

## BIRDS AT RISK IN AFRICA AND RELATED ISLANDS: THE CAUSES OF THEIR RARITY AND DECLINE

S.N. Stuart and N.J. Collar

### SUMMARY

Stuart, S.N. & Collar, N.J. 1988. Birds at risk in Africa and related islands: the causes of their rarity and decline. *Proc. VI Pan-Afr. orn. Congr.* 1-25.

The biogeography and ecology of the 297 threatened and near-threatened bird species in Africa and related islands are examined for comparative purposes. The species can be separated into four distinct biogeographical units, those from Palaeartic Africa, Afrotropical Africa, Madagascar and the oceanic islands. The last three are the most important for threatened species. The species at risk can also be divided into four ecological units, these being forest species, terrestrial non-forest species, inland water species and sea- and shorebirds. By far the largest of these groups is the forest species which account for 58 per cent of the total number of species at risk. On the African mainland the majority of the threatened and near-threatened forest species occurs in only five regions. Forest clearance and degradation is the single most important threat to the birds of Africa and related islands. Other serious threats include the clearance of non-forest habitats, the introduction of animals to islands, hunting and human exploitation, and human disturbance.

### INTRODUCTION

In our study of the threatened birds of Africa and related islands (Collar & Stuart 1985) we identify 172 species as being at risk of extinction, hereafter referred to as 'threatened species'. These species comprise the IUCN Red Data Book categories of Endangered, Vulnerable, Indeterminate, Rare and Insufficiently Known; details of these categories (and those 'Out of Danger' and 'Of Special Concern') are given in Collar & Stuart (1985). In this paper we present an analysis of the distributions, basic ecological requirements and threats to the survival of these species. We include in this analysis 'near-threatened species', i.e. those species in the categories of Out of Danger and Of Special Concern, as well as the near-threatened birds listed in Appendix C and the incipient species listed in Appendix E of Collar & Stuart (1985) (which contains simple explanations of both the 'near-threatened' and the 'incipient species' concepts). We also include here several species, mainly from northern Africa, not treated in Collar & Stuart (1985) (but mentioned in their Appendix D) which are likely to be treated in the Europe and Asia volume of the *ICBP/IUCN Red Data Book*: for the purposes of this analysis we regard Audouin's Gull *Larus audouinii*, the Roseate Tern *Sterna dougallii* and the newly described Red Sea Cliff Swallow *Hirundo perditia* (Fry & Smith 1985) as threatened species, and the Marbled Duck *Marmaronetta angustirostris*, White-headed Duck *Oxyura leucocephala*, Red Kite *Milvus milvus*, Little Bustard *Tetrax tetrax*, Great Bustard *Otis tarda*, Houbara Bustard *Chlamydotis undulata*, White-eyed Gull *Larus leucophthalmus* and Red-necked Nightjar *Caprimulgus ruficollis* as near-threatened species. We therefore incorporate 175 threatened and 122 near-threatened species from Africa and related islands in this study.

Our analysis covers both Palaeartic and Afrotropical Africa and all surrounding islands west to the mid-Atlantic Ridge and east to 80°E. Only 11 of the species discussed have breeding populations outside these limits. We follow the taxonomy of Morony, Bock & Farrand (1975) apart from a few

minor exceptions discussed fully in Collar & Stuart (1985). Subspecies are not considered, except when they are so distinct as to be recognized as incipient species. Data on all species discussed are taken (or for certain near-threatened species inferred) from Collar & Stuart (1985) except in the case of those mentioned in the previous paragraph, where we have relied largely on Cramp & Simmons (1977, 1980, 1983) and a few other sources in our files.

The aim of this paper is to describe the biogeography and ecology of the threatened and near-threatened birds of Africa and to draw attention to the most serious causes of their rarity and decline. We hope that this approach will assist conservationists in choosing the correct priorities.

