucotrichophora* and associated tree species like *Rhododendron arboreum, Myrica esculanta, Lyonia ovalifolia,* and *Benthamedia capitata*.

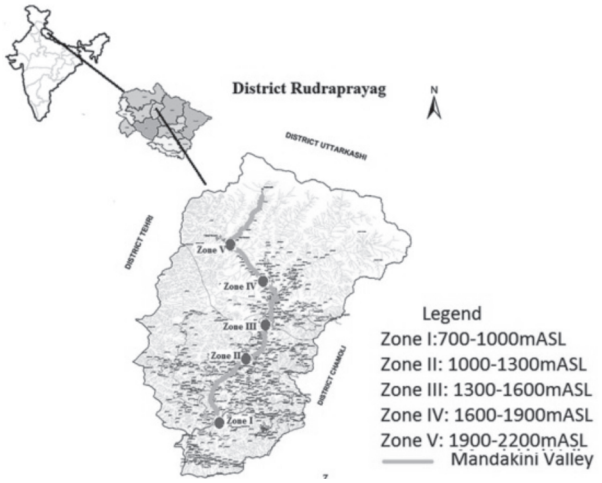


**Fig. 1.** Map of the study area, Mandakini Valley, showing the different elevation sites.

**Data Collection**

Field studies were conducted for two years on fixed line transects (Verner, 1985). Three transects of 1 km were laid in each zone at 100 m elevation. We recorded all birds seen in a strip of 30 m on each side of transect by walking once in a month. Sampling was carried out in the morning and evening and the timings vary with the seasons. The birds were identified in the field using Kazmierczak (2009) and Grimmett *et al.,* (1998) field guides. The birds were observed using Nikon binoculars (7x50) and altitudes were measured by GPS (Garmin e Trex Vista).

## Results and Discussion

This is first systematic inventory of the avian species from Mandakini Valley of Garhwal Himalaya. A total of 215 species (Table 1) were recorded from this valley belonging to 37 families. Family Muscicapidae emerges as the largest family in the valley including six subfamilies (Turdinae, Timaliinae, Sylviinae, Musscicapinae, Monarchinae and Rhipidurinae) and total 72 species. Nine families (Phalacrocoracidae, Upuidae, Indicatoridae, Cinclidae, Troglodytidae, Aegithalinae, Dicaeidae, Zosteropidae, Estrildidae) including one subfamily (Monarchinae) were represented by only one species. Four species endemic to Indian subcontinent, Variegated Laugthingthrush (*Garrulux variegates* Vigos, 1831*),* Black-chinned Babbler (*Stachyris pyrrhops*), Brown-capped Pygmy Woodpecker (*Dendroscopos nanus*), and Plum-headed Parakeet (*Psittacula cyanocephala),* were also recorded.

Variegated Laugthingthrush (*Garrulux variegates*) is considered to be endemic to Indian subcontinent and common altitudinal migrant that spends winter at low altitudes (1000-2100 m ASL) and summer at high altitudes (2400 m ASL; Ali and Ripley, 1968-78). Black-chinned Babbler *(Stachyris pyrrhops*) is considered to be fairly common within the 750-2000 m a.s.l. range in Indian subcontinent (Ali and Ripley, 1968-78). Two globally threatened (IUCN 2019) species were recorded from present study area. These are Red Headed Vulture (*Sarcogyps calvu*) and White Rumped Vulture (*Gyps bangalensis*). Red Headed Vulture (*Sarcogyps calvus*) has been seen frequently flying in the study area. It is reported as sparsely distributed and declining, and now rare or absent from some areas (IUCN,

