

Bird Records of Ayubia National Park, District Abbotabad, NWFP - Pakistan

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Abstract

We present bio-ecological investigation of bird fauna of Ayubia National Park covering the seasonal abundance and current status based on censuses carried out from 1997 to 2000. Study covers variable aspects such as population abundance, species richness, migrant and resident species and breeding records. We also report monthly counts which estimate the seasonal pattern of occurrence of species. The study recorded a total 154 bird species using this moist-temperate western Himalayan fairly dense forested landscape, including definitely a new record of collard fly-catcher (*Ficedula albicollis*) for the country based on a single sighting during the summer season and the rediscovery with a pair of green shrike babbler (*Pteruthias xanthochloris*) after a century back.

Key Words: Park, bird species, moist-temperate Himalayan, Ayubia National Park,

Introduction:

According to the WEMC/UNEP, there are now more than 44,000 protected areas, worldwide, covering about 10.1 percent of the world's terrestrial surface. Almost 42 percent (18,400 sites) are in the developing countries, including some of the most biologically rich habitats on the Earth. These protected areas are the cornerstone of biodiversity and species conservation (Kramer *et al.*, 1997; Bruner *et al.*, 2001). Ayubia National Park is one of the most important declared National Parks in NWFP – Pakistan (map) that falls in the IUCN-Category V. The Park is internationally known as a hot spot in the moist-temperate western-Himalayan mountainous range in the sense that many endemic, endangered or threatened species are inhabited in the Park.

The fairly-dense forested mountain landscapes serves as an international route used by the local and international migrant species. The Park is purely built to protect the beautiful landscape predominantly enriched with coniferous forest (*Abies pindrow*, *Cedrus deodara*, *Picea smithiana*, *Pinus wallichiana* and *Texus wallichiana*) mixed with broad-leaved evergreen plant species (*Quercus floribunda*, *Q. glauca*, *Q. incana*,) and deciduous broad-leave trees (*Acer caesium*, *Aesculus indica*, *Cornus macrophylla*, *Juglans regia*, *Populus ciliata*, *Prunus cornuta*, *Salix tetrasperma*, *Ulmus wallichiana*) in the moist-temperate environs of extreme western Himalayan range which inhabited a large faunal biodiversity together with some of the regional endemism including common leopard, *Panthera pardus* Himalayan

rhesus, *Macaca mulatta villosa* Murree vole, *Hyperacrius wynnei* yellow-throated marten *Martes flavigula* Koklass Pheasant, *Pucrasia macrolopha biddulphi* Kalij Pheasant, *Lophura leucomelana hamiltonii* Oriental White-backed Vulture, *Gyps bengalensis* Hodgson's Hawk Eagle *Spizaetus nepalensis* Wedge-tailed Green Pigeon *Trenon sphenura* Himalayan Jungle Crow *Corvus macrorhynchos intermedius* Himalayan Green Finch, *Carduelis spinoides* Orange Bullfinch *Pyrrhula aurantiaca* and Hawfinch *Coccothraustes coccothraustes*.

Material and Methods:

Since complete counting of birds is practically impossible as the present study area comprises of most difficult mountains of Himalayas ranges having altitudes upto approximately 3000 meters. It is for this reason, Anderson *et al.* (1976) strip census estimation method found to be the most suitable for bird count.

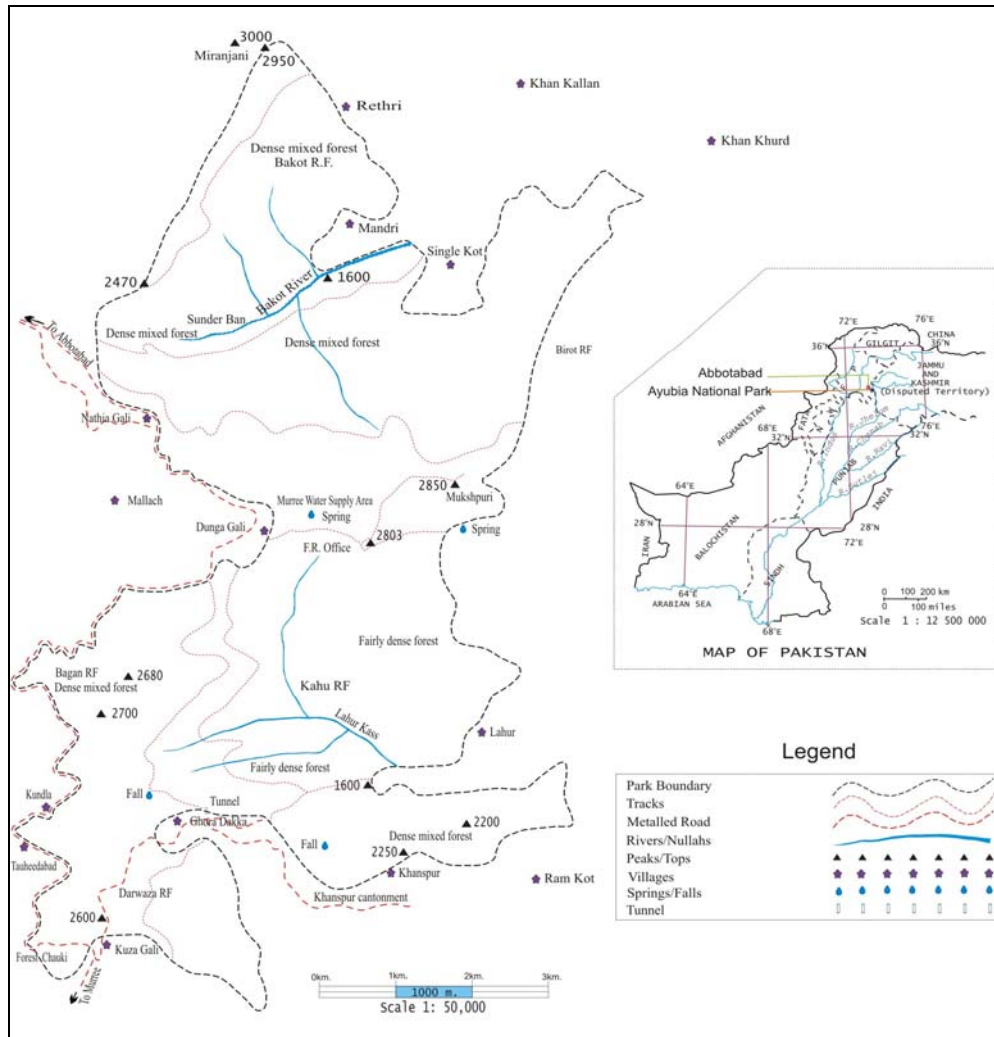
The strip census method was applied which entirely necessitates walking of predetermined track or line counting all the birds accrossed or observed in front or both left and right, and recording the distances at which they were seeded. The average of the flushing distance is determined and used to calculate the effective width of the strip covered. The average width is predetermined by trial and error method. The population of the entire area is considered to be the number of birds flushed, divided by the area of the strip and multiplied by the total area.

$$P = \frac{AZ}{2YX}$$

Where

- P = Population
- A = total area of study
- Z = number flushed
- Y = average flushing distance
- X = length of strip

During the visits, rapid bird biodiversity surveys were undertaken, partitioning the ranges of the area in all the habitats. Species diversity and species richness was encountered in every month of the study period.



Map of Ayubia National Park, District Abbotabad, NWFP, Pakistan.

Bird Identification:

Identification of birds was made following the literatures of Ali and Ripley (1982), King *et al.* (1986), Woodcock (1980), Heinzel *et al.* (1977). Certain small size birds which were difficult to identify at site, captured alive through the mist nets following the technique of Nagorsen and Peterson (1980). These birds were then identified and later released where they were caught. Many bird species were photographed which greatly assisted in identification without any confusion.

Tape Recordings:

Many species of birds were readily attracted to the tape-recorded calls of their own species. It was found to be most useful for population estimates. A comparative estimates of population density was obtained for these species by using a transect, and repeatedly playing suitable calls at intervals along their usual routes. Many birds of different species attracted to the calls, and then they were counted and assorted as they appeared or calls heard in response. This method was practically found to be much useful for shy skulking

species. Care had been taken to ensure that the volume at which the call was played remained constant through out the census.

Mist Netting:

Mist nets are made of fine nylon thread which trap birds unharmed when they fly into without seeing them, were used to assess changes in the abundance of a particular species in a locality. It has been observed that local birds especially used to avoid these nets, if the nets remained in the same site for several course entire days.

Random Nest Searching:

Fluctuations in breeding populations of some species of birds were obtained from the number of nests observed annually by random searching. During the study it was found that some birds may make more than one nest if their first effort was robbed by a predator, and also it was noted that some species of birds used their old nests in successive breeding seasons (constructed in the previous years) by renewing them to save their energy (thrush species). Birds which breed in large colonies were observed to occupy the same nesting area every year and such colonies were usually well known (martins and swallows). Some observations were most interesting as part of nesting. Species of wood peckers play an important role in the forest ecosystem, they benefit many other species of hole nesting. It was commonly observed that some hole nests of older colonies of Woodpeckers which were not in use were occupied by mynas as well as many other wildlife species of mammals (flying squirrels).

Small passerine birds have relatively short breeding cycle and nest more than once in a year as such counting nests all the time during the season had been done in order to be more accurate and precise.

Finding nests for some of territorial bird species is usually difficult for a population of more than 20 pairs instead it was to map the territorial system of the population, and this has the advantage that while nesting may be periodic, territories must remain fairly constant throughout the breeding season.

Results and Observations:

Prior to this work, little was known about the avian fauna of the Park. In the present study carried out by the scribes, a total of 154 bird species belonging to 42 families of 13 orders

were recorded. Which embrace as 12.9% permanent resident, 12.3% were resident altitudinal migrant, 18.9% were passage migrant, 29.2% were summer migrant, 4.5% were winter migrant, 10.4% were occasional, 10.4% were vagrant and 2.6% passed through their aerial route (Fig 1). Earlier to the present study, only in a few instances estimates of particular localities of the country are available, however with subsequent gaps of species abundance and diversity (Roberts, 1991), therefore, the present accounts could be relatively a complete reference of ANP. Birds are unpredictable due to their high mobility with the seasonal changes. Roberts (1991 & 1992), Ali and Ripley (1968, 1974, 1982, 1983 & 1987), Raja *et al.* (1997), Barker *et al.* (1996 & 1999) conducted ornithological surveys in the adjoining areas but none of them surveyed exclusively in the Park area. Therefore, the present accounts attempt to summarize the five main aspects including seasonal variation, relative abundance, breeding evidence, altitude and status of all bird species occurred in a protected area (ANP).

