First records of Chinese Sparrowhawk *Accipiter soloensis* wintering in Papua (Indonesian New Guinea)

FRANCESCO GERMI, AGUS SALIM & ANDREA MINGANTI

Chinese Sparrowhawks *Accipiter soloensis* were found for the first time wintering in mainland Papua (Indonesian New Guinea) during a field survey carried out between December 2010 and March 2011. A combination of 39 road, boat and foot transects were completed in the provinces of Papua and West Papua, covering a total of 2,303 km, of which 1,948 km were on roads or footpaths and 355 km on rivers. Transects were supplemented by frequent spot counts and stops to broadcast recordings of Chinese Sparrowhawk vocalisations. Routes covered eight sample areas in the most representative habitats of the region. A total of 10 Chinese Sparrowhawks were recorded at four locations, all close to the coast. The new records are up to 1,200 km east of the easternmost extent of the previously known wintering range, thus proving that this species does winter in Indonesian New Guinea, although most likely at low density. Seventeen other raptor species were recorded on the transects. In addition, 12 days were spent between 6 and 17 March 2011 at a suitable coastal watch site at the westernmost point of West Papua, but no visible migration of Chinese Sparrowhawk was observed.

INTRODUCTION

The Chinese Sparrowhawk *Accipiter soloensis* is a small-sized accipiter, whose breeding grounds, although imprecisely known, are in China, Korea and Ussuriland, and whose wintering grounds are thought to be mainly in the Philippines and eastern Indonesia. Despite this being the most numerous migratory raptor in East Asia, with an estimated global population running well into six figures (Ferguson-Lees & Christie 2001), very few records exist from the presumed wintering range, suggesting that the winter distribution remains largely unknown (Wattel 1973, White 1976, Mees 1982, White & Bruce 1986, Beehler *et al.* 1986).

Recent migration research (Germi 2005, Germi & Waluyo 2006, Nijman *et al.* 2006, Germi *et al.* 2009) showed that at least 350,000 individuals of this species are streaming into eastern Indonesia each autumn, through both the Sangihe-Talaud

Plate 1. The five Chinese Sparrowhawks collected in New Guinea in the nineteenth century at unspecified localities, held at the Natural History Museum, Tring, UK. From left to right: NHMUK 1955.6.N.20.2635; 1873.5.12.1638; 1955.6.N.20.2636; 1955.6.N.20.2633 and 1955.6.N.20.2632.

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Archipelago in the north and Bali in the west. Nevertheless, other than scattered records from Sulawesi's northern peninsula, winter observations of Chinese Sparrowhawk elsewhere on this island are negligible, despite some areas having been relatively well surveyed (Hartert 1896, Meyer & Wiglesworth 1898, Rozendaal & Dekker 1989). Likewise, there are very few winter records of this species from the Moluccas and the Lesser Sundas. A handful of specimens and records provide solid, albeit scarce, evidence that this species occurs further to the east in Wallacea and at least in the extreme western tip of New Guinea (Coates 1985, Beehler *et al.* 1986, Coates & Bishop 1997, Gjershaug & Røv 2000). Only four records from the islands off western Papua are known in the literature: Meyer & Wiglesworth (1898) quoted Salvadori (1880–1882) with two specimens collected at Gagi (by Bernstein) and Waigeo (by Platen) islands and one from an unspecified locality in '*Nova Guinea*' (by Wallace). Ripley (1964) reported one female collected at Efman (Jefman) Island near Sorong. Additionally, we located five specimens held in the ornithological collections at the Natural History Museum (formerly British Museum of Natural History), Tring, collected in New Guinea in the nineteenth century at unspecified localities (Plate 1). These specimens appear to have been overlooked in the relevant literature. As the islands of eastern Indonesia are regularly visited by birding tours, it is remarkable that such a large number of Chinese Sparrowhawks could have been so consistently unrecorded during the wintering months. Moreover, our observations on Sangihe Island (Germi *et al.* 2009) showed that when present the Chinese Sparrowhawk is easy to locate, both because of its strong diurnal vocal activity and when perched or hunting from prominent tree branches. The possible explanation for the fact that the species has been so widely 'overlooked' in Wallacea, may be: (1) it has been genuinely unrecorded due to an absence of observers present at the right time of year; or (2) the lack of suitable wintering areas in parts of Wallacea, so that a large proportion of the migrants disperse into remote and poorly surveyed areas as far as Papua (Indonesian New Guinea), or both. In order to address the paucity of winter records in Wallacea, we undertook this survey in Papua to establish if Chinese Sparrowhawk overwinter on the island, simultaneously carrying out the first raptor road counts in New Guinea.