**Table 1.** List of the avian species recorded from the study site during 2007-2009

| Family/Scientific Name/Habitat Use/IUCN Status/Migration Status | Family/Scientific Name/Habitat Use/IUCN Status/Migration Status | Family/Scientific Name/Habitat Use/IUCN Status/Migration Status |
|---|---|---|
| **Phalacrocoracidae** | **Strigidae** | *Motacilla flava* RU/LC/AM |
| *Phalacrocorax niger* R/LC/AM | *Glaucidium cuculoides* F/LC/R | **Campephagidae** |
| **Accipitridae** | *Strix leptogrammica* F/LC/R | *Hemipus picatus* F/LC/R |
| *Milvus migranus* FU/LCR | *Glaucidium radiatum* F/LC/R | *Coracina melaschistos* F/LC/RAM |
| *Ictinaetus malayensis* FU/LCR | *Athene brama* FU/LC/R | *Coracina melanoptera* F/LC/AM |
| *Hieraaetus pennatus* | *Asio flammeus* F/LC/WM | *Tephrodornis pondicerianus* F/LC/R |
| *Buteo buteo* | **Apodidae** | *Coracina macei* F/LC/RA |
| *Spilornis cheela* | *Apus apus* FU/LC/WM | *Pericrocotus ethologus* F/LC/RAM |
| *Neophron percnopterus* | *Collocalia brevirostris* FU/LC/R | *Pericrocotus flammeus* FU/LC/R |
| *Gyps fulvus* | *Apus affinis* FU/LC/R | *Pericrocotus cinnamomeus* F/LC/R |
| *Accipiter nisus* | **Alcedinidae** | **Pycnonotidae** |
| *Aquila chrysaetos* | *Megaceryle lugubris* R/LC/R | *Hypsipetes leucocephalus* FU/LC/RA |
| *Circus cyaneus* U/LC/WM | *Ceryle rudis* R/LC/R | *Pycnonotus leucogenys* FU/LC/R |
| *Gyps himalayensis* | *Alcedo atthis* R/LC/R | *Pycnonotus cafer* FU/LC/R |
| *Gypaetus barbatus* | *Halcyon smyrnensis* R/LC/R | **Irenidae** |
| *Ichthyophaga humilis* | **Upuidae** | *Aegithina tiphia* F/LC/R |
| *Nisaetus nipalensis* | *Upupa epops* FU/LC/SM | *Chloropsis hardwickii* F/LC/AM |
| *Circus cyaneus* | **Capitonidae** | **Laniidae** |
| *Sarcogyps calvus* | *Megalaima asiatica* FU/LC/R | *Lanius vittatus* FU/LC/RM |
| *Aquila nipalensis* | *Megalaima haemacephala* U/LC/R | *Lanius tephronotus* F/LC/R |
| *Gyps bengalensis* F/CR/R | *Megalaima virens* FU/AC/AM | *Lanius schach* F/LC/R |
| Falconidae | Indicatoridae | Cinclidae |
| *Falco tinnunculus* | *Indicator xanthonotus* F/NT/R | *Cinclus pallasii* R/LC/AM |
| *Falco subbuteo* FU/LC/RAM | **Picidae** | **Troglodytidae** |
| *Falco peregrines* FU/LC/R | *Dendrocopos auriceps* F/LC/R | *Troglodytes troglodytes* F/LC/AM |
| **Phasianidae** | *Dendrocopos nanus* F/LC/E | **Muscicapidae** |
| *Arborophila torqueola* FU/LC/R | *Dinopium javanense* FU/LC/R | **Turdinae** |
| *Lophura leucomelanos* F/LC/AM | *Picus flavinucha* R/LC | *Phoenicurus caeruleocephala* R/LC/AM |
| *Lophophorus impejanus* F/LC/AM | *Dinopium shorii* FU/LC | *Phoenicurus frontalis* F/LC/AM |
| **Columbidae** | *Dendrocopos macie* F/LC/R | *Monticola cinclorhynchus* F/LC/AM |
| *Columba pulchricollis* F/LC/R | *Dendrocopos canicapillus* FU/LC/R | *Myophonus caeruleus* FU/LC/AM |
| *Columba livia* U/LC/R | *Chrysocolaptes lucidus* FU/LC/R | *Monticola rufiventris* F/LC/AM |
| *Chalcophaps indica* F/LC/R | *Picus canus* F/LC/R | *Saxicola torquata* F/LC/R |
| *Streptopelia decaocto* FU/LC/R | *Dendrocopos himalayensis* FU/LC/R | *Tarsiger chrysaeus* F/LC/AM |
| *Streptopelia orientalis* FU/LC/R | *Picus squamatus* F/LC/R | *Saxicola ferrea* FU/LC/R |
| *Columba leuconota* FU/LC/R | *Picus chlorolophus* F/LC/R | *Saxicoloides fulicata* FU/LC/R |
| *Stigmetopelia Chinensis* FU/LC/R | *Dendrocopos hyperythrus* FU/LC/R | *Luscinia brunnea* F/LC/R |
| *Treron phoenicopterus* U/LC/R | *Celeus brachyurus* F/LC/R | *Saxicola caprata* FU/LC/R |
| *Stigmetopelia senegalensis* FU/LC/R | *Picumnus innominatus* F/LC/R | *Sylvia curruca* F/LC/R |
| **Psittacidae** | *Dendrocopos atratus* F/LC/R | *Enicurus scouleri* F/LC/AM |
| *Psittacula himalayana* FU/LC/R | *Dendrocopos maharattensis* F/LC/R | *Tarsiger cyanurus* F/LC/AM |
| *Psittacula cyanocephala* FU/LC/E | *Dendrocopos auriceps* F/LC/R | *Copsychus saularis* FU/LC/R |
| **Cuculidae** | **Hirundinidae** | *Rhyacornis fuliginosa* R/LC/AM |
| *Charysococcyx maculates* F/LC/SM | *Hirundo rustica* FU/LC/R | *Enicurus maculates* FU/LC/AM |
| *Eudynamys scolopaceus* FU/LC/SM | *Hirundo daurica* FU/LC/RAM | *Luscinia pectoralis* F/LC/AM |
| *Hierococcyxvarius* FU | **Motacillidae** | *Chaimarrornis leucolophus* R/LC/AM |
| *Cuculus canorus* F/LC/SM | *Motacilla cinerea* FU/LC/AM | **(2) Timaliinae (18)** |
| *Cuculus micropterus* F/LC/SM | *Anthus trivialis* F/LC/R | *Stachyris pyrrhops* FU/LC/E |
| *Cuculus sparverioides* F/LC/SM | *Anthus sylvanus* F/LC/R | *Minla strigula* F/LC/AM |
| *Centropus bengalensis* FU/LC/SM | *Athene brama* FU/LC/R | *Garrulax erythrocephalus* F/LC/AM |
| *Clamator jacobinus* F/LC/SM | *Asio flammeus* F/LC/WM | *Pericrocotus cinnamomeus* F/LC/R |

