

# Assessment of raptor migration and status along the Tsangpo-Brahmaputra corridor (India) by a local communities participatory survey

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**Abstract** – A raptor survey based on local knowledge was undertaken in 45 villages along Siang River valley, a part of Tsangpo-Brahmaputra corridor in Arunachal Pradesh, India during summer and autumn in 1999 and a comprehensive list of raptors of the area was prepared. The list was prepared involving the local people through systematic questionnaire using participatory processes. Elders and knowledgeable persons of the villages were involved in the process to get the best baseline information on raptors of the study area. The questionnaire was designed to address the status of raptors, their habitat use patterns, and migratory habits. The results were then compared with recent studies made by different experts from the region. Most survey records and previously documented data were found to be similar to each other, suggesting reliability of local knowledge. The study is a model for similar local-population-based research either for gap analysis, rapid environmental assessment or in areas where there is limitation for exclusive study and need for immediate effective conservation measures. We suggest to undertake a systematic survey and monitoring to confirm the presence of those species which were uncertain in the local knowledge. This research shows the importance of local participation, community involvement, and traditional knowledge in raptor conservation.

**Riassunto** – *Migrazione e status dei rapaci lungo il corridoio Tsangpo-Brahmaputra (India): una esperienza di censimento indiretto mediante interviste alle popolazioni locali.* In questo studio vengono descritti i risultati di un censimento dei rapaci condotto mediante interviste agli abitanti di 45 villaggi lungo la valle del fiume Siang (corridoio Tsangpo-Brahmaputra, Arunachal Pradesh, India) realizzata durante l'estate e l'autunno del 1999. Le informazioni, raccolte mediante un questionario in cui erano richieste informazioni riguardo allo status, uso dell'habitat e abitudini migratorie dei rapaci, sono state ottenute mediante un processo partecipativo, in cui sono stati coinvolti anche gli anziani ed esperti locali, in modo da ottenere le migliori informazioni di base relativamente ai rapaci dell'area. I risultati sono stati poi confrontati con informazioni recenti desunte dalla bibliografia o raccolte da esperti di rapaci della regione. Gran parte delle informazioni raccolte mediante interviste coincideva con quelle riportate in bibliografia e da esperti dell'area, suggerendo una certa attendibilità delle conoscenze delle popolazioni locali. Questo studio può essere considerato un modello per futuri studi basati su conoscenze locali, che possono risultare utili per *gap analysis*, valutazioni di impatto ambientale speditive, oppure in aree dove studi diretti sono difficili da condurre, pur essendo necessario introdurre rapide ed efficaci misure di conservazione. Sugeriamo comunque di effettuare studi mirati per confermare la presenza delle specie per cui sono emerse incertezze nelle conoscenze locali. In ogni caso, questo studio dimostra la potenziale importanza delle conoscenze tradizionali e dei processi partecipativi nella conservazione dei rapaci.

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Diurnal raptors show remarkable migratory patterns in India (Ripley 1982, Ali and Ripley 1987, Zalles and Bildstein 2000). Of 63 species of raptors recorded in India, 59 are believed to migrate in at least part of their range (Ripley 1982, Ali and Ripley 1987, Zalles and Bildstein 2000). Raptor migration between the Palearctic and the Indian Sub-continent occurs main-

ly along two corridors: the Indus River in Pakistan and the Tsangpo-Brahmaputra River in Tibet and Eastern India (Ali and Ripley 1987). Despite there are several accounts on raptor migration across the Himalayas between the Tibetan plateau and lowland plains (Thiollay 1979, Fleming 1983, Ali and Ripley 1987, Roder 1989, Bijlsma 1991, Inskipp and Inskipp 1991, Singh 1995, Grimmett *et al.* 1998, Barua and Sharma 1999, DeCandido *et al.* 2001, J. Hornbuckle *et al.*, unpublished data), there are only a few records

