

AVIFAUNA OF KALATOP-KHAJJJAR WILDLIFE SANCTUARY AND ADJACENT AREAS, HIMACHAL PRADESH, INDIA¹

ANIL KUMAR², RAHUL PALIWAL AND UTTAM SAIKIA³

High Altitude Regional Centre
Zoological Survey of India
Solan-173211, Himachal Pradesh, India

Abstract. Kalatop-Khajjjar Wildlife Sanctuary composed of a range of habitats from moist temperate forests to alpine moist pastures is located in the western Himachal Pradesh. For the documentation of avifauna, field surveys were undertaken during May 2010 to June 2012. Historically, 93 species has been listed so far from the area, based on present study and previously published data. A total of 74 species of birds belonging to 11 orders and 32 families were recorded in the present study including some interesting/new records; a few species remained unidentified due to inadequate observations. The most dominant family, Muscicapidae, represents 15 species followed by family Accipitridae and Corvidae, representing seven and six species, respectively. Some species of woodpeckers, raptors, thrushes, laughingthrushes, tits, warblers and wagtails have been recorded for the first time in the area.

Key words: India, Kalatop-Khajjjar Wildlife Sanctuary, avifauna, new distributional records

LA AVIFAUNA DEL SANTUARIO DE VIDA SILVESTRE DE KALATOP-KHAJJJAR Y ÁREAS ADYACENTES, HIMACHAL PRADESH, INDIA

Resumen. El Santuario de Vida Silvestre de Kalatop-Khajjjar está compuesto de diversos hábitats desde bosques templados húmedos a praderas alpinas húmedas y ubicado en el occidente de Himachal Pradesh. Para la documentación de la avifauna llevamos a cabo conteos de campo desde mayo de 2010 a junio de 2012. Se han registrado 93 especies en el área, en base a este estudio y datos publicados con anterioridad. En el presente estudio se registraron 74 especies de 11 órdenes y 32 familias, incluyendo varios registros interesantes; algunas especies quedaron sin identificar debido a observaciones insuficientes. La familia más dominante, Muscicapidae, representa 15 especies, seguida por Accipitridae y Corvidae, con siete y seis especies, respectivamente. Algunas especies de carpinteros, rapaces, zorzales, carboneritos y lavanderas han sido registradas por primera vez en el área.

Palabras clave: India, Santuario de Vida Silvestre de Kalatop-Khajjjar, avifauna, nuevos registros de distribución

INTRODUCTION

Kalatop-Khajjjar Wildlife Sanctuary (hereafter KKS) is located in the western Himachal Pradesh (32°02' to 32°04' N; 76°01' to 76°06' E).

When the study reported herein was undertaken, the sanctuary area was 69 km², which has now been reduced to 17.17 km² subsequent to rationalization by the State Government

¹Received 23 July 2014; accepted 12 December 2014

²Corresponding author: Anil Kumar: anilsona@gmail.com

³Present address: ZSL, Shillong- 793003, Meghalaya, India

(Notification No. FFE-B-F(6)11/2005-II/Kalatop-Khajjiar dated 7th June 2013). The study area mainly was composed of moist temperate mixed coniferous forest and sub-alpine/alpine moist pasture. The sanctuary is located in the catchment area of Ravi River, and is drained by a number of perennial tributaries of Ravi (Islam and Rahmani 2004). The Kalatop and surrounding area contains thick patches of Cedar *Cedrus deodara* followed by Ban Oak *Quercus incana* and Blue Pine *Pinus wallichiana*. Khajjiar is a small meadow surrounded by cedar. Some areas of the sanctuary are steep to very steep in terrain, with rocky cliffs. The area supports a fairly good number of faunal elements such as birds namely Kaleej Pheasant *Lophura leucomelanos*, Koklass Pheasant *Pucrasia macrolopha*, Cheer Pheasant *Catreus wallichii* and Himalayan Monal *Lophophorus impejanus* (Thakur et al. 2002), and mammals namely Goral *Nemorhaedus goral*, Serow *Nemorhaedus sumatraensis*, Asiatic Black Bear *Ursus thibetanus* and Indian Muntjac *Muntiacus muntjak* (Singh and Banyal 2012).

METHODS

Four field surveys were undertaken: 19 - 26 May and 14 - 20 September 2010; and 3 - 4 March and 12-16 June 2012. The first survey was conducted by just one of the authors (US), the second by two authors (AK, US), and the third and fourth surveys by all three authors. Four major tracks – Lakarmandi-Kalatop, Lakarmandi-Dainkund, Lakarmandi-Khajjiar and Lakarmandi-Dalhousie – were either walked on foot or covered by vehicle at slow speed, stopping to conduct point surveys at 300 to 1000 m intervals. Survey localities such as Khajjiar Lake and adjacent areas, Kalatop area, Dainkund area and one unnamed locality between Lakarmandi and Dalhousie were surveyed extensively (Fig. 1). During the field work, observations on birds were made every day starting from early morning to late evening (06:00 -18:00 with few exceptions), with the help of binocular (10x50) and digital camera, in different habitats such as thick patches of cedar forests, pine forests and meadows (Fig. 2). The presence of some nocturnal species was confirmed with the help of vocalizations. For this, vocal signals were recorded using a Marantz Digital Audio Tape