**Table 1.** *Continued ...*

| Family/Scientific Name/Habitat Use/IUCN | Family/Scientific Name/Habitat Use/IUCN | Family/Scientific Name/Habitat Use/IUCN Status/Migration Status |
|---|---|---|
| *Turdoides Striatus* FU/LC/R | *Motacilla alba* FU/LC/AM | *Pnoepyga albiventer* FU/LC/AM |
| *Heterophasia capistrata* FU/LC/AM | **Paridae** | **Corvidae** |
| *Pomatorhinus erythrogenys* F/LC/R | *Parus xanthogenys* FU/LC/R | *Garrulus lanceolatus* F/LC/AM |
| *Pteruthius erythropteras* F/LC/R | *Aegithalos concinnus* FU/LC/R | *Corvus splendens* U/LC/R |
| *Garrulax striatus* F/LC/AM | *Parus major* FU/LC/R | *Garrulus glandarius* F/LC/AM |
| *Yuhina gularis* F/LC/AM | *Parus monticolus* FU/LC/R | *Dendrocitta formosae* F/LC/R |
| *Pellorneum ruficeps* F/LC/R | **Sittidae** | *Corvus macrorhynchos* FU/LC/R |
| *Garrulax lineatus* FU/LC/R | *Sitta castanea* F/LC/AM | *Urocissa flavirostris* FU/LC/R |
| *Yuhina flavicollis* F/LC/AM | *Tichodroma muraria* FU/LC/R | *Dendrocitta vagabunda* FU/LC/R |
| *Garrulax albogularis* F/LC/AM | **Certhiidae** | *Pyrrhocorax pyrrhocorax* F/LC/AM |
| *Pteruthius flaviscapis* F/LC/AM | *Certhia himalayana* F/LC/AM | *Nucifraga caryocatactes* F/LC/AM |
| *Garrulax leucolophus* F/LC/AM | *Certhia familiaris* F/LC/AM | |
| *Garrulax variegates* F/LC/E | **Dicaeidae** | |
| *Alcippe vinipectus* F/LC/AM | *Dicaeum ignipectus* F/LC/R | *(F-Forest, U-Urban, FU-Both in Forest and Urban* |
| **Sylviinae** | **Nectariniidae** | *R-Riverine),* |
| *Cettia flavolivacea* FU/LC/AM | *Aethopyga siparaja* F/LC/R | *IUCN category (LC-Least Concern, EN-Endangered* |
| *Phylloscopus maculipennis* F/LC/AM | *Nectarinia asiatica* FU/LC/R | *NT-Near Threatened, CR-Critically Endangered* |
| *Abroscopus albogularis* F/LC/AM | *Aethopyga nipalensis* FU/LC/R | *and distribution status (R-Resident, AM-Altitudinal* |
| *Phylloscopus reguloides* U/LC/AM | *Aethopyga gouldiae* F/LC/R | *Migrant, E-Endemic, WM-Winter Migrant* |
| *Phylloscopus pulcher* FU/LC/AM | *Zosteropidae* | *SM-Summer Migrant, AM-Altitudinal Migrant,* |
| *Orthotomus sutorius* FU/LC/AM | *Zosterops palpebrosus* FU/LC/R | *RAM-Resident and Altitudinal Migrant* |
| *Tesia casteneocoronata* FU/LC/AM | **Fringillidae** | |
| *Phylloscopus trochiloides* F/LC/R | *Mycerobas icterioides* FU/LC/AM | |
| *Seicercus burkii* F/LC/AM | *Carpodacus rodochora* FU/LC/AM | |
| *Phylloscopus xanthoschistos* F/LC/R | *Mycerobas melanozanthos* FU/LC/AM | |
| *Cettia brunnifrons* FU/LC/R | *Carduelis spinoides* FU/LC/AM | |
| *Turdus boulboul* F/LC/R | **Estrildidae** | |
| *Phylloscopus humei* F/LC/R | *Lonchura punctulata* FU/LC/R | |
| *Phylloscopus chloronotus* F/LC/R | **Passeridae** | |
| *Niltava sundara* F/LC/AM | *Passer domesticus* U/LC/R | |
| *Prinia criniger* F/LC/AM | *Passer rutilans* FU/LC/R | |
| *Prinia atrogularis* F/LC/R | **Sturnidae** | |
| *Phylloscopus affinis* F/LC/R | *Acridotheres giginianus* U/LC/R | |
| *Cettia acanthizoides* F/LC/AM | *Acridotheres tristis* U/LC/R | |
| **Musscicapinae** | *Saroglossa spiloptera* FU/LC/R | |
| *Cyornis rubeculoides* F/LC/AM | **Oriolidae** | |
| *Muscicapa sibirica* U/LC/AM | *Oriolus xanthornus* F/LC/SR | |
| *Muscicapa ferruginea* F/LC/AM | *Oriolus oriolus* FU/LC/SM | |
| *Culicicapa ceylonensis* FU/LC/AM | *Oriolus traillii* F/LC/R F/LC/SM | |
| *Ficedula westermanni* FU/LC/AM | **Dicruridae** | |
| *Ficedula strophiata* F/LC/AM | *Dicrurus leucophaeus* FU/LC/AM | |
| *Niltava sundara* F/LC/R | *Dicrurus macrocercus* U/LC/R | |
| *Niltava macgrigoriae* F/LC/AM | *Dicrurus caerulescens* FU/LC/M | |
| *Ficedula tricolor* F/LC/R | **Certhiidae** | |
| *Cyornis tickelliae* U/LC/R | *Certhia himalayana* F/LC/AM | |
| *Ficedula superciliaris* F/LC/AM | *Certhia familiaris* F/LC/AM | |

