activity on feeding Sanderlings *Calidris alba* showed decreased foraging during day time and increased nocturnal foraging (Burger & Gochfeld 1991). However, the studies on American White Ibis *Eudocimus ruberruber*, a diurnal feeder, showed potentially inferior nocturnal visual capabilities (Rojas et. al. 1997). Painted Storks use both visual and tactile techniques for foraging (Kushlan 1978) and would be able to feed at night. There is a need to investigate nocturnal foraging in Indian waterbirds to assess the reasons and the benefits accrued by the birds under different foraging situations.

Fishermen indicated that they have seen pelicans feeding near the Rayadurg sea mouth and in the shallow water flats in the Pulicat Lake during full moon nights. Although no prior reports of nocturnal foraging have been reported in the Spot-billed Pelican, this is reported in the American White Pelican *Pelecanus erythrorhynchos* (McMohan & Evans 1992).

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Participation by Black Baza *Aviceda leuphotes* in mixed-species bird flocks in rainforests of the Anamalai hills, Western Ghats, India

Hari Sridhar

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Hari Sridhar, Wildlife Institute of India, P.O. Box #18, Chandrabani, Dehradun, Uttaranchal 248001, India. Email: *hari@ces.iisc.ernet.in*

Mixed-species bird flocks are found in tropical and temperate forest habitats. Birds are thought to participate in mixed-species flocks either to improve their foraging efficiency or to gain protection from predators (reviewed in Morse 1977; Terborgh 1990). Mixed-species flocks in South and South-east Asian tropical forests are usually dominated by members of bird families such as Dicruridae (drongos), Campephagidae (minivets), Sylviidae (warblers), Timaliidae (babblers), and Muscicapidae (flycatchers) (Laman 1992; Lee et. al. 2005; Sridhar 2005).

Here, we report participation by Black Baza *Aviceda leuphotes*, a raptor of the family Accipitridae, in mixed-species bird flocks in a rainforest fragment in the Anamalai hills, Western Ghats, India. So far, there have been no published reports of raptors participating in mixed-species flocks of insectivorous birds from any part of the world, although many raptor species including Black Baza are known to aggregate in large single-species and multi-species flocks during migration (DeCandido et al. 2004; Kerlinger 1989).

The Black Baza is a relatively small raptor found in evergreen forests of the Western Ghats, north-east India and in the Andaman group of islands within India. It is usually solitarily or found in small, possibly family, groups (Ali & Ripley 1983). Black Bazas feed mainly on lizards, frogs and insects and occasionally on bats and birds (Ali & Ripley 1983). To feed on insects they perch high in the canopy and make aerial sorties to catch prey on the wing or sally-glean them from the foliage (Ali & Ripley 1983).

Observations of Black Bazas participating in mixed-species bird flocks were made during a study, which looked at the effects of rainforest fragmentation on mixed-species bird flocks in the Valparai region adjoining the Indira Gandhi Wildlife Sanctuary (10°12'N–10°35'N 76°49'E–77°24'E). Plantations of tea, coffee and eucalyptus largely cover this region, interspersed among which are 35 rainforest fragments, ranging in area from less than one ha to over 100 ha (Mudappa & Raman in press). Black Baza was observed participating in flocks on two occasions, in a relatively less-disturbed private rainforest fragment called Pannimade (88 ha; 1,030 m above m.s.l.) in the Valparai region.

11.ii.2005 (Time: 10:10 hrs; Weather: clear, sunny): A mixed-species bird flock of 22 species and over 65 individuals was encountered at 09:40 hrs. The flock was dispersed over a fairly large area (50 m x 70 m), was very vocal but remained at the same location. At 10:10 hrs, an adult Black Baza flew and perched in the canopy of a tree (> 25 m) within the flock boundary and called two or three times. The call was like a squeal as described in Ali & Ripley (1983). Within a few seconds of the Black Baza appearing, two Greater Racket-tailed Drongos *Dicrurus paradiseus* flew and perched right next to the Black Baza and started alarm calling. This continued for less than a minute after which the drongos returned to their foraging. The Black Baza then started to make short flights in the canopy and changed its perch often. It finally succeeded in catching what looked a large orthopteran and proceeded to feed on it. Except for the initial alarm calls by the drongos, none of the birds interacted with or reacted to the presence of the Black Baza in the flock, over the next 20 minutes for which the flock was observed. During this time, the Black Baza was present with the flock and seemed to actively participate in it.

25.ii.2005 (Time: 09:50 hrs. Weather: clear, sunny): A mixed-species flock of 25 species and over 60 individuals was encountered at 9:50 hrs. A single Black Baza was already present within the flock boundary when the flock was encountered. The location of this flock was not very far (< 200 m) from where the earlier flock with Black Baza was located so it is likely that it was the same individual. On this occasion however, none of the other birds alarm called in response to the Black Baza's presence during the time when the flock was being observed. This flock was also more active than the earlier one and moved a distance of at least 100 m during observation. The Black Baza also moved along with the flock, staying in the canopy and making short flights within and between canopies of different trees. No successful prey captures by it were recorded on this occasion.