Recorder PMD 670 and Audio-Technica unidirectional shotgun microphone. Avisoft SAS Lab Pro was used for the generation of spectrograms. For bio-acoustic analysis, spectrograms were calculated using the following setting of SAS Lab: 512 FFT-length, 100% Frame, Flat Top window and 75% time window overlap. In case of low frequency calls of Eurasian Eagle Owl *Bubo bubo*, the temporal resolution was increased to 87.5%.

Identification of species was carried out with the help of field guides: Kazmierczak and Ber van Perlo (2000) and Grimmett et al. (2011). In case of inadequate sightings, we tried to identify the taxa to genus or family level. We compared our records with a previously published study carried out by Thakur et al. (2002) and produced a comprehensive checklist of birds. The nomenclature and taxonomy of birds is based on the recent developments/updates in this field (Chesser et al. 2010, Gill and Donsker 2014). Currently, the taxonomy of raptors is being re-evaluated (Urquhart and Bowley 2002, Wink et al. 2002). The order Accipitriformes has been proposed to include diurnal raptors such as hawks, eagles, vultures and some others. However, recent studies revealed that falcons are not closely related to Accipitriformes, having affinities with parrots and passerines (Gill and Donsker 2014). Therefore, keeping this in view, in the present study we placed Falconidae (Order Falconiformes) after Picidae (parakeets). The abundance of the species is based on the number of sightings/individuals of each species observed during surveys. The number of individuals of a species <10 was treated as rare/uncommon, followed by 11 to 50 as common, and >50 as abundant. Notes on new distributional records are given in detail.

RESULTS AND DISCUSSION

A total 74 species of birds belonging to 11 orders and 32 families (Appendix 1) was recorded including some interesting new records; a few species seen could not be identified due to inadequate observations. The highest number of birds (46 spp.) was recorded in June 2012 compared to May 2010 (28 spp.). Probably the difference was at least partly due to increased survey efficacy as three observers took part in June 2012 survey compared to one in May 2010.