**Table 1.** *Continued ...*

| Family/Scientific Name/Habitat Use/IUCN | Family/Scientific Name/Habitat Use/IUCN | Family/Scientific Name/Habitat Use/IUCN Status/Migration Status |
|---|---|---|
| *Eumyias thalassina* FU/LC/AM | **Dicaeidae** | |
| **Monarchinae** | *Dicaeum ignipectus* F/LC/R | |
| *Terpsiphone paradise* F/LC/AM | **Nectariniidae** | |
| **Rhipidurinae** | *Aethopyga siparaja* F/LC/R | |
| *Rhipidura albicollis* FU/LC/AM | *Nectarinia asiatica* FU/LC/R | |
| *Rhipidura aureola* FU/LC/AM | *Aethopyga nipalensis* FU/LC/R | |
| *Rhipidura hypoxantha* FU/LC/AM | *Aethopyga gouldiae* F/LC/R | |
| **Aegithalinae** | **Zosteropidae** | |
| *Aegithaliscus concinnus* F/LC/R | *Zosterops palpebrosus* FU/LC/R | |

2019). White Rumped Vulture (*Gyps bangalensis*) was observed in most of the visits sitting in conspecific flocks of 8 or 9 individuals on dry trees. The anti-inflammatory veterinary drug diclofenac, used to treat domestic livestock, has been identified as the cause of decline in the population of this species (Oaks *et al*., 2004; Shultz *et al*., 2004; Swan *et al.,* 2005; Gilbert *et al*., 2006 and Prakash, 2007). Stripe-breasted Pied Woodpecker (*Dendrocopos atratus)* was seen feeding two new young ones, sitting on a branch of tree at Kakragad (1000 m a.s.l.) (Chandra and Bhatt, 2012). The distribution of Stripe-breasted Pied Woodpecker in India and subcontinent was thought to be around eastern India as reported by Ali and Ripley (1983) but this report appears to be the first one indicating its presence in the hills of northern India.

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