METHODS

Study area

Papua, the Indonesian half of the island of New Guinea, covers an area of 416,129 km^2. It is still largely covered in relatively undisturbed primary forests, the largest tropical forest wilderness remaining in the Asia-Pacific region. For the past 50 years it was essentially inaccessible to all but a few field researchers, and thus a *terra incognita* (Marshall & Beehler 2007). Dominated by the massive Central Cordillera (more than 3,000 m high) that generates abundant rainfall, rivers drain into vast forested interior basins and alluvial floodplains. In the far south-east, near the Papua New Guinea border, is a swath of savannah known as the Trans-Fly, ecologically resembling northern Australia rather than New Guinea. To the west, the heavily logged Vogelkop and Bomberai peninsulas are dominated by small mountain ranges and island groups. Papua's equatorial climate is dominated by the North-west

Figure 1. Map of Papua, Indonesia. Black lines show all transects carried out during December 2010 – March 2011 in the numbered sample areas: (1) Merauke; (2) Kimaam; (3) Asmat; (4) Timika; (5) Wamena; (6) Manokwari; (7) Sorong; (8) Biak. Black stars: new Chinese Sparrowhawk records January–March 2011. White stars: old Chinese Sparrowhawk records 1880–1964. Black asterisk: migration watch site at Tanjung Kasuari, March 2011.

