



**West African Ornithological Society**  
**Société d'Ornithologie de l'Ouest**  
**Africain**



Join the WAOS and support  
the future availability of free  
pdfs on this website.

<http://malimbus.free.fr/member.htm>

If this link does not work, please copy it to your browser and try again.

Devenez membre de la  
SOOA et soutenez la  
disponibilité future des pdfs  
gratuits sur ce site.

<http://malimbus.free.fr/adhesion.htm>

Si ce lien ne fonctionne pas, veuillez le copier pour votre navigateur et réessayer.

## The avifauna of southeast Niger

by Flemming Pagh Jensen, Kim Diget Christensen & Bo Svenning Petersen

Orbicon, Ringstedvej 20, DK-4000 Roskilde, Denmark. <fpj@orbicon.dk>

Received 27 February 2007; revised 17 December 2007.

### Summary

A field survey of birds associated with the open habitats of Sahelian SE Niger was carried out in the rainy seasons of 2002, 2003 and 2005, using line transect counts in grassland and farmland plus observations in other habitats, in particular wetlands. In total 250 species are now known from the area. A high density of grasshoppers at the end of the rains is an annual phenomenon in SE Niger. We argue that the large numbers of Cattle Egrets *Bubulcus ibis*, Abdim's Storks *Ciconia abdimii*, Grasshopper Buzzards *Butastur rufipennis*, Abyssinian Rollers *Coracias abyssinicus* and African Grey Hornbills *Tockus nasutus*, observed at the end of the rains, had migrated northwards after breeding to feed on them. Compared to the 1970s, vultures, Bateleur *Terathopius ecaudatus* and Marabou Stork *Leptoptilos crumeniferus* appear to have declined dramatically and the Secretary Bird *Sagittarius serpentarius* has disappeared. A new International Bird Area (IBA) is proposed, the "Diffa-Kinzindi grassland and wetlands". Within it have been recorded six species of global conservation concern (Rüppell's Griffon Vulture *Gyps rueppellii*, Beaudouin's Snake Eagle *Circaetus beaudouini*, Pallid Harrier *Circus macrourus*, Lesser Kestrel *Falco naumanni*, Nubian Bustard *Neotis nuba* and Black-tailed Godwit *Limosa limosa*), 11 out of 16 Sahel biome species, and regularly more than 20,000 waterbirds (Cattle Egrets and Abdim's Storks).

### Résumé

**L'avifaune du Sud-Ouest du Niger.** Une étude de terrain sur les oiseaux associés aux habitats ouverts dans le SE sahélien du Niger a été réalisée pendant les saisons des pluies 2002, 2003 et 2005. L'étude a comporté des comptages d'oiseaux sur des transects dans des zones herbeuses et cultivées mais des observations dans d'autres habitats ont aussi été faites, en particulier dans les zones humides. Au total, 250 espèces ont maintenant été identifiées dans la région. Une densité élevée de sauterelles en fin de saison des pluies est un phénomène annuel au SE du Niger. Nous expliquons que le grand nombre des Hérons garde-boeufs *Bubulcus ibis*, des Cigognes d'Abdim *Ciconia abdimii*, des Buses des sauterelles *Butastur rufipennis*, des Rolliers d'Abyssinie *Coracias*

*abyssinicus* et des Petits Calaos à bec noir *Tockus nasutus* observés à la fin des pluies migrent ensuite vers le nord après la reproduction afin de s'en nourrir. En comparaison avec les années 1970, les vautours, les Bateleurs *Terathopius ecaudatus* et les Marabouts *Leptoptilos crumeniferus* apparaissent en dramatique déclin et le Messager serpenteur *Sagittarius serpentarius* a disparu. Une nouvelle zone importante pour la conservation des oiseaux (International Bird Area IBA) au SE du Niger est proposée, les "zones herbeuses et humides de Diffa-Kinzindi". A l'intérieur de cette zone on a observé six espèces dont l'état de conservation est préoccupant au plan global (Vautour de Rüppell *Gyps rueppellii*, Circaète de Beaudouin *Circaetus beaudouini*, Busard pâle *Circus macrourus*, Faucon crécerellette *Falco naumanni*, Outarde de Nubie *Neotis nuba* et Barge à queue noire *Limosa limosa*), 11 sur 16 espèces du biome Sahel et la présence régulière de plus de 20 000 oiseaux aquatiques (Hérons garde-boeufs et Cigognes d'Abdim).

### Introduction

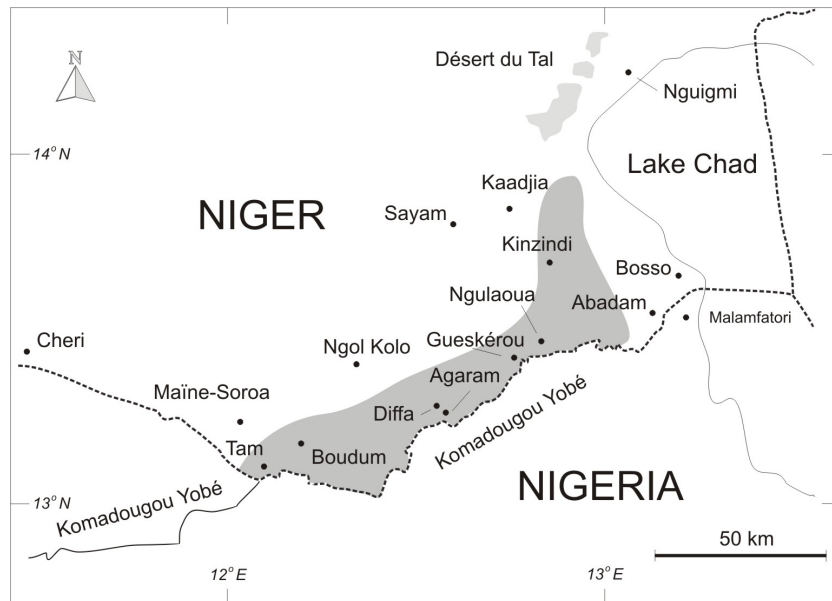
Very little has been published on the birds of southeast Niger. The observations summarized by Giraudoux *et al.* (1988) were mainly from the 1970s, with a few from the 1920s by Buchanan (Hartert 1921, Bates 1933) and from the 1940s by Rousselot (1947). We have not been able to trace any subsequent published records from this part of Niger. In January 1994 and 1995 W. Mullié visited SE Niger in connection with the Africa Waterbird Census. His unpublished records are stored in the Niger Bird Database (NiBDaB), and are also included in this account on the SE Niger birds.

During the rainy seasons of 2002, 2003 and 2005 we studied the birds in SE Niger, with the aims of assessing the extent to which birds control grasshopper populations and how human grasshopper control may affect birds. From our base in Diffa we mainly focused on birds associated with grassland and farmland but, on an *ad hoc* basis, we also recorded birds associated with other habitats, in particular wetlands.

### Study area

Our study area (Fig. 1) lies within the Sahel zone and corresponds to "Zone écologique 4" of Giraudoux *et al.* (1988). This part of Niger has a single rainy season from late May to early October with an average annual precipitation of *c.* 340 mm. The natural vegetation is mostly grassland with scattered trees, in particular *Acacia* spp. and *Balanites aegyptiaca*. During the rainy season, many isolated wetlands form across the grassland, some of which hold water for a few months after the end of the rainy season. To the north and west, the grassland is bordered by huge tracts of sand dunes, including the Désert du Tal, with no or only a thin cover of desert grass and shrub-land. The eastern

border follows the former shore of the now dry northern basin of Lake Chad, where the vegetation is at present mainly Mesquite *Prosopis juliflora*, an introduced American tree (Mulli   *et al.* 1995). The Komadougou Yob   river forms the southern boundary of our study area, and is the border with Nigeria. The vegetation is denser along the river and is often flooded during the height of the rainy season. Small-scale rice cultivation and irrigated fields with vegetables (especially sweet pepper) are found close to the river, in particular near Diffa. In a belt extending *c.*5 km away from the river the grassland has been cultivated in many places to grow millet and sorghum. Ma  n  -Soroa, Diffa and Nguigmi are the only towns and most villages are found along the river and the former shore of L. Chad. Fulani pastoralists with herds of cattle and goats utilise most of the grassland during the rainy season and some months after. During the dry season most herders move their livestock to areas close to the river or into Nigeria.



**Figure 1. SE Niger with localities mentioned in the text. The dark shaded area shows the main feeding area of Abdim's Storks in Aug–Oct and corresponds to a proposed IBA.**

While thick layers of wind-deposited sand cover most of the Sahel, the grassland in SE Niger is mainly on a clayey plain, with extensive layers of sand only to the north and west. This provides particularly favourable breeding habitat for

grasshoppers, most notably the Senegalese Grasshopper *Oedaleus senegalensis*. In July to early August this species reaches very high numbers in SE Niger. In August–September, Senegalese Grasshoppers that have hatched further north in Niger move south as the vegetation dries out, and reach SE Niger in huge numbers in late September and October, bringing the density of grasshoppers up to 10–30 per m<sup>2</sup>, and locally even higher (Z. Ouambama pers. comm.). Unlike locusts, Senegal Grasshoppers have been recorded in high densities in the grassland of SE Niger every year since the mid-1990s when grasshopper studies were initiated there (Z. Ouambama pers. comm.).