To record the avifauna of a particular area and their identification is a complicated job. The present study spans over a period of three years during which all the seasons were covered and avian census made at monthly frequency of occurrence. Table 1, shows the variation in abundance of birds during different seasons in three consecutive years: Spring (March to May); summer (June to August); autumn (September to November); and winter (December to February).

Research on the contemporary status of the avifauna exclusively of Ayubia National Park was lacking, however Roberts (1991 & 1992) mentioned a list of birds recorded from Pakistan. Ali and Ripley in a series of papers (1968, 1974, 1982 & 1987) gave an overall picture of the birds of the India and Pakistan. Other workers conducted ornithological survey in the adjoining areas including Raja *et al.* (1997) Barker *et al.* (1996) and (1999), Whistler (1930a), Magrath (1908a,b), but none of them surveyed entirely the Park area.

Out of 154 species of birds, 20 bird species were resident and 19 species were found resident but locally altitudinal migrant, 16 species were occasional, 46 species were summer migrant and 7 species were winters migrant, 28 species were passage migrant, 16

species were found to be vagrant while one was new record in the country and one other found to be endemic rediscovered after a century back (Figure 2).

The present study spans over for a continuous period of 3 years (March 1997 - February 2000) covering all seasons and all areas of the Park. In respect of bioecological characteristics, many evidences collected interpreting their habits and behavioral activities in consideration with their seasonal movements. Appearance of birds in the field immediately recorded and identified by the existing literature in hand.

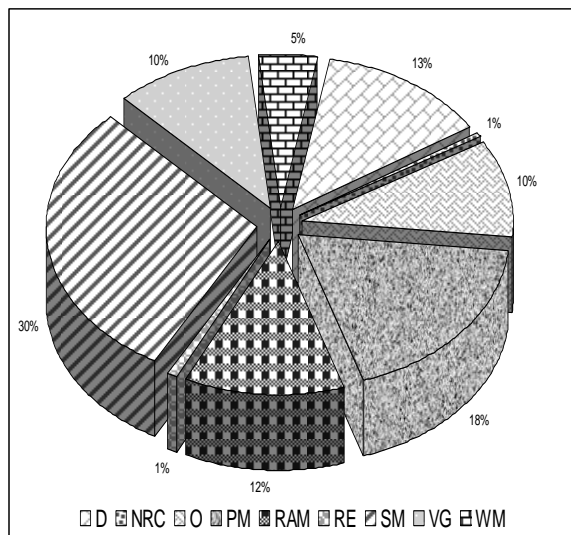


Fig 1: Graph showing the species abundance in percentage in different categories of status.

The largest numbering of species richness and diversity was calculated during the months of June and July and the lowest number occurred in March (Fig. 3). From March onward a substantial increase in the population of bird species is clearly indicating that the approach of summer or breeding season is the main factor inhabiting greater populations. This increase in numbering and species is continued till the month of July, then after, in the same pattern it may be observed from the graph (Fig. 3) decreasing gradually till December. In the winter with some beautiful new species arrival looked interesting as migratory finches, inhabitant of high altitudes which migrate from the Eastern Europe to wintering in the mountains of Pakistan (Whistler 1930).

Studies on dynamics of species appear to have successional changes. The results (totals) for various species groups show that species turnover does occur, some species disappear and others added but the number of species often stays approximately constant. For instance, the total number of birds in a given month or season in different years were nearly same (Table 1). This actually is the maximum holding capacity of the area which showed the stability providing adequate shelter and space.

The highest species representation was that of the order Passeriformes with 90 species belonging to 26 families followed by the order Accipitriformes with 17 species belonging to only one family Accipitridae, while two species of Falconidae of order Falconiformes. Three species of Phasianidae represented by the order Galliformes and single species of family Gruidae of order Gruiformes. Some other records were those of three species represented by the family Columbidae of order Columbiformes, two species of family Psittacidae of order Psittaciformes and six species of family Cuculidae of order Cuculiformes. Five species diversified by the family Strigidae of order Strigiformes, and single species of Caprimulgidae of order Caprimulgiformes.

Some accounts were represented by the presence of five species of family Apodidae of order Apodiformes and three species of order Coraciiformes belonging to the two families Coraciidae and Upupidae. Study also recorded proceeding with the six species of the order Piciformes belonging to the two families of Capitonidae and Pisidae out of the 154 species of birds. About 52 species were found breeding in the Park area (Table 1).

The present survey recorded the presence of two green shrike babblers *Pteruthius xanthochloris* Gray of family Timalidae of the order Passeriformes which is rediscovered (Table 1). During the present expedition the species was sighted only in April-1998 at the altitude of 2300 m after a century back when a solitary bird was recorded by General Buchanan who took a clutch of 3 eggs near Changla Gali on 13 July 1900 at 2,400m altitude (Whistler, 1930).

The sighting of Collard Flycatcher *Ficedula albicollis* Temminck of family Muscicapidae of Passeriformes was surprising because it has not

been reported in Pakistan. Only single species was seen at the altitude of 2400 m in May 1999 perching on a tree of *Salix tetrasperma* at mid-day, thereafter, never sighted during the years of survey (Table 1).

Among the order Accipitriformes which comprises of 17 species belonging to a single family Accipitridae includes Crested Honey Buzzard, *Pernis ptilorhynchus* Indian Kite, *Milvus migrans govinda* Large Indian Kite, *M. m. lineatus* occasionally visited the area while Lammergeier or Bearded Vulture, *Gypaetus barbatus* Oriental White-backed Vulture, *Gyps bengalensis* Eurasian Griffon Vulture, *G. fulvus* Himalayan Griffon Vulture, *G. himalayensis* passed flying over through their aerial route during summer. Other raptors includes in this order were Marsh Harrier, *Circus aeruginosus* Hen Harrier, *C. cyaneus* Northern Goshawk or Goshawk, *Accipiter gentilis* Eurasian Sparrow Hawk, *A. nisus* Shikra or Indian Sparrow Hawk, *A. badius* White-eyed Buzzard, *Butastur teesa* Black Eagle, *Ictinaetus malayensis* Steppe Eagle (photographed), *Aquila rapax nipalensis* Booted Eagle, *Hieraaetus pennatus* Hodgson's Hawk Eagle, *Spizaetus nipalensis*.

Crested Honey Buzzard, *Pernis ptilorhynchus* was occasionally seen at the site during winter and probably migrated from Northern Himalaya while White-eyed Buzzard was observed as vagrant species. Two species of kites; Indian kite, *Milvus migrans govinda* and Large Indian kite, *M. m. lineatus* (Photographed) occasionally visited the area. Lammergeir, *Gypaetus barbatus* always seen during winter migration, while three vulture species, Oriental white-backed vulture, *Gyps bengalensis*; Eurasian Griffon vulture, *G. fulvus* and Himalayan Griffon vulture, *G. himalayensis* seen only during their migration in summer, although these species were recorded breeding in this area some fifty years back (Roberts 1991) but now these birds never sighted even for a short stay, they passed in their fly route. Two species of Harrier, Marsh Harrier, *Circus aeruginosus* and Hen Harrier, *C. cyaneus* migrated to Indus Plains and Cholistan deserts of Pakistan during winter from Russian grounds observed rarely passing over site in winter. Among three species of Hawks includes Northern Goshawk, *Accipiter gentilis* Eurasian Sparrow Hawk, *A. nisus*, and Shikra, *A. badius* the Eurasian Sparrow Hawk, *A. nisus* now became the permanent resident of this area, few pairs always would stay round

the year and bred during summer. Four species of Eagles include Black Eagle, *Ictinaetus malayensis* Steppe Eagle, *Aquila rapax nipalensis* Booted Eagle, *Hieraaetus pennatus* and Hodgson's Hawk Eagle *Spizaetus nipalensis* were observed in the Park. Of which Steppe Eagle, *Aquila rapax nipalensis* (Photographed) is a winter migrant and stays whole of the winter in the Park. This species progressed entering in October and at the end of April it left the site to higher mountain range to the north and thus never seemed during summer in the Park.

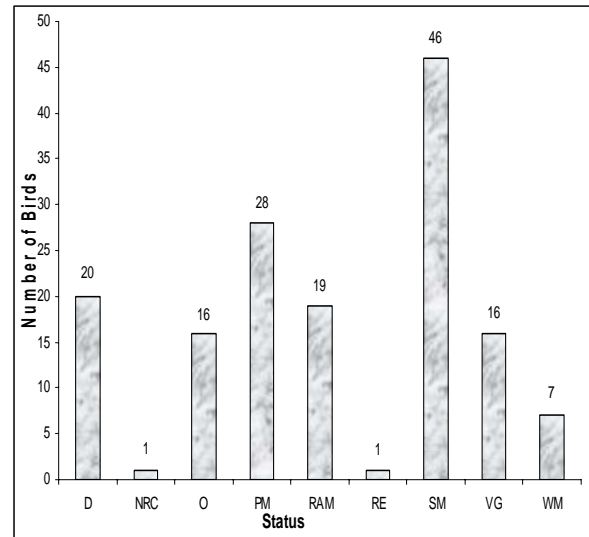


Fig 2: Graph representing the bird species frequency of occurrence in different categories of status.

Two species of Falcons include Eurasian kestrel, *Falco tinnunculus* and Northern Hobby *F. subbuteo* belonging to single family Falconidae of order Falconiformes were observed as locally migrant species from the higher Northern Mountains of Pakistan. Few birds of Eurasian kestrels, *Falco tinnunculus* were observed summering during the months of April to September.

Three species of pheasants of family phasianidae of order Galliformes include Chukar, *Alectoris chukar*, Koklass pheasant, *Pucrasia macrolopha biddulphi* (Photographed) and Kalij pheasant, *Lophura leucomelana hamiltonii* are the resident species of the Park areas. Chukar, *Alectoris chukar* is now becoming very rare although it was once abundantly occurring in the area but now it only seemed during summer. Koklas pheasant,

Pucrasia macrolopha biddulphi and Kalij pheasant, *Lophura leucomelana hamiltonii* which are now considered, threatened throughout Himalayas but the population of Koklas Pheasant, *Pucrasia macrolopha biddulphi* is the largest occurring as compared to any other areas of Pakistan. However, Kalij Pheasant has been declared endangered by IUCN and the present research encountered few pairs inhabiting in the lower altitudinal areas of the Park due to its preference for some drier places and never seemed during snow fall or in the moistest places of the forest probably it locally migrates to lower elevation.