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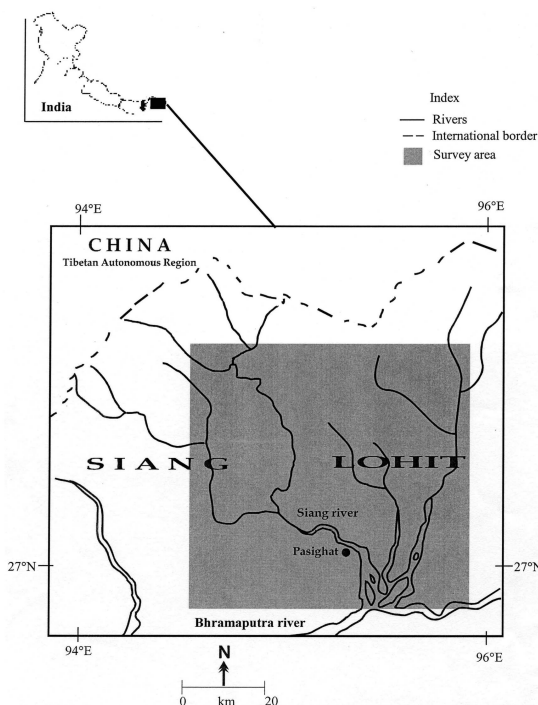
of their movements in the Tsangpo-Brahmaputra river valley (see Ripley 1982, Ali and Ripley 1987, Singh 1995, Grimmett *et al.* 1998, Barua and Sharma 1999, Zalles and Bildstein 2000).

Arunachal Pradesh and Assam in India, which are parts of Tsangpo-Brahmaputra River valley, are well explored by ornithologists (Gauntlett 1971, Chaudhury 1990, Samant *et al.* 1995, Singh 1995, Barua and Sharma 1999; P. Alström *et al.*, unpublished data, K. D. Bishop, unpublished data, R. Martins, unpublished data). About 89% of the total raptor species of India have been reported from these two North Eastern states (see Appendix). Eleven of 15 globally threatened raptor species of the Indian sub-continent (Collar *et al.* 1994, Birdlife International 2000) are reported from the region (Singh 1995, Barua and Sharma 1999). However, there is very little information available on the ecology and migratory patterns of declining bird of prey species from the corridor, mainly due to lack of human and financial resources.

In order to assess the importance of the Tsangpo-Brahmaputra River valley as a raptor migratory corridor, the Eastern Himalayan Program of Ashoka Trust for Research in Ecology and the Environment (ATREE) reviewed the raptor status using participatory processes along this corridor. Local communities participatory tools are becoming important instruments for low-cost applied conservation biology (Maharana *et al.* 2000; Rai *et al.* 2002; Chettri and Sharma 2006). The study adopted both a literature review and a local population participatory approach. The initiative got valuable inputs from the local inhabitants especially in assessing the distribution of raptors. It was envisaged that the continuation of this method of local communities participatory monitoring for these species is needed. It was felt that strengthening the capacity of local youths on systematic survey and monitoring techniques will provide a valuable opportunity for long-term raptor preservation.

## METHODS

The Siang River valley, a part of Tsangpo-Brahmaputra in Arunachal Pradesh was considered for the present study. The study was undertaken during summer and autumn in 1999. The area comprises mainly the Upper Siang River basin and the adjacent villages along the Brahmaputra valley (Fig. 1). Most of the study area has a sub-tropical climate, with a



**Figure 1.** Map showing the Siang river valley, a part of Tsangpo-Brahmaputra corridor in Arunachal Pradesh, India. – *Localizzazione della valle del fiume Siang, parte del corridoio Tsangpo-Brahmaputra, Arunachal Pradesh, India.*

few tropical areas along the valley. The main natural habitat categories are riverine belt followed by agricultural lands, degraded forest patches and some natural forests.

The human composition of this area is diverse, with about 10 ethnic groups. *Padam* is the predominant ethnic group but confined to only six villages out of the total 45 villages considered for the study. They are followed by *Minyong*, *Nepali*, *Milin* and other tribes distributed in uneven number among the villages. Agriculture is the main source of livelihood of people living in the study area.

Forty-five villages were identified along the Siang River valley in Arunachal Pradesh for the present study. Each of these villages was used as a sampling unit with a preset systematic questionnaire. All the raptor species passed through or seen within the village by the local inhabitants during different seasons were noted in the questionnaire. The estimation of density was beyond the scope of the study, thus the number of individuals was ignored (Thiollay 1989). Identification of raptors was possible with the help of raptor identification sections of various books such as Ripley (1982), Ali and Ripley (1987),

Grimmett *et al.* (1998) and Zalles and Bildstein (2000). The raptors that could be identified by the local inhabitants were then enlisted with reference to their habit, habitat or seasonal movement patterns.

