

## BIRD TO WATCH

# Rediscovery of a Milky Stork *Mycteria cinerea* breeding colony in South Sumatra province, Indonesia

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The Milky Stork *Mycteria cinerea* is currently listed as Vulnerable because it has undergone a rapid population decline due to ongoing loss of coastal habitat, human disturbance, hunting and trade. Its population is estimated at 5,550 individuals with the majority in Indonesia, about 5,000 in Sumatra, its last stronghold and 400 in west Java (Silvius & Verheugt 1989; BirdLife International 2004 & 2008; Wetlands International 2006). Breeding is colonial, often occurring in multi-species aggregations. There are estimated to be only 10–20 pairs at Tonle Sap lake, Cambodia (James Eaton *in litt.* 2008), it is a vagrant to Thailand and Vietnam, whilst numbers have declined sharply in Malaysia with counts falling from over 100 individuals in 1984 to less than 10 birds in 2005. In Malaysia, only two eggs hatched from 21 nests and neither young survived at Matang mangrove forest in 1989, no successful breeding was observed in 1990 at Pulau Kelumpang, and in October 1997, 11 Milky Stork nests were found at Pulau Kelumpang by aerial survey, but again no successful breeding was recorded (Li *et al.* 2006). Its status in Indonesia is less well known, but although good numbers can still be found at sites in southern Sumatra there are reports that numbers have declined considerably (BirdLife International 2008).

In Indonesia three breeding sites, all located in South Sumatra province, were discovered in 1988, totalling about 1,000 occupied nests (Danielsen *et al.* 1991, Elliott 1992). Today the only other known colony is at Pulau Rambut in west Java, (Lambert & Erfemeijer 1989, Imanudin & Mardiasuti 2003, Ady Kristanto *in litt.* 2008). The species no longer breeds at Pulau Dua (Milton & Marhadi 1985).

In 2001, Wetlands International Indonesia Programme searched for Milky Stork breeding sites in the Banyuasin peninsula, South Sumatra, without success (Goenner & Hasudungan 2001). In September 2006, a juvenile Milky Stork was found at the house of a local forestry worker on Sungai Belidang river, Simpang Tiga village, Ogan Komering Ilir District, South Sumatra. A follow-up survey was carried out to locate the breeding site in July and August 2007, but again without success, although chicks and juveniles caught by local people in Simpang Tiga Sakti village were seen

(Iqbal & Hasudungan 2008). Based on the experience of 2001, 2006 and 2007, it is clear that survey work in this region is physically difficult, time-consuming and expensive. Between 6–17 March 2008, a survey of 200 km of the east coastline of South Sumatra province from Pasir river in the south (Ogan Komering Ilir District) to Benu river in the north (Banyuasin District) was carried out by boat. During the survey, detailed interviews were conducted with local people to obtain information on the whereabouts of Milky Stork. By June 2008 all the information had been collated and a route arranged using roads and tracks crossing as many rivers and creeks as possible. With assistance from local people surveys on foot and by shallow-draft boats and canoe were planned.

On 17 June 2008 after a gap of 20 years (2 September 1988), a Milky Stork breeding colony was found in Sumatra on Kumpai lake (02°26'01.7"S 105°34'52.8"E). The lake (or flooded area) is located about 6–7 km from the mouth of the Kumpai river, and can only be reached after three hours paddling in a small canoe. Administratively it is part of Sugihan sub-district,

**Plate 1.** The Kumpai colony, located in open mangrove backswamps 6–7 km from the coast with mostly dead trees within a flooded area, June 2008. (All plates accompanying this article are from the same locality and date.)



Ogan Komering Ilir District, South Sumatra. The three breeding sites discovered in South Sumatra in September 1988 were all in mangrove backswamp and located at Tanjung Koyan, Tanjung Selokan and Banyuasin peninsula, but accurate locations were withheld to avoid disturbance (Danielsen *et al.* 1991). The Kumpai site we located is that described as Tanjung Selokan by Danielsen. This site has been cited as an Important Bird Area (SID26) (Holmes & Rombang 2001) and has been designated Hutan Lindung (forest protected by provincial or district government), but neither the Department of Forestry of South Sumatra nor Ogan Komering Ilir District have taken practical action to protect its natural resources. The area is physically difficult to access, and only 25% of the total area could be surveyed. In the accessible parts, we found 31 Milky Stork nests and 65–75 adult birds. It is estimated that there are 100–115 nests within the site. The colony was located in open mangrove backswamps some 6–7 km from the coast, with nests 2–20 m up in mostly dead trees within a flooded area about 15 ha in extent (Plate 1). At the time of our visit, the area was flooded to a depth of 10–30 cm. A total of 300 nests were reported in September 1988 (Danielsen *et al.* 1991) but this included all waterbirds using large stick nests in the area. We found that great care was needed to confirm the ownership of nests: it was easy to mistake Great Egret nests for Milky Stork nests and we found Milky Storks perched in trees where all nests were occupied by Great Egrets. It is not certain therefore how big the decline in the number of active Milky Stork nests has been over 20 years. The timing of nesting appears to be in line with past experience in Sumatra—breeding observed July–September (Verheugt *et al.* 1993), a bird seen in breeding plumage in May (Nash & Nash 1985), and egg-laying June–August (Hancock *et al.* 1992). Dry-season breeding probably coincides with maximum fish stocks, following the rainy season (Hancock *et al.* 1992), and presumably increased ease of prey capture as water levels drop, although this may not apply to birds feeding in tidal areas (BirdLife International 2001).