A single flock of 39 Common Cranes, *Grus grus*, was observed in the month of October 1999 flying over the study site during their aerial pass towards the planes from the higher mountainous areas. While, another flock of 160 birds of European Bee-eaters *Merops apiaster* Linnaeus, was encountered crossing through Dunga Gali, Ayubia, the dense forest of the Park in the month of May 1998, utilizing the forest canopy and hunting thousands of insects in their way. Both the species used the oriental international migratory route over the Park.

Three species of Columbidae of order Columbiformes include Oriental Turtle Dove, *Streptopelia orientalis* which breeds in the Park (Photographed), nesting was observed in May 1998 on a bush *Sorbaria tomentosa*, Chinese Dove, *S. chinensis* and Wedge-tailed Green Pigeon, *Treron sphenura* were also occurred in the Park. Wedge-tailed Green Pigeon, *Treron sphenura* was once common in the Park but now it has become very rare and seemed occasionally in summer as a threatened species. The other two species were found throughout summering in the site where they breed but never observed during winter. Chinese Dove is also a rare bird species.

Two species of parakeet, Blossom-headed parakeet, *Psittacula cyanocephala* and Slaty-headed Parakeet *P. himalayana* were observed in the Park. Former is an inhabitant of lower ranges while the latter species acquired higher altitudinal ranges and found to be occurring as a permanent resident of the Park which commonly breeds (Photographed) in the summer and may be absent from the scene for a short period. Broad leaf trees species are the favourite one for resting and sheltering.

Himalayan Jungle Nightjar, *Caprimulgus indicus hazarae* of family Caprimulgidae of order Caprimulgiformes was the summer visitor of the Park. Sometimes we acrossed it during the summer nights survey resting on the ground. It does not occur commonly, it is a migrant in this area, very restricted bird and in essence a bird of subtropical deciduous and evergreen forest.

Six species of Cuckoos include Pied Crested Cuckoo, *Clamator jacobinus* which occurred near the water channels, Indian Plaintive Cuckoo, *Cacomantis merulinus passerinus* comprise this zone but at lower altitudes, Indian or Short-winged Cuckoo, *Cuculus micropterus* occurred in the monsoon season, Common or Eurasian Cuckoo, *C. canorus* Oriental or Himalayan Cuckoo, *C. saturatus* and Little or Small Cuckoo, *C. poliocephalus* belonging to the family Cuculidae of order Cuculiformes were only seen after their long migration to reach this area in summer. They stayed for short periods just for resting during their journey. Of these Pied Crested Cuckoo, *Clamator jacobinus* and Indian Plaintive Cuckoo, *Cacomantis merulinus passerinus* were rare and occasional. The rest of the Cuckoo species particularly small Cuckoo's (Photograph) population was generally seemed to be very low. Many host species were recorded occurring in the area incubating the eggs of Cuckoo birds laid in their nests (Buchanan, 1903; Cock & Marshal, 1873).

Five species of Owls include Indian Scops Owl, *Otus bakkamoena* Mountain Scops Owl, *O. spilocephalus* Collard Pygmy Owl, *Glaucidium brodiei* Himalayan Barred Owlet, *G. cuculooides* and Himalayan Wood Owl, *Strix aluco himalayana* all belong to Strigidae of Strigiformes were recorded in the Park area.

A single bird of Himalayan Barred Owlet, *G. cuculooides*, was seen only once in June 1998. Himalayan Wood Owl, *Strix aluco himalayana* (photographed) were more commonly seen during night round the year and were found to be the permanent resident of the Park. Mountain Scops Owl, *O. spilocephalus* and Collard Pygmy Owl, *Glaucidium brodiei* (photographed) were not seen during peak snowy season. While Indian Scops Owl, *Otus bakkamoena* seemed summering in the Park.

Five species of swifts including White-throated Needle tail, *Hirundapus caudacutus* Swift or Eastern Swift, *Apus apus pekinensis* Pacific

Swift, *A. pacificus* Alpine Swift, *A. melba* and Indian House Swift, *A. affinis* (family Apodidae and order Apodiformes) were observed only summering in colonies or mixed species flocks. All swifts were seen affecting Park area in the months of April to July except Alpine Swift, *A. melba* which were late comer and visited the Park during August and September.

Two species of rollers including European Roller or Kashmir Roller, *Coracias garrulus* and Indian Roller or Blue Jay, *C. bengalensis* (family Coraciidae, order Coraciformes) was found to be now very rare but it was the first author's experience that it was very common in the Park some twenty years back. Another bird Hoopoe, *Upupa epops* (photographed, family Upupidae of order Coraciformes) were observed commonly visiting during summer, most of its preference was the area of Dunga Gali but avoiding thick forest.

Great Himalayan Barbet, *Megalaima virens* (photographed) belongs to family Capitonidae of order Piciformes is a common bird and permanent resident of the mixed coniferous and broad leaf forest of the Park. These all are inhabitants as cavity nesting and bred successfully in the Park. Their populations seemed to prefer the dense forested areas. Five species of Woodpeckers belonging to the family Picidae of the same order include Black-naped Green Woodpecker, *Picus canus* Scaly-bellied Woodpecker, *P. squamatus* (photographed) Himalayan Pied Woodpecker, *Dendrocopos himalayensis* (photographed) Rufous-bellied Woodpecker or Rufous-bellied Sapsucker, *D. hyperythrus* and Brown-fronted Woodpecker, *D. auriceps* were observed in the Park. Black-naped Green Woodpecker, *Picus canus* (photographed) Rufous bellied Woodpecker, *D. hyperythrus* and Brown fronted Woodpecker, *D. auriceps*, were seen during summer but in winter they migrated to lower altitudes. However, others two were the hardy species; Scaly-bellied Green Woodpecker, *P. squamatus* and Himalayan Pied Woodpecker, *Dendrocopos himalayensis* (photographed). They were common breeder and permanent inhabitant of the Park. All the species belonging to this order play an animated and vigorous role likely as a carpenter, constructing shelters not only for themselves but also providing facilitation of cavities and holes to breed and inhabit a large variety of wild life species befitting not only the

Park species but the world ecosystems in general.

Twenty seven families of order Passeriformes were recorded in the Park. Family Hirundinidae include two species of Martins; Northern Crag Martin, *Ptyonoprogne rupestris* (photographed) and Asian House Martin, *Delichon dasypus cashmeriensis* (photographed) flushed in the Park, of which latter species was very abundant and found commonly breeding in colonies using the residential barracks and huts present in the Park (photographed) but they migrated to the lower valleys during the winter. Red-rumped Swallow (photographed) was also a summer visitor and visited for breeding.

Three species of family Motacillidae were found occurring in the study site, of which single species of Tree Pipit or called Brown Pipit *Anthus trivialis*, was found using the double migratory passage through the Park. Two species of Wagtails; Grey Wagtail *Motacilla cinerea* and Siberian White Wagtail *M. alba dukhunensis* (photographed) were observed, of which the latter was found to be as vagrant due to a single sighting of three birds in May 1997.

A single species of each family representing of Long-tailed Minivet, *Pericrocotus ethologus* (photographed) Asiatic or Brown Dipper, *Cinclus pallasii* and Northern Wren, *Troglodytes troglodytes* were observed belonging to the families of Campephagidae, Cinclidae and Troglodytidae, respectively. The Long-tailed Minivet, *Pericrocotus ethologus* was found to be permanent summer inhabitant and breeder of the Park between 2000 to 2600 m altitude in the well-wooded mixed conifer and broad-leaved forest and seemed leaving the area in the winter to the lower valleys as altitudinal migrant. Few pairs of Brown or Asiatic Dipper *Cinclus pallasii* were regularly sighted reaching in summer and inhibited the fresh water nullahs of the Park, while Northern wren is a permanent resident and breeder bird which was encountered on the higher altitudes round the year. Local migration was noted when more birds reached and entered wintering to the Park from the higher northern mountains due to the heavy snowfall there. The species don't undergo long distance migration from their breeding grounds because of being a weak flyer and can't expose itself in large flocks vulnerable to a number of predators (pers. obs).

Three species of Bulbuls; White-checked Bulbul, *Pycnonotus leucogenys leucogenys* (photographed) Red-vented Bulbul, *P. cafer* and Black Bulbul, *Hypsipetes madagascariensis* belonging to the family Pycnonotidae were recorded. Of these the latter was a common permanent resident breeder and never observed above 2300 m altitude in the summits of the Park while White-checked Bulbul, *Pycnonotus leucogenys leucogenys* showed its affection in winter and the latter *P. cafer* in summer but rarely.

Four species of accenters; Black-throated Accenter, *Prunella atrogularis* Altai or Himalayan Accenter, *P. himalayana* Alpine Accenter, *P. collaris* and Rufous-breasted Accenter, *P. strophciata* include in the family Prunellidae were reported visiting in the more open wooded area during their altitudinal migration to the southern plains. Black-throated, *Prunella atrogularis* and Altai or Himalayan Accenter, *P. himalayana* were seen using double migratory passage while the Alpine Accenter, *P. collaris* was noted as a straggler and Rufous-breasted Accenter, *P. strophciata* was a locally altitudinal migrant to the Park. All the Accenters were found temporarily using the summits of the Park on their way to the breeding grounds of lower altitudinal ranges.

Family Turdidae was noted contributing a large number of species (21 species) in the Park. Four species of Redstarts occurred which include the Blue-capped Redstart, *Phoenicurus caeruleocephalus* (photographed) Kashmir Redstart, *P. ochruros phoenicuroides* Plumbeous Redstart, *Rhyacornis fuliginosus* (photographed) and White-capped Redstart or Water Redstart, *Chaimarrornis leucocephalus*. Six species of Chats/Robins showed their presence which represented by the inclusion of Indian Blue Robin, *Luscinia brunnea* Orange-flanked Bush Robin or Red-flanked Blue-tail, *Tarsiger cyanurus* (photographed) Golden Bush Robin, *T. chrysaeus* Common Stonechat or Indian Bush-chat, *Saxicola torquata* Pied Bush Chat, *S. caprata* (photographed) Grey Bush Chat or Dark-grey Bush Chat, *S. ferrea* (photographed). Other nine Turdids include recognizing as Thrushes; Blue-capped or Blue-headed Rock Thrush, *Monticola cinclorhyncha* Chestnut-bellied Rock Thrush, *M. rufiventris* Blue Rock Thrush, *M. solitarius* Blue Whistling Thrush or Himalayan

Whistling Thrush, *Myiophonus caeruleus* (photographed) Tickell's Thrush, *Turdus unicolor* Chestnut Thrush or Grey-headed Thrush, *T. rubrocanus* (photographed) Dark-throated Thrush or Black-throated Thrush, *T. ruficollis atrogularis* (photographed) Himalayan Mistle Thrush, *T. viscivorus bonapartei* which were reported occurring commonly (Table 1) with the exception of Golden Bush Robin which includes a single soaring sighting in May 1997. Two species of forktails known as Little Forktail, *Enicurus scouleri* and Spotted Forktail, *E. maculatus* (photographed), of the sub family Enicurinae were observed always during the summer along the water channels in the Park, possibly bred during their migratory passage. Of the twenty one species of family Turdidae, eight were noted to be using the Park as breeding haunts (Table - 1).

