The Ortolan Bunting *Emberiza hortulana* wintering in West Africa, and its status as a passage migrant in Mauritania

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Summary

Information on the Ortolan Bunting *Emberiza hortulana* wintering in West Africa, the primary wintering area of the declining western European breeding populations, has not previously been consolidated. Here we present a comprehensive review of published and unpublished records of the species in West Africa. The majority of observations come from Mauritania, where the Ortolan Bunting is a regular passage migrant during autumn, especially along the coast, peaking in the first ten days of October, whereas spring migration is less marked and winter records are rare. Outside Mauritania, about 40 records from 11 countries exist, mostly from November to March. There are none south of 16°N before mid-November. Based on these, we consider that the core wintering area is most likely to be in highland grasslands, especially of the Fouta Djallon Massif in Guinea, around Mount Nimba in Guinea–Liberia, and in the Tingi and Loma Mountains in Sierra Leone. Observations from Nigeria, concentrated in open habitats on the Jos Plateau, indicate that the winter quarters extend that far east. However, a few winter records from further north may be indicative of overwintering in lowland savanna habitats.

Résumé

Le Bruant Ortolan *Emberiza hortulana* hivernant en Afrique de l'Ouest, et son statut en tant que migrateur de passage en Mauritanie. Les informations sur le Bruant Ortolan *Emberiza hortulana* hivernant en Afrique de l'Ouest, principale région d'hivernage des populations en déclin qui se reproduisent en Europe de l'Ouest, n'avaient pas auparavant été consolidées.

Nous présentons ici une revue complète des observations publiées et non publiées de l'espèce en Afrique de l'Ouest. La majorité des observations vient de la Mauritanie, où le Bruant Ortolan est un migrateur qui passe régulièrement en automne, surtout le long de la côte, avec un pic dans les dix premiers jours d'octobre, alors que la migration de printemps est moins marquée et que les observations en hiver sont rares. En dehors de la Mauritanie, environ 40 observations ont été faites dans 11 pays, la plupart de novembre à mars. Il n'y en a pas au sud de 16°N avant mi-novembre. Sur la base de ces observations, nous considérons que le cœur de la région d'hivernage doit se situer dans les prairies d'altitude, en particulier dans le massif du Fouta Djallon en Guinée, autour du Mont Nimba à la frontière de la Guinée et du Libéria, ainsi que dans les montagnes de Tingi et Loma en Sierra Leone. Des observations au Nigeria, concentrées dans les habitats ouverts du Plateau de Jos, indiquent que les quartiers d'hiver s'étendent aussi loin à l'est. Cependant, quelques observations en hiver plus au nord pourraient indiquer que l'espèce passe l'hiver dans des habitats de savane de plaine.

Introduction

Conservation of long-distance migrant birds presents a significant challenge, as these species are affected by environmental changes in multiple regions (Sanderson *et al.* 2006, Both *et al.* 2010, Vickery *et al.* 2014). The Ortolan Bunting *Emberiza hortulana* is a long-distance migrant passerine that breeds in Europe and winters in sub-Saharan Africa, north of 5°N (Cramp & Perrins 1994, Glutz von Blotzheim & Bauer 1997, Fry & Keith 2004, Bairlein *et al.* 2009). The majority of western European breeding populations of the Ortolan Bunting have undergone considerable declines in recent decades (BirdLife International 2004, Klvaňová *et al.* 2010, Vickery *et al.* 2014), with the only population expansion reported being from Catalonia (Brotons *et al.* 2008). Environmental changes in the African wintering grounds are widely suspected as a cause of the decline (*e.g.* Gatter 2000, Lang 2007, Menz & Arlettaz 2012), but knowledge of these areas remains largely anecdotal. Currently, there is little in the way of consolidated information on the main wintering grounds, foraging ecology, habitat use, winter movements and winter mortality of this species, particularly in West Africa.