#### BIOGEOGRAPHY OF THE BIRDS AT RISK

Biogeographical classifications of the threatened and near-threatened bird species are given in Table 1. The avifauna can be divided into four discrete biogeographical units: Palaearctic Africa, Afrotropical Africa, Madagascar and the oceanic islands. In this analysis, landbridge islands are included in the nearest mainland: for example, the island of Fernando Po (or Bioko) is considered part of Afrotropical Africa (but Socotra is considered oceanic). Only five of the 297 threatened and near-threatened species occur in more than one of the biogeographical units. The identities of the bird species in the four biogeographical units are given in Appendix 1. These units are discussed below.

Table 1. Ecological and biogeographical classifications of threatened and near-threatened bird species in Africa and related islands.

ECOLOGICAL CLASSIFICATIONS											
Biogeographical units	Forest species		Terrestrial non forest species		Inland water species		Sea- & shore-birds		Total		Total number of species at risk
	T	NT	T	NT	T	NT	T	NT	T	NT	
Palaearctic Africa and related land-bridge islands	1	0	1	5	0	2	2	1	4	8	12
Afrotropical Africa and related land-bridge islands	63	48	24	32	7	6	2	5	96	91	187
Madagascar and related land-bridge islands	16	7	3	6	7	1	5	0	29	14	43
Oceanic islands	33	5	9	6	0	1	7	1	49	13	62
Total	113	60	37	47	14	9	13	6	175	122	297
Grand totals	173		84		23		19		297		

Key: T = Threatened, NT = Near-threatened

It should be noted that several species occur in more than one of the locations and ecological classifications given in Table 1 and so the total number of species cannot be obtained by simply adding the figures in the

rows and columns. The species concerned are the Madagascar Heron *Ardea humbloti*, the Madagascar Teal *Anas bernieri* and the Madagascar Fish Eagle *Haliaeetus vociferoides*, which occur in both inland water and coastal situations in Madagascar, the Réunion Harrier *Circus maillardi* which occurs in terrestrial non-forest habitats on Madagascar and some oceanic islands (Réunion and the Comoros), the Red Kite *Milvus milvus* which occurs in terrestrial non-forest habitats in Palaeartic Africa (Morocco) and oceanic islands (the Canaries), the Madagascar Pond Heron *Ardeola idae* which occurs on inland waters in Madagascar and on an oceanic island (Aldabra), the White-eyed Gull *Larus leucophthalmus* which occurs in coastal parts of Palaeartic and Afrotropical Africa, and the Roseate Tern *Sterna dougalli* which occurs in coastal parts of Palaeartic and Afrotropical Africa, Madagascar and oceanic islands (the Azores and the Seychelles).

Table 2. The occurrence of threatened and near-threatened bird species in Madagascar and related landbridge islands.

Ecological grouping	Number of threatened species	Number of near-threatened species	Total
Coastal species	5	0	5
Inland water species	8	1	9
Eastern rainforest species	13	6	19
North-western forest species	2	0	2
South-western arid zone species*	4	1	5
Widely and thinly distributed land birds	0	6	6
Total	29	14	43

\* This includes birds from several habitats, including Appert's Greenbul *Phyllastrephus apperti*, which lives in dry forest.

It should be noted that three species, the Madagascar Heron *Ardea humbloti*, the Madagascar Teal *Anas bernieri* and the Madagascar Fish Eagle *Haliaeetus vociferoides*, occur on both inland and coastal waters.

### 1. Palaeartic Africa

Only four threatened and eight near-threatened species occur, and all but one of these, the Algerian Nuthatch *Sitta ledanti*, also occur in either Europe or Asia or both. Most of these birds have more important populations outside Africa, but the most important exception is the critically threatened Northern Bald Ibis *Geronticus eremita*, which is now largely restricted to Morocco.