Data on habitat types were collected from each of the 45 villages based on the surrounding vegetation types found within a 1-km radius of the surveyed village. All these habitat types were categorised as “riverine” when a majority of the areas surveyed were near the riverbed. Similarly, “agricultural field” was considered when the area surveyed was dominated by agricultural lands including paddy fields, “human settlement” for those which have bigger settlement areas; “dense forest” with >40% canopy coverage, “degraded forest” with <40% canopy coverage; and, “fallow land” if it was uncultivated farmland. The numbers of habitat types encountered amongst the 45 sampled areas were 15 for human settlements, 11 for paddy fields, 10 for riverine, and three each for dense forests, fallow land and degraded forests, respectively. Migratory patterns, habitat use and status of the recorded raptors were cross-checked with Ali and Ripley (1987), Singh (1995), Grimmett *et al.* (1998) and Barua and Sharma (1999).

Initially, a checklist of raptors was devised from an exhaustive literature review. This list was then cross-checked with the village elders and other knowledgeable persons. The questionnaire included information such as name of the frequent visiting and migratory raptor species, knowledge on their feeding habits, status and reasons for decline, and multiple reasoning were allowed and noted, if appropriate. The survey was supplemented by group discussion in which community members were supplemented with colour photographs of the enlisted raptors to ensure proper species identification. The cross-checked information was then compared with the recent studies on raptors from the region. All scientific names followed Inskipp *et al.* (1996) and Grimmett *et al.* (1998).

## RESULTS

A total of 22 species of raptors was enlisted from the participatory survey. 91% of species were reported from sub-tropical forests and only two species, Eurasian griffon *Gyps fulvus* and lesser spotted eagle *Aquila pomarina*, were reported from the tropical forest areas. During the participatory survey, six species, namely greater spotted eagle *Aquila clanga*,

imperial eagle *Aquila haliaca*, steppe eagle *Aquila nipalensis*, cinereous vulture *Aegypius monachus*, lesser-spotted eagle *Aquila pomarina* and red-necked falcon *Falco chicquera*, were reported as new to the Siang valley. These species were not new from the corridor, as they were reported by the earlier workers from other parts of Arunachal and Assam within the same migratory route. These reports were of interest to the conservationists as they were not reported earlier from these specific localities along the corridor. Most importantly, out of the 22 raptor species reported, two are known to be critically endangered (CE), five near threatened (NT) and four vulnerable (V) (Tab. 1).

### *Migratory habits*

The review of the literature revealed that 12 species are residents in the area, followed by eight winter visitors and one summer visitor (Tab. 1). According to the villagers, seven of these 22 recorded species were reported as residents (R) of the area, five as winter visitors (WV), four as migrants without specifying them as winter or summer migrants (M), and one as summer visitors (SV). The literature reports multiple statements by different authors from the region (see Appendix). When the participatory survey data and literature data were compared then about 60% were found to be similar. However, there were notable variations especially for species like cinereous vulture, red-headed vulture *Sacrogyaps calvus*, pied harrier *Circus melanoleucos*, and pied falconet *Microhierax melanoleucos* between the community and scientific reports (Tab. 1 and Appendix). The variations concerning other species were due to uncertainty and/or lack of adequate knowledge.

### *Distribution pattern*

From the literature survey, eight species were reported as common (C), seven as uncommon (U), four as occasional sightings (O), two as stray (S) and one as uncertain (?) (Tab. 1). By comparison, the local communities considered seven species as common (C) to the area followed by 12 uncommon (U) or rare, one occasional (O) and two as uncertain (?) (Tab. 1). Therefore, a comparison between the earlier reported checklists and the community reported

**Table 1.** Checklist of raptors from Siang Valley of Arunachal Pradesh along with their threat category and documented migratory behaviour (D), people’s report on migratory behaviour (P) and documented (D) and people’s report (P) on their status. – Checklist *dei rapaci della valle del fiume Siang (Arunchal Pradesh) con indicato il comportamento migratorio e lo status (D = documentato sulla base della bibliografia; P = secondo le conoscenze delle comunità locali).*