Although the migration phenology of Ortolan Bunting is relatively well documented within Europe and between Europe and northern Africa (Moreau 1972, Stolt 1977, 1997, Stolt & Fransson 1995, Yosef & Tryjanowski 2002, Bairlein *et al.* 2009), its migratory movements and wintering areas in Africa are poorly known. Birds from northwestern and central European breeding populations have been shown to migrate in a southwesterly direction, indicative of wintering areas in West Africa (Stolt 1977, Stolt 1997, Bairlein *et al.* 2009).

More reports come from East Africa (Cramp & Perrins 1994, Glutz von Blotzheim & Bauer 1997, Bairlein *et al.* 2009), where the species winters primarily in open upland habitats in the highlands of Ethiopia and Sudan above 900 m, usually between 1000 and 3000 m (Zedlitz 1911, Lynes 1924, Moreau 1972; see also Cramp & Perrins 1994, Glutz von Blotzheim & Bauer 1997, Fry & Keith 2004). In Central and West Africa, Ortolan Buntings typically winter in the rainforest block, between 9 and 12°N (Glutz von Blotzheim & Bauer 1997; 5–10°N quoted in Cramp & Perrins 1994). Brosset (1984) recorded the species as being common in grasslands at 1250–1400 m on the Guinea side of Mount Nimba, while the largest wintering densities were recorded in the Fouta Djallon highlands at 800–1100 m (Jarry 1993, T. Aversa pers. comm.).

Here we present a detailed account of all available published records of the Ortolan Bunting wintering in West Africa (east to Chad and the Central African Republic, and south to the Congo Republic), to identify potential key wintering areas of declining western European populations. Knowledge of the species' wintering areas may elucidate potential causes of the observed decline and guide future efforts to identify the habitat and foraging requirements of the species in its winter quarters. In addition, we present previously unpublished records of the species in Guinea, and results from extensive fieldwork in Mauritania, which give new insights into the migration pattern and the status of the species as a passage migrant.

Methods

Records of Ortolan Buntings in West Africa were obtained by searching published literature, and online resources including the African Bird Image Database (http://birdquest.net/afbid/), the African migrants database (http://192.38.112.111/africamigrants/default.asp), trip reports on the Birding Africa webpage (http://www.birdingafrica.com/birding_trip_reports.htm), and the Surfbirds web site (http://www.surfbirds.com/). All online sources were consulted in July 2011. Additional information was obtained by personal communication with observers.

During the Swiss Ornithological Institute's (SOI) project "Bird migration across the Sahara", extensive field work was carried out in Mauritania in the springs of 2003 and 2004, and in autumn 2003, consisting of transect counts, mist-netting and daily casual observations including number of observed birds. Field surveys comprised a total of 556 field days on the coast and inland in spring and in autumn (Table 1), covering the majority of the migration periods of the Ortolan Bunting (F. Liechti & D. Peter pers. comm.).

M. Herremans (pers. comm.) carried out a ringing campaign north of Nouakchott (Mauritania) in autumn 2003 (27 days, 29 Sep to 26 Oct) including overnight sound-luring using song and flight calls of Ortolan Buntings.

The species' phenology in Mauritania is presented as the sum of Ortolan Buntings observed per 5-day period (pentad, as *per* Berthold 1973) using all the available Mauritanian observations. In order to compare Ortolan migration recorded by the SOI

project between seasons (autumn, spring) and sites (coast, inland), *G*-tests applying William's correction and Mann-Whitney *U*-tests were calculated using GenAlEx 6.5 (Peakall & Smouse 2012).

Table 1. Number of field days per season and location of the SOI project in Mauritania in the springs of 2003 and 2004, and in autumn 2003.

	Coast	Inland	Total
Spring	67	242	309
Autumn	67	180	247
Total	134	422	556

Results

Records in West Africa other than Mauritania

We found more than 40 records of the Ortolan Bunting in West Africa outside Mauritania (Appendix). The species has been recorded in 11 other West African countries, with the majority of records from The Gambia, Guinea, Nigeria and Senegal (Appendix, Figs 1 and 2). Figs 1 and 2 show the records of Ortolan Buntings in different seasons. Records in Aug–Oct are presumed to represent birds on autumn migration (triangles, Fig. 1). Records from March (filled circles, Fig. 1) may include birds on return spring migration and late-wintering individuals, while records from Apr–May (crosses, Fig. 1) presumably represent birds on spring migration. Records from November are thought to include late autumn migrants and birds that have already reached their wintering grounds (triangles, Fig. 2), whereas Dec–Feb is considered to be the main wintering period (filled circles, Fig. 2).