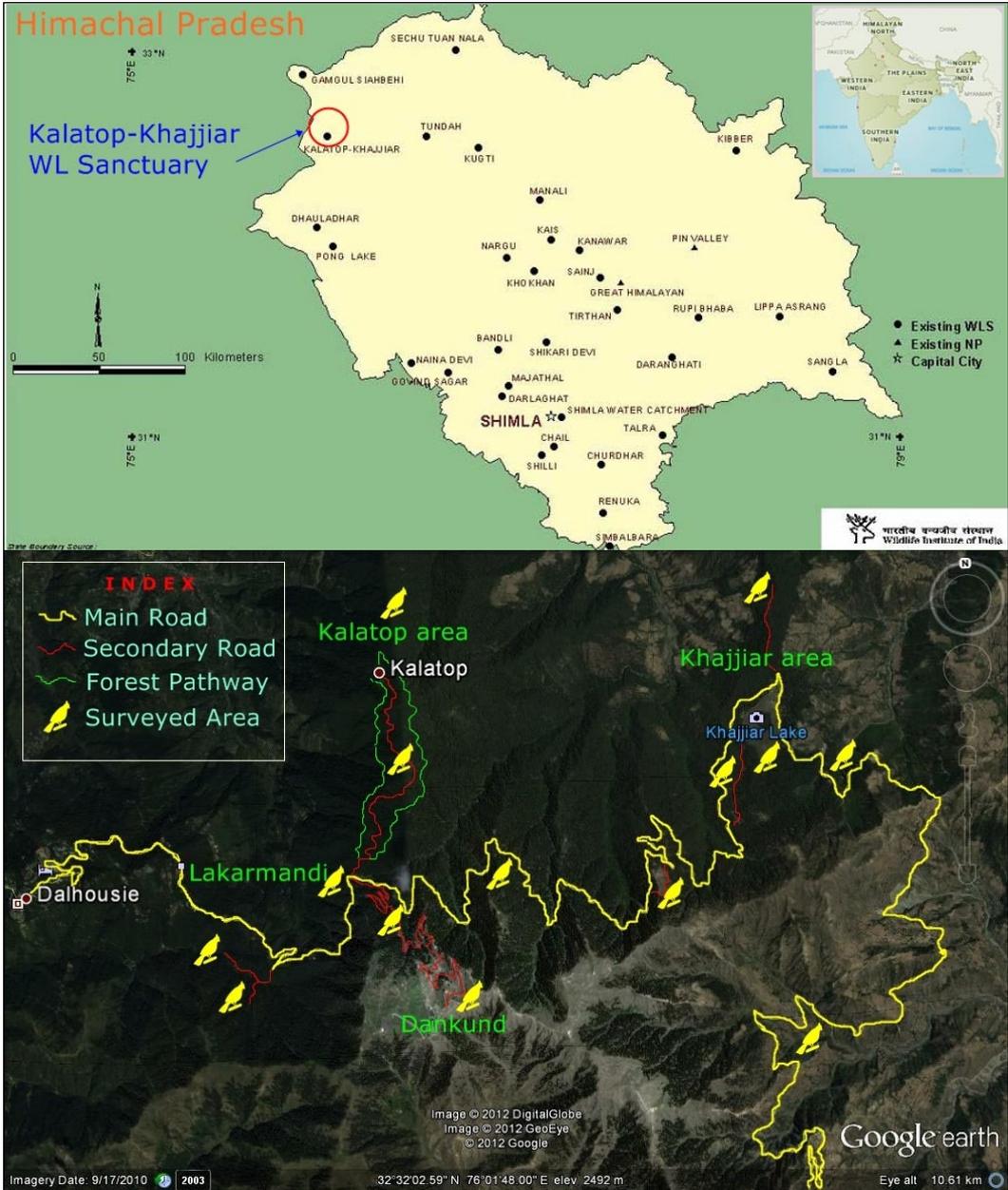


FIGURE 1. Top, the study area showing the location of Kalatop-Khajjiar Wildlife Sanctuary in India and, bottom, survey localities.

A total 93 species have been listed so far from the area, based on the present study and previously published data (Appendix 1). The most dominant family was Muscicapidae, representing 15 species, followed by Accipitridae and Corvidae, representing seven and six

species, respectively (Fig. 3). Some species of woodpeckers, raptors, thrushes, laughing-thrushes, tits, warblers and wagtails were recorded for the first time in the area.

Previously, Thakur et al. (2002) recorded three species of pheasants, while we recorded only

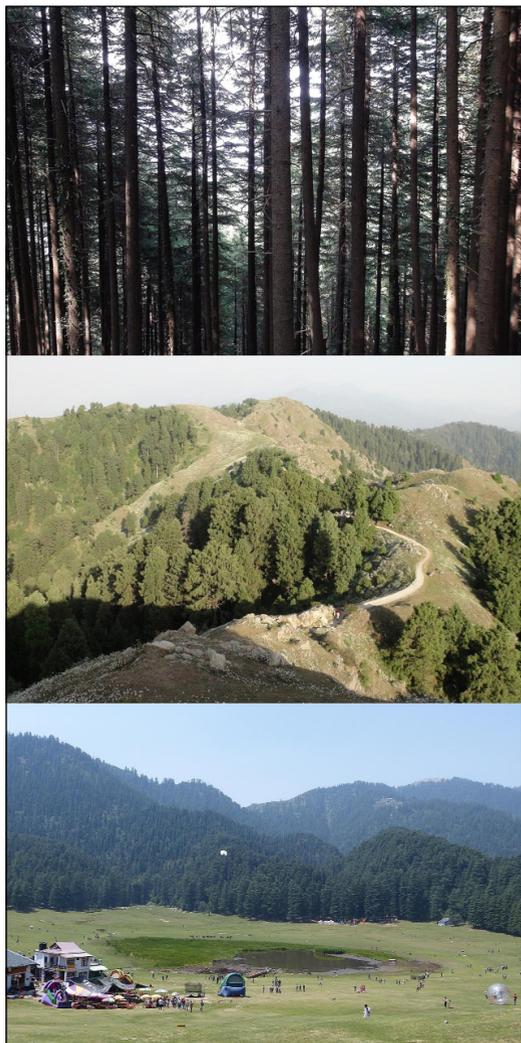


FIGURE 2. Different types of habitats in the study area: Top, thick forest of Cedar; middle, mixed alpine forest with meadows and, bottom, Khajjiar Lake.

two including a new record. Our observations revealed that Koklass Pheasant is a common resident. However, sightings were not frequent owing to the skulking behavior of the species, and its limited, fragmented population. Often, it exhibits its presence through species specific, loud advertisement calls. Three to four calls/min were produced. It was recorded on Kalatop-Lakarmandi-Dainkund trails.

Four species of woodpeckers were recorded. Occurrence of Eurasian Eagle Owl was confirmed with the help of calls. Collared Owl

was another rare owl species seen in the area. Among raptors, Himalayan Vulture was commonly seen, while Shikra and Black Eagle were rarely observed.

Five species of laughingthrushes, four species of tits, four species of flycatchers, three species of blackbirds, three species of redstarts and three species of *Phylloscopus* warblers proved to be striking features of the avifauna. We sighted Oriental Magpie Robin only once, ~15 km outside of the sanctuary area. Its identity could not be confirmed owing to the long distance at which it was seen. It could have been Blue-capped Redstart *Phoenicurus coeruleocephala*. Siberian Stonechat *Saxicola maurus* was recorded adjacent to the northern boundary of the sanctuary (Khajjiar area). It is a recently validated species and is supposed to have five to six sub-species. The Himalayan sub-species is *S. m. indicus*. Earlier, *S. maurus* was included in *S. torquatus*, known as Common Stonechat. Now, *S. torquatus* is assigned to African Stonechat, distributed across sub-Saharan Africa (Urquhart and Bowley 2002).