The Milky Stork is essentially a coastal species favouring mangroves, mudflats and estuaries (Hancock *et al.* 1992), and also feeds on ricefields and fish ponds (Verheugt 1987). The major breeding colonies are in mangroves, with nests built 2–30 m up in trees (BirdLife International 2001). The mangrove species utilised for nesting include *Avicennia marina* and *Rhizophora apiculata*. In Pulau Rambut, Java, most nests are built in *Sterculia foetida* (Imanudin & Mardiastuti 2003). At Kumpai lake, the nest site is mangrove backswamp with *Avicennia* vegetation. We

tentatively identified the tree species as *Avicennia officinalis*. The nests were built 2–20 m up in mostly dead trees (Plates 2 & 3). Eight nests were built below 5 m, the remainder between 5–20 m up. Nine nests were found in trees that were clearly dead, and 22 nests were in trees that were partly dead. Most trees supported two nests, one tree supported four nests and four trees supported one



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**Plate 2.** Two nests built 2 m up in a dead tree.

**Plate 3.** A nest built more than 10 m up with adult and a single chick.



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nest. The nests previously observed in Sumatran breeding colonies were built between 2–15 m (Danielsen & Verheugt 1991). In Java at Pulau Rambut the nests are usually 30 m up, and at Pulau Dua they were originally as low as 4 m prior to disturbance (Hancock *et al.* 1992). Most nests held a single chick; only two nests with two chicks were



**Plate 4.** Nest with two chicks.

**Plate 5.** Nest with single chick approximately 20–25 days old and an unhatched egg.



found (Plate 4). No nests held more than two chicks. An unhatched egg was found in a nest with single chick (Plate 5). From Java there are reports of clutches of three eggs (Hellebrekers & Hoogerwerf 1967) and clutches of five eggs have been recorded (Imanudin & Mardiasuti 2003). All the chicks seen (Plates 4&5) were about 20–25 days old (Imanudin & Mardiasuti 2003). The incubation period is estimated at 27–30 days (Hoogerwerf 1936, Imanudin & Mardiasuti 2003). Based on these estimates, it is suspected that at Kumpai lake laying started in late April/early May and the eggs hatched in late May/early June.

Adult birds have been recorded taking large (10–23 cm) mudskippers (*Periophthalmus*), also small fish, snakes and frogs (Elliott 1992), but nothing has been reported about the diet of chicks. We found two species of prawn—Indian white prawn *Penaeus indicus* and banana prawn *P. merguensis* and one clupeid fish species, Dussumier's thryssa *Thryssa dussumieri* (Plate 6), in and around nests. The prawn and fish averaged between 7–10 cm in length, prawns predominating. The prawns are of commercial value to local fishermen.

Other waterbirds recorded nesting at the site were Great Egret *Egretta alba*, Intermediate Egret *Egretta intermedia*, Little Egret *Egretta garzetta* and Little Cormorant *Phalacrocorax niger* (Plate 7). There are no previous breeding records for Little Egret and Little Cormorant in Sumatra, and these sightings constitute first breeding records for the island. Black-headed Ibis *Threskiornis melanocephala*, Grey Heron *Ardea cinerea*, Javan Pond Heron *Ardeola speciosa*, Oriental Darter

**Plate 6.** Dussumier's thryssa *Thryssa dussumieri* was found to be part of the diet of young Milky Stork.



*Anhinga melanogaster*, and Striated Heron *Butorides striatus* were also observed and suspected to be breeding, but no nests were found. In the past in Sumatra, Milky Storks have been recorded nesting alongside Great Egret, Lesser Adjutant *Leptoptilos javanicus*, Javan Pond Heron, Grey Heron and Black-headed Ibis (Danielsen *et al.*