Benin. One record of a single individual.
Cameroon. One record of a single individual. A further record of one bird from Douing (11°5′N, 14°58′E), 30 Jan 2003 (Demey 2003) was not accepted by Languy *et al.* (2005), on the basis of lack of proper documentation; further information on this record seems never to have been published.
Chad. Two records, numbers of individuals unknown.
The Gambia. Five records of single individuals.
Ghana Two records of one and two birds, from the northern part of the country.
Guinea. Probably not uncommon in suitable habitats: nine records from Mt Nimba and the Fouta Djallon highlands, where the highest wintering densities for West Africa were recorded, including flocks of up to 200 birds at Labé.
Liberia. One record of two birds on Mount Nimba.
Mali. Rare passage migrant according to Lamarche (1981): few observations during autumn (Sep) and spring (Apr) in the Sahel and Bamako. No winter records.

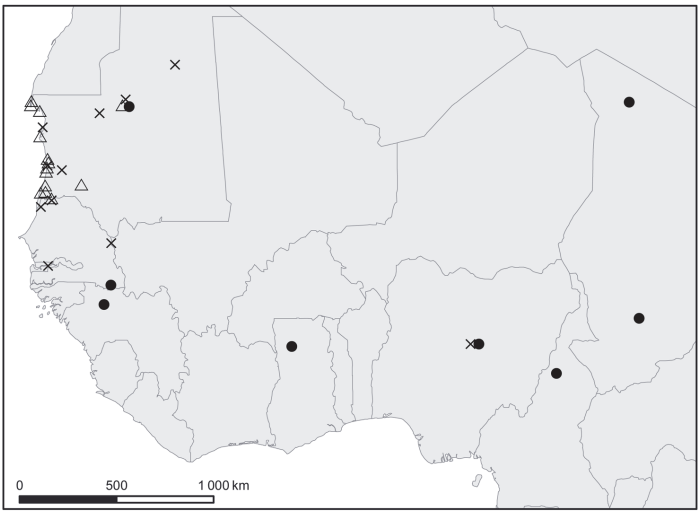

Figure 1. Records of Ortolan Buntings on autumn migration in August–October (triangles) and on presumed spring migration in March (filled circles, this category may include birds still wintering) and April–May (crosses).

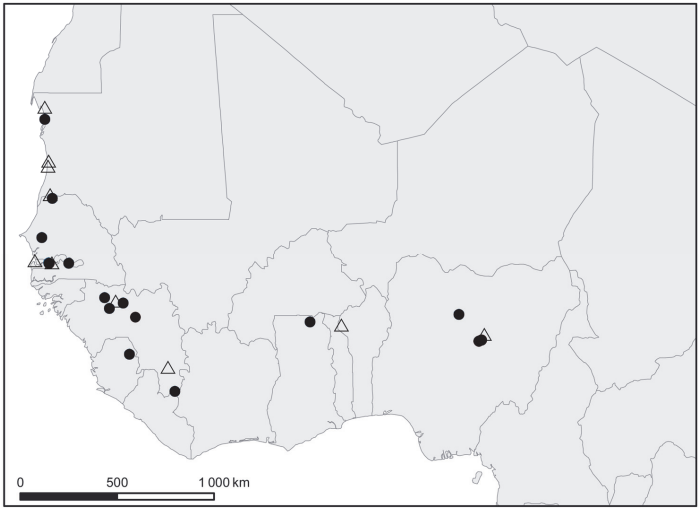

Figure 2. Records of Ortolan Buntings wintering in West Africa in November (triangles, this category may include birds still on migration) and December–February (filled circles).