NEW AVIAN RECORDS

Twenty two avian species were sighted in the study area for the first time. The details of their occurrence are contained in Table 1.

COMPARISON WITH PREVIOUS WORK

A review of the literature revealed two studies that had been conducted on the avifauna of our study area. We recorded 47 out of the 66 species reported by Thakur et al. (2002). The species we missed were ones that frequented dense vegetation, were of low densities and most were shy or vagrant. We also came across a recently published study by Singh and Banyal (2013), which we found to have many errors. A few of these are as follows:

1. The title is misleading as the *Khajjiar Lake* in the centre of a meadow, is very small in area, even less than a small pond, and mostly crowded with tourists (Fig. 2). The area has not been found supporting any significant birdlife.

2. The area of KKS is stated as 20.69 km², which is not true. KKS since its establishment had an area of 69 km² which has recently been reduced to 17.17 km² after rationalization in June 2013.

3. Surprisingly, the methodology does not provide the details of the surveys undertaken

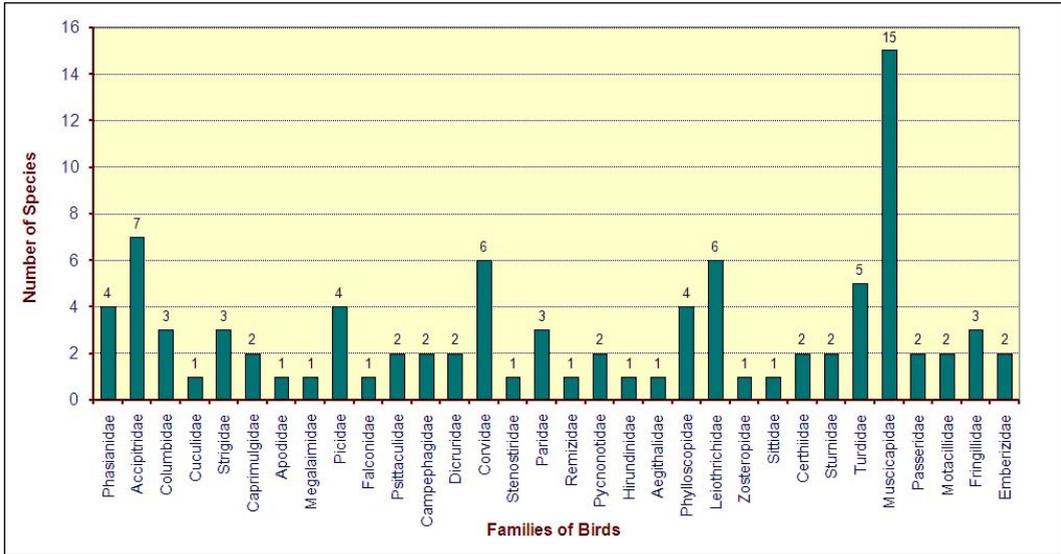


FIGURE 3. Number of species and families recorded in the study.

during the study, i.e. the year, period and frequency of survey.

4. The authors claimed to observe 77 species of birds at *Khajjiar Lake* (including 65 of 66 spp. reported by Thakur et al. (2002) from different habitats/areas of entire KKS), while we could record only 9 species at *Khajjiar Lake* and surrounding grassland/meadow. This difference is difficult to reconcile.

5. The authors claimed that family Muscicapidae represented by 22 species. Apparently not being familiar with recent advances in the taxonomy, species such as laughingthrushes (family Leiothrichidae), blackbirds (Turdidae) and *Phylloscopus* warblers (Phylloscopidae) were retained under Muscicapidae.

6. The authors observed 77 species at *Khajjiar Lake*, including many species (such as thrushes and laughingthrushes) that are skulking and very shy and always prefer bushes and dense vegetation. High mountain species such as Bearded Vulture would not visit an area like *Khajjiar Lake*.

CONCLUSION

Presented is the first consolidated account of the KKS avifauna, composed of a sizable number of species, including rare pheasants, raptors and passerines. Currently there are no major conservation threats, yet habitat degradation is

apparent in peripheral areas due to expanding agricultural activities, unorganized settlements and natural resource extraction. Increasing tourism is also imposing direct/indirect impact on the sustainability of the KKS avifauna. For example, *Khajjiar Lake* and adjacent area have been converted into a picnic spot and owing to overcrowding and human activities (Fig. 2), this area is becoming unsuitable for a number of shy passerines. All such activities should be regularized and controlled for a healthy sustainable avifauna of this area.