### Methods

Observations were made near Diffa, along the Komadougou Yobé and at various temporary wetlands across the grassland area from 30 Jul to 2 Aug and 23–27 Sep 2002, 19–23 Aug and 23 Sep to 1 Oct 2003, and 22 Sep to 7 Oct 2005. In 2003 we also made excursions through the grassland to Ngol Kolo and Nguigmi. In 2005 we visited Ngol Kolo, Sayam, Kinzindi, Nguigmi and the Désert du Tal as well as Bosso on the former shore of L. Chad.

Bird counts were carried out on line transects in the grassland and farmland mosaic in the last part of the rainy season, 22–26 Sep 2003 and 23–27 Sep 2005. The starting point for the counts was the road connecting Maïné-Soroa, Diffa and Nguigmi. The counts were carried out with two observers, each counting four line-transect sections of 50 min., corresponding to *c.* 1000 m. Based on these observations, density (number per km<sup>2</sup>) was estimated for each bird species. For a more comprehensive account of the method and data analyses, see Petersen *et al.* (2007).

For the species recorded in 2002–5 the following abundance assessment is used (from Morel & Tye 1995): VA = Very abundant (>100 may be seen or heard in suitable habitat per day); A = Abundant (11–100 may be seen or heard in suitable habitat per day); C = Common (1–10 may be seen or heard in suitable habitat per day), F = Frequent (often seen or heard but not every day); U = Uncommon (few records only); for rarer species we give details of all records. An abundance assessment assigned to the period “Aug–Oct 2002–5” means throughout the period we worked in the area. Sahel biome species (as defined in Fishpool & Evans 2001) observed in 2002–5 are marked “SB”. Sequence and nomenclature follow Borrow & Demey (2001).

### Results

We list the 250 bird species for which we have been able to trace records from SE Niger. In addition to our own observations this includes the observations from Zone 4 in Giraudoux *et al.* (1988) plus additional records provided by P.J. Jones and

unpublished observations (NiBDaB) by W. Mullié. For each species the source of information is listed and, for the species recorded during our survey, an abundance assessment is given. Density estimates are presented for the species recorded during the transects counts in 2003 and 2005.

#### **Podicipedidae**

*Podiceps nigricollis* Black-necked Grebe. Six at Diffa, 23 Jan 1995 (NiBDaB).

#### **Phalacrocoracidae**

*Phalacrocorax africanus* Long-tailed Cormorant. C, Aug–Oct 2002–5. Several at Diffa, Tam and Agaram; Jan 1994 and 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Pelecanidae**

*Pelecanus onocrotalus* Great White Pelican. Three over Désert du Tal, 27 Dec 1977 (Giraudoux *et al.* 1988).

#### **Ardeidae**

*Ixobrychus minutus* Little Bittern. C, along Komadougou Yobé, Aug–Oct 2002–5.

*Ardeola ralloides* Squacco Heron. C, along the Komadougou Yobé, Aug–Oct 2002–5. Transect density (in adjacent grassland): 0.4 per km<sup>2</sup> in Sep 2005 (zero in 2003). Also recorded at a temporary pond at Nguigmi, 22 Aug 2003. Several at Tam and Bagara, Jan 1994, and Diffa, Tam and Agaram, Jan 1995 (NiBDaB).

*Bubulcus ibis* Cattle Egret. VA, Aug–Oct 2002–5. Transect density (in adjacent grassland): 62 per km<sup>2</sup> in Sep 2003, 48 per km<sup>2</sup> in Sep 2005. Many at Diffa, Tam and Agaram, Jan 1994 and 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988), Large numbers (probably over 25,000) were observed in Aug–Oct 2002, 2003 and 2005 within *c.* 25 km of the Komadougou Yobé from west of Boudum to Bosso. They were primarily associated with the cultivated area and adjacent grassland where they were observed feeding intensively on grasshoppers. They typically spent the middle of the day and the night at the river, moving to and from the feeding areas in large flocks during the day. No breeding colonies were observed in the area.

*Butorides striatus* Green-backed Heron. C, at the Komadougou Yobé, Aug–Oct 2002–5.

*Egretta ardesiaca* Black Heron. C, along the Komadougou Yobé, Aug–Oct 2005, but none seen 2002 and 2003.

*E. garzetta* Little Egret. C, along the Komadougou Yobé, Aug–Oct 2002–5. Several at Diffa, Tam and Agaram, Jan 1994 and 1995 (NiBDaB).

*E. intermedia* Intermediate Egret. F, along the Komadougou Yobé, Aug–Oct 2002–5. Also at temporary pond at Nguigmi, 22 Aug 2003. Recorded at Diffa, Tam and Agaram, Jan 1995 (NiBDaB).

*E. alba* Great Egret. F, along the Komadougou Yobé, Aug–Oct 2002–5. Recorded at Diffa, Tam and Agaram, Jan 1994 and Diffa and Agaram, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

*Ardea purpurea* Purple Heron. F, along the Komadougou Yobé, Aug–Oct 2002–5. Also at Tam, Jan 1994, and Diffa, Tam and Agaram, Jan 1995 (NiBDaB).

*A. cinerea* Grey Heron. C, along the Komadougou Yobé, Aug–Oct 2002–5. Several at Tam, Diffa and Agaram, Jan 1994, and Diffa, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

*A. melanocephala* Black-headed Heron. C, Aug–Oct 2002–5. Several at Agaram, Jan 1994, and Diffa and Agaram, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Scopidae**

*Scopus umbretta* Hamerkop. One at a temporary pond near Sayam, 1 Oct 2005.

#### **Ciconiidae**

*Anastomus lamelligerus* African Openbill Stork. Flock of *c.* 30 at Komadougou Yobé, Aug 2002. Small flocks at Komadougou-Yobé, 29 Dec 1977 (Giraudoux *et al.* 1988)

*Ciconia nigra* Black Stork. A single bird circling over the grassland *c.* 10 km north of Diffa, 4 Oct 2005, appears to be the only record from the region (including NE Nigeria).

*C. abdimii* Abdim's Stork. VA, Aug–Oct 2002–5. Transect density: 7.4 per km<sup>2</sup> in Sep 2003; 22 per km<sup>2</sup> in Sep 2005. Large flocks were observed foraging in the grassland north of the Komadougou Yobé and in an area north of Kinzindi (Fig. 1). They were there from early Aug to late Sep or Oct and included a large proportion of juveniles. In 2003 their total number was estimated at *c.* 17,000, with numbers probably similar in 2002 and 2005 (Petersen *et al.* in press). Also common in Aug 1975 (Giraudoux *et al.* 1988). While in SE Niger the storks appeared to feed almost exclusively on medium size grasshoppers (Petersen *et al.* in press). In the morning and late afternoon they were typically spread out in the grassland in flocks of 30–200. When feeding, they often formed a “front of birds” and collectively walked or ran forward through the grass. This forced the grasshoppers to take off and the storks then tried to grab them in the air. This behaviour often attracted other bird species, in particular Black Kites and falcons (especially Lanners: see below), which swooped low over the storks to catch the low-flying grasshoppers in the air. By mid-day the storks typically congregated in flocks of up to several thousands and started to circle high over the grassland before flying to the Komadougou Yobé where they spent the middle of the day resting in the shallow water or in trees. Common in flocks near Cheri, 12 Aug 1975 (P.J. Jones *in litt.*) and Aug 1978 (Giraudoux *et al.* 1988).

*C. episcopus* Woolly-necked Stork. One resting at a temporary pond near Sayam, 1 Oct 2005.

*C. ciconia* White Stork. A flock of 1000 at a temporary pond 50 km southwest of Nguigmi, 21 Aug 2003; four at the same place, 3 Oct 2005; *c.* 100 30 km northeast of Diffa, 27 Sep 2005. The birds observed in August are unlikely to be migrants from Eurasia as those that follow the eastern flyway are known first to appear in S Sudan and Chad in mid-September (van den Bossche 2002). The same timing probably applies to the storks that take the western route over Gibraltar. It seems likely, therefore, that they were from the N African breeding population. Ringed White Storks breeding in Morocco, Algeria and Tunisia have been recovered from N Nigeria

(Elgood *et al.* 1994) and storks breeding in Algeria are known to leave the breeding area in mid-July and August to move south across the Sahara (Isenmann & Moali 2000). Flocks of 3, 25 and 100 were observed in the same area in Aug 1975 (Giraudoux *et al.* 1988).

*Leptoptilos crumeniferus* Marabou Stork. One in grassland near Diffa, 26 Sep 2003. Many seen between Mainé-Soroa and Nguigmi, Aug 1975, and small flocks at Komadougou Yobé, Dec 1977 (Giraudoux *et al.* 1988).

#### **Phoenicopteridae**

*Platalea leucorodia* Lesser Flamingo. Observed in late Feb and Oct 1970 at a small temporary lake among dunes north of L. Chad (Vielliard 1972).

#### **Threskiornithidae**

*Plegadis falcinellus* Glossy Ibis. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988) and at Tam, Jan 1995 (NiBDaB).

*Threskiornis aethiopicus* Sacred Ibis. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988) and at Agaram, Jan 1994 (NiBDaB).

#### **Anatidae**

*Dendrocygna bicolor* Fulvous Whistling Duck. Six at Agaram, 22 Jan 1994 (NiBDaB).

*D. viduata* White-faced Whistling Duck. C, Aug–Oct 2002–5. 32 at Diffa and 618 at Tam, Jan 1994; 30 at Agaram and 532 at Diffa, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

*Alopochen aegyptiacus* Egyptian Goose. Two at Tam, 22 Jan 1994; two at Diffa, 23 Jan 1995; one at Tam, 24 Jan 1995 (NiBDaB). One observation at Ngalaoua, 29 Dec 1977 (Giraudoux *et al.* 1988).