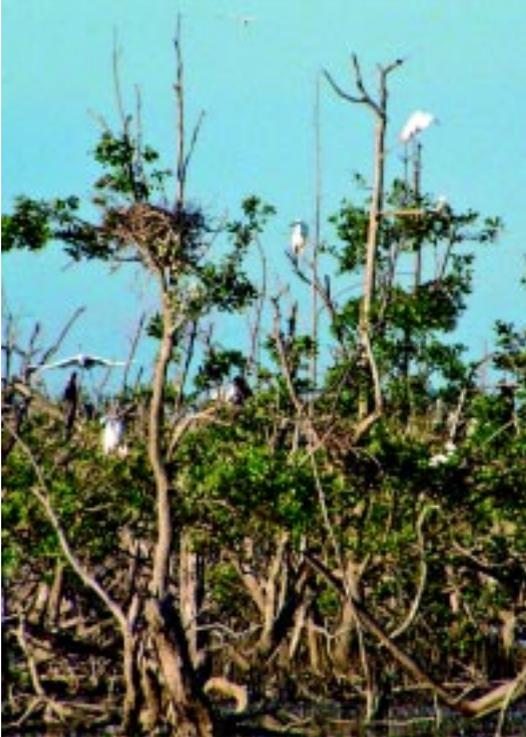
1991). At Pulau Rambut the colonies contained Purple Heron *Ardea purpurea*, Grey Heron, Great Egret, Little Egret, Cattle Egret *Bubulcus ibis*, Glossy Ibis *Plegadis falcinellus*, Black-crowned Night-heron *Nycticorax nycticorax*, Cormorants, Oriental Darter and Black-headed Ibis (Imanudin & Mardiasuti 2003).

No predation of young Milky Stork was seen during the survey. However, the track of a monitor lizard *Varanus salvator* was seen near a tree where Milky Storks were nesting (Plate 8) and local people in the Sungai Batang river reported that the monitor lizard takes Milky Stork eggs and chicks at the Kumpai site. At Pulau Rambut, both monitor lizard and White-bellied Sea-eagle *Haliaeetus leucogaster* have been observed preying Milky Stork chicks (Imanudin & Mardiasuti 2003), whilst other potential predators at Pulau Rambut are reticulated python *Python reticulatus*, cat snake *Boiga dendrophylla* and Brahminy Kite *Haliastur indus*. At Pulau Kelumpang, Malaysia, although there were no direct observations of eggs or young, it was reported that Brahminy Kites were disturbing the nesting Milky Stork and that monitor lizard and common palm civet *Paradoxurus hermaphroditus* were other potential predators and may have contributed to the zero survival rate (Li *et al.* 2006).

Human disturbance and hunting are the biggest threats to the survival of the Milky Stork in South Sumatra. Interviews with local people in the southern part of the east coast of South Sumatra province (Ogan Komering Ilir district) revealed that they have a tradition of harvesting the bird in the wild and exploiting eggs and chicks for food and to keep as pets. The eggs are a delicacy and the chicks are easily managed. There are no specific local hunters in the area, and most birds and eggs are taken by local fishermen who anchor their motorised boats near breeding colonies coincidentally in the course of their fishing activities. The market price of a young Milky Stork is Rp 25,000 (about US\$3) (Iqbal & Hasudungan 2008). The exploitation of eggs and chicks was identified as the principal threat to the continued survival of the colony at Kumpai lake.

#### Acknowledgements

This field work is a part of the Milky Stork *Mycteria cinerea* population assessment in South Sumatra, supported by a Wildlife Conservation Society Research Fellowship, Rufford Small Grant and Idea Wild. We wish to thank Mike Crosby, Christian Gonner, Yus Rusila Noor, Dewi Prawiradilaga, Nick Brickle, William Banham, Kate Mastro, Lynn Duda, Jane Rufford, Josh Rufford, Wally van Sickle, Henry Stephen, Anne Marie and Sean Kelly for making



**Plate 7.** Other nesting waterbirds are Great Egret, Intermediate Egret, Little Egret and Little Cormorant.

**Plate 8.** The track of a monitor lizard at the site, a potential predator of young Milky Stork.



this work possible. We would like to thank Pak Ajit (formerly head of Sungai Batang village), and Qodir and Pak Reli's family in Sungai Batang. We also would like to thank to Prof. Ani Mardiatuti (Institute Pertanian Bogor), James Eaton (Birdtour Asia), Ady Kristanto (Jakarta Birdwatching Community) and Insan Kurnia (IPB) for sharing their data.

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