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TABLE 1. New avian records, along with remarks, compiled in the present study of Kalatop-Khajjiar Wildlife Sanctuary, 2010-2012.

| Species | Remarks |
|---|---|
| 1 Red Junglefowl <i>Gallus gallus</i> | Sighted on 20 May 2010, about one km west of Kalatop Guest House. It is a rare or most probably vagrant in the area, since it was not observed in subsequent surveys, and study site is quite far from its normal distributional range. |
| 2 Shikra <i>Accipiter badius</i> | It is rarely seen in the study area. On 17 Sept 2010, one individual was seen between Lakarmandi and Khajjiar. |
| 3 Eurasian Eagle Owl <i>Bubo bubo</i> | On the evening of 17 Sept 2010, we heard and recorded calls near Kalatop Guest House. Calls were simple, loud, stereotyped, resonating and monotonous, made up of three low frequency elements, produced at the rate of 1-2 calls/min. |
| 4 Collared Owlet <i>Glaucidium brodiei</i> | It is rarely seen in the sanctuary area. On 13 June 2012, one individual (Fig. 4) was observed about 4 km from Khajjiar on Khajjiar-Lakarmandi track. |
| 5 Indian Nightjar <i>Caprimulgus asiaticus</i> | On 31 March 2012, we heard only calls at dusk near Khajjiar. We tried to relocate the individual, but failed. It seems that it is vagrant in the area. |
| 6 Brown-fronted Woodpecker <i>Dendrocopos auriceps</i> | On 1 April 2012, one individual was seen near Khajjiar. It is rare in the area, being observed only once in four surveys. |
| 7 Common Kestrel <i>Falco tinnunculus</i> | On 31 March 2012 one individual (Fig. 4) was seen just outside the northern boundary check post of the sanctuary. During the June 2012 survey, it was again spotted in the same area. |
| 8 Scarlet Minivet <i>Pericrocotus flammeus</i> | Often seen in the sanctuary area. On 1 April 2012, two individuals were seen about 2 km inside Cedar forest on Lakarmandi-Kalatop track. |
| 9 Ashy Drongo <i>Dicrurus leucophaeus</i> | It is often seen in the sanctuary area. We spotted it first time on 15 Sept 2010 near Kalatop Guest House. |
| 10 Grey-headed Canary Flycatcher <i>Culicicapa ceylonensis</i> | It is rarely seen in the sanctuary area. We saw it on 12 June 2012 near Khajjiar. |
| 11 Fire-capped Tit <i>Cephalopyrus flammiceps</i> | Rarely seen in the sanctuary area. On 2 April 2012, we sighted one individual on Khajjiar-Lakarmandi track. |
| 12 Grey-hooded Warbler <i>Phylloscopus xanthoschistos</i> | We sighted it for the first time on 17 Sept 2010, and recorded the song during June 2012. The song was composed of discrete melodious phrases. Rate of production was 5-6 calls/min. |
| 13 White-throated Laughingthrush <i>Garrulax albogularis</i> | It is a common species of the sanctuary, sighted many times (Fig. 4) and often heard in song (resembles laugh of human being), comprised of a variety of modulated frequencies, complex call notes/ elements and phrases. |
| 14 Striated Laughingthrush <i>Garrulax striatus</i> | Rarely seen in the sanctuary area. First time spotted on 22 May 2010 near Khajjiar. We recorded song during our third and fourth surveys, between Lakarmandi and Khajjiar. The song was composed of species-specific discrete melodious loud phrases. Six to seven phrases/min were produced. |
| 15 Chestnut-crowned Laughingthrush <i>Trochalopteron erythrocephalum</i> | We observed (Fig. 4) and recorded it in Dainkund area on 13 June 2012. It produced stereotyped, loud calls at a very fast rate (about 100 - 120 calls/min.). Behavioural correlates revealed that these were alarm calls. |
| 16 Eurasian Treecreeper <i>Certhia familiaris</i> | It is rarely seen in the sanctuary area. On 16 Sept 2010, one individual was seen near Kalatop. |
| 17 Scaly Thrush <i>Zoothera dauma</i> | It is rarely seen in the sanctuary area. On 17 Sept 2010, one individual was seen under dense canopy cover near Khajjiar. |

TABLE 1. Continued.

| Species | Remarks |
|--|---|
| 18 Tibetan Blackbird <i>Turdus maximus</i> | It is rarely seen in the sanctuary area. We spotted it between Lakarmandi and Khajjar at different locations. |
| 19 Blue-fronted Redstart <i>Phoenicurus frontalis</i> | On 20 May 2010, one individual was seen near Kalatop. |
| 20 White Wagtail <i>Motacilla alba</i> | It is often seen in the sanctuary area. We sighted it on 17 Sept 2010 near Khajjar. |
| 21 Grey Wagtail <i>Motacilla cinerea</i> | It is often seen in the sanctuary area. It was sighted first time on 22 May 2010 near Khajjar (Fig. 4). |
| 22 Spectacled Finch <i>Callacanthus burtoni</i> | Rarely seen in the sanctuary area. During April 2012, we sighted it at two distinct localities i.e. on 1 April 2012, about 3 km from Lakarmandi (Fig. 4) towards Kalatop, and on 2 April 2012 between Lakarmandi and Khajjar. |



FIGURE 4. Photographs of some new avian records. Left column, top to bottom: Collared Owlet *Glaucidium brodiei*, Common Kestrel *Falco tinnunculus*, White-throated Laughingthrush *Garrulax albogularis*; right column, Chestnut-crowned Laughingthrush *Trochalopteron erythrocephalum*, Spectacled Finch *Callacanthus burtoni* and Grey Wagtail *Motacilla cinerea*.