Eleven species of tiny birds called warblers of family Sylviidae were reported in the study area that include Pale Strong-footed Bush Warbler, *Cettia fortipes pallides* and Grey-sided or Rufous-capped Bush Warbler, *C. brunnifrons* Straited Prinia or Brown Hill Warbler, *Prinia criniger* Lesser White-throat, *Sylvia curruca* Grey-headed Warbler or Grey-headed Flycatcher Warbler, *Seicerus xanthoschistos* Western or Large Crowned Leaf Warbler, *Phylloscopus occipitalis* (photographed) Greenish Warbler or Dull Green Leaf Warbler, *P. trochiloides viridanus* (photographed) Pallas's or Yellow-rumped Leaf Warbler, *P. proregulus simlaensis* Hume's Leaf Warbler or Hume's Willow Warbler, *P. inornatus humei* Eurasian Chiffchaf or Brown Leaf Warbler, *P. collybita tristis* and Goldcrest, *Regulus regulus*. Of which four were found breeders. With the exception of grey-sided bush warbler and Brown hill warbler which were observed scarcely kept as occasional in the category of status, others which were found frequently in their particular visiting seasons (Table 1) were considered as common including the four breeders.

Seven species of Flycatchers which include in the family Muscipidae made registered their presence mostly in summer in the study site. These were as Rufous-bellied or Beautiful Niltava, *Niltava sundara* Verditer Flycatcher, *Muscicapa thalassina* (photographed) Dark-sided or Sooty Flycatcher, *M. sibirica* Slaty-blue Flycatcher, *Ficedula tricolor* Ultramarine Flycatcher or White-browed Blue

Flycatcher, *F. superciliaris* Collard Flycatcher, *Ficedula albicollis* and Grey-headed Canary Flycatcher, *Culicicapa ceylonensis*. A single species of family Rhipiduridae, known as White-throated Fantail Flycatcher *Rhipidura albicollis* was also observed. Almost all of the Muscicapids made their regular appearance in consecutive seasons of the year. Conversely white-throated fantail flycatcher found to be a straggler presenting a single sighting of three birds in November 1998, while Collard Flycatcher (*Ficedula albicollis*) is a new record for the country.

Family Timalidae represented six species covering White-throated Laughing Thrush, *Gerrulax albogularis* Variegated Laughing Thrush, *G. variegatus similis* (photographed) Streaked or Himalyan Laughing Thrush, *G. Lineatus* (photographed) White-browed or Red-winged Greater Shrike Babbler, *Pteruthius flaviscapis* Green Shrike Babbler, *P. xanthochloris* and Black-capped or Black-headed Sibia, *Heterophasia capistrata*. White-throated Laughing Thrush was found to be as vagrant because of a single observation of two birds in June 1999 while Variegated Laughing Thrush, *G. variegatus similis* (Photographed) and Streaked or Himalyan Laughing Thrush, *G. Lineatus* (Photographed) were found to be the commonest permanent residents and breeders of the Park. Green shrike babbler, a Sino-Himalayan species was rediscovered by a single sighting of two birds at 2300 m altitude in April 1998, once it was a breeder of this area when Buchanan took a clutch of three eggs from the present study site (Changla-gali) about a century ago (Whistler, 1930). Black-capped Sibia was also found to be a resident but altitudinal migrant to lower adjacent valleys during the winter days.

Eight species of beautiful small birds recognized as tits belonging to family Aegithalidae were occurring, of these two species as White-throated longtailed Tit, *Aegithalos niveogularis* and Red-headed Long-tailed Tit, *A. concinnus* (photographed) were very hardy species to be present during below zero degree temperatures, only during the months of January and February, while others (Paridae), Simla or Black Crested Tit, *Parus rufonuchalis* Spot-winged Black Tit or Crested Black Tit, *P. melanolophus* Great Tit or Grey Tit, *P. major* Green-backed Tit, *P. monticolus* (photographed) were the common members of the Park. The

latter is a hardy species and permanent resident of the Park which was observed joining the incoming migratory species of tits in parties during winters. The Yellow-cheeked Tit was the only tit bird found to be a vagrant because of its single sighting in June 1998.

Of all the Tits, Grey Tit is a large-sized of its allied members encountered only during March to June on its way to the north to higher mountains, though its population was not so high but seemed breeding at the site. Green-backed Tit was the second commonest bird in this group and also found to be a permanent resident breeder as well as spot-winged black Tit. Fire-Capped Tit, *Cephalopyrus flammiceps* of the family Remizidae was found a summer visitor for a limited period only in May and June.

Two species of Nuthatches; White-Cheeked Nuthatch, *Sitta leucopsis* and Brooks or Kashmir Nuthatch, *S. europaea cashmirensis* of the family Sittidae were recorded of which the White-checked Nuthatch represented as a permanent resident and breeder of the site while Brooks or Kashmir Nuthatch was found a summer visitor but small flocks were observed during the winter migrating from the northern mountains while passing through the Park.

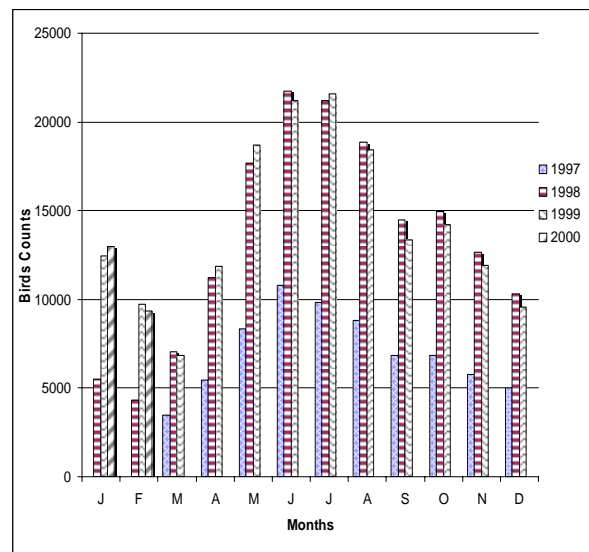


Fig: 3 Monthly variations in the number of birds of Ayubia national Park from March 1997 to February 2000.

A single species of creeper of the family Certhidae viz Himalayan Tree Creeper, *Certhia himalayana* (photographed) was encountered in

all the seasons and found to be as a commonest resident of the Park which breeds successfully and an increase in population noticed particularly during winter when more birds entered into the Park to pass down wintering in the lower valleys. The species has a variable adaptation because it has also recorded by the first author of this study, fairly occurring in the juniper forests of Balochistan.

Four families were represented by a single species each. These were Purple Sunbird, *Nectarinia asiatica* (Nectarinidae) Oriental White-eye *Zosterops palpebrosa* (Zosteropidae) Golden Oriole (photographed) *Oriolus oriolus* (Oriolidae) and Long-tailed Shrike or Rufous-backed Shrike *Lanius schach* (Lanidae). A single sunbird was sighted in June 1998 and considered to be a straggler or occasional. Oriental white Eye was observed at two occasions in July 1998 and in May 1999.

Table: 1. Seasonal variation in number of birds, relative abundance and related ecological information of Ayubia National Park from March 1997 to February 2000. (PM - Passage Migrant SM - Summer Migrant WM - Winter Migrant O - Occasional Sighting VG - Vagrant or Straggler RE - Rediscovered NRC - New Record for Country RAM - Resident-Altitudinal Migrant D - Permanent Resident AR - Aerial Route C - Confirmed)

Name of Species Common / Scientific	Year	Spring			Summer			Autumn			Winter		Total	Relative Abundance	Breeding Evidence	Altitude(m)	Status
		March	April	May	June	July	August	September	October	November	December	January					
Crested Honey Buzzard <i>Pernis ptilorhynchus</i>	1997-98											1	1	0.0012			
	1998-99	1											1	0.0006		2650	O
	1999-00																
Indian Kite <i>Milvus migrans govinda</i>	1997-98			2									2	0.0025			
	1998-99		1										1	0.0006		1800	O
	1999-00																
Large Indian Kite <i>M.m. lineatus</i>	1997-98															2500	O
	1998-99									1	2		3	0.0017			
	1999-00											1	1	0.0006			
Lammergeir <i>Gypaetus barbatus</i>	1997-98									1	2		3	0.0037			
	1998-99											1	1	0.0006		AR	W M
	1999-00											1	1	0.0006			
Oriental White-backed Vulture <i>Gyps bengalensis</i>	1997-98					1							1	0.0012			
	1998-99				1	1							2	0.0012		AR	SM
	1999-00						1						1	0.0006			
Eurasian Griffon Vulture <i>G. fulvus fulvescens</i>	1997-98				2	1							3	0.0037			
	1998-99				1								1	0.0006		AR	SM
	1999-00			1		2							3	0.0018			
Himalayan Griffon Vulture <i>G. himalayensis</i>	1997-98			3	6	1							10	0.0123			
	1998-99		1	12	6	3							22	0.0128		AR	SM
	1999-00		2	5	4	2							13	0.0077			
Marsh Harrier <i>Circus aeruginosus</i>	1997-98											1	1	0.0012			
	1998-99		1										1	0.0006		1700	PM
	1999-00		1									1	2	0.0012			

