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Short note | Nota breve

Has the magnificent frigatebird *Fregata magnificens* in the Cape Verde Islands reached the end of the road?

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On 6 October 2012, the remains of a frigatebird were recovered at João Barrosa beach (16°01.387'N, 022°43.610'W), southeastern Boavista, Cape Verde Islands. The carcass had been found in mid September 2012, during a beach survey to monitor loggerhead turtle nesting activity in the area and was then buried in the sand. The field assistant of the Cabo Verde Natura 2000 turtle project who found the bird indicated the location of the corpse to the first author. His description of the bird allowed it to be identified as an adult female magnificent frigatebird *Fregata magnificens* Mathews, 1914. The remains consisted of numerous black and white feathers as well as several bones, including the skull, thorax and wing bones, which are preserved at the Cabo Verde Natura 2000 headquarters at Sal Rei, Boavista. Some feathers, together with remains of an egg and tissue of a mummified male found at Ilhéu de Baluarte in 2005 (see below), were deposited at the Centro de Análise Molecular, Centro de Investigação em Biodiversidade e Recursos Genéticos (CMA/CIBIO), Vairão, Portugal.

During the 20th and 21st centuries, Ilhéu de Baluarte and Ilhéu do Curral Velho, off the eastern and southern coast of Boavista island, respectively, have been the only known breeding sites of the magnificent frigatebird in the Cape Verde Islands and the eastern Atlantic (Hazevoet 1995, Lopez-Suárez *et al*. 2007). In theory, albeit not in practice, both islets are Integral Reserves under Decree No. 3/2003 of Cape Verde law. The magnificent frigatebird was listed as critically endangered in the First Red List of Cape Verde (Hazevoet 1996). Historical data indicate that in the past the species also bred at Ilhéu dos Pássaros, off Sao Vicente, and at Ilhéu de Rabo-de-Junco, off Sal (Hazevoet 1995). During the mid 19th century, it was said to be more numerous at Ilhéu dos Pássaros than anywhere else in the archipelago (Keulemans 1866). Its demise and disappearance there has most likely been due to the islet's position at the entrance of Porto Grande, São Vicente, which became an important coaling centre during the second half of the 19th century (cf. Hazevoet 1994).

Although colonization of the archipelago could have occurred by random dispersal of individuals from the western Atlantic, it also seems possible that the Cape Verde frigatebird population constitutes a relic of a pan-Atlantic distribution. Bombard (1953) frequently met with frigatebirds across the whole width of the Atlantic on his extraordinary solitary voyage from the Canary Islands to Barbados in October-December 1952. Their occasional occurrence in the Azores, Madeira and Canary Islands (Garcia-del-Rey 2011) also points to trans-Atlantic movements rather than being attributable to stray birds from the tiny Cape Verde population. The few frigatebirds seen off

2008	Male	Female	Total
02 March	2	-	2
09 March	1	1	2
13 March	-	2	2
16 March	-	2	2
2009			
25 February	-	1	1
29 March	1	2	3
14 April	-	1	1
05 December	1	2	3
2010			
12 April	1	2	3
13 November	-	1	1
2011			
13 March	1	-	1
21 March	1	1	2
10 October	-	-	1 (sex unknown)
12 November	1	1	2
2012			
01 April	1	1	2
12 April	1	-	1
22 November	-	1	1

Table 1. Sightings of magnificent frigatebirds *Fregata magnificens* at Ilhéu de Curral Velho, Boavista, Cape Verde Islands, during the years 2008-2012.

Mauritania (Lamarche 1988) and The Gambia (Gore 1990) may have concerned birds from the Cape Verdes, although this is impossible to ascertain. Historically, the magnificent frigatebird may thus have had a continuous distribution across the tropical Atlantic from the Caribbean to the Cape Verde Islands (see also Bourne 1957), but there are no indications that, in historical times, it has bred elsewhere in the eastern Atlantic.

A pan-Atlantic distribution would throw doubt on the validity of a separate 'subspecies' (*lowei* Bannerman, 1927) for birds from the Cape Verde Islands (cf. Bourne 1957, Hazevoet 1995). Bannerman (1927) named his alleged subspecies on account of the 'enormous bill' of a mere two specimens (a male from Boavista and a female collected off The Gambia). However, bill size (as well as other size measurements) of Cape Verde birds shows substantial overlap with those obtained from Caribbean and Galapagos birds (cf. Bourne 1957). Nevertheless, Hailer *et al.* (2011) demonstrated that magnificent frigatebirds from the Galapagos Islands are strongly differentiated from non-Galapagos birds (i.e. birds from the rest of the eastern Pacific and western Atlantic), both genetically and in body measurements. Their study did, however, not include samples from the Cape Verde Islands. Our anticipated genetic analysis, as well as measurement data from a larger number of individuals, may shed further light on the possible distinctiveness of Cape Verde frigatebirds.

