

A review of flocking behavior by Hook-billed Kite, *Chondrohierax uncinatus*, in South America

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ABSTRACT: The Hook-billed Kite (*Chondrohierax uncinatus*) is a diurnal raptor species that is widely distributed across the Neotropics, but some aspects of its social and ecological behavior are poorly understood. Here, we review and report records of flocking behavior of this species at various locations in South America, mainly in Brazil. We report eight new observations of such behavior, mainly in northern Brazil. It is possible that flocking behavior in this species is more common in northern South America than in the southern part of the continent, but it is perhaps overlooked or goes unreported by observers in these places.

KEY-WORDS: Accipitridae, Brazil, flocks, migration, raptor.

Hook-billed Kite *Chondrohierax uncinatus* is widely distributed in the Neotropics (Ferguson-Lees & Christie 2001). It is a mid-sized polymorphic diurnal raptor distributed from the southernmost USA (southern Texas) and western Mexico south through Central and South America to southern and eastern Brazil, and northern Argentina, as well as on Trinidad and on Grenada (Ferguson-Lees & Christie 2001). Cuban Kite *C. wilsonii*, which is endemic to the mountains of eastern Cuba, is sometimes considered conspecific with Hook-billed Kite but is now frequently regarded as a separate species, whereas *C. u. mirus*, which is endemic to Grenada, is generally considered to be a subspecies of Hook-billed Kite (del Hoyo & Collar 2014). Hook-billed Kite is usually considered solitary and sedentary, but there have been recent reports of flocking behavior and migratory movements, mainly in Central America and northern South America (Bildstein & Zalles 2001, Jones 2003, Porrás-Peñaranda & McCarty 2005, Eisermann & Avendaño 2006, Jones & Komar 2006, 2008, 2011), and the species is considered a partial migrant in part of its range in South America (Juhant 2011). In Venezuela, it has been reported to congregate in small to large flocks of 6–12 individuals between June and September (Paulson 1983, Hilty 1999), and in central Brazil, in Tocantins, and northeast Brazil, in Sergipe, migratory movements have been recorded between November and February

(Olmos *et al.* 2006, Rego *et al.* 2011). The species is reported to migrate in flocks in the Andes (Fjeldså & Krabbe 1990) and to be a partial migrant in Argentina as well (Contreras *et al.* 1990, di Giacomo 2005).

Flocking is a well-known behavior for some New World hawks, like Red-tailed Hawk *Buteo jamaicensis*, Swainson's Hawk *B. swainsoni* and Snail Kite *Rosthramus sociabilis* (Hilty & Brown 1986, Ferguson-Lees & Christie 2001). In many cases, flocking by raptors is related to their migrations, and this has been suggested in the case of *C. uncinatus* (Hilty 1999). Here we report additional observations of this intriguing behavior, registered mainly in northern Brazil. Our objective is to verify geographic and seasonal patterns of flocking migratory behavior of *C. uncinatus* in South America based on the literature and additional observations reported herein.

In Amazonas state, four birds were seen together at Itacoatiara (03°08'31"S; 58°26'33"W), in 1999 in the dry season (Mario Cohn-Haft, pers. comm.). In Belém, the capital of Pará state, a flock of *c.* 30 birds was observed in Parque do Utinga, near the Museu Paraense Emílio Goeldi (MPEG), in February or March 2002 (Bret Whitney, pers. comm.). In September 2003, four individuals (none of them dark morph) were observed circling together over the Reserva Biológica Sooretama (*c.* 19°03'S; 40°00'W), near the town of Linhares, Espírito Santo state by G.M.K.

On 29 May 2007, at *c.* 09:30 h, S.M.D. photographed a flock of about 35 individuals, flying over the research campus of the Museu Paraense Emílio Goeldi (MPEG), in Belém (01°27'21"S; 48°30'16"W) (Fig. 1). It was not possible to accurately count the number of individuals of each morph, as no binoculars were available, but at least ten were pale gray below, with three broad white bands and two narrower black bands in the tail. Some were darker below, with two white and two black bands on the tail, and there was at least one black-morph individual. The flock was observed soaring for about two minutes before disappearing from sight in a northeasterly direction.

A flock of 6–8 individuals was observed over the city of Ipanema, Minas Gerais (19°48'03"S; 41°42'47"W), in October 2009, flying over a mosaic of urban area, forest and grassland, at the edge of the city (Paulo Thieres, pers. comm.). On 05 May 2011, a flock of *c.* 25 individuals, also involving multiple morphs, was seen by CEBP in the municipality of Marabá (05°22'11.59"S; 49°11'54.32"W), Pará, at about 10:30 h. The flock was observed very briefly, crossing above the canopy of a small forest fragment. The very bright sky did not permit many differences in morphology among the birds to be appreciated, but at least two different plumage patterns were involved. The flock apparently moved off northeast. A flock of 11 birds was observed near Manaus, Amazonas (03°06'S; 60°01'W), on 18 September 2011 by E.P. (Fig. 1), and a similar (or the same?) flock was seen one week later, 20 km away. Finally, on 28 May 2016, a flock of eight birds was seen by S.M.D. in the municipality of Portel, also in Pará state.

Most records of flocking behavior are from northern South America. Hook-billed Kite is distributed over most of South America, and the available records at the internet site Wikiaves (<http://www.wikiaves.com.br/caracoleiro>) are as equally concentrated in southeast Brazil as in northernmost parts of the country. Given the larger number of birdwatchers in southern Brazil as

opposed to the north of the country, it might be expected that such behavior would be as frequently registered in southern Brazil if it was as common there as in northern South America. Family flocks of up to four individuals of *C. uncinatus* have been observed, but cannot be linked to migration (Bret Whitney, pers. comm.), so it is possible that the small flocks observed in Espírito Santo and Minas Gerais states (the two southernmost ones) pertained to families rather than migrants. If so, that would leave migration in this species apparently restricted to northernmost Brazil. Such differences in the behaviour of a diurnal raptor across the continent would not be unique to *Chondrohierax*, as in many well-known migratory raptors, only part of the population migrates (Ferguson-Lees & Christie 2001).

Records in Brazil and Venezuela were made mainly between September and February, and in May–June. This matches well with observations of flocks in the USA and Central America, which have mostly been made between September and November, and April and May (Bildstein & Zalles 2001, Jones 2003, Brush 2005, Porrás-Peñaranda & McCarty 2005, Eisermann & Avendaño 2006, Jones & Komar 2006, 2008, 2011). Most observations in cis-Andean South America were made along or near major rivers (the Orinoco, Amazonas, Tocantins, São Francisco, Rio Doce – Fig. 2), which may merely reflect the specie preference for humid areas with abundant snails. Based on the comparatively small number of observations, flocking behavior may be only occasional in eastern South America, but it is perhaps also frequently overlooked or unreported by observers unaware of its significance. In conclusion, the few available observations suggest that *C. uncinatus* flocks more frequently in northern South America than in the far southeast of its range, and mainly in the middle of the year or between September and February. Nevertheless, more information on this interesting behavior will be essential to determine if it is linked to migrations and if they really are seasonal movements.



Figure 1. Large flocks of Hook-billed Kites (soaring over Belém, Pará state (left) and Manaus, Amazonas state (right), both in Brazil.



Figure 2. Localities of Hook-billed Kite (*Chondrohierax uncinatus*) flocks in South America. Numbers indicate bibliographic references: 1 - Paulson (1983); 2 - Hilty & Brown (1999); 3 - Olmos *et al.* (2006); 4 - Rego *et al.* (2011); 5 - this study. Rivers depicted in gray.

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