Hen Harrier <i>C. cyaneus</i>	1997-98													1	0.0012				
	1998-99		1											1	0.0017	2000		PM	
	1999-00		1											2	0.0018				
Northern Goshawk <i>Accipiter gentilis</i>	1997-98																		
	1998-99			1										1	0.0006	2600		O	
	1999-00								1					1	0.0006				
Eurasian Sparrow Hawk <i>A. nisus melachistos</i>	1997-98	3	2	3	6	8	3	6	3	5	3	4	3	49	0.0605				
	1998-99	3	6	5	5	8	4	2	4	3	4	6	3	53	0.0308	C	2400-2700	D	
	1999-00	5	6	5	7	6	4	3	5	2	3	4	3	53	0.0312				
Shikra <i>A. badius cenchroides</i>	1997-98		1											1	0.0012				
	1998-99																	2550	O
	1999-00			1										1	0.0006				
White-eyed Buzzard <i>Butastur teesa</i>	1997-98																		
	1998-99																	1900	VG
	1999-00				1									1	0.0006				
Black Eagle <i>Ictinaetus malayensis</i>	1997-98										1			1	0.0012				
	1998-99																	2400-2600	O
	1999-00								1	1				2	0.0012				
Steppe Eagle <i>Aquila rapax nepalensis</i>	1997-98	8	18							11	13	9	2	61	0.0753				
	1998-99	7	33							16	15	11	26	108	0.0627			2300-2600	W M
	1999-00	6	22							12	9	10	17	76	0.0447				
Booted Eagle <i>Hieraaetus pennatus</i>	1997-98					1								1	0.0012				
	1998-99					2								2	0.0012			2500	SM
	1999-00				1									1	0.0006				
Hodgson's Hawk Eagle <i>Spizaetus nepalensis</i>	1997-98																		
	1998-99																	2450	VG
	1999-00				1									1	0.0006				
Eurasian Kestrel <i>Falco tinnunculus</i>	1997-98		1	4		2								7	0.0086				
	1998-99		2	3	6									11	0.0064			2500-2700	SM
	1999-00		1	2	2			1						6	0.0035				
Nothorn Hobby <i>F. subbuteo</i>	1997-98			8										8	0.0099				
	1998-99				2									2	0.0012			2550	PM
	1999-00				1									1	0.0006				
Chukar <i>Alectoris chukar</i>	1997-98				3									3	0.0037				
	1998-99				2									2	0.0012			1700-2000	SM
	1999-00				4	7								11	0.0065				
Koklass Pheasant <i>Pucrasia macrolopha biddulphi</i>	1997-98	45	71	132	170	190	171	182	142	117	63	43	34	1360	1.6792				
	1998-99	108	195	271	298	306	317	333	263	182	159	107	88	2627	1.5242	C	1600-2750	D	
	1999-00	144	185	207	241	277	290	266	243	222	152	133	82	2442	1.4374				
Kalij Pheasant	1997-98			2	4	6	3	5		6	3			29	0.0358	C	1600-2200	RA M	

<i>Lophura leucomelana hamiltonii</i>	1998-99			7	11	13	18	16	2	8	2			77	0.0447			
	1999-00		1	4	7	10	7	6		3	7			45	0.0265			
Common Crane <i>Grus grus</i>	1997-98																AR	PM
	1998-99																	
	1999-00								39					39	0.0230			
Oriental Turtle Dove <i>Streptopelia orientalis</i>	1997-98			9	19	9	3							40	0.0494			
	1998-99		7	35	40	25	8							115	0.0667	C	2200-2600	PM
	1999-00		3	22	43	20	7	1						96	0.0565			
Chinese Dove <i>S. chinensis</i>	1997-98				2									2	0.0025			
	1998-99			3	4									7	0.0041	C	2300-2550	PM
	1999-00			1	2	1								4	0.0024			
Wedge-tailed Green Pigeon <i>Trenon sphenura</i>	1997-98																	
	1998-99				2									2	0.0012		2300	O
	1999-00							1						1	0.0006			
Blossom-headed Parakeet <i>Psittacula cyanocephala</i>	1997-98					13								13	0.0161			
	1998-99				5									5	0.0029		1600-1800	SM
	1999-00				4	18								22	0.0129			
Slatty-headed Parakeet <i>P. himalayana</i>	1997-98	55	103	156	212	271	103	35	114	93	77	84	40	1343	1.6582			
	1998-99	237	273	356	305	316	226	57	43	135	219	124	105	2396	1.3902	C	2000-2700	D
	1999-00	294	350	475	355	457	432	73	125	237	350	175	140	3463	2.0384			
Pied Crested Cuckoo <i>Clamator jacobinus</i>	1997-98					1								1	0.0012			
	1998-99				3									3	0.0017		2100	PM
	1999-00				8									8	0.0047			
Indian Plaintive Cuckoo <i>Cacomantis merulinus passerinus</i>	1997-98					1								1	0.0006		1700	O
	1998-99																	
	1999-00			1										1	0.0006			
Indian Cuckoo <i>Cuculus micropterus</i>	1997-98					1								1	0.0012			
	1998-99				2									2	0.0012		2450	SM
	1999-00				1									1	0.0006			
Eurasian Cuckoo <i>C. canorus</i>	1997-98			1	8	14	5							28	0.0346			
	1998-99			7	24	21								52	0.0302		2200-2600	PM
	1999-00			3	19	39	13							74	0.0436			
Himalayan Cuckoo <i>C. saturatus</i>	1997-98				6	11								17	0.0210			
	1998-99			3	16	25								44	0.0255		1600-1900	SM
	1999-00				7	21								28	0.0165			
Small Cuckoo <i>C. poliocephalus</i>	1997-98				3	5	1							9	0.0111			
	1998-99			1	8	3								12	0.0070		1600-1900	PM
	1999-00			4	10	7								21	0.0124			
Indian Scops Owl <i>Otus bakkamoena</i>	1997-98				14	10	6							30	0.0370	C	2100-2450	SM
	1998-99			4	36	66	30							136	0.0789			

	1999-00			22	84	74	24							204	0.1201			
Mountain Scops Owl <i>O. spilocephalus</i>	1997-98			11	18	23	5	9	9	11	2			88	0.1087			
	1998-99		12	4	21	34	28	21	16	18	6			160	0.0928	C	1800-2800	RAM
	1999-00		6	16	34	25	31	12	2	23	6			155	0.0912			
Collared Pygmy Owl <i>Glaucidium brodiei</i>	1997-98		2	13	16	26	23	17	11	8	2			118	0.1457			
	1998-99	7	18	37	49	39	42	33	25	21	9			280	0.1625	C	1800-2800	RAM
	1999-00	4	25	31	51	73	55	24	19	12	2			296	0.1742			
Himalayan Barred Owlet <i>G. cuculoides</i>	1997-98																	
	1998-99				1									1	0.0006		1900	VG
	1999-00																	
Himalayan Wood Owl <i>Strix aluco himalayana</i>	1997-98	15	18	17	5	3	6	7	6	9	8	8	18	120	0.1482			
	1998-99	55	25	39	16	10	16	12	12	19	28	49	55	336	0.1949		2300-2700	D
	1999-00	49	40	45	7	12	9	15	19	18	39	55	61	369	0.2172			
Himalayan Jungle Nighthjar <i>Caprimulgus indicus hazarae</i>	1997-98				2									2	0.0025			
	1998-99			2	1	1								4	0.0023		1900-2300	SM
	1999-00			2	1									3	0.0018			
White-throated Needletail <i>Hyrundapus caudacutus</i>	1997-98				2	1								3	0.0037			
	1998-99			2	7	4								13	0.0075		2300-2700	PM
	1999-00			2	3	1								6	0.0035			
Eastern Swift <i>Apus apus pekinensis</i>	1997-98		5	3	4									12	0.0148			
	1998-99			7										7	0.0041		2300-2700	SM
	1999-00		2											2	0.0012			
Pacific Swift <i>A. pacificus</i>	1997-98			9	39									48	0.0593			
	1998-99				12									12	0.0070		2500-2800	SM
	1999-00			3	13									16	0.0094			
Alpine Swift <i>A. melba</i>	1997-98						44	35						79	0.0975			
	1998-99						56							56	0.0325		2600-2800	SM
	1999-00							136						136	0.0801			
Indian House Swift <i>A. affinis</i>	1997-98			2	6	1								9	0.0111			
	1998-99			13	28	13								54	0.0313	C	2200-2500	SM
	1999-00		12	18	25									55	0.0324			
European Bee-eater <i>Merops apiaster</i>	1997-98																	
	1998-99			160										160	0.0928		2475	PM
	1999-00																	
Kashmir Roller <i>Coracias garrulus</i>	1997-98					2								2	0.0025			
	1998-99																1800	VG
	1999-00																	
Indian Roller <i>C. bengalensis</i>	1997-98																	
	1998-99																1800	VG
	1999-00			1										1	0.0006			
Hoopoe <i>Upupa epops</i>	1997-98			11	4	1								16	0.0198		2300-2500	PM

	1998-99			7	39	27	4							77	0.0447			
	1999-00			3	19	11								33	0.0194			
Great Himalayan Barbet <i>Megalaima virens</i>	1997-98	55	72	81	108	130	140	145	135	115	112	40	23	1156	1.4273	C	2000-2600	D
	1998-99	82	105	208	249	305	344	264	342	334	295	184	37	2749	1.5950			
	1999-00	92	128	269	285	323	350	272	252	219	188	120	62	2560	1.5069			
Black-naped Green Woodpecker <i>Picus canus</i>	1997-98			6	11	7	3							27	0.0333	C	1650-2000	RAM
	1998-99			16	43	22	2							83	0.0482			
	1999-00			13	17	12	1							43	0.0253			
Scally-bellied Green Woodpecker <i>P. Squamatus</i>	1997-98	51	62	77	96	120	135	121	105	84	71	59	44	1025	1.2656	C	1800-2550	D
	1998-99	123	195	210	250	263	278	271	212	196	141	112	127	2378	1.3797			
	1999-00	107	183	220	272	312	287	260	230	210	121	88	102	2392	1.4080			
Himalayan Pied Woodpecker <i>Dendrocopus himalayensis</i>	1997-98	150	208	185	217	233	241	220	181	200	180	154	136	2305	2.8460	C	1900-2700	D
	1998-99	305	372	411	360	507	500	450	431	446	388	331	322	4823	2.7983			
	1999-00	87	396	437	462	496	522	473	432	383	347	316	382	4733	2.7859			
Rufous-bellied Pied Woodpecker <i>D. hyperythrus</i>	1997-98				9	7	2	5						23	0.0284		1700-2000	RAM
	1998-99				2	15	26	13	9					65	0.0377			
	1999-00				4	11	8	16	6	3				48	0.0283			
Brown-fronted Woodpecker <i>D. auriceps</i>	1997-98			1	23	8	15							47	0.0580		2250-2400	RAM
	1998-99			10	38	21	8							77	0.0447			
	1999-00			18	53	34	3							108	0.0636			
Northern Crag Martin <i>Ptyonoprogne rupestris</i>	1997-98																2200-2300	O
	1998-99				1									1	0.0006			
	1999-00				2									2	0.0012			
Red-rumped swallow <i>Hirundo daurica nipalensis</i>	1997-98				2	5								7	0.0086	C	2300-2500	SM
	1998-99				11	18	2							31	0.0180			
	1999-00				8	13								21	0.0124			
Asian House Martin <i>Delichon dasypus cashmeriensis</i>	1997-98	133	223	308	343	354	373	313	214	33				2294	2.8324	C	2200-2700	SM
	1998-99	317	411	446	649	744	754	699	628	243				4891	2.8378			
	1999-00	204	319	522	543	727	772	742	621	234				4684	2.7571			
Tree Pipit or Brown Pipit <i>Anthus trivialis</i>	1997-98		6					4						10	0.0123		2400-2600	PM
	1998-99		4						1					5	0.0029			
	1999-00		3					7	2					12	0.0071			
Grey Wagtail <i>Motacilla cinerea</i>	1997-98				6			2	1					9	0.0111		2400-2700	PM
	1998-99				6									6	0.0035			
	1999-00				27			10	4					41	0.0241			
Siberian White Wagtail <i>M. alba dukhunensis</i>	1997-98			3										3	0.0037		2650	VG
	1998-99																	
	1999-00																	
Long-tailed Minivet <i>Pericrocotus ethologus</i>	1997-98			23	33	41	53	27	24	3				204	0.2519	C	2000-2600	SM
	1998-99		3	28	43	73	94	71	58	4				374	0.2170			