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APPENDIX 1. Systematic list of birds observed and identified in Kalatop-Khajjiar Wildlife Sanctuary and adjacent areas.

| Species | Previous records (Thakur et al. 2002) | Field Surveys | | | | Abundance/ Remark |
|--|--|---------------|-----------|------------|-----------|----------------------|
| | | May 2010 | Sep. 2010 | March 2012 | June 2012 | |
| Order: Galliformes Family: Phasianidae | | | | | | |
| 1 Koklass Pheasant <i>Pucrasia macrolopha</i> | * | * | * | - | * | 2 |
| 2 Himalayan Monal <i>Lophophorus impejanus</i> | * | - | - | - | - | |
| 3 Red Junglefowl <i>Gallus gallus</i> | - | * | - | - | - | 1/ NR |
| 4 Kalij Pheasant <i>Lophura leucomelanos</i> | * | | | | | |
| Order: Accipitriformes Family: Accipitridae | | | | | | |
| 5 Black Kite <i>Milvus migrans</i> | - | - | * | - | - | 1 |
| 6 Bearded Vulture <i>Gypaetus barbatus</i> | * | - | - | - | - | |
| 7 Egyptian Vulture <i>Neophron percnopterus</i> | * | - | - | - | - | |
| 8 Himalayan Vulture <i>Gyps himalayensis</i> | * | * | * | * | * | 3 |
| 9 Cinereous Vulture <i>Aegypius monachus</i> | * | - | - | - | - | |
| 10 Shikra <i>Accipiter badius</i> | - | - | * | - | - | 1/ NR |
| 11 Black Eagle <i>Ictinaetus malayensis</i> | * | - | * | - | - | 1 |

APPENDIX 1. Continued.

| Species | Previous records (Thakur et al. 2002) | Field Surveys | | | | Abundance/ Remark |
|--|--|---------------|-----------|------------|-----------|----------------------|
| | | May 2010 | Sep. 2010 | March 2012 | June 2012 | |
| Order: Columbiformes Family: Columbidae | | | | | | |
| 12 Rock Dove <i>Columba livia</i> | - | * | * | - | - | 2 |
| 13 Oriental Turtle Dove <i>Streptopelia orientalis</i> | * | * | * | * | * | 3 |
| 14 Wedge-tailed Green Pigeon <i>Treron sphenurus</i> | * | - | - | - | - | |
| Order: Cuculiformes Family: Cuculidae | | | | | | |
| 15 Common Cuckoo <i>Cuculus canorus</i> | * | - | - | - | * | 2 |
| Order: Strigiformes Family: Strigidae | | | | | | |
| 16 Eurasian Eagle Owl <i>Bubo bubo</i> | - | - | * Calls | - | - | 1/ NR |
| 17 Asian Barred Owllet <i>Glaucidium cuculoides</i> | * | - | - | * | - | 2 |
| 18 Collared Owllet <i>Glaucidium brodiei</i> | - | - | - | - | * | 1/ NR |
| Order: Caprimulgiformes Family: Caprimulgidae | | | | | | |
| 19 Large-tailed Nightjar <i>Caprimulgus macrurus</i> | * | - | - | - | - | |
| 20 Indian Nightjar <i>Caprimulgus asiaticus</i> | - | - | - | *Calls | - | 1/ NR |
| Order: Apodiformes Family: Apodidae | | | | | | |
| 21 Little Swift <i>Apus affinis</i> | * | - | - | * | - | 1/ ? |
| Order: Piciformes Family: Megalaimidae | | | | | | |
| 22 Great Barbet <i>Megalaima virens</i> | * | * | * | * | * | 3 |
| Family: Picidae | | | | | | |
| 23 Himalayan Woodpecker <i>Dendrocopos himalayensis</i> | * | * | * | - | * | 3 |
| 24 Grey-headed Woodpecker <i>Picus canus</i> | * | - | * | * | * | 3 |
| 25 Brown-fronted Woodpecker <i>Dendrocopos auriceps</i> | - | - | - | * | - | 1/ NR |
| 26 Scaly-bellied Woodpecker <i>Picus squamatus</i> | * | - | - | * | - | 2 |
| Order: Falconiformes Family: Falconidae | | | | | | |
| 27 Common Kestrel <i>Falco tinnunculus</i> | - | - | - | * | * | 1/ NR |

APPENDIX 1. Continued.