Discussion

This is probably the first report of a raptor participating in mixed-species bird flocks. This is all the more interesting because, one of the main hypotheses put forward to explain why birds participate in such flocks is for better protection from predators such as raptors. Usually when a raptor flies into or close to a flock, a lot of alarm calling followed by mobbing of the raptor by flock participants takes place. Birds such as drongos and babblers fly and perch right next to the raptor and continuously alarm call, probably letting the raptor know that it has been spotted. In the case of the Black Baza however, this kind of a response was seen only for a few seconds on one occasion by just one species. Therefore, it seemed like members of the flock didn't mind the presence of the Black Baza close to them. This could be because the Black Baza does not really pose a threat to flock participants, since its main prey items are probably lizards, frogs and insects. The Black Baza, by associating with the flocks, probably gained feeding advantages by preying on the insects that were flushed by the flock's activity. Raptors have been reported to associate with primates in South America to gain similar benefits (Fontaine 1980; Boinski & Scott 1988; Zhang & Wang 2000). For e.g., Double-toothed Kites *Harpagus bidentatus* on Barro Colorado Island, Panama follow white-faced capuchin monkeys *Cebus capucinus* and feed on insects flushed by the capuchin's activity (Fontaine 1980). The observations reported here lend support to the hypothesis that birds participate in mixed-species flocks to improve their foraging efficiency since Black Baza is unlikely to have any predators.

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Recent records of wintering White *Ciconia ciconia* and Black *C. nigra* storks and flocking behaviour of White-necked Storks *C. episcopus* in Maharashtra and Karnataka states, India

Satish Pande*, Niranjan Sant, Rohan Bhate, Aditya Ponkshe, Pranav Pandit, Amit Pawashe & Charu Joglekar

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Satish Pande, ELA Foundation, C-9 Bhosale Park, Sahakarnagar-2, Pune 411009, Maharashtra, India. Email: *pande.satish@gmail.com*
Niranjan R. Sant, 27, Adarsha Nagar, Vadgao, Belgaum 590005, Karnataka, India.
Rohan Bhate, Nature Study Club, C/o Dr Madhukar Bhate, Surgeon, Somvar Peth, Karad, Maharashtra, India.
Aditya Ponkshe, 18 Raghav, Raghuraj Hsg. Soc., Opp. Deepak Nitrate Factory, Sinhagad Road, Pune 411030, Maharashtra, India.
Pranav Pandit, A-15, Siddhivinayak, Prathamesh Nagari, Anandnagar, Pune 411051, Maharashtra, India.
Amit Pawashe, 436/C, SopanNagar, Pune District, Saswad 412301, Maharashtra, India.
Charu Joglekar, Statistician, KEM Hospital and Research Center, Diabetes Unit, Rasta Peth, Pune 411009, Maharashtra, India.

European White Storks *Ciconia ciconia* and Black Storks *Ciconia nigra* are regular winter migrants to India, and are widespread in the country, usually occurring in low densities in their winter habitat (Ali & Ripley 1968). There are few sites with regular annual observations of numbers of these species in their wintering grounds (Pande et al. 2003). Resident White-necked Storks *Ciconia episcopus* are usually seen as single birds or in pairs (Ali & Ripley 1968) similar to the habits of European White Storks, while Black Storks are seen mostly in flocks of varying sizes. Flocks of White-necked Storks in India are known to occur but there is little published information on this aspect (Santharam 1996; Sundar 2006). We carried out counts of these three species at some sites in Pune and Satara districts of Maharashtra, and Belgaum district of Karnataka in the winter of 2005–2006. Generally these storks occur in low densities on particular water bodies and hence their surveillance is important.

Satish Pande

Flock of White-necked Storks *Ciconia episcopus* with solitary European White Stork *C. ciconia*

Methods

All sites, except Dhebewadi, were visited twice every month from October 2005 to the end of May 2006. Dhebewadi was visited only on one occasion. In addition to these sites several other water bodies were also visited but storks were not seen there. The water bodies without the storks were both seasonal and perennial but were regularly frequented by people and were adjacent to villages, while water bodies where storks were seen were about 3 to 4 km from villages and were secluded. Additionally, Hidkal reservoir in Karnataka is a sensitive area due to the location of a dam, and entry is restricted. Our visits to the various sites were a part of an ongoing monitoring for waterbirds specifically to look for wintering storks in view of our past experience (Pande et al. 2003).

We used the non-parametric Kruskal-Wallis test to establish the difference in flock sizes of White-necked Storks observed by us from October to December versus those from January to March, in the study areas for Maharashtra and Karnataka, and for both combined.

Plumage characteristics were used to distinguish adult and juvenile Black Storks. Adult Black Storks are glossy-black with a white lower-belly and breast conspicuous in flight, coral-red beak and legs, and with red periorbital skin. Juvenile Black Storks have an overall brownish plumage with grey-green beak, legs and periorbital skin (Ali & Ripley 1968). Plumage characteristics are inadequate to