*Plectropterus gambensis* Spur-winged Goose. C, Aug–Oct 2002 and 2003; none in 2005. 26 at Agaram, 22 Jan 1994 (NiBDaB). In 1995, 23 were observed at Diffa, 23 Jan, and 6 at Agaram, 24 Jan (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

*Sarkidiornis melanotos* Knob-billed Goose. F, Aug–Sep 2003; none in 2002 or 2005. In 1994, 45 observed at Diffa, 20 Jan 1994, and one at Tam, 22 Jan 1994 (NiBDaB). In 1995, 263 at Diffa, 23 Jan, and 60 at Tam, 24 Jan (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

*Nettapus auritus* African Pygmy Goose. U, small numbers at Komadougou Yobé, Sep–Oct 2005. None observed in 2002 or 2003.

*Anas capensis* Cape Teal. A pair at Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

*A. acuta* Northern Pintail. 100 at Agaram, 22 Jan 1994 (NiBDaB). Several thousand on the Komadougou Yobé, with a particularly large concentration at Abadam, Dec 1977 (Giraudoux *et al.* 1988).

*A. hottentota* Hottentot Teal. Flock of 25 at a temporary pond near Nguigmi, 22 Aug 2003.

*A. querquedula* Garganey. C. 350 at a temporary pond 30 km north of Diffa, 30 Sep 2005. In 1994, 415 at Tam, 20 Jan, 85 at Diffa, 22 Jan, and 2500 at Agaram, 22 Jan



(NiBDaB). In 1975, 500 at Diffa, 26 Feb and 30 at Cheri, 24 Aug (Giraudoux *et al.* 1988).

*A. clypeata* Northern Shoveler. C. 35 at a temporary pond 30 km north of Diffa, 30 Sep 2005.

#### **Pandionidae**

*Pandion haliaetus* Osprey. One at Komadougou Yobé near Diffa, 7 Oct 2005.

#### **Accipitridae**

*Pernis apivorus* European Honey Buzzard. Three passing over Diffa, 29 Sep 2005.

*Elanus caeruleus* Black-shouldered Kite. C, Aug–Oct 2002–5. Density in grassland 0.1 per km<sup>2</sup> in Sep 2003; 0.1 per km<sup>2</sup> in Sep 2005. Observed at Tam and Agaram, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

*Chelictinia riocourii* African Swallow-tailed Kite. Five in grassland northwest of Diffa, 26 Sep 2002.

*Milvus migrans* Black Kite. VA, Aug–Oct 2002–5. Transect density: 6.3 per km<sup>2</sup> in Sep 2003, 2.8 per km<sup>2</sup> in Sep 2005. All individuals identified to subspecies were *M. m. parasitus*. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Neophron percnopterus* Egyptian Vulture. At Kaadjia, 13 Aug 1975 (Giraudoux *et al.* 1988).

*Necrosyrtes monachus* Hooded Vulture. Six at Tam, 24 Jan 1995 (NiBDaB). In the 1970s “common all year” (Giraudoux *et al.* 1988).

*Gyps africanus* African White-backed Vulture. Observed near Cheri, 12 Aug 1975 (P.J. Jones *in litt.*), between Diffa and Nguigmi, 22 Aug 1975, and between Cheri and Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

*G. rueppellii* Rüppell’s Griffon Vulture. Three between Diffa and Nguigmi, 22 Aug 2003. Observed at Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

*Torgos tracheliotus* Lappet-faced Vulture. At Maïné-Soroa, 24 Aug 1975, and at Abadam, 28 Dec 1977 (Giraudoux *et al.* 1988).

*Trigonoceps occipitalis* White-headed Vulture. At Abadam, 28 Dec 1977, and at Gueskéro, 29 Dec 1977 (Giraudoux *et al.* 1988).

*Circaetus gallicus* Short-toed Eagle. F, Aug–Oct 2002–5.

*C. beaudouini* Beaudouin’s Snake Eagle. U, rainy season 2003 and 2005. Transect density: 0.3 per km<sup>2</sup> in 2003 (zero in 2005).

*C. cinereus* Brown Snake Eagle. U, Aug–Sep 2003; none in 2002 and 2005.

*Terathopius ecaudatus* Bateleur. Three between Maïné-Soroa and Diffa, 25 Feb 1975; several between Cheri and Maïné-Soroa and between Maïné-Soroa and Nguigmi, 24 Aug 1975 (Giraudoux *et al.* 1988).

*Polyboroides typus* African Harrier Hawk. F, Aug–Oct 2002–5.

*Circus macrourus* Pallid Harrier. F, Aug–Oct 2002–5. Observed at Agaram and Tam, Jan 1995 (NiBDaB).

*C. pygargus* Montagu’s Harrier. F, Aug–Oct 2002–5.

*C. aeruginosus* Eurasian Marsh Harrier. F Aug–Oct 2002–5. Observed at Diffa and Tam, Jan 1995 (NiBDaB).

*Micronisus gabar* Gabar Goshawk. F, Aug–Oct 2002–5. Observed at Diffa, Jan 1995 (NiBDaB).

*Melierax metabates* Dark Chanting Goshawk. C, Aug–Oct 2002–5. Transect density: 0.7 per km<sup>2</sup> in Sep 2003 (zero in 2005). Also recorded Jan 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

*Accipiter badius* Shikra. C, Aug–Oct 2002–5. Transect density: 0.8 per km<sup>2</sup> in Sep 2003, 0.8 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Butastur rufipennis* Grasshopper Buzzard. A, Aug–Oct 2002–5. Transect density: 19 per km<sup>2</sup> in Sep 2003, 11 per km<sup>2</sup> in Sep 2005. Abundant in the grasslands in the S and E of the study area from the beginning of Aug to mid- or late Oct. Most were juveniles. The buzzards fed almost exclusively on grasshoppers on the ground by either swooping down from trees to grab them on the ground or by walking and catching the grasshoppers with their feet. Also recorded in Aug 1975 (Giraudoux *et al.* 1988, P.J. Jones *in litt.*).

*Buteo rufinus* Long-legged Buzzard. One at Diffa, 23 Jan 1995 (NiBDaB).

*B. auguralis* Red-necked Buzzard. C, Aug–Oct 2002–5. Transect density: 1.8 per km<sup>2</sup> in Sep 2003, 2.1 per km<sup>2</sup> in Sep 2005. Also recorded Jan 1995 (NiBDaB) and Aug 1975 (Giraudoux *et al.* 1988, P.J. Jones *in litt.*).

*Aquila pomarina* Lesser Spotted Eagle. R; one between Maïné-Soroa and Diffa, 7 Oct 2005.

*A. rapax* Tawny Eagle. C, Aug–Oct 2002–5. Transect density 0.1 per km<sup>2</sup> in Sep 2005 (zero in 2003). Recorded in the 1970s (Giraudoux *et al.* 1988).

*A. wahlbergi* Wahlberg's Eagle. One at Komadougu-Yobé west of Diffa, 30 Jul 2002.

*Hieraetus pennatus* Booted Eagle. C, Sep–Oct 2005, U in Aug–Sep 2002–3.

#### **Sagittariidae**

*Sagittarius serpentarius* Secretary Bird. “Frequently observed near Nguigmi” (Rousselot 1947). Observed between Cheri and Maïné-Soroa, 12 Aug 1975, and south of Maïné-Soroa, 25 Dec 1977 (Giraudoux *et al.* 1988).

#### **Falconidae**

*Falco naumanni* Lesser Kestrel. A flock of 35 feeding on grasshoppers flushed by foraging Abdim's Storks c. 10 km east of Maïné-Soroa, 26 Sep 2005.

*F. tinnunculus* Common Kestrel. F, Aug–Oct 2002–5. Transect density: 0.4 per km<sup>2</sup> in Sep 2005 (zero in 2003). Recorded in the 1970s (Giraudoux *et al.* 1988).

*F. alopex* Fox Kestrel. SGB. C, Aug–Sep 2002; F, Sep–Oct 2003 and 2005. Transect density: 0.2 per km<sup>2</sup> in Sep 2005 (zero in 2003).

*F. ardosiaceus* Grey Kestrel. One at Diffa, 20 Aug 2003; one near Sayam, 1 Oct 2005. One, 110 km south of Nguigmi, 23 Aug 1975 (Giraudoux *et al.* 1988).

*F. chicquera* Red-necked Falcon. F, Aug–Oct 2002–5. Transect density: 0.2 per km<sup>2</sup> in Sep 2005 (zero in 2003).

*F. vespertinus* Red-footed Falcon. One near Maïné-Soroa, 25 Sep 2005.

*F. subbuteo* Eurasian Hobby. U, Aug–Oct 2002–5.

*F. cuvierii* African Hobby. One chasing grasshoppers flushed by foraging Abdim's Storks near Maïné-Soroa, 24 Sep 2005.

*F. biarmicus* Lanner Falcon. C, Aug–Oct 2002–5. Transect density: 1.7 per km<sup>2</sup> in Sep 2003, 1.4 per km<sup>2</sup> in Sep 2005. Lanners were very numerous in SE Niger in Aug–Oct 2002, 2003 and 2005, in particular in areas with feeding flocks of Abdim's Storks. As soon as storks started to feed on grasshoppers, Lanners arrived and started flying low over them to grab flushed grasshoppers in mid-air. Up to four Lanners were observed feeding together over a flock of storks. It seems likely that several hundred Lanners were congregated in SE Niger during these periods.