Nigeria. At least six records, mostly from the Jos Plateau. Elgood *et al.* (1994) considered the species rare in Nigeria, with the Jos area being south of the normal wintering range. However, a modelled prediction of the potential winter distribution (Bairlein *et al.* 2009) includes part of central and northern Nigeria.
Senegal. At least seven records, four of them from the lower Senegal River valley.
Sierra Leone. Records from the Loma and Tingi Mountains.

The Ortolan Bunting as a passage migrant in Mauritania

To date only a minor fraction of Ortolan Bunting observations from Mauritania have been published (Heim de Balsac & Heim de Balsac 1950, Heim de Balsac & Mayaud 1962, Duhautois *et al.* 1974, Dick 1975, Trotignon 1979, Gee 1984, Mahe 1985, Lamarche 1988, Ens *et al.* 1989, Isenmann 2006, Isenmann *et al.* 2010). Other significant contributions come from the unpublished data of P. Browne (pers. comm.), J.P. Gee (*per* P. Browne pers. comm.), M. Herremans (pers. comm.) and the SOI project (F. Liechti & D. Peter pers. comm.).

The above records reveal that the Ortolan Bunting is a regular passage migrant during autumn (Sep–Nov) and spring (Mar–Apr; Figs 1–3). Extreme dates are 6 Sep (P. Christy *in* Lamarche 1988) and 19 Nov (J.P. Gee *per* P. Browne pers. comm.) in autumn, and 10 Mar and 1 May (F. Liechti & D. Peter pers. comm.) in spring. The peak of autumn migration is reached in the period 3–7 Oct (median and mode) and during spring in the period 11–15 Apr (median) or 6–10 Apr (mode) (Fig. 3). Sites used for migration stopover include coastal habitats (Roth 2004), oases (Heim de Balsac & Heim de Balsac 1950) and desert habitats (F. Liechti & D. Peter pers. comm.).

The observations from 27 Dec (O. Pineau *in* Lamarche 1988) and Jan (location and exact date not published: Gee 1984) constitute the only winter records. One record in Jun was published without further details (Gee 1984).

During the SOI project, Ortolan Buntings were observed during 27 field days (Table 2), with 92 individuals recorded (Table 3). In terms of the proportion of field days on which at least one Ortolan Bunting was observed, migration was significantly stronger on the coast than inland (combining autumn and spring: $G_1 = 31.804$, $P < 0.001$), and significantly stronger in autumn than in spring (combining coastal and inland records: $G_1 = 5.583$, $P = 0.018$). Also, autumn migration along the coast was significantly stronger compared to autumn in the interior ($G_1 = 39.181$, $P < 0.001$). Similarly, the number of Ortolan Buntings observed was significantly higher along the coast than in the interior for both autumn and spring combined (Mann-Whitney *U*-test, $Z = –2.709$, $P = 0.007$). Additionally, the number of Ortolan Buntings was significantly higher in autumn than in spring for both coastal and inland records combined (Mann-Whitney *U*-test, $Z = –2.618$, $P = 0.009$).

The ringing programme by M. Herremans using overnight sound-luring resulted in 36 Ortolan Buntings being captured and daily observations of “small flocks” over a period of 17 days between 26 Sep and 19 Oct 2003 (Fig. 3). The maximum number of birds seen was 12 on 8 October. No exact numbers were available for the size of the

flocks observed on the other dates, but assuming that at least two birds were observed on each of the remaining dates results in at least 41 birds observed during that period (Fig. 3).