The Cape Verde frigatebird population may never have exceeded more than a few dozens of pairs, although no less than Christopher Columbus, in his famous *Diario del descubrimiento*, reported the sighting of a frigatebird on the Atlantic Ocean in September 1492 and commented that "there are many of these in the Cape Verde Islands" (Hartog 1993). During recent decades, the population has declined rapidly. In 1965, Naurois (1969) estimated the total breeding population at Ilhéu de Curral Velho to be 10-12 pairs. During the years 1988-1992, no more than five pairs were present on Baluarte and Curral Velho together (Hazevoet 1995), while Noeske & Pfützke (1994) reported two breeding pairs at Curral Velho islet in 1993. Six birds (four males – two in breeding condition – and two females), perching on two nests, were seen at Baluarte islet, 6 April 2003 (Dirk Colin & Nico Geiregat *in litt.*).

Magnificent frigatebird *Fregata magnificens*, female, Ilhéu de Baluarte, Boavista, Cape Verde Islands, 4 June 2003 (Pedro López Suárez).

The finding of a mummified male on Baluarte islet, 25 January 2005, reduced the known population to five birds. In 2006, a maximum of two females and two males was counted, all on Curral Velho islet (López Suárez *et al*. 2007). From 1999-2000 to 2005-2006, the population was regularly surveyed for seven consecutive breeding seasons. Reproductive failure, either resulting from genetic (inbreeding depression) or demographic (ageing, lack of recruits, Allee effect) imbalances, is considered to have brought the frigatebird to the verge of extinction (López Suárez *et al*. 2007). However, the initial decline of the frigatebird population in Cape Verde was likely triggered by human persecution, as has been the case for several other seabird populations since the islands were first colonized by man during the 15th century (Hazevoet 1994, 1995).

Since 2007, the frigatebird population has only been monitored occasionally and most information during the past five years has come from opportunistic sightings provided by birdwatchers, fishermen and sporadic surveys of Baluarte and Curral Velho islets by the first author (Table 1). During the summer of 2011, local fishermen saw three individuals on Baluarte islet. A single nest, occupied by a male, was reported on Curral Velho islet, 22 April 2012. In 2012, there were no sightings of more than two individuals together. Several sightings of a single female and a single male have been made in the area of Curral Velho and at the bay of Sal Rei, the main town on Boavista island, and these two birds were thought to represent the total remaining population (P. López Súarez *in* Hazevoet 2012). During the years 2007-2010, there have also been occasional sightings of single birds off the islands of São Vicente and Sal (Hazevoet 2010, 2012). It is as yet unclear whether these concerned local wanderers or birds originating from populations in the western Atlantic.

The death of the female found in September 2012 may signal the prelude to the imminent extinction of the magnificent frigatebird in the Cape Verde Islands. Further monitoring during the breeding season will be needed to establish whether the breeding population has now indeed been reduced to two individuals, a male and a female. However, if birds from the western Atlantic indeed reach the Cape Verde Islands, there remains the (albeit remote) possibility of replenishment of the Cape Verde population. Calls for the protection of the frigatebird's breeding sites in Cape Verde have been made for almost 50 years (Naurois 1964, Bannerman & Bannerman 1968, Bannerman 1973, Le Grand *et al.* 1984, Nørrevang & Hartog 1984, Hartog 1990, Hazevoet 1994, 1995, 1996), but have met with little or no response from the local authorities so far. With the population now reduced to the smallest number of birds possible, it is of utmost importance that decisive steps are taken to uphold the law and enforce strict protective measures in order to save this emblematic bird of the Cape Verde Islands.

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REFERENCES

Bannerman, D., 1927. [Description of a new frigate-bird from the Cape Verde Islands and the Gambian coast.] Bulletin of the British Ornithologists' Club 48: 12-13.

Bannerman, D.A., 1973. On the great interest to zoologists of the fauna of the Portuguese islands of the eastern Atlantic and the importance attached to their conservation, with special relation to the birds. Pp. 99-117 in: Livro de homenagem ao Professor Fernando Frade. Junta de Investigacões do Ultramar, Lisbon.