#### **Phasianidae**

*Coturnix coturnix* Common Quail. C, Sep–Oct 2005; none in 2002 and 2003. Transect density 0.6 per km<sup>2</sup> in Sep 2005.

*Francolinus clappertoni* Clapperton's Francolin. F, Sep 2003; none in 2002 or 2005. Transect density 0.3 per km<sup>2</sup> in Sep 2003. Observed at Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

#### **Turnicidae**

*Ortyxelos meiffrenii* Quail-plover. F, Sep 2003; two, 27 Sep 2005; none in 2002. Transect density: 1.3 per km<sup>2</sup> in Sep 2003 (zero in 2005). Observed at Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

*Turnix sylvatica* Little Buttonquail. A single observation, Sep 2003; none in 2002 and 2005. Transect density: 0.7 per km<sup>2</sup> in Sep 2003 (zero in 2005).

#### **Rallidae**

*Amaurornis flavirostris* Black Crane. Observed at Bosso, 28 Dec 1977 (Giraudoux *et al.* 1988).

*Gallinula chloropus* Common Moorhen. C, along Komadougou Yobé, Aug–Oct 2002–5. At Diffa and Tam, Jan 1995 (NiBDaB).

#### **Gruidae**

*Balearica pavonina* Black Crowned Crane. Between Cheri and Maïné-Soroa, 24 Aug 1975; at Kaadjia. 13 Aug 1975; at Ngalaoua, 29 Dec 1977 (Giraudoux *et al.* 1988).

#### **Otididae**

*Neotis denhami* Denham's Bustard. A single bird and a pair observed in grassland c. 20 km north of Diffa, 25 Sep 2003. Two between Nguigmi and Maïné-Soroa, 23 Aug 1975 (Giraudoux *et al.* 1988).

*N. nuba* Nubian Bustard. SB. Observed twice: a pair in a mosaic of grassland and millet fields near Diffa, 24 Sep 2002; another pair in similar habitat near Diffa, 26 Sep 2003. In Aug 1975 several were observed and three nests found in the Dillia de Lagana valley between 130 and 167 km northwest of Nguigmi just north of Zone 4 (Giraudoux *et al.* 1988). The pairs near Diffa during the rains in 2002 and 2003 suggest that the grasslands west of L. Chad may still hold a breeding population of this rare bustard.

*Ardeotis arabs* Arabian Bustard. SB. One in grassland northwest of Diffa, 24 Sep 2002.

*Eupodotis senegalensis* White-bellied Bustard. One near Diffa, 23 Sep 2003.

*E. melanogaster* Black-bellied Bustard. F, Sep 2002; U, Sep 2003; none in 2005. Transect density: 0.3 per km<sup>2</sup> in Sep 2003.

**Jacanidae**

*Actophilornis africana* African Jacana. C, at Komadougou Yobé, Aug–Oct 2002–5. At Diffa, Tam and Agaram, Jan 1994 and 1995 (NiBDaB).

*Microparra capensis* Lesser Jacana. One at Tam, 22 Jan 1994 (NiBDaB).

**Recurvirostridae**

*Himantopus himantopus* Black-winged Stilt. C, Aug–Oct 2002–5. At Diffa, Tam and Agaram, Jan 1994; at Diffa, Tam and Agaram, Jan 1995 (NiBDaB). Common at Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

*Recurvirostra avosetta* Pied Avocet. At Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

**Burhinidae**

*Burhinus senegalensis* Senegal Thick-knee. Ten between Cheri and Mainé-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

*B. capensis* Spotted Thick-knee. C, Aug–Oct 2002–5. Transect density: 1.7 per km<sup>2</sup> in Sep 2003 (zero in 2005). Recorded in the 1970s (Giraudoux *et al.* 1988).

**Glareolidae**

*Pluvianus aegyptius* Egyptian Plover. Flock of eight at Komadougou Yobé near Diffa, 23 Aug 2003.

*Rhinoptilus chalcopterus* Bronze-winged Courser. Two in farmland near Diffa, 24 Sep 2005.

*Glareola cinerea* Grey Pratincole. Observed at Kaadjia, 13 Aug 1975 (Giraudoux *et al.* 1988).

**Charadriidae**

*Charadrius dubius* Little Ringed Plover. Small numbers at Diffa and Tam, Jan 1994 and 1995 (NiBDaB). Observed at Kaadjia, 13 Aug 1975, and at Abadam, 28 Dec 1977 (Giraudoux *et al.* 1988).

*C. pecuarius* Kittlitz's Plover. Five at Diffa, 20 Jan 1995, and two, 23 Jan 1995 (NiBDaB). Observed at Kaadjia, 13 Aug 1975, and at Diffa, 25 Dec 1977 (Giraudoux *et al.* 1988).

*C. marginatus* White-fronted Plover. One at Diffa, 20 Jan 1994 (NiBDaB). Observed at Kaadjia, 24 Aug 1975 (Giraudoux *et al.* 1988).

*Vanellus tectus* Black-headed Lapwing. A, Aug–Oct 2002–5. Transect density: 34 per km<sup>2</sup> in Sep 2003, 25 per km<sup>2</sup> in Sep 2005. Recorded in Jan 1994 and 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

*V. spinosus* Spur-winged Lapwing. C, Aug–Oct 2002–5. Transect density: 0.7 per km<sup>2</sup> in Sep 2003 (zero in 2005). Recorded in Jan 1994 and 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

**Scolopacidae**

*Calidris minuta* Little Stint. At Diffa, 351 on 22 Jan 1994 and two, 23 Jan 1995 (NiBDaB). Observed at Cheri, 24 Aug 1975, and Bosso, 28 Dec 1977 (Giraudoux *et al.* 1988).

*C. temminckii* Temminck's Stint. U, Aug–Oct 2002–5.

*Philomachus pugnax* Ruff. F, Aug–Oct 2002–5. At Diffa, 398 on 20 Jan 1994 and five, 23 Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

*Gallinago gallinago* Common Snipe. Fifteen at Diffa, 20 Jan 1994; one at Tam, 22 Jan 1994; one at Tam, 24 Jan 1995 (NiBDaB). At Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

*Limosa limosa* Black-tailed Godwit. 32 at Diffa, 20 Jan 1994 (NiBDaB).

*Tringa erythropus* Spotted Redshank. Four at a temporary pond near Sayam, 1 Oct 2005. 710 at Diffa, 20 Jan 1994 (NiBDaB). One at Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

*T. totanus* Common Redshank. U, Aug–Oct 2002–5.

*T. stagnatilis* Marsh Sandpiper. Two at a temporary pond near Sayam, 1 Oct 2005. One at Tam, 22 Jan 1994 (NiBDaB).

*T. nebularia* Common Greenshank. At Diffa, 25 on 20 Jan 1994 and one, 23 Jan 1995 (NiBDaB).

*T. ochropus* Green Sandpiper. F, Aug–Oct 2002–5. Transect density: 0.1 per km<sup>2</sup> in Sep 2003, 0.1 per km<sup>2</sup> in Sep 2005. Five at Diffa, 23 Jan 1995 (NiBDaB).

*T. glareola* Wood Sandpiper. F, Aug–Oct 2002–5. Transect density: 0.8 per km<sup>2</sup> in Sep 2005 (zero in 2003). Recorded Jan 1994 and 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

*Actitis hypoleucos* Common Sandpiper. F, Aug–Oct 2002–5. Four at Diffa, 23 Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Sternidae**

*Chlidonias hybridus* Whiskered Tern. C, along the Komadougou Yobé near Diffa, Aug–Oct 2002–2005. Three at Diffa, 20 Jan 1994 (NiBDaB).

*C. leucopterus* White-winged Tern. Observed at Kaadjia, 13 Aug 1975 (Giraudoux *et al.* 1988).

#### **Pteroclididae**

*Pterocles exustus* Chestnut-bellied Sandgrouse. C, Aug–Oct 2002–5. Transect density: 1.7 per km<sup>2</sup> in Sep 2003 (zero in 2005). Recorded in the 1970s (Giraudoux *et al.* 1988).

*P. quadricinctus* Four-banded Sandgrouse. C, Aug–Oct 2002–5. Transect density: 2.5 per km<sup>2</sup> in Sep 2003, 1.1 per km<sup>2</sup> in Sep 2005. Between Cheri and Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

#### **Columbidae**

*Treron waalia* Bruce's Green Pigeon. Three in Diffa, 20 Aug 2003.

*Oena capensis* Namaqua Dove. A, Aug–Oct 2002–5. Transect density: 18 per km<sup>2</sup> in Sep 2003, 10 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Columba guinea* Speckled Pigeon. C, Aug–Oct 2002–5. Transect density: 0.3 per km<sup>2</sup> in Sep 2003, 0.2 per km<sup>2</sup> in Sep 2005. Observed at Cheri and Kaadjia, 12–13 Aug 1975 (Giraudoux *et al.* 1988).

*Streptopelia decipiens* African Mourning Dove. F, Aug–Oct 2002–5. Transect density: 0.6 per km<sup>2</sup> in Sep 2005 (zero in 2003).

*S. vinacea* Vinaceous Dove. A, Aug–Oct 2002–5. Transect density: 6.2 per km<sup>2</sup> in Sep 2003, 7.8 per km<sup>2</sup> in Sep 2005.

*S. roseogrisea* African Collared Dove. SB. VA, Aug–Oct 2002–5. Transect density: 42 per km<sup>2</sup> in Sep 2003, 19 per km<sup>2</sup> in Sep 2005. Very common at Kaadjia, 25 Feb 1975 and common between Cheri and Nguigmi, 12 Aug 1975 (Giraudoux *et al.* 1988).