| Species | Previous records (Thakur et al. 2002) | Field Surveys | | | | Abundance/ Remark |
|---|--|---------------|--------------|---------------|--------------|----------------------|
| | | May 2010 | Sep. 2010 | March 2012 | June 2012 | |
| Order: Psittaciformes | | | | | | |
| Family: Psittaculidae | | | | | | |
| 28 Slaty-headed Parakeet <i>Psittacula himalayana</i> | * | - | - | * | * | 3 |
| 29 Plum-headed Parakeet <i>Psittacula cyanocephala</i> | * | * | - | * | - | 3 |
| Order: Passeriformes | | | | | | |
| Family: Campephagidae | | | | | | |
| 30 Scarlet Minivet <i>Pericrocotus flammeus</i> | - | - | - | * | * | 1/ NR |
| 31 Long-tailed Minivet <i>Pericrocotus ethologus</i> | * | * | * | - | - | 1 |
| Family: Dicruridae | | | | | | |
| 32 Black Drongo <i>Dicrurus macrocercus</i> | * | - | - | * | - | 2 |
| 33 Ashy Drongo <i>Dicrurus leucophaeus</i> | - | - | * | - | * | 1/ NR |
| Family: Corvidae | | | | | | |
| 34 Eurasian Jay <i>Garrulus glandarius</i> | * | * | * | - | * | 3 |
| 35 Black-headed Jay <i>Garrulus lanceolatus</i> | * | - | - | * | * | 3 |
| 36 Yellow-billed Blue Magpie <i>Urocissa flavirostris</i> | * | * | * | * | * | 3 |
| 37 Red-billed Blue Magpie <i>Urocissa erythrorhyncha</i> | * | - | - | - | - | |
| 38 Grey Treepie <i>Dendrocitta formosae</i> | * | * | - | - | * | 2 |
| 39 Large-billed Crow <i>Corvus macrorhynchos</i> | * | * | * | * | * | 3 |
| Family: Stenostiridae | | | | | | |
| 40 Grey-headed Canary Flycatcher <i>Culicicapa ceylonensis</i> | - | - | - | - | * | 1/ NR |
| Family: Paridae | | | | | | |
| 41 Black-crested Tit <i>Parus melanolophus</i> | * | * | * | * | * | 3 |
| 42 Great Tit <i>Parus major</i> | * | - | - | - | * | 1 |
| 43 Green-backed Tit <i>Parus monticolus</i> | * | * | - | - | * | 2 |
| Family: Remizidae | | | | | | |
| 44 Fire-capped Tit <i>Cephalopyrus flammiceps</i> | - | - | - | * | - | 1/ NR |
| Family: Pycnonotidae | | | | | | |
| 45 Himalayan Bulbul <i>Pycnonotus leucogenys</i> | * | - | * | * | * | 3 |

APPENDIX 1. Continued.

| Species | Previous records (Thakur et al. 2002) | Field Surveys | | | | Abundance/ Remark |
|---|--|---------------|-----------|------------|-----------|----------------------|
| | | May 2010 | Sep. 2010 | March 2012 | June 2012 | |
| 46 Black Bulbul <i>Hypsipetes leucocephalus</i> | * | * | * | - | * | 3 |
| Family: Hirundinidae | | | | | | |
| 47 Red-rumped Swallow <i>Cecropis daurica</i> | * | - | - | - | * | 1/ ? |
| Family: Aegithalidae | | | | | | |
| 48 Black-throated Bushtit <i>Aegithalos concinnus</i> | * | - | - | * | * | 3 |
| Family: Phylloscopidae | | | | | | |
| 49 Common Chiffchaff <i>Phylloscopus collybita</i> | * | - | - | - | * | 1 |
| 50 Greenish Warbler <i>Phylloscopus trochiloides</i> | * | - | * | - | - | 1 |
| 51 Green-crowned Warbler <i>Seicercus burkii</i> | * | - | - | - | - | |
| 52 Grey-hooded Warbler <i>Phylloscopus xanthoschistos</i> | - | - | * | - | * | 2/ NR |
| Family: Leiothrichidae | | | | | | |
| 53 White-throated Laughingthrush <i>Garrulax albogularis</i> | - | * | * | - | * | 3/ NR |
| 54 Striated Laughingthrush <i>Garrulax striatus</i> | - | * | - | * | * | 2/ NR |
| 55 Streaked Laughingthrush <i>Trochalopteron lineatum</i> | * | - | * | - | * | 2 |
| 56 Variegated Laughingthrush <i>Trochalopteron variegatum</i> | * | - | - | - | * | 1 |
| 57 Chestnut-Crowned Laughingthrush <i>Trochalopteron erythrocephalum</i> | - | - | - | - | * | 1/ NR |
| 58 Rufous Sibia <i>Heterophasia capistrata</i> | * | - | - | * | * | 2 |
| Family: Zosteropidae | | | | | | |
| 59 Oriental White-eye <i>Zosterops palpebrosus</i> | - | - | * | - | - | 1 |
| Family: Sittidae | | | | | | |
| 60 White-cheeked Nuthatch <i>Sitta leucopsis</i> | * | - | * | - | * | 2 |
| Family: Certhiidae | | | | | | |
| 61 Eurasian Treecreeper <i>Certhia familiaris</i> | - | - | * | - | - | 1/ NR |
| 62 Bar-tailed Treecreeper <i>Certhia himalayana</i> | * | - | * | * | * | 3 |
| Family: Sturnidae | | | | | | |
| 63 Common Myna <i>Acridotheres tristis</i> | * | * | * | - | * | 3 |
| 64 Jungle Myna <i>Acridotheres fuscus</i> | * | - | - | - | - | |