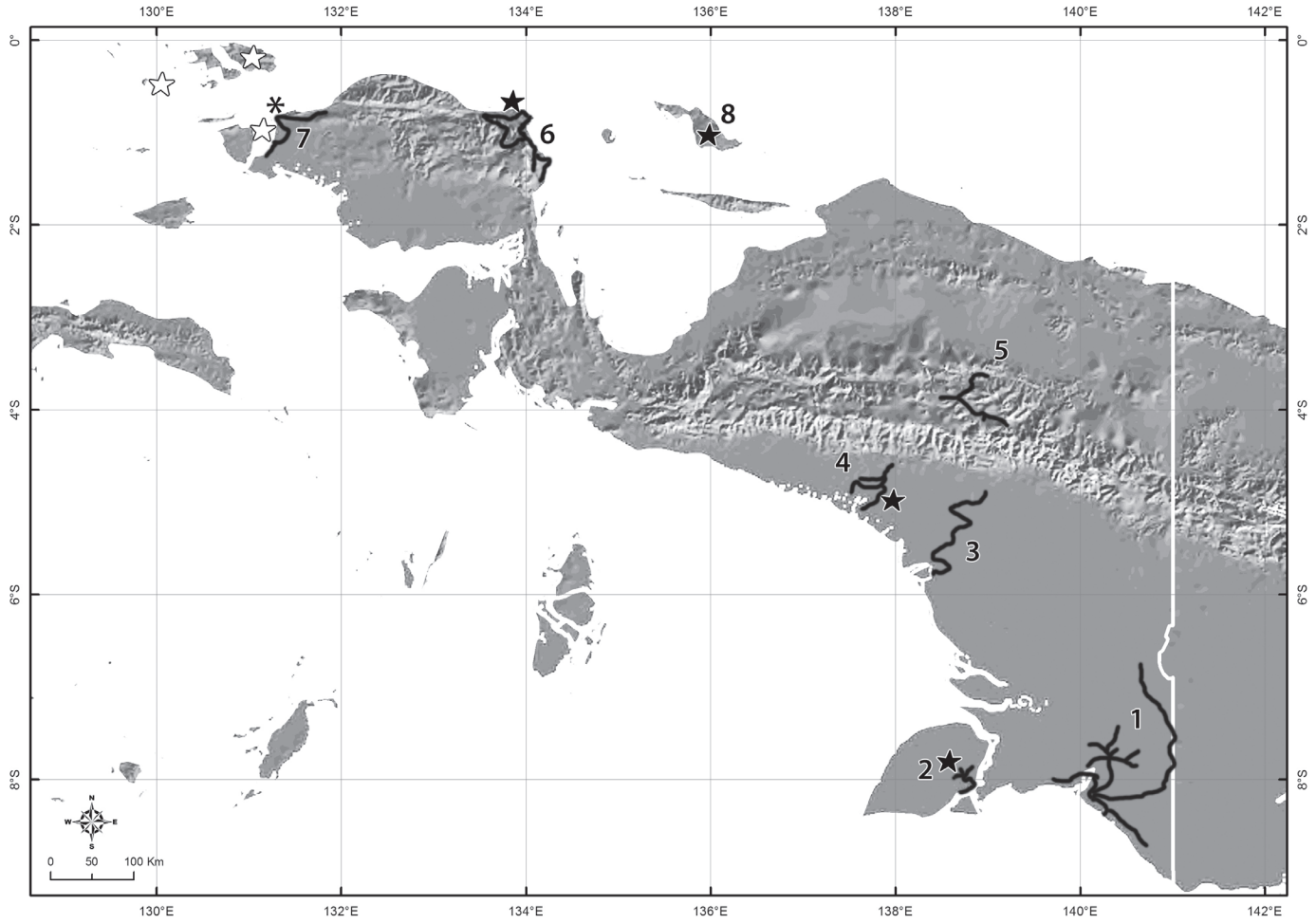

Table 1. Sample areas, transects and Chinese Sparrowhawk records, Papua, December 2010–March 2011.

Sample area	Coordinates	Habitat types	Transects	Chinese Sparrowhawk records
Merauke	8.479ºS 140.580°E	1,3,4,5,13,14,15	road 454 km; foot 22 km	
Kimaam	7.957°S 138.862°E	1,5,6,14	foot 48 km; river 28 km	7.980°S 138.853°E, one on 10 January roosting at Kimaam airstrip
Asmat	5.518°S 138.117°E	4,6,7,14	foot 17 km; river 327 km	
Timika	4.755°S 136.865°E	4,6,7,10,14, 15	road 708 km; foot 13 km	4.691°S 136.887°E, a flock of six in westward migration on 3 March over coastal swampland
Wamena	3.964°S 138.946°E	2,8,13,14	road 160 km; foot 11 km	
Manokwari	0.791°S 134.023°E	9,10,13,14,15	road 175 km	0.808°S 134.053°E, one on 12 February roosting in secondary forest
Sorong	0.823°S 131.231°E	10,13,14,15	road 328 km; foot 12 km	
Biak	1.048°S 135.959°E	11,12,14,15	point counts	1.094°S 136.330°E, two singles at the same locality, 14 and 15 February, roosting in degraded woodland

Habitat types: 1 Trans-Fly savannah, 2 Grassland, 3 Inundated grassland , 4 Swampland, 5 Monsoon forest , 6 Mangrove forest , 7 Lowland rainforest, 8 Montane forest, 9 Coastal forest, 10 Secondary forest , 11 Degraded woodland, 12 Semi-arid scrub, 13 Agricultural landscapes, 14 Villages, 15 Transmigration settlements.

Monsoon and the South-east Trade Winds. The main rainy season occurs from November to March; however in the wetter areas the seasons are reversed, and most rain falls in the April–October period. The highest rainfall is recorded in the southern scarp of the Central Cordillera, with more than 5,000 mm/year. Temperature varies little, with elevation being the key variable. At sea level, where most of our survey areas were located, the average temperature is 25–27°C (Marshall & Beehler 2007).

Survey techniques

Our general methodology followed a combination of classic survey techniques described in the literature (Fuller & Mosher 1987, Bibby *et al.* 1998, Bibby *et al.* 2000, Bird & Bildstein 2007, Malan 2009). We also reviewed specific literature on previous raptor road surveys from other parts of the world in order to adapt our own protocols to local conditions (Millsap & LeFranc 1988, Ellis *et al.* 1990, Hanowsky & Niemi 1995, Vergara 2010).