*S. turtur* European Turtle Dove. C, Sep 2003; none in 2002 and 2005. Transect density: 10 per km<sup>2</sup> in Sep 2003.

*S. senegalensis* Laughing Dove. A, Aug–Oct 2002–5. Transect density: 10 per km<sup>2</sup> in Sep 2003, 2.5 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Psittacidae**

*Psittacula krameri* Rose-ringed Parakeet. U, Aug–Oct 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Musophagidae**

*Crinifer piscator* Western Grey Plantain-eater. F, Aug–Oct 2002–5.

#### **Cuculidae**

*Oxylophus jacobinus* Jacobin Cuckoo. F, Aug–Oct 2002–5. Transect density: 0.3 per km<sup>2</sup> in Sep 2003, 0.8 per km<sup>2</sup> in Sep 2005.

*Clamator glandarius* Great Spotted Cuckoo. F, Aug–Oct 2002–5. Transect density: 1.0 per km<sup>2</sup> in Sep 2003, 0.5 per km<sup>2</sup> in Sep 2005.

*Cuculus solitarius* Red-chested Cuckoo. A single observation near Diffa, 25 Sep 2003, the first record for Niger (Christensen *et al.* 2005).

*C. canorus* Common Cuckoo. Observed 113 km south of Nguigmi on the way to Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

*Chrysococcyx klaas* Klaas's Cuckoo. One near Diffa, 1 Aug 2003.

*C. caprius* Didric Cuckoo. F, Aug–Oct 2002–5.

*Centropus senegalensis* Senegal Coucal. C, Aug–Oct 2002–5.

#### **Strigidae**

*Ptilopsis leucotis* White-faced Owl. One at Sayam, 1 Oct 2005.

*Bubo africanus* Spotted Eagle Owl. One, west of Diffa, 31 Jul 2002.

*B. lacteus* Verreaux's Eagle Owl. One, northeast of Diffa, 23 Sep 2005.

#### **Apodidae**

*Cypsiurus parvus* African Palm Swift. C, Aug–Oct 2002–5.

*Apus pallidus* Pallid Swift. One over Diffa, 6 Oct 2005.

*A. apus* Common Swift. C, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

*A. caffer* White-rumped Swift. One foraging over a pond north of Diffa, 27 Sep 2005; one with Little Swifts in Diffa, 6 Oct 2005.

*A. affinis* Little Swift. A, Aug–Oct 2002–5.

#### **Coliidae**

*Urocolius macrourus* Blue-naped Mousebird. F, Aug–Oct 2002–5. Transect density: 0.9 per km<sup>2</sup> in Sep 2003, 1.4 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Alcedinidae**

*Halcyon leucocephala* Grey-headed Kingfisher. F, Sep 2003 and Sep–Oct 2005.

*H. senegalensis* Woodland Kingfisher. F, Aug–Oct 2002–5. Transect density: 0.3 per km<sup>2</sup> in Sep 2003 (zero in 2005).

*H. chelicuti* Striped Kingfisher. F, Aug–Oct 2002–5. Transect density: 0.4 per km<sup>2</sup> in Sep 2003 (zero in 2005). Recorded in the 1970s (Giraudoux *et al.* 1988).

*Alcedo cristata* Malachite Kingfisher. C, along Komadougou Yobé, Aug–Oct 2002–5. Observed at Diffa, Jan 1995 (NiBDaB).

*Ceryle rudis* Pied Kingfisher. C, along Komadougou Yobé, Aug–Oct 2002–5. Recorded in Jan 1994 and 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

#### **Meropidae**

*Merops pusillus* Little Bee-eater. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

*M. albicollis* White-throated Bee-eater. A–VA, Aug–Oct 2002–5. Transect density: 18 per km<sup>2</sup> in Sep 2003, 34 per km<sup>2</sup> in Sep 2005. In addition to the birds on stopover that were recorded on the transects, very large numbers were observed on southward migration in Sep–Oct 2003 and 2005. Throughout SE Niger flocks of 10–50 were observed resting in trees and bushes. About half of them were juveniles. They mainly took grasshoppers, either in the air or on the ground, mostly without landing. Recorded in the 1970s (Giraudoux *et al.* 1988).

*M. orientalis* Little Green Bee-eater. C, Aug–Oct 2002–5. Transect density: 1.6 per km<sup>2</sup> in Sep 2003 (zero in 2005). Recorded in the 1970s (Giraudoux *et al.* 1988).

*M. nubicus* Northern Carmine Bee-eater. C, at Komadougou Yobé near Diffa, Aug 2002. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Coraciidae**

*Coracias naevia* Rufous-crowned Roller. Near Diffa, 24 Aug 1975 (Giraudoux *et al.* 1988).

*C. abyssinicus* Abyssinian Roller. A, Aug–Oct 2002–5. Transect density: 16 per km<sup>2</sup> in Sep 2003, 24 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Phoeniculidae**

*Phoeniculus purpureus* Green Wood-hoopoe. C, Aug–Oct 2002–5. Transect density: 0.8 per km<sup>2</sup> in Sep 2003, 0.8 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Rhinopomastus aterrimus* Black Wood-hoopoe. F, Aug–Oct 2002–5. Transect density: 0.2 per km<sup>2</sup> in Sep 2003, 0.1 per km<sup>2</sup> in Sep 2005.

#### **Upupidae**

*Upupa epops* Hoopoe. C, Aug–Oct 2002–5. Transect density: 2.9 per km<sup>2</sup> in Sep 2003, 3.0 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Bucerotidae**

*Tockus erythrorhynchus* Red-billed Hornbill. C, Aug–Oct 2002–5. Transect density: 2.5 per km<sup>2</sup> in Sep 2003, 5.8 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*T. nasutus* African Grey Hornbill. A, Aug–Oct 2002–5. Transect density: 6.7 per km<sup>2</sup> in Sep 2003, 37 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Capitonidae**

*Lybius vieilloti* Vieillot's Barbet. F, Aug–Oct 2002–5. Transect density: 0.7 per km<sup>2</sup> in Sep 2003, 0.6 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Trachyphonus margaritatus* Yellow-breasted Barbet. Observed at Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

**Picidae**

*Jynx torquilla* Eurasian Wryneck. U, Aug–Oct 2002–5. Transect density: 0.5 per km<sup>2</sup> in Sep 2003, 0.4 per km<sup>2</sup> in Sep 2005.

*Dendropico elachus* Little Grey Woodpecker. SB. U, Aug–Oct 2002–5. Transect density: 0.7 per km<sup>2</sup> in Sep 2003 (zero in 2005).

*D. goertae* Grey Woodpecker. Observed at Kaadjia, 13 Aug 1975, and 110 km south of Nguigmi, 23 Aug 1975 (Giraudoux *et al.* 1988).

**Alaudidae**

*Mirafra cantillans* Singing Bush Lark. A, Aug–Oct 2002–5. Transect density: 25 per km<sup>2</sup> in Sep 2003, 18 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Pinarocorys erythropygia* Rufous-rumped Lark. U, Sep 2003; not seen in 2002 and 2005. Transect density: 1.1 per km<sup>2</sup> in Sep 2003.

*Eremalauda dunnii* Dunn's Lark. SB. F, Sep 2003; none in 2002 and 2005. Transect density: 2.2 per km<sup>2</sup> in Sep 2003.

*Galerida cristata* Crested Lark. C, Aug–Oct 2002–5. Transect density: 2.1 per km<sup>2</sup> in Sep 2003, 0.7 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Eremopterix leucotis* Chestnut-backed Sparrow Lark. A, Aug–Oct 2002–5. Transect density: 32 per km<sup>2</sup> in Sep 2003, 35 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*E. nigriceps* Black-crowned Sparrow Lark. A, Aug–Oct 2002–5. Transect density: 20 per km<sup>2</sup> in Sep 2003, 3.2 per km<sup>2</sup> in Sep 2005. Also recorded in Mar and in large numbers in Aug 1975 (Giraudoux *et al.* 1988, P.J. Jones *in litt.*).

**Hirundinidae**

*Riparia paludicola* Plain Martin. F, Sep–Oct 2005.

*R. riparia* Common Sand Martin. C, Aug–Oct 2002–5.

*Hirundo daurica* Red-rumped Swallow. F, Aug–Oct 2002–5.

*H. aethiopica* Ethiopian Swallow. C, Aug–Oct 2002–5.

*H. rustica* Barn Swallow. A, Aug–Oct 2002–5.

**Motacillidae**

*Motacilla flava* Yellow Wagtail. C, Aug–Oct 2002–5. Transect density: 2.2 per km<sup>2</sup> in Sep 2003, 3.6 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Anthus campestris* Tawny Pipit. Three in a tree in grassland near Diffa, 24 Sep 2002; one near Sayam, 1 Oct 2005.

*A. trivialis* Tree Pipit. C, Sep 2003; none in 2002 and 2005. Transect density: 3.9 per km<sup>2</sup> in Sep 2003.

**Pycnonotidae**

*Pycnonotus barbatus* Common Bulbul. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

**Turdidae**

*Cercotrichas galactotes* Rufous Scrub Robin. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).



*C. podobe* Black Scrub Robin. SB. C, Aug–Oct 2002–5. Transect density: 6.8 per km<sup>2</sup> in Sep 2003, 10 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Saxicola rubetra* Whinchat. C, Aug–Oct 2002–5. Transect density: 1.2 per km<sup>2</sup> in Sep 2003, 1.1 per km<sup>2</sup> in Sep 2005.