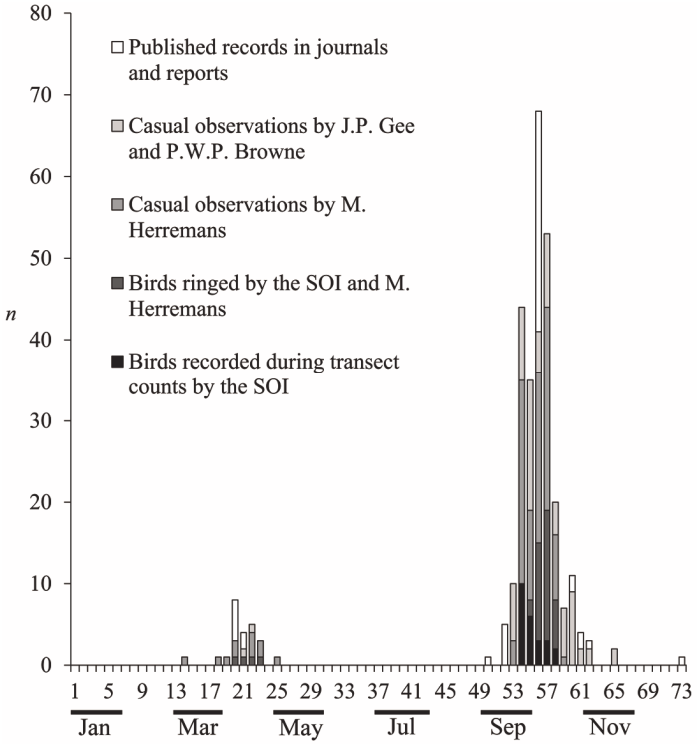

Figure 3. Phenology of Ortolan Bunting in Mauritania, based on records of 288 individuals; *n* = the sums of birds recorded per five-day period (pentads, which follow Berthold 1973).

Table 2. Number of days during the SOI project with Ortolan Bunting observations and (in parentheses) their value relative to effort per site and season (proportion of field days with bunting observations).

	Coast	Inland	Total
Spring	3 (0.04)	6 (0.02)	9 (0.03)
Autumn	17 (0.25)	1 (0.01)	18 (0.07)
Total	20 (0.15)	7 (0.02)	27 (0.05)

Table 3. Total numbers of Ortolan Buntings recorded during the SOI project and (in parentheses) relative to effort per site and season (total number of Ortolan Buntings divided by field days).

	Coast	Inland	Total
Spring	4 (0.06)	11 (0.05)	15 (0.05)
Autumn	76 (1.13)	1 (0.01)	77 (0.31)
Total	80 (0.60)	12 (0.03)	92 (0.17)

Discussion

Records of Ortolan Buntings from the Sahel countries show that the species occurs primarily as a passage migrant (end of March to April and September to October or November). Observations made during recent extensive fieldwork suggest that autumn migrants follow the Mauritanian coast prior to reaching the southern edge of the desert. In Mali, Ortolan Buntings were rarely encountered in September (Lamarche 1981), and there are no autumn records available from Niger or Chad, which is also indicative of Ortolan Buntings migrating further west (Fig. 1).

Of the 12 records from Senegal and the Gambia, four were in Dec–Jan, which might point towards a small number of birds wintering there, north of the presumed core wintering area, as suggested by Morel & Morel (1990). However, these observations could equally represent late migrants (Bairlein *et al.* 2009), as could the two Mauritanian winter records. Ortolan Bunting migration in Central Europe lasts until the end of October (*e.g.* Maumary *et al.* 2007) and, in Morocco, Ortolan Buntings are occasionally observed in November (Thévenot *et al.* 2003). It seems plausible to assume that late migrants regularly occur in sub-Saharan Africa. However, it remains unknown whether such late migrants continue southwards or spend the winter further north, in the Sahel or even in northwest Africa. Two winter records from Morocco (Thévenot *et al.* 2003) may indicate the latter, although regular overwintering north of the Sahara is questionable (Bairlein *et al.* 2009).