Thirty-nine road, boat and foot transects were carried out in eight sample areas in the Indonesian administrative provinces of Papua and West Papua (Figure 1), chosen by habitat type and for their accessibility. The following main habitats were surveyed: Trans-Fly savannah and grassland, swamp forest, mangrove forest, lowland rainforest, secondary forest and agricultural landscapes (Table 1). Logistical difficulties such as lack of roads and suitable transport, high cost of transport, access restrictions due to oil and mining exploration and floods due to the rainy season hindered the fieldwork. The resulting poor accessibility and the insecurity of some areas restricted the number of study sites and the time spent in them. All 39 transects were carried out in the middle of the wet season (December–late February) and recorded as GPS tracks, and all raptor sightings as GPS waypoints. The length of routes was measured by using a GPS, the vehicle odometer and topographic maps. As habitat structure, detectability of raptors and driving conditions were too variable, we did not follow a strict methodology protocol (i.e. strip, line or point transects), but a combination of the three. To facilitate relocation of the routes for future surveys, we downloaded all recorded tracks in a GPS navigation software (Touratech QV). Sample segments were arranged by habitat type. To minimise differences in detectability among transects, we standardised the time of day and weather conditions. Driving speed was 40–60 km/hr on paved road and 20–40 km/hr or less on dirt roads, although road conditions and habitat type were too variable to permit a uniform driving speed. Roadside counts were conducted by 1–2 observers assisted by one driver. Observers looked carefully for accipiters while driving slowly (<50 km/hr), and during frequent stops to identify distant birds or scan the landscape, from after sunrise to before sunset (07h00–18h00), using 10× binoculars and a 20–60× telescope. All accipiters seen perched or flying were counted and identified if possible. As habitat structure in the proximity of the roads affected detectability of birds, we stopped at points spaced about 1–3 km in suitable habitats to look and listen for accipiters during a 5–10 minute period, or to conduct foot transects when necessary. During these stops we broadcast three different recordings of Chinese Sparrowhawk vocalisations in an effort to elicit vocal responses or approaches, using a standardised protocol (Parker 1991).

Twelve days from 6 to 17 March 2011 were spent at a peninsular migration watch site, Tanjung Kasuari (0.823°S 131.231°E), near the westernmost point of West Papua, in the proximity of the town of Sorong, to assess whether migratory movements were visible at this site. Methods were similar to those used in previous migration studies in Indonesia (Germi *et al.* 2009).

RESULTS

Transects covered a total length of 2,303 km, of which 1,948 km were on roads or footpaths and 355 km on rivers. Transects in forest habitats resulted in very few raptor sightings, probably due to poor detectability in dense forest, thus suggesting that this habitat type requires a different methodological approach to carry out raptor counts (Thiollay 1989, Whitacre 1991, Whitacre & Turley 1991). Eighteen raptor species were recorded during transects, all at low density (Table 2), and including three species (Black-shouldered Kite *Elanus caeruleus*, Bat Hawk *Macheiramphus alcinus* and Brown Goshawk *Accipiter fasciatus*) from areas outside their known distribution, thus extending their range within New Guinea.

Chinese Sparrowhawk was observed five times at four sites (Kimaam, Timika, Manokwari and Biak), 10 individuals in all (Table 1), up to 1,200 km east of the previously known limit of the wintering range, thus proving that this species does winter in Papua. These are the first records for the species in mainland New Guinea. All five records were at sea level, near coasts, in degraded habitats and swampland. Individuals were observed at sufficiently close range to permit positive identification using diagnostic field characters. The authors are very familiar with the identification of this species from previous field studies in the region (Germi 2005, Germi & Waluyo 2006, Germi *et al.* 2009).

New records

Kimaam, Dolok island: 10 January 2011, one adult male observed and photographed at short distance, roosting on a light pole at Kimaam airstrip (7.980°S 138.853°E) in Trans-Fly savannah.

Manokwari: 12 February 2011, one adult male roosting on a tree branch in secondary coastal forest in the proximity of the town of Manokwari (0.808°S 134.053°E).

Table 2. Raptor species recorded during transects, Papua, December 2010–March 2011.

Species	Merauke	Kimaam	Asmat	Timika	Wamena	Manokwari	Sorong	Biak	Total
Black-shouldered Kite *Elanus caeruleus*		12							12
Bat Hawk *Macheiramphus alcinus*			1						1
Pacific Baza *Aviceda subcristata*				4		3			7
Long-tailed Honey-buzzard *Henicopernis longicauda*	2			6		4			12
Whistling Kite *Haliastur sphenurus*	67	8		11					86
Brahminy Kite *Haliastur indus*	15	9	6	11	1	8	6	4	60
White-bellied Fish-eagle *Haliaeetus leucogaster*	2	3	4	5		1			15
Papuan Harrier *Circus spilothorax*	4	4		3	10				21
Chinese Sparrowhawk *Accipiter soloensis*		1		6		1		2	10
Grey Goshawk *Accipiter novaehollandiae*			1	4					5
Varied Goshawk *Accipiter hiogaster*	1	1		3	1				6
Collared Sparrowhawk *Accipiter cirrhocephalus*	3	2	2	5	1	3	1		17
Brown Goshawk *Accipiter fasciatus*	3	2							5
Gurney's Eagle *Aquila gurneyi*		1	1						2
Wedge-tailed Eagle *Aquila audax*	3								3
Oriental Hobby *Falco severus*			1						1
Brown Falcon *Falco subniger*				2					2
Peregrine Falcon *Falco peregrinus calidus*	1						8	2	11

Note: The taxonomy of *Accipiter novaehollandiae* and *A. hiogaster* remains controversial among authors. Here they are treated as separate species.