*Oenanthe oenanthe* Northern Wheatear. C, Aug–Oct 2002–5. Transect density: 2.0 per km<sup>2</sup> in Sep 2003, 5.6 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*O. hispanica* Black-eared Wheatear. C, Aug–Oct 2002–5. Transect density: 1.2 per km<sup>2</sup> in Sep 2003, 2.2 per km<sup>2</sup> in Sep 2005.

*O. heuglini* Heuglin's Wheatear. F, Sep 2002 and 2003; none in 2005. Transect density: 0.4 per km<sup>2</sup> in Sep 2003.

*O. isabellina* Isabelline Wheatear. C, Sep 2002 and 2003; none in 2005. Transect density: 2.0 per km<sup>2</sup> in Sep 2003.

*Myrmecocichla aethiops* Northern Anteater Chat. U, Sep 2002 and Sep 2005 near Diffa; none in 2003.

#### **Sylviidae**

*Hippolais pallida* Olivaceous Warbler. C, Aug–Oct 2002–5. Transect density: 1.3 per km<sup>2</sup> in Sep 2003, 4.3 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Cisticola ruficeps* Red-pate Cisticola. F, Sep 2002 and 2003. Transect density: 0.5 per km<sup>2</sup> in Sep 2003.

*C. juncidis* Zitting Cisticola. C, Sep 2003; none in 2002 and 2005. Transect density: 1.6 per km<sup>2</sup> in Sep 2003.

*C. aridus* Desert Cisticola. C, Aug–Oct 2002–5. Transect density: 9.9 per km<sup>2</sup> in Sep 2003, 8.6 per km<sup>2</sup> in Sep 2005.

*Prinia subflava* Tawny-flanked Prinia. A pair near Maïné-Soroa, 30 Jul 2002.

*P. fluviatilis* River Prinia. SB. A pair observed building nest in low vegetation flooded by the Komadougou Yobé at Diffa, 23 Sep 2005. The nest was only a few m from the road bridge over the river to Nigeria. The birds were still finishing the nest on 29 Sep. Since it has been uncertain if the type locality of this species was in Mali or Niger (Brouwer *et al.* 2001), this appears to be the first definite record from Niger.

*Spiloptila clamans* Cricket Warbler. SB. A, Aug–Oct 2002–5. Transect density: 14 per km<sup>2</sup> in Sep 2003, 21 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Phyllolais pulchella* Buff-bellied Warbler. A pair *c.* 40 km west of Diffa, 25 Sep 2005, the first record for Niger (Christensen *et al.* 2005).

*Camaroptera brachyura* Grey-backed Camaroptera. F, Aug–Oct 2002–5, in gardens in Diffa. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Eremomela icteropygialis* Yellow-bellied Eremomela. C, Aug–Oct 2002–5. Transect density: 1.1 per km<sup>2</sup> in Sep 2003, 1.5 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Sylvietta brachyura* Northern Crombec. Observed at Kaadija, 26 Feb 1975 (Giraudoux *et al.* 1988).

*Phylloscopus collybita* Chiffchaff. F, Sep 2002 and 2003; none in 2005. Transect density: 0.7 per km<sup>2</sup> in Sep 2003.

*P. trochilus* Willow Warbler. C, Sep 2003; none in 2002 and 2005. Transect density: 4.7 per km<sup>2</sup> in Sep 2003.

*P. sibilatrix* Wood Warbler. A, Sep 2003; none in 2002 and 2005. Transect density: 0.7 per km<sup>2</sup> in Sep 2003.

*P. bonelli* Western Bonelli's Warbler. One northeast of Diffa, 23 Sep 2002.

*Sylvia hortensis* Orphean Warbler. Observed in Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

*S. borin* Garden Warbler. C, Sep 2003. Transect density: 1.3 per km<sup>2</sup> in Sep 2003 (none in 2005).

*S. communis* Common Whitethroat. C, Sep 2003; F, Sep–Oct 2005; none in 2002. Transect density: 1.3 per km<sup>2</sup> in Sep 2003, 0.6 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*S. curruca* Lesser Whitethroat. F, Sep 2003; none in 2002 and 2005. Transect density: 0.7 per km<sup>2</sup> in Sep 2003. Common in Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

*S. cantillans* Subalpine Warbler. C, Sep 2002 and 2003; A, Sep–Oct 2005. Transect density: 0.7 per km<sup>2</sup> in Sep 2003, 21 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Muscicapidae**

*Melaenornis pallidus* Pale Flycatcher. One near Diffa, 24 Sep 2002.

*Muscicapa striata* Spotted Flycatcher. C, Aug–Oct 2002–5. Transect density: 2.7 per km<sup>2</sup> in Sep 2003, 8.5 per km<sup>2</sup> in Sep 2005.

#### **Remizidae**

*Anthoscopus punctifrons* Sennar Penduline Tit. SB. A pair near Diffa, 24 Sep 2002.

#### **Nectariniidae**

*Hedydipna platura* Pygmy Sunbird. C, Aug–Oct 2002–5. Transect density: 2.7 per km<sup>2</sup> in Sep 2003, 1.5 per km<sup>2</sup> in Sep 2005.

*Cinnyris pulchellus* Beautiful Sunbird. C, Aug–Oct 2002–5. Transect density: 2.1 per km<sup>2</sup> in Sep 2003, 1.3 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Laniidae**

*Lanius meridionalis* Southern Grey Shrike. A, Aug–Oct 2002–5. Transect density: 8.5 per km<sup>2</sup> in Sep 2003, 6.3 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*L. collurio* Red-backed Shrike. F, Sep 2003; none in 2002 and 2005. Transect density: 1.0 per km<sup>2</sup> in Sep 2003.

*L. senator* Woodchat Shrike. A, Aug–Oct 2002–5. Transect density: 9.1 per km<sup>2</sup> in Sep 2003, 8.8 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Malaconotidae**

*Laniarius barbarus* Yellow-crowned Gonolek. F, Sep 2002 near the Komadougou Yobé; none in 2003 and 2005. Common along the river, Dec 1977 (Giraudoux *et al.* 1988).

*Nilaus afer* Brubru. F Sep 2003; none in 2002 and 2005. Transect density: 1.0 per km<sup>2</sup> in Sep 2003.

#### **Oriolidae**

*Oriolus oriolus* Eurasian Golden Oriole. C, Sep 2003 and Sep–Oct 2005; none in 2002. Transect density: 2.5 per km<sup>2</sup> in Sep 2003, 6.1 per km<sup>2</sup> in Sep 2005.

#### **Dicruridae**

*Dicrurus adsimilis* Fork-tailed Drongo. Observed 130 km south of Nguigmi, 24 Aug 1975 (Giraudoux *et al.* 1988).

#### **Corvidae**

*Corvus ruficollis* Brown-necked Raven. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

*C. albus* Pied Crow. C, Aug–Oct 2002–5 (in towns). Recorded in the 1970s (Giraudoux *et al.* 1988).

*Ptilostomus afer* Piapiac. Observed in an oasis between Cheri and Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

#### **Sturnidae**

*Lamprotornis purpureus* Purple Glossy Starling. U, Sep 2002.

*L. chalybaeus* Greater Blue-eared Starling. A, Aug–Oct 2002–5. Transect density: 11 per km<sup>2</sup> in Sep 2003, 14 per km<sup>2</sup> in Sep 2005.

*L. caudatus* Long-tailed Glossy Starling. U, Sep–Oct 2005; none in 2002 and 2003. Transect density 0.1 per km<sup>2</sup> in Sep 2005.

*L. pulcher* Chestnut-bellied Starling. SB. A, Aug–Oct 2002–5. Transect density: 25 per km<sup>2</sup> in Sep 2003, 22 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Buphagidae**

*Buphagus africanus* Yellow-billed Oxpecker. F, Sep 2002 and Sep–Oct 2005; none in 2003. Transect density: 0.3 per km<sup>2</sup> in Sep 2005.

#### **Passeridae**

*Passer domesticus* House Sparrow. A male in Nguigmi, 21 Aug 2003. None recorded in 2005 in spite of search.

*P. griseus* Northern Grey-headed Sparrow. VA, Aug–Oct 2002–5. Transect density: 23 per km<sup>2</sup> in Sep 2003, 53 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*P. luteus* Sudan Golden Sparrow. SB. VA, Aug–Oct 2002–5. Transect density: 330 per km<sup>2</sup> in Sep 2003, 1600 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Petronia pyrgita* Yellow-spotted Petronia. One near the road between Diffa and Maïné-Soroa, 26 Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*P. dentata* Bush Petronia. F, Aug–Oct 2002–5. Transect density: 0.7 per km<sup>2</sup> in Sep 2003, 1.8 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Ploceidae**

*Bubalornis albirostris* White-billed Buffalo Weaver. A, Aug–Oct 2002–5. Transect density: 16 per km<sup>2</sup> in Sep 2003, 24 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Sporopipes frontalis* Speckle-fronted Weaver. C, Aug–Oct 2002–5. Transect density: 3.9 per km<sup>2</sup> in Sep 2003, 8.2 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Ploceus luteolus* Little Weaver. C, Aug–Oct 2002–5. Transect density: 0.5 per km<sup>2</sup> in Sep 2003, 10 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*P. velatus* African Masked Weaver. C, Sep 2002 and 2003. Transect density: 5.8 per km<sup>2</sup> in Sep 2003. None in 2005.

*P. cucullatus* Village Weaver. C, Aug–Oct 2002–5.