	1999-00		9	23	59	84	108	62	70	14				429	0.2525		
White-Cheeked Bulbul	1997-98		1											1	0.0012		
<i>Pycnonotus leucogenys</i>	1998-99		5											5	0.0029	2100	W
<i>leucogenys</i>	1999-00		13											13	0.0077		M
Red-vented Bulbul	1997-98				1									1	0.0012		
<i>P. cafer</i>	1998-99															2000	O
	1999-00				2									2	0.0012		
Black Bulbul	1997-98	175	213	258	308	329	372	364	290	251	241	191	161	3153	3.8930		
<i>Hypsipetes</i>	1998-99	346	476	466	535	543	646	532	418	340	385	286	121	5094	2.9556	C	1800-2300
<i>madagascariensis</i>	1999-00	190	318	537	617	725	800	762	630	492	452	375	297	6195	3.6465		D
Brown Dipper	1997-98				1	3	1	1	3					9	0.0111		
<i>Cinclus pallasii</i>	1998-99			1	1	4	9	4	2					21	0.0122	C	1800-2100
	1999-00			1	4	16	12	7	1	1				42	0.0247		SM
Northern Wren	1997-98	34	31	27	35	27	43	28	32	30	48	77	61	473	0.5840		
<i>Troglodytes troglodytes</i>	1998-99	79	55	100	93	76	87	45	54	88	97	132	126	1032	0.5988	C	2300-2800
	1999-00	76	64	75	84	69	82	52	57	81	93	130	114	977	0.5751		D
Black-throated Accenter	1997-98		9								31	19		59	0.0728		
<i>Prunella atrogularis</i>	1998-99		35								47	70		152	0.0882		2600-2800
	1999-00		26							76				102	0.0600		PM
Himalayan Accenter	1997-98		3							2				5	0.0062		
<i>P. himalayana</i>	1998-99		13								7			20	0.0116		2500-2700
	1999-00		17											17	0.0100		PM
Alpine Accenter	1997-98											3		3	0.0037		
<i>P. collaris</i>	1998-99																2750
	1999-00																VG
Rufous-breasted Accenter	1997-98			14										14	0.0173		
<i>P. strophata</i>	1998-99			45										45	0.0261		2500-2800
	1999-00			16										16	0.0094		SM
Indian Blue Chat	1997-98				58	65	73	70	52					318	0.3926		
<i>Luscinia brunnea</i>	1998-99			57	121	146	178	150	103	8				763	0.4427	C	2300-2600
	1999-00			13	146	142	145	124	110					680	0.4003		SM
Orange-flanked Bush Chat	1997-98			22	25				48	40	19			154	0.1901		
<i>Tarsiger cyanurus</i>	1998-99			58	31				66	48	27			230	0.1334		2300-2600
	1999-00		3	65	14				72	60	32			246	0.1448		PM
Golden bush Robin	1997-98			1										1	0.0012		
<i>T. chrysaeus</i>	1998-99																1800
	1999-00																VG
Blue-headed Redstart	1997-98	103	114						158	171	206	235		987	1.2187		
<i>Phoenicurus</i>	1998-99	223	264						310	408	405	511		2121	1.2306		2000-2700
<i>caeruleocephalus</i>	1999-00	208	220						309	318	360	440		1855	1.0919		PM
Indian Redstart	1997-98			68					54	71				193	0.2383		2300-2700
<i>P. ochruros</i>																	PM

	1998-99	34	25					116	46				221	0.1282				
	1999-00	17	43					36	82				178	0.1048				
Plumbeous Redstart <i>Rhyacornis fuliginosus</i>	1997-98		9	16				7	13	1			46	0.0568	C	1600-2400	SM	
	1998-99	6	10	18				21	29				84	0.0487				
	1999-00	5	17	24				44	15	4			109	0.0642				
Common Stone-Chat <i>Saxicola torquata</i>	1997-98	17	26	45	20	5							113	0.1395		2250-2700	SM	
	1998-99	12	48	76	12	16	3						167	0.0969				
	1999-00	62	52	44	16	1							175	0.1030				
Pied Bush Chat <i>Saxicola caprata</i>	1997-98		13	113	119	13							258	0.3186		2200-2500	SM	
	1998-99		14	115	18		6						153	0.0888				
	1999-00		16	114	122	13							265	0.1560				
Dark Grey Bush-Chat <i>S. ferrea</i>	1997-98	45	94	83	54								276	0.3408	C	2100-2600	SM	
	1998-99		46	94	145	93							378	0.2193				
	1999-00	79	57	163	204	142	69						714	0.4203				
White-capped Redstart <i>Chaimarromis leucocephalus</i>	1997-98	8	11	17	19	22	15	12	18	20	8	5	3	158	0.1951	C	1700-2700	D
	1998-99	18	35	28	31	40	24	25	33	28	22	25	20	329	0.1909			
	1999-00	13	18	32	41	48	29	36	46	39	14	11	6	333	0.1960			
Blue-headed Rock Thrush <i>Monticola cinclorhyncha</i>	1997-98		18	35	34	4							91	0.1124		2100-2600	SM	
	1998-99	4	75	70	57	14							220	0.1276				
	1999-00	11	58	78	61	24							232	0.1366				
Chestnut-bellied Rock Thrush <i>Monticola rufiventris</i>	1997-98		32	72	88	27	39	78	46				382	0.4717	C	2200-2800	RAM	
	1998-99		233	213	280	40	31	255	282	16			1350	0.7833				
	1999-00	45	175	198	261	70	54	228	169				1200	0.7063				
Blue Rock Thrush <i>Monticola solitarius</i>	1997-98		9	5									14	0.0173		1600-1800	SM	
	1998-99		18	2									20	0.0116				
	1999-00		3	10	2								15	0.0088				
Blue Whistling Thrush <i>Myophonus caeruleus</i>	1997-98	9	35	54	64	81	70	58	98	72	69	27	20	657	0.8112	C	2200-2600	D
	1998-99	70	83	115	158	180	127	120	173	160	103	38	29	1356	0.7868			
	1999-00	56	68	88	150	156	112	108	182	162	122	48	23	1275	0.7505			
Tickell's Thrush <i>Turdus unicolor</i>	1997-98	2	8	17	7								34	0.0420		1900-2500	SM	
	1998-99	8	16	45	26	3							98	0.0569				
	1999-00	8	26	40	18	7							99	0.0583				
Grey-winged Black-bird <i>T. boulboul</i>	1997-98			12	8			17					37	0.0457	C	1800-2200	SM	
	1998-99		21	24	12	3							60	0.0348				
	1999-00		9	25	4			46					84	0.0494				
Grey-headed Thrush <i>T. rubrocanus</i>	1997-98		19	94	121	88	63	57	33				475	0.5865	C	2300-2600	RAM	
	1998-99	30	147	324	357	303	225	178	138				1702	0.9875				
	1999-00	64	174	155	312	277	177	129	60				1348	0.7935				
Black-Throated Thrush	1997-98		272					506	482	312	1305	735	3612	4.4598		2000-2800	PM	

<i>T. ruficollis atrogularis</i>	1998-99		385					700	1190	700	3272	1662	7909	4.5889			
	1999-00		677					550	800	470	2350	1250	6097	3.5888			
Himalayan Mistle Thrush <i>T. viscivorus bonapartei</i>	1997-98	33	24					35	9				101	0.1247			
	1998-99	43	27					18	11				99	0.0574		2450-2700	PM
	1999-00	38	17					57					112	0.0659			
Little Forktail <i>Enicurus scouleri</i>	1997-98								2	3	4	3	12	0.0148			
	1998-99									6	10	3	19	0.0110		1600-2200	PM
	1999-00								3	13	6	7	29	0.0171			
Spotted Forktail <i>E. maculatus</i>	1997-98	5	7					6	3	2			23	0.0284			
	1998-99	13	15					7	13	6			54	0.0313		1600-2400	PM
	1999-00	17	20					18	13	5			73	0.0430			
Strong-footed Bush Warbler <i>Cettia fortipes pallides</i>	1997-98		6	59	156	171	175	150	113	72			902	1.1137			
	1998-99		23	136	378	365	395	236	210	156			1899	1.1018	C	2200-2800	RA M
	1999-00		32	112	348	342	376	234	152	116			1712	1.0077			
Grey-sided Bush Warbler <i>C. brunifrons</i>	1997-98	2											2	0.0025			
	1998-99															2350	O
	1999-00										4		4	0.0024			
Brown Hill Warbler <i>Prinia criniger hodgsoni</i>	1997-98		1										1	0.0012			
	1998-99															2300	O
	1999-00					2							2	0.0012			
Lesser White-throat <i>Sylvia curraca</i>	1997-98		9										9	0.0111			
	1998-99		11										11	0.0064		2000-2100	PM
	1999-00		65	11									76	0.0447			
Grey-headed Fly-catcher Warbler <i>Seicercus xanthoschistos</i>	1997-98		167	91	79	24							361	0.4457			
	1998-99		176	136	282	56							650	0.3771		1900-2100	SM
	1999-00		313	187	78	14							592	0.3485			
Western-Crowned Leaf Warbler <i>Phylloscopus occipitalis</i>	1997-98		412	635	788	867	473						3175	3.9202			
	1998-99		946	1468	1675	1822	1298						7209	4.1827	C	2100-2650	SM
	1999-00		1164	1386	1488	1522	1138						6698	3.9426			
Greenish Warbler or Leaf Warbler <i>P. trochiloides viridanus</i>	1997-98		6										6	0.0074			
	1998-99		15	3									18	0.0104		2400	PM
	1999-00		49	103									152	0.0895			
Pallas's Leaf Warbler <i>P. proregulus simlaensis</i>	1997-98		239	356	103			232	153	78	44		1205	1.4878			
	1998-99		414	628	181			683	387	277	133	36	2739	1.5892	C	2300-2600	RA M
	1999-00		458	670	211			560	135	46	21		2101	1.2367			
Hume's Willow Warbler <i>P. inornatus humei</i>	1997-98		76	202	248			148	23	16			713	0.8803			
	1998-99		87	516	478	3		333	158	57			1632	0.9469	C	2300-2600	RA M
	1999-00		174	442	519			415	236	127			1913	1.1260			
Eurasian Chiff Chaff <i>P. collybita tristis</i>	1997-98	327	185					81	23				616	0.7606		2600-2800	RA M
	1998-99	714	418					88	9				1229	0.7131			