Species	Threat	Migratory pattern		Status	
		D	P	D	P
Jerdon’s baza <i>Aviceda jerdoni</i>	-	R	R	U	U
Pallas’ fish eagle <i>Haliaeetus leucoryphus</i>	V	R	R	C	C
White-tailed eagle <i>Haliaeetus albicilla</i>	NT	WV	?	O	U
Lesser fish eagle <i>Ichthyophaga humilis</i>	NT	R	?	?	U
Grey-headed fish eagle <i>Ichthyophaga ichhyaetus</i>	NT	R	R	C	C
White-rumped vulture <i>Gyps bengalensis</i>	CE	R	R	C	C
Long-billed vulture <i>Gyps indicus</i>	CE	R	R	C	C
Eurasian griffon <i>Gyps fulvus</i>	-	R	?	U	C
Cinereous vulture <i>Aegyptius monachus</i>	NT	WV	M	O	?
Red-headed vulture <i>Sacrogyaps calvus</i>	NT	R	SV	U	U
Crested serpent eagle <i>Spilornis cheela</i>	-	WV	M	C	?
Pied harrier <i>Circus melanoleucos</i>	-	WV	R	C	C
Lesser spotted eagle <i>Aquila pomarina</i>	-	R	WV	U	U
Greater spotted eagle <i>Aquila clanga</i>	V	WV	WV	C	C
Steppe eagle <i>Aquila nipalensis</i>	-	WV	?	U	U
Imperial eagle <i>Aquila haliaca</i>	V	WV	WV	S	U
Golden eagle <i>Aquila chrysaetos</i>	-	R	M	U	U
Pied falconet <i>Microhierax melanoleucos</i>	-	R	WV	O	O
Lesser kestrel <i>Falco naumanni</i>	V	M	?	O	U
Common kestrel <i>Falco tinnunculus</i>	-	R	R	C	U
Red-necked falcon <i>Falco chicquera</i>	-	WV	WV	U	U
Amur falcon <i>Falco amurensis</i>	-	SV	M	S	U

Acronyms: Threat category: CE - critically endangered, V- vulnerable, NT- near threatened  
Migratory pattern: R- resident, M- migratory, WV- winter visitor, SV- summer visitor  
Status: C- common, U- uncommon, O- occasional, S- stray (only few records) and ?- uncertain

species showed that 86% of the common species, 33% of the uncommon species, and 100% of the occasional sightings were similar between the two reported lists. However, there were few notable variations between the participatory survey and earlier scientific reports (Tab. 1). One of the species, the Eurasian griffon, was reported as common by the local communities in contrast to its reported status of uncommon by the earlier workers. The differences in rest of the species were again mainly due to uncertainty and/or lack of knowledge.

**Habitat-use pattern**

The participatory survey data revealed that the majority of the species were from riverine habitat,

followed by human settlements, agriculture land, and dense forests (Tab. 2). The people’s perception revealed that there were specific dominant species in particular habitat types (Tab. 2). Though the majority of species were reported from almost all the habitat types, there was strong support from the communities that there were some species which were mostly found in either in riverine areas or in the forested land. The communities also stated that there has been a sharp decline in frequency of visits to particular habitats by some of the species during the last three decades. Among the perceived causes of raptor declines, 35% of respondents mentioned that it could be due to habitat destruction, followed by over hunting (33%), climate change (9%), agriculture expansion and others (23%) (Tab. 3).

**Table 2.** Distribution patterns of the most common raptor species (i.e. those recorded at least thrice in two seasons) in different habitat types along the Siang Valley, Arunachal Pradesh. – *Distribuzione delle specie di rapaci più comuni (specie osservate almeno 3 volte in almeno 2 stagioni) in diverse tipologie ambientali nella valle del fiume Siang (Arunachal Pradesh).*

Habitat types (N villages)	N species	Most common species
Riverine (10)	20	Crested serpent eagle, long-billed eagle, white-rumped vulture, Pallas' fish eagle, lesser-spotted eagle
Human settlement (15)	18	Common kestrel, pied harrier, Pallas' fish eagle, grey-headed eagle, crested serpent eagle
Agriculture field (11)	14	Pallas' fish eagle, white-rumped eagle, long-billed eagle, pied harrier
Dense forest (3)	13	Jerdon's baza, imperial eagle
Fallow land (3)	13	Lesser kestrel, long-billed vulture, common kestrel, crested serpent eagle, golden eagle
Degraded forest (3)	11	Jerdon's baza, red-headed vulture, greater-spotted eagle, imperial eagle, common kestrel