*P. melanocephalus* Black-headed Weaver. F, Sep–Oct 2005 along Komadougou Yobé; none in 2002 and 2003.

*Quelea quelea* Red-billed Quelea. A, Sep 2003; none in 2002 and 2005. Transect density: 4.5 per km<sup>2</sup> in Sep 2003. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Euplectes afer* Yellow-crowned Bishop. F, Sep 2003 and Sep–Oct 2005. Transect density: 0.7 per km<sup>2</sup> in Sep 2003, 1.8 per km<sup>2</sup> in Sep 2005.

*E. franciscanus* Northern Red Bishop. C, Aug–Oct 2002–5. Transect density: 6.2 per km<sup>2</sup> in Sep 2003, 0.7 per km<sup>2</sup> in Sep 2005. Recorded at Cheri, 12 Aug 1975 (P.J. Jones *in litt.*).

#### **Estrilididae**

*Pytilia melba* Green-winged Pytilia. Observed in Kaadjia, 26 Feb and 13 Aug 1975, and 110 km south of Nguigmi, 23 Aug 1975 (Giraudoux *et al.* 1988).

*Lagonosticta senegala* Red-billed Firefinch. C, Aug–Oct 2002–5. Transect density: 1.9 per km<sup>2</sup> in Sep 2003, 2.2 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Uraeginthus bengalus* Red-cheeked Cordon-bleu. C, Aug–Oct 2002–5. Transect density: 1.2 per km<sup>2</sup> in Sep 2003, 4.4 per km<sup>2</sup> in Sep 2005.

*Lonchura cantans* African Silverbill. F, Sep–Oct 2005; none in 2002 and 2003. Transect density: 0.3 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*Amadina fasciata* Cut-throat. C, Aug–Oct 2002–5. Transect density: 5.6 per km<sup>2</sup> in Sep 2003, 5.1 per km<sup>2</sup> in Sep 2005.

#### **Viduidae**

*Vidua chalybeata* Village Indigobird. F, Sep 2003; none in 2002 and 2005. Transect density: 1.2 per km<sup>2</sup> in Sep 2003. Recorded in Nguigmi, 23 Aug 1975 (Giraudoux *et al.* 1988).

*V. orientalis* Sahel Paradise Whydah. F, Aug–Oct 2002–5. Transect density: 1.1 per km<sup>2</sup> in Sep 2003, 0.3 per km<sup>2</sup> in Sep 2005. Recorded at Kaadjia, 13 Aug 1975 (Giraudoux *et al.* 1988), and at Cheri, 12 Aug 1975 (P.J. Jones *in litt.*).

#### **Fringillidae**

*Serinus leucopygius* White-rumped Seed-eater. F, Sep–Oct 2005; none in 2002 and 2003. Transect density: 1.0 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

#### **Emberizidae**

*Emberiza tahapisi* Cinnamon-Breasted Rock Bunting. F, Aug–Oct 2002–5. Transect density: 1.7 per km<sup>2</sup> in Sep 2003, 0.8 per km<sup>2</sup> in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

*E. flaviventris* African Golden-breasted Bunting. Observed at Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

## Discussion

### Limitations to the list of birds known from SE Niger

The number of bird species recorded in SE Niger will most likely increase when more field studies are carried out. At Malamfatori in NE Nigeria, c. 10 km south of Bosso, 311 bird species were encountered in 1997–2000, of which 105 were Palearctic migrants (Gustafsson *et al.* 2003). The tree cover at Malamfatori may be slightly denser than north of the border and the study in Nigeria included netting on the old lake bottom (Ottosson *et al.* 2002), a habitat that has so far not been studied on the Niger side. There has been no netting in SE Niger and this may partly explain the lower number of Palearctic passerines recorded. Species recorded at Malamfatori that are probably also present on the Niger side of the border include the five species of nightjars (no nightjars have been recorded from SE Niger), Black-billed Wood Dove *Turtur abyssinicus*, Black-headed Tchagra *Tchagra senegala*, Black-headed Gonolek *Laniarius erythrogaster*, Orange-cheeked Waxbill *Estrilda melpoda* and Black-rumped Waxbill *E. troglodytes*, which are all common just south of the border (Gustafsson *et al.* 2003). Some major differences do seem to exist, however, between the avifauna in SE Niger and neighbouring Nigeria. For instance, the large flocks of Abdim's Storks and Cattle Egrets and the high density of Grasshopper Buzzards in the southern part of SE Niger in Aug–Oct have not been noted for NE Nigeria.

### Post-breeding congregations

We noted that several bird species (particularly Cattle Egret, Abdim's Stork, Grasshopper Buzzard, Red-necked Buzzard, Lanner Falcon, White-throated Bee-eater, Abyssinian Roller and African Grey Hornbill) were present in very high numbers compared to other parts of S Niger at the same time of year.

In Niger, Cattle Egrets usually breed in dense colonies in large trees in or just outside villages (pers. obs.). We saw scattered colonies further west in the central-southern part of Niger, but none in SE Niger. The many egrets associated with the grasslands and cultivation close to the Komadougou Yobé had therefore possibly arrived from breeding areas elsewhere, perhaps most likely from N Nigeria where large colonies are known in the Hadejia Wetlands (Elgood *et al.* 1994).

The breeding population of Abdim's Stork in SE Niger is relatively small, probably c. 100 pairs (unpubl. data). The young fledge around mid-Sep, but data (unpubl.) from satellite-tagged storks further west in Niger have shown that the young and adults usually stay in the nesting area until early Oct or early Nov. This strongly suggests that the large flocks of Abdim's Storks with a high proportion of juveniles

that arrived in SE Niger in early Aug, must come from breeding areas south of Niger, where the rainy season and consequently the nesting period start earlier (Petersen *et al.* in press).

The breeding status of the Grasshopper Buzzard in Niger is uncertain. Breeding is thought to take place during the rainy season (cf. Brouwer *et al.* 2000). The main nesting area is believed to be in the Sudan savanna further south (Thiollay 1978). The high numbers of this species observed in SE Niger between early Aug and early Oct, including many juveniles, point to an origin south of Niger where breeding starts earlier.

The Cattle Egrets, Abdim's Storks and Grasshopper Buzzards we observed in SE Niger during Aug–Oct all appeared to feed almost exclusively on grasshoppers. Their occurrence in high numbers outside or at the limit of their breeding area suggests a northwards post-breeding movement into SE Niger to utilise a superabundant food source for a couple of months before moving south as the dry season develops. High densities of Abdim's Stork and Cattle Egret were also recorded further west in N-central Niger in Sep but not in Jun–Jul (Petersen *et al.* in press). This suggests that these species make widespread northern movements at the end of the rains as an adaptation to the seasonal abundance of grasshoppers in the northern grassland. To what extent the high densities of Lanner Falcon in SE Niger during Aug–Nov reflect northern movements are less clear. This species is widespread throughout Sahelian Niger, and the high numbers observed may just be opportunistic congregation.

Abyssinian Roller and African Grey Hornbill were also observed in unexpectedly high densities, considering the relatively low number of potential nesting trees in SE Niger. Flocks of African Grey Hornbills were regularly observed flying in from the south. This was also observed in other parts of S Niger during the rains (pers. obs.). However, the densities of African Grey Hornbill in Jul–Sep in south-central Niger between Zinder and Tanout, with roughly the same precipitation and tree cover, only reached 1.1 per km<sup>2</sup> (Petersen *et al.* 2007), while the densities in SE Niger in September 2003 and 2005 were 6.7 per km<sup>2</sup> and 37 per km<sup>2</sup>, respectively. Migration of Abyssinian Rollers into SE Niger from the south was not observed, but most likely took place unnoticed as this species was recorded in densities of only 3.6 per km<sup>2</sup> between Zinder and Tanout in Jul–Sep (Petersen *et al.* 2007) and 16 per km<sup>2</sup> and 24 per km<sup>2</sup> in SE Niger in September 2003 and 2005, respectively. Many juveniles were observed of both Abyssinian Rollers and Grey Hornbills, suggesting that these species made post-breeding movements with their young to SE Niger, to feed on the abundance of grasshoppers.

The White-throated Bee-eater breeds in the northernmost sector of the Sahel during the rains (Fry & Harwin 1988). Some of the birds observed in SE Niger may therefore be local breeders, but the vast majority were undoubtedly on southward migration with their young from breeding sites further north. The very high densities recorded in Sep 2003 and 2005 (18 and 34 per km<sup>2</sup>, respectively), most likely represent birds that briefly stopped during their southward migration to feed on grasshoppers before continuing south. It is unknown if the bee-eaters migrate south on

a broad front, or if the high densities in SE Niger are of birds from a large breeding area that have moved specifically to this area.