The median dates of the autumn migration of Ortolan Buntings fall in the beginning of September over a wide range in central and western Europe: 3 Sep, Helgoland, Germany (Dierschke *et al.* 2011); 11 Sep, Baden-Württemberg, Germany (Hölzinger 1997); 10 Sep, Lake Constance area, Austria, Germany and Switzerland (Heine *et al.* 1999); 4 Sep, Col de Bretolet, Switzerland (Maumary *et al.* 2007); 11 Sep, France as a whole (Claessens 1992); 4 Sep, the Landes, France (Girardot *et al.* 2009). This is indicative of a rather fast passage, perhaps in order to reach presumed re-fuelling areas in southwestern Europe quickly, such as the Iberian peninsula (Cramp & Perrins 1994). Approximately 70% of Ortolan Buntings caught during autumn migration in the Landes, southwest France (including birds ringed in Belgium, Germany, Norway, Sweden, Russia and Poland) had no visible fat deposits (Girardot *et al.* 2009), supporting the idea that Ortolan Buntings migrate quickly through central

Europe, followed by stopovers further southwest. In Morocco, the main passage of Ortolan Buntings takes place from September until the beginning of October (Thévenot *et al.* 2003), whereas peak migration (both median and mode) in Mauritania is reached in the period 3–7 Oct. Records of Ortolan Buntings are rare south of 16°N before mid-November and rare south of 12°N before December. Whether this is an indication of a prolonged stay after the desert crossing somewhere in the more arid zones just south of the desert, or just an artefact due to the weak spatial and temporal observer coverage further south remains unknown. However, as in some other species (*e.g.* Willow Warbler *Phylloscopus trochilus*: Salewski *et al.* 2002), Ortolan Buntings may stay close to the Sahara until food resources become scarce before continuing to their final wintering areas.

The core wintering area of western European Ortolan Bunting populations is most likely to be in the highland grasslands between 7° and 11°N, and 8° and 12°W, especially around Mount Nimba in Guinea–Liberia, the Fouta Djallon Massif in Guinea and the Loma and Tingi Mountains in Sierra Leone, where Ortolan Buntings have been observed, often in relatively large numbers, at altitudes between 800 and 1800 m (Field 1973, Curry-Lindahl 1981, Brosset 1984, Gatter 1987, Jarry 1993, Glutz von Blotzheim & Bauer 1997, Aversa 2007, Trolliet & Fouquet 2001, Demey & Rainey 2004b, T. Aversa pers. comm., C. Evenhouse pers. comm.). Here, the species occupies open, short, often (partly) burned off grassland, cultivated fields and rocky habitats, including small patches surrounded by dry woodland (see Appendix for habitat descriptions). It has been observed to associate with Tree Pipits *Anthus trivialis*, Long-billed Pipits *A. similis* and Cinnamon-breasted Rock Buntings *Emberiza tahapisi* (Morel & Roux 1966, Smith 1967, Field 1973, Brosset 1984).

Records from Nigeria (Elgood *et al.* 1966, 1994) indicate that the winter quarters extend that far east, though it has been suggested that the species is rare there or vagrant (Elgood *et al.* 1994, McGregor 2004). However, the patchy occurrence of the species there may be due to habitat selection, which is likely to be similar to that further west (high-altitude short grassland, whether natural or formed by human activity). McGregor (2004) observed the species around rocky outcrops and feeding at the edges of grassy patches amongst bare rock, as well as occasionally in savanna scrub. In East Africa, the species appears in some cases to use human-modified habitats, such as eroded plateaux stripped of all trees and various types of cultivated and abandoned fields in Ethiopia (Curry-Lindahl 1981). It is known that the overwintering of many Palaearctic migrants south of the Sahara desert depends on habitat state or food availability (Berthold 2012), so numbers and occurrence of Ortolan Buntings in the above areas may fluctuate from year to year, as indicated by the observations from Labé, Guinea (Appendix: T. Aversa pers. comm.).

Although Ortolan Buntings have been primarily observed in open highland grassland habitats, winter observations also exist from more densely vegetated areas (Aversa 2007) and lowlands, such as the Senegal River valley. Ortolan Buntings frequenting large open habitats may be more easily detected than those using smaller

open patches in savanna mosaics. Therefore, the proportion of Ortolan Buntings wintering in lowland West Africa or in the forest zone may be underestimated.