## DISCUSSION

Though the objective of the study was to assess the status of raptors in the areas through participatory research based on local knowledge, both the literature review and people's reports revealed that the study area is rich in raptor species. Of the 22 raptor species known for the area, two were critically endangered (CE), five near threatened (NT) and four vulnerable (V). This reveals that the Siang Valley is an important area for raptor conservation supporting the designation of this area as an Important Bird Areas (IBA) of the continental Asia (Stattersfield *et al.* 1998). The research revealed that the majority of raptor species use riverine beds as their habitat followed by human-dominated areas. However, there was very little variation in the distribution of number of species and most of the species were common to many habitats, with few exceptions. This could be due to mosaic of habitat avail-

**Table 3.** People's responses on concerning the perceived factors of decline of raptors in the surveyed area (multiple responses were allowed in questionnaires, see Methods). – *Fattori percepiti di declino delle specie di rapaci nell'area di studio (i questionari compilati prevedevano risposte multiple, vedi Metodi).*

Factors	N of responses	%
Habitat destruction	20	35
Over hunting	19	33
Climate change	5	9
Did not respond	5	9
No idea	3	5
Agricultural expansion	2	4
Rise in population	2	4
Do not believe in decline	1	2

able to species being smaller than their home range (Bijlsma 1991, Thiollay 1998).

The comparative assessment of the distribution pattern revealed that people's knowledge was similar to the existing scientific records. The enlisted records and community statements for Pallas' fish eagle *Haliaeetus leucoryphus*, grey-headed fish eagle *Ichthyophaga ichthyaetus*, white-rumped vulture *Gyps bengalensis*, long-billed vulture *Gyps indicus*, pied harrier and many others showed similarity to the distribution pattern devised from Ali and Ripley (1987), Singh (1995), Barua and Sharma (1999) and J. Hornbuckle *et al.* (unpublished data). Interestingly, the pied harrier, which was reported as a winter migrant by earlier studies (Ali and Ripley 1987, Singh 1995, Grimmett *et al.* 1998), has been confirmed by the community as a resident species, supporting Narayan and Rosalind (1990). Similarly, red-headed vulture, steppe eagle, golden eagle *Aquila chrysaetos* and red-necked falcon *Falco chichquera* also were reported as uncommon, supporting the earlier reports of Ali and Ripley (1987), Singh (1995) and Barua and Sharma (1999). However, species like the white-tailed eagle *Haliaeetus albicilla*, imperial eagle, lesser kestrel *Falco naumanni* and Amur falcon *Falco amurensis* were found to have some differences from people's perception. The categories such as occasional and uncommon (white-tailed eagle, lesser kestrel) and stray and uncommon (imperial eagle, Amur falcon) still remained uncertain when compared with the participatory reports. The communities also were not certain about cinereous vulture and crested serpent eagle *Spilornis cheela*, which can be attributed to uncertainty of their range and migratory patterns, as reported by Thiollay (1989).

Moreover, the habits of resident species Jerdon's baza *Aviceda jerdoni*, Pallas' fish eagle, grey-headed fish eagle, white-rumped vulture, long-billed vulture and common kestrel *Falco tinnunculus*, and some migrants (imperial eagle, greater spotted eagle, cinereous vulture, Amur falcon and red-necked falcon) reported by the villagers were similar to the records made by the earlier scientific reports (see Ali and Ripley 1987, Singh 1995). On the contrary, there were some differences between the local people's opinion and earlier reports concerning migratory habits, especially those of the red-headed vulture, lesser spotted eagle, golden eagle and pied falconet. Discrepancies can be attributed to wide coverage of different habitat by these species as reported by Barua and Sharma (1999), or they could have been using mostly the lowland of Brahmaputra valley (Assam), visiting the Siang Valley only occasionally either during winter or summer. In the case of steppe eagles, the local people were uncertain about their migratory pattern. The observations of Fleming (1983) and Inskipp and Inskipp (1991) revealed that they are highly migratory, with movements recorded during the month of October, and have a wide range of migratory routes, which sometime pass through the Himalayas (Zalles and Bildstein 2000).

The report on habitat-use by species was interesting. The majority of the species were recorded from riverine habitats. Species such as long-billed vulture, white-rumped vulture, Pallas' fish eagle and lesser-spotted eagle were predominant in riverine and agriculture (paddy field) habitats. Similarly, Jerdon's baza, imperial eagle and golden eagle were reported to use fallow and degraded habitats. All these data were similar to the earlier records of Ali and Ripley (1987), Grimmett et al. (1998) and Barua and Sharma (1999).