Bannerman, D.A. & W.M. Bannerman, 1968. History of the birds of the Cape Verde Islands. Birds of the Atlantic Islands. Vol. 4. Oliver & Boyd, Edinburgh. xxxii + 458 pp.

Bombard, A., 1953. Naufragé volontaire. Éditions de Paris, Paris. 324 pp.

Bourne, W.R.P., 1957. Additional notes on the birds of the Cape Verde Islands, with particular reference to *Bulweria mollis* and *Fregata magnificens*. The Ibis 99: 182-190.

Garcia-del-Rey, E., 2011. Field guide to the birds of Macaronesia. Lynx Edicions, Barcelona. 341 pp.

Gore, M.E.J., 1990. Birds of The Gambia. BOU Check-list No. 3. 2nd edition. British Ornithologists' Union, Tring. 152 pp.

Hailer, F., E.A. Schreiber, J.M. Miller, I.I. Levin, P.G. Parker, R.T. Chesser & R.C. Fleischer, 2011. Long-term isolation of a highly mobile seabird on the Galapagos. Proceedings of the Royal Society B 278: 817-825.

Hartog, J.C. den, 1990. Birds of the Cape Verde Islands: notes on species observed (9 August-10 September 1986), distribution, migration, status, origin and conservation. Courier Forschungsinstitut Senckenberg 129: 159-190.

Hartog, J.C. den, 1993. An early note on the occurrence of the magnificent frigatebird, *Fregata magnificens* Mathews, 1914, in the Cape Verde Islands: Columbus as an ornithologist. Zoölogische Mededelingen 67: 361-364.

Hazevoet, C.J., 1994. Status and conservation of seabirds in the Cape Verde Islands. Pp. 279-293 in: D.N. Nettleship, J. Burger & M. Gochfeld (eds.), Seabirds on islands: Threats, case studies, and action plans. BirdLife Conservation Series No. 1. BirdLife International, Cambridge, U.K.

Hazevoet, C.J., 1995. The birds of the Cape Verde Islands. BOU Check-list No. 13. British Ornithologists' Union, Tring. 192 pp.

Hazevoet, C.J., 1996 Lista vermelha para as aves que nidificam em Cabo Verde. Pp. 127-135 in: T. Leyens & W. Lobin (eds.), Primeira lista vermelha de Cabo Verde. Courier Forschungsinstitut Senckenberg 193.

Hazevoet, C.J., 2010. Sixth report on birds from the Cape Verde Islands, including records of 25 taxa new to the archipelago. Zoologia Caboverdiana 1: 3-44.

Hazevoet, C.J., 2012. Seventh report on birds from the Cape Verde Islands, including records of nine taxa new to the archipelago. Zoologia Caboverdiana 3: 1-28.

Keulemans, J.G., 1866. Opmerkingen over de vogels van de Kaap-Verdische Eilanden en van Prins-Eiland (Ilha do Principe) in de bogt van Guinea gelegen. Nederlandsch Tijdschrift voor de Dierkunde 3: 363-401.

Lamarche, B., 1988. Liste commentée des oiseaux de Mauritanie. Études Sahariennes et Ouest-Africains 1 (4): 1-164.

Le Grand, G., K. Emmerson & A. Martin, 1984. The status and conservation of seabirds in the Macaronesian islands. Pp. 377-391 in: J.P. Croxall, P.G.H. Evans & R.W. Schreiber (eds.), Status and conservation of the world's seabirds. ICBP Technical Publication No. 2. International Council for Bird Preservation, Cambridge, U.K.

López Suárez, P., N. Varo Cruz, C.J. Hazevoet & L.F. López Jurado, 2007. Restricted nesting habitat and reproductive failure of Magnificent Frigatebirds *Fregata magnificens* in the Cape Verde Islands. Atlantic Seabirds 7 [for 2005]: 107-120.

Naurois, R. de, 1964. Les oiseaux des îles du Cap Vert. Suggestions en vue de leur sauvegarde. Garcia de Orta 12: 609-619.

Naurois, R. de, 1969. Notes brèves sur l'avifaune de l'archipel du Cap-Vert. Faunistique, endémisme, écologie. Bulletin de l'Institut fondamental d'Afrique noire, Série A, 31: 143-218.

Noeske, A. & S. Pfützke, 1994. The Cape Verde Islands: tropical birding in the Western Palearctic. Birding World 7: 152-160.

Nørrevang, A. & J.C. den Hartog, 1984. Bird observations in the Cape Verde Islands (4-22 June 1982). Courier Forschungs-institut Senckenberg 68: 107-134.

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