The lack of detailed knowledge on the ecological requirements of the species in its West African winter quarters complicates the interpretation of the effects of threats such as habitat changes, pesticide use (Vepsäläinen *et al.* 2005, Zwarts *et al.* 2009) and hunting. New lightweight tracking technologies (Bächler *et al.* 2010) and stable isotope analysis (*e.g.* Hobson 1999, Evans *et al.* 2003, Reichlin *et al.* 2013) might assist with the identification of wintering areas of this species. A first step in identifying threats and the status of the species in West Africa would be to conduct further surveys in core areas, such as Mount Nimba, the Fouta Djallon and the Loma and Tingi Mountains. Further locations that might support overwintering populations of the Ortolan Bunting were predicted by Bairlein *et al.* (2009) based on an analysis of climatic variables. These include a number of regions in West Africa which warrant further investigation. We encourage people birdwatching or doing fieldwork in West Africa to report any Ortolan observations, including, if possible, dates and geographic coordinates, number of birds observed (estimates at least), description of the birds (especially from countries where the species has not or only very rarely been encountered) and the habitat used.

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Appendix

Summary of all records obtained of the Ortolan Bunting *Emberiza hortulana* in West Africa, excluding Mauritania (see text) and Mali (only one source, see text). Coordinates given by the sources are marked *; other coordinates were inferred by us for the locations reported.

Country, date	n birds	Habitat	Location	Coordinates	Source
Benin					
14 Nov 2009	1	-	Mountains east of Cobly	10°29′N, 0°59′E	Demey 2010b
Cameroon					
13 Mar 2009	1	-	Poli	8°28′N, 13°14′E	Demey 2009
Chad					
8 Mar 1937	>1	-	Melfi	11°N, 18°E	Malbrant *in* Salvan 1969
End Mar	>1	-	Serir Tibesti	21°0′N, 17°48′E	Jarry *in* Salvan 1969
The Gambia					
11–16 Nov 1965[1]	1	-	Bund Road, nr Banjul	13°27′N, 16°34′W	Morel 1972
3 Apr 1981	1♂	-	Tendaba	13°26′N, 15°48′W	Gore 1990
15 Nov 1999	1	-	Tendaba	13°26′N, 15°48′W	Demey 2000
2/5 Dec 2003	1♀	-	Bansang Quarry	13°25′N, 14°39′W	Merrill 2003, Demey 2004
17 Jan 2005	1	Wooded savanna near river	Tendaba	13°26′N, 15°48′W*	MT, this paper
Ghana					
23 Mar 2006	1♂	-	Mole National Park	9°42′N, 1°50′W	Lister 2007
6 Dec 2009	2	-	Tongo Hills	10°43′N, 0°48′W	Demey 2010a
Guinea					
Dec 1983	Nine records of 2–3 birds on a 12-km track	Highland grassland with bushes and rocks between 1250 and 1400 m a.s.l.	Mount Nimba	7°30′N, 8°30′W	Brosset 1984

Beginning Mar 1993	2–5 birds per 10 ha of fields	Open highland grasslands and cultivated fields, with streams, between 800 and 1100 m a.s.l.	Fouta Djallon	11°40′N, 12°30′W	Jarry 1993
24 Feb 1995	1	Grassland (partially burned off), lightly wooded savanna, *c.* 1000 m a.s.l.	Labé Airport area, Fouta Djallon	11°20′N, 12°17′W	T. Aversa pers. comm.
25 Feb 1995	2	”	”	”	”
27 Feb 1995	6	”	”	”	”
28 Feb 1995	200	”	”	”	”
19 Dec 2002	1	”	”	”	”
11 Dec 2004	>75	”	”	”	”
12 Dec 2000	2	Rocky plateau with burnt grassland and scattered bushes, surrounded by dry wooded savanna, *c.* 1100 m a.s.l.	East of Diontou, Fouta Djallon	11°50′N, 12°34′W*	Trolliet & Fouquet 2001
27–30 Nov 2002	1	Highland grassland, *c.* 900 m a.s.l.	Pic de Fon Forest Reserve	8°31′N, 8°54′W*	Demey & Rainey 2004a (coords), 2004b, H.J. Rainey pers. comm.
21 Dec 2002	1	Open gallery forest	Balyan-Souroumba Forest Reserve, Dabola	10°56′N, 10°55′W	Aversa 2007 (but coords erroneous), T. Aversa pers. comm.
22 Nov 2006	3	-	1 km west of Koubia, Fouta Djallon	11°35′N, 11°54′W	C. Evenhouse pers. comm.
27 Nov 2006	>1	-	”	”	”
Liberia					
23 Feb 1983	2	Former mining area, on detritus, with dry grass and bushes	Mount Nimba	7°30′N, 8°30′W	Gatter 1987
24 Feb 1983	1	”	”	”	”