To conclude, the study revealed that the Siang Valley and rest of the Tsangpo-Brahmaputra region is an important area for raptors. The area (Assam and Tsangpo valley of Arunachal Pradesh) harbours the highest diversity of birds of prey in India. Such diversity is attributed to the diverse and varied ecological conditions along the valley. However, very little data were available on the ecology and migratory behaviour of raptors from this ecologically rich corridor. The close association of local people with nature in their day-to-day life has given them an important knowledge, which obviously came through experience and practices. The present study, which is a comparative study of local knowledge and the scientific literature,

represents a updated review on the raptors of the region. We suggest that our approach could be used either for gap analysis or for rapid assessment when there is limitation for specific studies and the need for immediate effective conservation measures on these declining species. Moreover, this is an important baseline study that could be followed by raptor monitoring programmes in the valley by enhancing the capacity of knowledgeable local experts.

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**Appendix.** List of raptor species reported from Assam and Arunachal Pradesh along with their reported migratory pattern and status reported by respective documents from the region. – Check-list *delle specie di rapaci dell'Assam e dell'Arunchal Pradesh con indicato il comportamento migratorio e lo status, come documentato sulla base della bibliografia disponibile.*

OBC*	Species	Migratory pattern	Status	References
961	Osprey <i>Pandion haliaetus</i>	WV/M	C	Grimmett <i>et al.</i> 1998
962	Jerdon's baza <i>Aviceda jerdoni</i>	R	U	Samant <i>et al.</i> 1995
964	Black baza <i>Aviceda leuphotes</i>	M	-	Barua and Sharma 1999
965	Oriental honey buzzard <i>Pernis ptilorhynchus</i>	R	C	Singh 1995, Barua and Sharma 1999
968	Black-shouldered kite <i>Elanus caeruleus</i>	R	C	Barua and Sharma 1999
970	Black kite <i>Milvus migrans</i>	R/WV/M	U	Barua and Sharma 1999
971	Brahminy kite <i>Haliastur indus</i>	WV/R	C	Singh 1995, Barua and Sharma 1999
973	Pallas' fish eagle <i>Haliaeetus leucorhynchus</i>	R	C	Singh 1995, Barua and Sharma 1999
974	White-tailed eagle <i>Haliaeetus albicilla</i>	WV/M	U	P Alström <i>et al.</i> , unpublished data, Singh 1995, Barua and Sharma 1999
976	Lesser fish eagle <i>Ichthyophaga humilis</i>	R	U	Barua and Sharma 1999
977	Grey-headed fish eagle <i>Ichthyophaga ichthyaeus</i>	R	C	Barua and Sharma 1999
978	Lammergeier <i>Gypaetus barbatus</i>	R	U	Singh 1995
980	White-rumped vulture <i>Gyps bengalensis</i>	R	C	Singh 1995, Barua and Sharma 1999
981	Long-billed vulture <i>Gyps indicus</i>	R	C	Barua and Sharma 1999
982	Himalayan griffon <i>Gyps himalayensis</i>	R/M	U	Singh 1995, Barua and Sharma 1999
983	Eurasian griffon <i>Gyps fulvus</i>	R/M	C	Singh 1995, Grimmett <i>et al.</i> 1998, Barua and Sharma 1999
984	Cinereous vulture <i>Aegypius monachus</i>	WV/M	?	P Alström <i>et al.</i> , unpublished data, Barua and Sharma 1999
985	Red-headed vulture <i>Sacrogyaps calvus</i>	R	U	Singh 1995, Barua and Sharma 1999
986	Short-toed snake eagle <i>Circaetus gallicus</i>	WV	U	Singh 1995, Barua and Sharma 1999
987	Crested serpent eagle <i>Spilornis cheela</i>	WV/R	?	Barua and Sharma 1999
993	Eurasia marsh harrier <i>Circus aeruginosus</i>	WV/M	C	Barua and Sharma 1999
995	Hen harrier <i>Circus cyaneus</i>	WV/M	C	Barua and Sharma 1999
997	Pied harrier <i>Circus melanoleucos</i>	WV/M	C	Barua and Sharma 1999
998	Montagu's harrier <i>Circus pygargus</i>	?	?	KD Bishop, unpublished data
999	Crested goshawk <i>Accipiter trivirgatus</i>	R/?	O	Barua and Sharma 1999