	1999-00	824	294					137	46				1301	0.7658		
Goldcrest <i>Regulus regulus</i>	1997-98	30	28	17	11	3	3			4	23	38	157	0.1938		
	1998-99	55	33	18	13					16	54	67	256	0.1485	2400-2700	PM
	1999-00	47	14	20	19	15				28	113	92	348	0.2048		
Beautiful Niltava <i>Niltava sundara</i>	1997-98		1	1	4	1							10	0.0123		
	1998-99			2	11	8				3	3		27	0.0157	2400-2500	SM
	1999-00	1	3	1						2	1		8	0.0047		
Verditer Flycatcher <i>Muscicapa thalassina</i>	1997-98		11	15	30	34	48	37	27	17	12		231	0.2852		
	1998-99		33	43	76	63	90	81	60	39	27		512	0.2971	C	2100-2800
	1999-00		31	27	51	45	72	57	40	33	24		380	0.2237		RA
Dark-sided Flycatcher <i>M. sibirica</i>	1997-98			57	78	33	37	27	48	116	38		434	0.5359		
	1998-99			105	180	90	42	25	112	168	49		771	0.4473	C	2400-2800
	1999-00			126	168	52	64	42	90	204	111		857	0.5044		RA
Slaty-blue Flycatcher <i>Ficedula tricolor</i>	1997-98			4	6	8							18	0.0222		
	1998-99			2	22	25	4						53	0.0308		2300-2700
	1999-00			6	19	42	10						77	0.0453		SM
Ultramarine Flycatcher <i>F. supercilialis</i>	1997-98			25	60	30	16						131	0.1617		
	1998-99			45	135	79	48						307	0.1781	C	2200-2600
	1999-00			34	112	54	24						224	0.1319		SM
Collared Flycatcher <i>F. albicollis</i>	1997-98															
	1998-99														2400	NR
	1999-00			1									1	0.0006		C
Grey-headed Flycatcher <i>Culicicapa ceylonensis</i>	1997-98			83	94	13							190	0.2346		
	1998-99			130	172	87							389	0.2257		1750-2000
	1999-00			138	132	91							361	0.2125		SM
White-throated Fantail Flycatcher <i>Rhipidura albicollis</i>	1997-98															
	1998-99									3			3	0.0017		2200
	1999-00															VG
White-throated Laughing Thrush <i>Garrulax albogularis</i>	1997-98															
	1998-99														2300	VG
	1999-00			2									2	0.0012		
Variegated Laughing Thrush <i>G. variegatus similis</i>	1997-98	122	144	222	303	318	347	337	281	234	191	146	102	2747	3.3917	
	1998-99	264	350	515	644	660	700	674	612	513	427	300	218	5877	3.4099	C
	1999-00	247	370	532	644	650	678	713	706	626	489	290	138	6083	3.5806	
Streaked Laughing Thrush <i>G. lineatus</i>	1997-98	659	682	758	824	83	935	893	808	817	775	759	640	8633	10.6592	
	1998-99	1380	1407	1566	1724	1821	1900	1934	1748	1800	1686	1467	1272	19705	11.4330	C
	1999-00	1343	1437	1624	1788	1947	1922	1954	1876	1868	1813	1836	1322	20730	12.2021	
White-browed Shrike Babler <i>Pteruthius flaviscapis</i>	1997-98		2	9									11	0.0136		
	1998-99		14	11									25	0.0145		1600-2100
	1999-00		13	26									39	0.0230		PM

	1999-00	16	38	84	186	226	270	78	70	57	46	18	10	1099	0.6469		
Cinnamon Tree Sparrow <i>Passer rutilans</i>	1997-98		6	66	124	104	94	51				85	109	639	0.7890		
	1998-99		118	193	312	271	167	125				245	162	1593	0.9243	C	1900-2600
	1999-00		36	172	380	312	262	148				195	277	265	2047	1.2049	
Common Chaffinch <i>Fringilla coelebs</i>	1997-98									1				1	0.0012		
	1998-99																2500
	1999-00																
Brambling <i>F. montifringilla</i>	1997-98											6	13	19	0.0235		
	1998-99											33		33	0.0191		2250-2700
	1999-00										30	86	13	129	0.0759		
Himalayan Green Finch <i>Carduelis spinoides</i>	1997-98			11	17			24	82					134	0.1655		
	1998-99			112	23			112	252					499	0.2895		2400-2650
	1999-00			38	52			66	217					373	0.2196		
Plain Mountain Finch <i>Leucosticte nemoricola</i>	1997-98										109	185	208	502	0.6198		
	1998-99											558	254	812	0.4711		2300-2700
	1999-00										351	878	412	1641	0.9659		
Pink-browed Rosefinch <i>Carpodacus rhodochrous</i>	1997-98							3						3	0.0037		
	1998-99																2450-2550
	1999-00			16	36									52	0.0306		
Orange Bullfinch <i>Pyrrhula aurantiaca</i>	1997-98		8											8	0.0099		
	1998-99		17											17	0.0099		2600-2800
	1999-00		3										5	8	0.0047		
Black and Yellow Grosbeak <i>Mycerobas icteroides</i>	1997-98		3	7										10	0.0123		
	1998-99		3	18								3		24	0.0139		2400-2650
	1999-00		28	17								4	13	62	0.0365		
Spotted-winged Grosbeak <i>M. melanozanthos</i>	1997-98							1						1	0.0012		
	1998-99																2500
	1999-00				2									2	0.0012		
Hawfinch <i>Coccothraustes coccothraustes</i>	1997-98																
	1998-99																2450
	1999-00											7		7	0.0041		
White-capped Bunting <i>Emberiza stewarti</i>	1997-98					3								3	0.0037		
	1998-99																2300
	1999-00																
Rock Bunting <i>Emberiza cia</i>	1997-98			11	24									35	0.0432		
	1998-99			31	86									117	0.0679		2100
	1999-00			14	40									54	0.0318		
Total	1997-98	3453	5440	8342	10817	9825	8817	6812	6862	5779	5038	5490	4316	80991			
	1998-99	7062	11236	17678	21743	21229	18878	14503	14932	12659	10299	12426	9707	172352			
	1999-00	6825	11857	18698	21186	21574	18456	13343	14183	11894	9555	12978	9340	169889			

Golden Oriole a passage migrant observed in every June in successive years from 1997 to 1999, while Long-tailed Shrike or Rufous-backed Shrike *Lanius schach* (photographed) was found to be summering in the lower summits and a breeder of the Park (cover photograph taken by the first author of this study, fledglings of the species) .

Two species of Drongos i.e., Black Drongo or King Crow, *Dicrurus macrocercus* and Ashy or Grey Drongo, *D. leucophaeus* (photographed) of the family Dicruridae were found entering in the Park only in the summer. The latter was seen nesting in June 1998 on Blue Pine, *Pinus wallichiana*, while Black Drongo ascended from the south (warm climate) in summer but occasionally.

Seven species belonging to the family Corvidae were enlisted in this complex of bird site which represented as Himalayan or Red-crowned Jay, *Garrulus glandarius bispecularis* and Lanceolated Black-headed or Lanceolated Jay, *G. lanceolatus* Yellow-billed Blue Magpie, *Urocissa flavirostris* (photographed) Indian Tree-pie, *Dendrocitta vagabunda* Nutcracker, *Nucifraga caryocatactes* Indian House Crow, *Corvus Splendens* (photographed) and Himalayan Jungle Crow, *Corvus macrorhynchos intermedius* (photographed). Of these, Indian Tree-pie, *Dendrocitta vagabunda* was found to be an occasional summer visitor. Few pairs of Nutcrackers, *Nucifraga caryocatactes* were seen entering in the Park every summer.

Two species of crows were observed including the Indian House Crow, *Corvus Splendens* as a summer straggler and Himalayan Jungle Crow *Corvus macrorhynchos* as a permanent resident. House crow was seen only once as a single bird soaring on the lower summits of the Park while Himalayan Jungle Crow *Corvus macrorhynchos intermedius* was a common, permanent resident and breeder (Photographed) nesting was seen at Deodar *Cedrus deodara* in May. Common Myna or Indian Myna *Acridotheres tristis* belonging to the family Sturnidae was found fairly common round the year and a permanent resident breeder (Photographed). Cinnamon Tree Sparrow *Passer rutilans* (photographed) was also the only member of the family Passeridae which starts arriving in the Park from April as a regular summer visitor, breeding was also noted (photographed). At the approach of fall

they started to leave the study site but again in the winter flocks were encountered coming from the northern high mountains to the lower valleys. They stayed for the resting purpose and then passed down wintering in the lower valley or plains.

Two species including Common Chaffinch, *Fringilla coelebs* and Brambling, *F. montifringilla* grouped under the family Estrildidae were recorded. Common chaffinch was found to be a straggler because only once a single bird was observed soaring on Himalayan dogwood *Cornus macrophylla* however, Brambling was found to be a regular winter visitor.