Country, date	n birds	Habitat	Location	Coordinates	Source
Nigeria					
25 Dec 1963	1♂	Low shrubs and steep rock faces	Kufena Rock, Zaria	11°4′N, 7°42′E	Fry & Smith 1964, Fry 1965
24–25 Mar 1964	2 ringed	Garden with shrubs and trees at city edge, next to open farmed grassland and rocky hills	Vom, Jos Plateau	9°50′N, 8°50′E*	Fry & Smith 1964, Smith 1965 (coords, habitat)
18 Mar to 15 Apr 1965	3 captured[2]	”	”	”	Smith 1965
27 Dec 1965	1♀ ringed	”	”	”	Smith 1965, 1967
Jan–Mar 1966	1–2[3]	”	”	”	”
Nov–Dec 2002	up to 4, 1 captured	On or near rocky outcrops, edges of small grassy patches amongst bare rock, Guinea savanna scrub with streams	Amurum Forest Reserve, Jos Plateau	9°52′N, 8°58′E*	McGregor 2004
Senegal[4]					
6 Oct 1958	1♀	Savanna	Richard Toll	16°28′N, 15°42′W*	Morel & Roux 1962
29 Apr 1961	1♀	”	”	”	”
Apr 1964	Small groups, some collected	Drinking from puddles in river bed	Vallée de la Falémé, Kidira	14°30′N, 12°12′W*	Morel & Roux 1966, Morel & Morel 1990
20 Mar 1972	1	-	West of Kédougou	12°33′N, 12°10′W*	Morel 1972, Morel & Roux 1973, Morel & Morel 1990
7 Jan	1 captured	Rice fields	Richard Toll	16°28′N, 15°42′W*	Morel & Morel 1990
14 Dec	1 captured	-	Djourbel, 125 km east of Dakar	14°38′N, 16°13′W*	Morel & Morel 1990
11 Apr 1993	1♀ captured	-	Djoudj NP	16°10′N, 16°18′W*	Rodwell *et al.* 1996

Sierra Leone					
1st week of Jan 1973	~50	Highland grassland (mostly burned) with open rocky patches, large boulders and scattered trees, on slope between *c.* 1650 and *c.* 1800 m a.s.l.	SE face of Mount Bintimane, Loma Mountains	9°13′N, 11°06′W*	Field 1973, Cramp & Perrins 1994
Dec–Jan	uncommon	-	Tingi Mountains	8°55′N, 10°47′W	G.D. Field *in* Cramp & Perrins 1994

[1]Date given as 1955 by Gore (1990) and Barlow *et al.* (1997), apparently in error.
[2]Smith (1965) mentions five birds captured in the winters of 1963–4 and 1964–5 between 18 Mar and 15 Apr, without further details. Two of these birds, captured 24 and 25 Mar 1964 (not Apr, *pace* Elgood *et al.* 1966), were mentioned by Fry & Smith (1964, published after Apr 1964). Therefore the remaining three birds were probably captured between 18 Mar and 15 Apr 1965.
[3]Two birds observed in early Jan, one staying until mid-Mar.
[4]The map in Morel & Morel (1990) indicates at least three more observations in Senegal (squares 15–16°N 14–15°W, 16–17°N 13–14°W and 13–14°N 15–16°W) for which we found no indications in the literature. Morel & Morel (1990) published the coordinates listed here for Senegal, except those of Rodwell *et al.* (1996).