#### **Trend over the past 30 years for certain species**

The limited fieldwork that has been carried out in SE Niger before 2002 makes it difficult to assess trends, but there are a number of exceptions. In the 1970s, six species of vulture were recorded from SE Niger, of which five appeared to be relatively common (Giraudoux *et al.* 1988). During our fieldwork, we saw vultures only once: a small flock of Rüppell's Griffon *Gyps rueppellii* between Kinzindi and Nguigmi on 22 Aug 2003. At Malamfatori, two African White-backed Vultures *Gyps africanus* and one Rüppell's Griffon were observed between 1997 and 2000 (Gustafsson *et al.* 2003). This suggests a large decline, in line with the findings of Thiollay (2006), who compared densities of raptors across W Africa in 1969–1973 with 2003–4 and found a 98% reduction in numbers. Bateleur *Terathopius ecaudatus* also seems to have declined greatly over the last three decades: P.J. Jones observed several between Maïné-Soroa and Diffa on 25 Feb 1975, and west of Maïné-Soroa and between Maïné-Soroa and Nguigmi on 24 Aug 1975 (Giraudoux *et al.* 1988, P.J. Jones pers. comm.). We never saw this species in SE Niger but it was observed twice in 2000 in neighbouring NE Nigeria (Gustafsson *et al.* 2003). The Secretary Bird *Sagittarius serpentarius* was “frequently observed near Nguigmi” (Rousselot 1947) and observed west of Maïné-Soroa on 12 Aug 1975 and south of Maïné-Soroa on 25 Dec 1977 (Giraudoux *et al.* 1988). We never saw this species in SE (or elsewhere in) Niger, and according to Thiollay (2006) it is probably now extinct in W Africa. The Marabou Stork *Leptoptilos crumeniferus* also appears to have declined much over the last decades. In Aug 1975 P.J. Jones observed several along the road between Maïné-Soroa and Nguigmi, and small flocks were present at Komadougou Yobé River in Dec 1978 (Giraudoux *et al.* 1988). The species was found breeding 54 km northwest of Nguigmi on 22 Aug 1975 just outside Zone 4 (Giraudoux *et al.* 1988). In the 1990s flocks of 10–20 were still observed annually between Maïné-Soroa and Diffa in Aug–Sep, feeding on grasshoppers with Abdim's Storks (Z. Ouambama pers. comm.). During our fieldwork we saw one only, on 26 Sep 2003. A few were observed in NE Nigeria in 2000 just south of the border (Gustafsson *et al.* 2003). This species is definitely much rarer now in SE Niger than just 10 years ago.

#### **Proposal for new IBA**

Brouwer *et al.* (2001) identified 15 Important Bird Areas (IBAs) for Niger. None includes the grasslands and wetlands of SE Niger. Based on the new knowledge of the avifauna, we propose that a new IBA be designated that encompasses the grassland and wetlands where the major concentrations of Abdim's Storks were located (Fig. 1). We also found this part of SE Niger to be especially important to several species of global conservation concern and for a number of species confined to the Sahel biome. The proposed IBA, the “Diffa-Kinzindi Grassland and Wetlands” meets the following criteria for qualification (as defined in Fishpool & Evans 2001):

A1. Six species of global conservation concern (<http://www.iucnredlist.org/> accessed Dec 2007) have been recorded at the site within the last 30 years: Rüppell's Griffon Vulture (Near-threatened), Beaudouin's Snake Eagle (Vulnerable), Pallid Harrier (Near-threatened), Lesser Kestrel (Vulnerable), Nubian Bustard (Near-threatened) and Black-tailed Godwit (Near-threatened). However, it is not known whether they are ever present in significant numbers.

A3. The site is known to hold a significant component of the group of species whose distribution is largely or wholly confined to the Sahel biome: 11 of the 16 species that occur in Niger have been recorded at the site. An additional species, Golden Nightjar *Caprimulgus eximius*, most likely occurs too, as it is known from Dilia de Lagané just north of the Diffa-Kinzindi grassland and wetlands (Brouwer *et al.* 2001) and has recently been recorded just across the border in NE Nigeria (Gustafsson *et al.* 2003).

A4iii. The site is known or thought to hold, on a regular basis, at least 20,000 waterbirds. Biologists studying grasshoppers in SE Niger since the mid-1990s have confirmed that flocks of Abdim's Storks of the same magnitude as in 2003 (where the numbers were estimated at 17,000), have been present annually from August to October for more than a decade. Also the very large numbers of Cattle Egrets observed in 2002, 2003 and 2005 are believed to be present every year and the combined number of Abdim's Storks and Cattle Egrets by far exceeds the 20,000 threshold.

#### Acknowledgments

We thank the staff at Agrhymet Regional Centre in Niamey, Niger, in particular Zakaria Ouambama, for important information on the birds of SE Niger and great company in the field. We also thank Knud Falk, Morten Møller Hansen, Marchel Rahner, Jan Fischer Rasmussen, Henrik Skov and Anders Tøttrup for help with the fieldwork and Christian Hjort for information on results of the Lake Chad Bird Migration Project at Malamfatori in NE Nigeria. Joost Brouwer is thanked for very valuable comments on an earlier version of this paper and for access to the information in the Niger Bird Database (NiBDaB). All data from the NiBDaB used in this paper were collected by Wim Mullié and he is thanked for permission to use this information. Peter Jones is thanked for helpful comments on the manuscript and for unpublished data from 1975. The fieldwork for this study was carried out as part of the Préliiss project funded by DANIDA.

#### References

- BATES, G.L. (1933) Birds of the southern Sahara and adjoining countries in French West Africa. Part I. *Ibis* (3)13: 752–780.



- BORROW, N. & DEMEY, R. (2001) *Birds of Western Africa*. Christopher Helm, London
- BOSSCHE, W. VAN DEN (2002) *Eastern European White Stork populations: Migration Studies and Elaboration of Conservation Measures*. Skripten 66, Bundesamt für Naturschutz, Bonn.
- BROUWER, J., MULLIÉ, W.C. & SOUVAIRAN, P. (2000) Colour of the downy young and notes on breeding and food of the Grasshopper Buzzard *Butastur rufipennis* in Niger. *Malimbus* 22: 34–37.
- BROUWER, J., CODJO, S.F. & MULLIÉ, W.C. (2001) Niger. Pp. 661–672 in FISHPOOL, L.D.C. & EVANS, M.I. (eds.) *Important Bird Areas in Africa and Associated Islands*. Pisces, Newbury.
- CHRISTENSEN, K.D., TØTTRUP, A.P., RAHNER, M.C. & BROUWER, J. (2005) First records for Niger of Red-chested Cuckoo *Cuculus solitarius*, Grassland Pipit *Anthus cinnamomeus*, Buff-bellied Warbler *Phyllolais pulchella* and Isabelline Shrike *Lanius isabellinus*. *Bull. Afr. Bird Club* 12: 162–164.
- ELGOOD, J.H., HEIGHAM, J.B., MOORE, A.M., NASON, A.M., SHARLAND, R.E. & SKINNER, N.J. (1994) *The Birds of Nigeria*. Checklist 4 (2nd ed.), British Ornithologists Union, Tring.
- FISHPOOL, L.D.C. & EVANS, M.I. (eds.) (2001) *Important Bird Areas in Africa and Associated Islands*. Pisces, Newbury.
- FRY, C.H. & HARWIN, M. (1988) Order Caprimulgiformes in FRY, C.H., KEITH, S. & URBAN, E.K. (eds.) *The Birds of Africa*, vol. 3. Academic Press, London.
- GIRAUDOUX, P., DEGAUQUIER, R., JONES, P., WEIGEL, J. & ISENMANN, P. (1988) Avifaune du Niger: état des connaissances en 1986. *Malimbus* 10: 1–140.
- GUSTAFSSON, R., HJORT, C., OTTOSSON, U. & HALL, P. (2003) Birds at Lake Chad and the Sahel of NE Nigeria 1997–2000. The Lake Chad Bird Migration Project. Special Rep., Ottenby Bird Observatory, Degerhamn.
- HARTERT, E. (1921) The birds collected by Capt. Angus Buchanan during his journey from Kano to Air or Asben. *Novit. Zool.* 1921: 78–141.
- ISENMANN, P. & MOALI, A. (2000) *Les Oiseaux d'Algérie — Birds of Algeria*. Société d'Etudes Ornithologiques de France, Paris.
- MOREL, G.J. & TYE, A. (1995) Guidelines for avifaunal papers in *Malimbus*. *Malimbus* 17: 35–37.
- MULLIÉ, W.C., BROUWER, J. & SCHOLTE, P. (1995) Numbers, distribution and habitat of wintering White Storks in the east-central Sahel in relation to rainfall, food and anthropogenic influences. Pp. 219–240 in BIBER, O., ENGGIST, C. MARTI, C. T. SALATHÉ (eds.) *Proceedings of the International Symposium on the White Stork (Western Population)*. Basel.
- OTTOSSON, U., BAIRLEIN, F., & HJORT, C. (2002) Migration patterns of Palaearctic *Acrocephalus* and *Sylvia* warblers in north-eastern Nigeria. *Vogelwarte* 41: 249–262.
- PETERSEN, B.S., CHRISTENSEN, K.D. & JENSEN, F.P. (2007) Bird population densities along two precipitation gradients in Senegal and Niger. *Malimbus* 79: 101–121.

- PETERSEN, B.S., CHRISTENSEN, K.D. & JENSEN, F.P. in press. Abdim's Stork *Ciconia abdimii* predation on Senegalese Grasshopper *Oedaleus senegalensis* in south-eastern Niger. *Waterbirds*
- ROSSELOT, R. (1947) Notes sur la faune ornithologique des cercles de Maradi et Tanout (Niger français). *Bull. Inst. Fr. Afr. Noire* 147: 99–137.
- THIOLLAY, J.-M. (1978) Les migrations de rapaces en Afrique Occidentale: adaptations écologique aux fluctuations saisonnières de production des écosystèmes. *Terre Vie* 32: 89–133.
- THIOLLAY, J.-M. (2006) The decline of raptors in West Africa: long term assessment and the role of protected areas. *Ibis* 148: 240–254.
- VIELLIARD, J. (1971) Données biogéographiques sur l'avifaune d'Afrique Centrale. *Alauda* 39: 227–248.