Biak island: 14 and 15 February 2011, two single females (possibly the same bird) observed at the same site, roosting on a tree branch in degraded woodland (1.094°S 136.330°E).

Timika: 3 March 2011, a flock of six individuals soaring and gliding at low altitude, apparently in westward migration, observed and photographed over swampland (4.691°S 136.887°E) along the mining road between the town of Timika and the port of Amamapare.

From previous observation in Sangihe (Germi *et al.* 2009), we found that Chinese Sparrowhawk can be conspicuously vocal when perched on exposed tree branches, especially in the early morning. Although we broadcast Chinese Sparrowhawk vocalisations on numerous occasions in seven sample areas (excluding Biak) and towards the individual observed in Manokwari, we never obtained any response or approach.

During 12 days spent at a suitable watch site at the westernmost point of Papua during the migration season, no movements of Chinese Sparrowhawk were observed, although dates were chosen to precede by a few days the known passage period in North Sulawesi.

DISCUSSION

We plotted the known records of migrating Chinese Sparrowhawks in Wallacea and the handful of historical winter records from the islands off the westernmost tip of Papua. This hinted at a probable winter distribution in poorly surveyed but ecologically suitable areas in Papua, particularly in the open habitats of the south-east. As this territory is subject to heavy flooding during the rainy season, its wintering avifauna is poorly known, partly because of the inaccessibility of much of the region. Moreover, very few formal surveys have been published from Papua in the past 20 years and only a handful of informal accounts from short visits by ornithologists and birdwatchers have appeared (Marshall & Beehler 2007).

Records of wintering Chinese Sparrowhawks in other parts of Indonesia show that this accipiter is not a closed-canopy forest species; instead it occupies a variety of open habitats ranging from forest edge, secondary forest and scrub to agricultural landscapes. Previous observations in central Flores (Germi *et al.* 2009) showed that wintering Chinese Sparrowhawks feed primarily on cicadas, and the majority of birds leave the island in late November once cicada emergences cease, and only small numbers remain through the winter. Interestingly, large emergences of cicadas are known to occur at the beginning of the rains in October–November in Papua and in October–February in the Moluccas, suggesting that Chinese Sparrowhawks move east when insect abundance shifts with the advancing rainy season (Germi *et al.* 2009). The south-east of Papua, part of the Greater Trans-Fly, is characterised by an extensive mosaic of monsoon forest, secondary forest, swampland and swathes of savannah, thus potentially ideal wintering habitat. Although this region was initially the focus of our study, lack of accessibility and the subsequent paucity of records (only one individual at Kimaam, Dolok island) prompted us to extend the survey into different parts of Papua. Most areas surveyed presented several logistical constraints and difficult access. Suitable habitat covered large inaccessible areas, and the scarcity of records during this study suggests that the species disperses at low density within the vast region. However our records, although small in number, clearly indicate that an unknown proportion of this accipiter population overwinters in Papua, apparently in coastal areas.

The absence of migrating Chinese Sparrowhawks in March (migration season) at the watch site of Tanjung Kasuari (Figure 1) might reflect the use of a different route further to the south. We assumed that migrants would travel from the Sorong area to Waigeo and Halmahera islands, but the lack of migrants at Tanjung Kasuari could indicates that migrants leave Papua via Salawati Island, where shorter water crossings are available, and continue east through Kofiau, Obi and the Sula islands before reaching

Sulawesi. Access restrictions on the Papua coast in the proximity of Salawati prevented us from testing this hypothesis.

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***Francesco GERMI**, 46 (2F2) Elm Row, Edinburgh EH7 4AH, UK. Email: fgermi@yahoo.co.uk*

***Agus SALIM**, Jl. Palem Putri VIII No. 5–7, Taman Jasmin 5, Bogor, 16113, West Java, Indonesia. Email: salim@asalim.org*

***Andrea MINGANTI**, Via Monti di Primavalle 96/a, 00168 Rome, Italy. Email: andming@alice.it*