APPENDIX 1. Continued.

| Species | Previous records (Thakur et al. 2002) | Field Surveys | | | | Abundance/ Remark |
|---|--|---------------|--------------|---------------|--------------|----------------------|
| | | May 2010 | Sep. 2010 | March 2012 | June 2012 | |
| Family: Turdidae | | | | | | |
| 65 Scaly Thrush <i>Zoothera dauma</i> | - | - | * | - | - | 1/ NR |
| 66 White-collared Blackbird <i>Turdus albocinctus</i> | * | - | - | - | - | |
| 67 Grey-winged Blackbird <i>Turdus boulboul</i> | * | * | - | - | * | 1 |
| 68 Tibetan Blackbird <i>Turdus maximus</i> | - | - | * | * | * | 1/ NR |
| 69 Mistle Thrush <i>Turdus viscivorus</i> | * | - | - | - | - | |
| Family: Muscicapidae | | | | | | |
| 70 Blue-headed Rock Thrush <i>Monticola cinclorhynchus</i> | * | - | - | - | - | |
| 71 Chestnut-bellied Rock Thrush <i>Monticola rufiventris</i> | * | - | * | - | - | 1 |
| 72 Blue Whistling Thrush <i>Myophonus caeruleus</i> | * | - | * | * | * | 3 |
| 73 Dark-sided Flycatcher <i>Muscicapa sibirica</i> | * | - | - | * | - | 1 |
| 74 Little Pied Flycatcher <i>Ficedula westermanni</i> | * | - | - | - | - | |
| 75 Ultramarine Flycatcher <i>Ficedula superciljaris</i> | * | * | * | * | * | 3 |
| 76 Verditer Flycatcher <i>Eumyias thalassinus</i> | * | * | - | - | * | 3 |
| 77 Oriental Magpie Robin <i>Copsychus saularis</i> | - | - | - | - | * | 1/ ? |
| 78 Rufous-bellied Niltava <i>Niltava sundara</i> | * | * | * | * | * | 3 |
| 79 White-capped Redstart <i>Chaimarrornis leucocephalus</i> | * | - | - | - | - | |
| 80 Plumbeous Water Redstart <i>Rhyacornis fuliginosa</i> | * | - | - | - | - | |
| 81 Blue-fronted Redstart <i>Phoenicurus frontalis</i> | - | * | - | - | - | 1/ NR |
| 82 Spotted Forktail <i>Enicurus maculatus</i> | * | - | - | * | - | 1 |
| 83 Siberian Stonechat <i>Saxicola maurus</i> | - | - | * | - | - | 1 |
| 84 Grey Bushchat <i>Saxicola ferreus</i> | * | * | * | - | * | 3 |
| Family: Passeridae | | | | | | |
| 85 House Sparrow <i>Passer domesticus</i> | * | * | - | - | - | 1 |
| 86 Russet Sparrow <i>Passer rutilans</i> | * | * | - | * | * | 3 |

APPENDIX 1. Continued.

| Species | Previous records (Thakur et al. 2002) | Field Surveys | | | | Abundance/ Remark |
|---|--|---------------|-----------|------------|-----------|----------------------|
| | | May 2010 | Sep. 2010 | March 2012 | June 2012 | |
| Family: Motacillidae | | | | | | |
| 87 White Wagtail <i>Motacilla alba</i> | - | - | * | - | - | 1/ NR |
| 88 Grey Wagtail <i>Motacilla cinerea</i> | - | * | * | * | - | 1/ NR |
| Family: Fringillidae | | | | | | |
| 89 Yellow-breasted Greenfinch <i>Carduelis spinoides</i> | * | - | - | - | - | |
| 90 Black-and-yellow Grosbeak <i>Mycerobas icteroides</i> | * | - | * | * | * | 2 |
| 91 Spectacled Finch <i>Callacanthis burtoni</i> | - | - | - | * | - | 1/ NR |
| Family: Emberizidae | | | | | | |
| 92 Crested Bunting <i>Melophus lathamii</i> | * | - | - | - | - | |
| 93 Rock Bunting <i>Emberiza cia</i> | * | - | - | - | - | |
| Total Species | 66 | 28 | 39 | 34 | 46 | |

* = present; - = absent; ? = doubtful record; 1= rare/uncommon; 2 = common, and 3 = abundant