Appendix. Continued – *Continua*

OBC*	Species	Migratory pattern	Status	References
1001	Shikra <i>Accipiter badius</i>	WV/R	U	Barua and Sharma 1999
1008	Japanese sparrow hawk <i>Accipiter gularis</i>	M	S	Barua and Sharma 1999
1009	Besra <i>Accipiter virgatus</i>	R	?	Grimmett <i>et al.</i> 1998
1013	Eurasian sparrow hawk <i>Accipiter niscus</i>	R/M	C	Barua and Sharma 1999
1014	Northern goshawk <i>Accipiter gentilis</i>	WV/M	O	Singh 1995, Grimmett <i>et al.</i> 1998, Barua and Sharma 1999
1016	White-eyed buzzard <i>Butastur teesa</i>	?	?	Samant <i>et al.</i> 1995, Barua and Sharma 1996
1019	Common buzzard <i>Buteo buteo</i>	WV/R	C	Barua and Sharma 1999
1020	Long-legged buzzard <i>Buteo rufinus</i>	?	?	Samant <i>et al.</i> 1995, Singh, 1995, Barua and Sharma 1997
1021	Upland buzzard <i>Buteo hemilasius</i>	?	?	Singh 1995
1024	Black eagle <i>Ictinaetus malayensis</i>	R	?	Singh 1995, Samant <i>et al.</i> 1995, Grimmett <i>et al.</i> 1998, Barua and Sharma 1999
1025	Lesser spotted eagle <i>Aquila pomarina</i>	R	U	Barua and Sharma 1999
1026	Greater spotted eagle <i>Aquila clanga</i>	WV/M	C	J Hornbuckle <i>et al.</i> , unpublished data, Barua and Sharma 1999
1028	Stepped eagle <i>Aquila nipalensis</i>	WV/M	U	Barua and Sharma 1999
1029	Imperial eagle <i>Aquila haliaea</i>	WV/M	S	R Martins, unpublished data, Barua and Sharma 1999
1031	Golden eagle <i>Aquila chrysaetos</i>	R	U	Singh, 1995, Grimmett <i>et al.</i> 1998
1032	Bonelli's eagle <i>Hieraetus fasciatus</i>	?	O	Barua and Sharma 1998
1033	Booted eagle <i>Hieraetus pennatus</i>	R	U	Barua and Sharma 1999
1035	Rufous-bellied eagle <i>Hieraetus kienerii</i>	R/M	S	Singh 1995, Grimmett <i>et al.</i> 1998, Barua and Sharma 1999
1036	Changeable hawk eagle <i>Spizaetus cirrhatus</i>	R	U	Singh 1995, Grimmett <i>et al.</i> 1998, Barua and Sharma 1999
1037	Mountain hawk eagle <i>Spizaetus nipalensis</i>	R/M	O	Singh 1995, Grimmett <i>et al.</i> 1998, Barua and Sharma 1999
1044	Collared falconet <i>Microhierax caerulescens</i>	R	?	Singh 1995
1048	Pied falconet <i>Microhierax melanoleucos</i>	R/M	O	Singh 1995, Grimmett <i>et al.</i> 1998, J Hornbuckle <i>et al.</i> unpublished data, Barua and Sharma 1999
1049	Lesser kestrel <i>Falco naumanni</i>	M/?	U	Chaudhary 1990, Singh 1995, Barua and Sharma 1999
1050	Common kestrel <i>Falco tinnunculus</i>	R/M	C	Singh 1995, Barua and Sharma 1999
1053	Red-necked falcon <i>Falco chicquera</i>	R/WV/M	U	P Alström <i>et al.</i> , unpublished data, Singh 1995, Barua and Sharma 1999
1055	Amur falcon <i>Falco amurensis</i>	SV/M	U	Singh 1995, Barua and Sharma 1999
1057	Merlin <i>Falco columbarius</i>	WV	?	Singh 1995, Grimmett <i>et al.</i> 1998
1058	Eurasian hobby <i>Falco subbuteo</i>	R	?	Singh 1995
1059	Oriental hobby <i>Falco severus</i>	R	?	Gauntlett 1971, Singh 1995, Grimmett <i>et al.</i> 1998, Barua and Sharma 1999
1061	Lagger falcon <i>Falco juggar</i>	?	?	Singh 1995
1064	Peregrine falcon <i>Falco peregrinus</i>	R/M	U	Singh 1995, Barua and Sharma 1999

\* OBC number from Inskipp *et al.* 1996

Acronyms: Migratory pattern: R- resident, M- migratory, WV- winter visitor, SV- summer visitor  
Status: C- common, U- uncommon, O- occasional, S- stray (only few records) and ?- uncertain