Seven species of beautiful small passerines called finches belonging to sub family Carduelinae were documented in the study site. They are known as Yellow-breasted Greenfinch or Himalayan Greenfinch, *Carduelis spinoides* (Photographed) Plain Mountain Finch or Hodgson's Mountain Finch, *Leucosticte nemoricola* (photographed) Pink-browed Rosefinch, *Carpodacus rhodochrous* (photographed) Orange Bullfinch, *Pyrrhula aurantiaca* Black-and-Yellow Grosbeak, *Mycerobas icteroides* Spotted-winged Grosbeak, *M. melanozanthos* (photographed) and Hawfinch, *Coccothraustes coccothraustes*. All the species of finches were found to be long distance migrant visiting the Park temporarily during their migratory routes. Two species of buntings of the sub family Emberizinae were recorded of which White-capped Bunting, *Emberiza stewarti* (photographed) found to be a straggler because of the single sighting during the three years investigation while Rock Bunting or Meadow Bunting, *E. cia* (photographed) was observed using the migratory route regularly in summer.

Discussion:

Species of birds regional conservation concern were rerecorded inhabiting in the areas of Dunga Gali, Changla Gali (Magrath 1908a, 1909a and 1909b). These species include Egyptian Vulture, *Neophron pernopterus* Crested Serpent Eagle *Spilornis cheela* Himalayan Snow Cock *Tetrogularis himalayensis* Red Jungle Fowl, *Gallus gallus* Cheer Pheasant, *Catreus wallichi* Himalayan Monal *Lophophorus impejanus*. These areas are presently included in the Ayubia National Park. Similarly Rattray (1906) also reported the Crested Serpent Eagle *Spilornis cheela* and Himalayan Snow Cock

Tetragularis himalayensis occurring in the Galliat Forest and in the areas presently included in the study site. Cock and Marshal (1873) reported breeding of the Egyptian Vulture in the southern adjoining hills of the park (Murree). The present first author of this study during his last 16 years association with these areas has never been accrossed these birds nor did Roberts (1991, 1992) during his many visits of 26 years in this area. However, the study has recorded many new bird species for the area (Table 1) and a new record of Collard Flycatcher *Ficedula albicollis* Temmink for the country while the rediscovery of Green Shrike Babbler, *Pteruthias xanthochloris* after a century back is a great finding. Earlier, the species has a definite ancient breeding record in the present study area.

Some earlier ornithologists have conducted surveys around or in some of the areas presently included in the Ayubia National Park; they enlisted their findings with the first record of 70 species of birds breeding in the southern adjoining hills (Cock and marshal 1873) of the present study site. Rattray (1906) reported 109 species of birds nesting in Murree Hills (located in the southern hills of the Park) including Dunga Gali, Changla Gali, Kuza Gali and Nathia Gali which presently are the part of Park (ANP). Magrath (1908a, 1909a and 1909b) visited these temperate mountains and enjoyed recording some useful records of bird including those species which are declared endangered (IUCN 1996), he recorded 91 and 67 breeding species in 1908 and 1909 respectively. Corfield (1983) recorded 263 species occurring in Islamabad and 89 species from the Murree Hills during the spring and summer seasons. The latest published figures were those given by Thomas (1998) who prepared a list of 109 species of birds conducting a few days survey of ANP. These were mainly based on Roberts (1991, 1992) observations. The present investigation recorded a total of 154 bird species consisting of all categories (resident, migrant and breeding) in an area of 33 sq. km. of ANP. Therefore, this may be categorized as a rich biodiversity area compared to any other Protected Areas and National Parks in the country.

Barua and Sharma (1999) compiled the bird records from Kaziranga National Park India figuring 478 species from 430 sq. km. area. Drijvers *et al.* (1999) gave a list of 144 bird species in an area of 250 sq. km. from Punjab

and NWFP. Raja *et al.* (1999) recorded bird species in an area of 1413 sq km from Palas, NWFP. A bird list of 161 species from the records of Kalesar Wildlife Sanctuary Haryana, India was presented in response to studying from 1993-1995 (Kalsi,1998) at an area of 133 sq km. Shafique *et al.* (2002) working on bird fauna of Chiltan-Hazarganji National Park, Balochistan, recorded 74 bird species from an area of 155 sq km.

The records of birds from Ayubia National Park during the present study indicate comparatively highest ratio of terrestrial ecosystems. Globally endangered declared species were still present in the park including Oriental White-backed Vulture, *Gyps bengalensis* Orange Bullfinch, *Pyrrhula aurantiaca* White-throated Tit, *Aegithalos niveogularis* and regionally and nationally threatened species such as Koklass pheasant, *pucrasia macrolopha biddulphi* Kalij Pheasant, *Lophura Leucomelana hamiltonii* Wedge-tailed Green pigeon, *Treron sphenura* and pink-browed Rosefinch, *Carpodacus rhodochrous*. Habitat shrinkage has led these species in deep trouble for their future subsistence. Many key species were found including common crane, *Grus grus* now globally declared as endangered and European Bee-eater, *Merops apiaster* were the first ever record in the area seen during their migratory way. Common Crane migrant species in the Great Rann of Kutch and Saurashtra in Indian territory (Roberts, 1991), the first author of this study noted wintering of these birds at coastal marsh areas of Jabho and Sandho Lakes in district Badin, Sindh - Pakistan (photographed). European Bee-eater which migrates from southern Europe and winters in the Southern and Central Africa (Roberts, 1991). On return through Pakistan they were observed routing the ANP and breeding in central Balochistan (Shafique *et al.*, 2002), and through the NWFP, Chitral northwards to lower Swat and Indus Kohistan (Roberts, 1991, 1992), routing through Ayubia National Park, a moist-temperate region is the first ever record during the present study.

Reference:

Ali. S. and Ripley, S.D., 1964-1974. Handbook of the birds of India and Pakistan, Vol. 1-10. Bombay: Oxford University Press.

Ali, S. and Ripley, S. D., 1982. A Pictorial Guide to the Birds of the Indian Subcontinent Oxford University Press, New York, 183 pp.

- Ali, S. and Ripley, S. D., 1987. *Compact Handbook of the Birds of India and Pakistan*, Oxford University Press, New York, 737 pp.
- Ali, S. and Ripley, S. D., 1995. *A Pictorial Guide to the Birds of the Indian Subcontinent*. Bombay Natural History Society., Oxford University Press, Calcutta. 183 pp.
- Anderson, D. R., 1976. Guidelines for line transect sampling of biological populations. Utah Coop. Wildl. Res. Unit, Logan, Utah., 27 pp.
- Barker, C., Bean, N.J., Davidson, P.J., Drijvers, R. and Showler, D.A., 1996. Survey of eastern Tragopan, *Tragopan melanocephalus*. In the PalasValley, NWFP, December1995-March1996. Final report to Birdlife International and the Himalayan Jungle Project. Unpublished.
- Barker, C., Bean, N., Davidson, P., Drijvers, R. and Showler, D., 1999. Some recent records of birds around Islamabad, Pakistan. *Forktail*, 15: 96-97.
- Barua, M. and Sharma, P., 1999. Birds of Kaziranga National Park, India, *Forktail*, 15: 47 – 60.
- Buchanan, K., 1903. Nesting Notes from Kashmir, *J. Bombay Nat. Hist. Soc.*, 15: 131-3.
- Cock, C. and Marshall, C. H. T., (1873) Notes on Collection of eggs made at Murree. *Stray Feathers*, 1: 348 – 358
- Corfield, D. M., 1983. Birds of Islamabad and the Murree hills, Asian Study, Group Islamabad Post Box No. 1552, Pakistan. pp 1 - 44.
- Drijvers, R., Barker, C., Bean, N., Davidson, P. and Showler, D., 1999. Olive-backed Pipit *Anthus hodgsoni*: a new species for Pakistan. *Forktail*, 15: 98 pp.
- Heinzel, H., Fitter, R., and Parslow, J., 1977. *Birds of Britain and Europe*. William Collins Sons & Co. Ltd., London. 320 pp.
- Kalsi, R. S., 1998. Birds of Kalesar Wildlife Sanctuary, Haryana, India. *Forktail*, 13: 29 – 32.
- King, B. F., Dickinson, E. D., Woodcock, M. W., 1986. Birds of South East Asia, *Collins*, Grafton Street, London. 480 pp.
- Magrath H. A. F., 1908a. Notes on the birds of Thandiani. *J. Bombay Nat. Hist. Soc.*, 18 (2): 284-299.
- Magrath H. A. F., 1908b. Notes on the birds found at Bannu, NWFP, *J. Bombay Nat. Hist. Soc.*, 18 (3): 684-685.
- Magrath H. A. F., 1909a. Bird notes from Murree and the Gallies, *J. Bombay Nat. Hist. Soc.*, 19 (1): 142 – 156.
- Magrath H. A. F., 1909b. Bird notes from Dunga Gali, *J. Bombay Nat. Hist. Soc.*, 19: 753– 755.
- Nagorsen, D. W., and Peterson, R. L., 1980. *Mammal Collectors' Manual*. Life Sciences Miscellaneous Publications Royal Ontario Museum. 79 pp.
- Raja, N. A., Davidson, P., Bean, N., Drijvers, R., Showler, D. A. and Barker, C., 1999. The birds of Palas, North-west Frontier Province, Pakistan. *Forktail*, 15: 77-85.
- Ratray R.H., 1905. Birds nesting in the Murree Hills and Gullies: *J. Bombay Nat. Hist. Soc.*, 16 (3): 421-8.
- Ratray, R. H., 1906. Birds nesting in the Murree Hills and Gallies. *J. Bombay Nat. Hist. Soc.*, 16 part-1: 421 –428, part-2: 657-663.
- Roberts, T.J., 1991. *The birds of Pakistan*, Vol.1 Karachi: Oxford University Press. 598 pp.
- Roberts, T.J., 1992. *The birds of Pakistan*, Vol.2 Karachi: Oxford University Press. 617 pp.
- Shafique, C. M., Hassan, A. and Arain, Q. N., 2002. Wildlife of Chiltan Hazarganji National Park, Balochistan. *Rec. Zool. Surv. Pakistan*, 14: 55 -79.
- Thomas, T., 1998. Birds of Ayubia National Park, NWFP, Pakistan. *Pakistan J. Ornith.*, 2 (1 – 2): 45 – 61.
- Whistler, H., 1930a. The Kashmir Paddy-field Warbler *Acrocephalus consinens hokrae*, *Bull. Brit. Ornith. Club*, 50: 71.
- Woodcock, M., 1980. Collins Handguide to the Birds of the Indian Sub-Continent. William Collins Sons and Co Ltd, London. 176 pp.