### 2. Afrotropical Africa

The majority of the species at risk in the region under discussion occur in Afrotropical Africa (63 per cent). This is not surprising since Afrotropical Africa is much richer in species than any of the other biogeographical units considered here. Moreau (1966) estimated that there were 1481 Afrotropical species, of which 96 (6.5 per cent) must now be considered threatened and a further 91 (6.1 per cent) near-threatened. Despite this alarmingly high number at risk, no recent avian (global) extinction is documented from the African mainland (including Palaeartic Africa), though one bird, the Yellow-throated Serin *Serinus flavigula*, has not been seen for almost a century and another, the Golden-naped Weaver *Ploceus aureonucha*, not for over 50 years.

### 3. Madagascar

Fewer threatened and near-threatened species are known from Madagascar (see Table 1 and 2). However, the avifauna, which is relatively species-poor though high in endemism, is under much more serious threat as a whole, with 25 per cent of the endemic avifauna threatened and 13 per cent near-threatened. There is one certain avian extinction from Madagascar, that of the Elephant-bird *Aepyornis maximus*, and one probable extinction, that of the Snail-eating Coua *Coua delalandei*, though the latter is included in this study since there is a slight chance it still survives.

Table 3. The occurrence of threatened and near-threatened bird species on the oceanic islands (here including Socotra) around Africa.

Island(s)	Number of threatened species	Number of near-threatened species	Total
Aldabra	1	2	3
Amsterdam	1	0	1
Ascension	1	0	1
Azores	1	0	1
Canaries	5	1	6
Cape Verde	2	0	2
Comoros (including Mayotte)	5	2	7
Gough	2	0	2
Madeira	3	0	3
Mauritius	7	2	9
Pagalú (or Annobon)	0	1	1
Príncipe	1	1	2
Réunion	2	2	4
Rodrigues	2	0	2
St. Helena	1	0	1
São Tomé	7	3	10
Seychelles	8	1	9
Socotra	0	1	1
Tristan da Cunha group (excluding Gough)	4	0	4
<b>Total</b>	<b>49</b>	<b>13</b>	<b>62</b>

It should be noted that some threatened and near-threatened species occur on more than one of the islands listed above, and so the total number of species cannot be obtained by simply adding the figures in the columns.

### 4. Oceanic islands

There are 49 threatened and 13 near-threatened species on the oceanic islands around Africa, representing 21 per cent of the total number of species at risk in the area under review. It is on the islands that most of the recent avian extinctions to date have taken place (see, e.g. Greenway 1967, Olson 1973 and Preamble 8 of King 1981). The most critical situation occurs on Mauritius where all but one of the endemic land species are either threatened, near-threatened or extinct. The most critical islands for the conservation of species at serious risk can be judged from Table 3. Islands which are traditionally associated with conservation need, such as the Canaries, Mauritius and the Seychelles, are shown indeed to be important for threatened species. However, other islands, such as

the Comoros and São Tomé, are equally important but have largely been neglected by conservationists. Although there is no certain avian extinction from São Tomé, four of its threatened species have not been seen for over 50 years, one of them not this century. It is noteworthy that, just as there have been many more extinctions on oceanic islands than on Madagascar and the African mainland, there are many more threatened than near-threatened species on oceanic islands, suggesting that the factors causing species decline on islands are so severe that they quickly reduce a species to the threatened level, and hence, if unchecked, to extinction. Of the most threatened species (i.e. those in the IUCN Red Data Book categories Endangered and Vulnerable), 42 per cent are birds restricted to oceanic islands.

#### AN ECOLOGICAL CLASSIFICATION OF THE BIRDS AT RISK

Ecological classifications of the threatened and near-threatened bird species are also given in Table 1. Throughout the four biogeographical units, four broad ecological units can be distinguished, these being for forest species, terrestrial non-forest species, inland water species, and sea- and shorebirds. Only three of the 297 threatened and near-threatened species occur in more than one of these ecological units. The identities of the bird species in the four ecological units are given in Appendix 2. These units are discussed below.

##### 1. Forest species

This is easily the largest of the ecological units, accounting for 58 per cent of the total number of threatened and near-threatened species. Of the 173 forest species at risk, 111 occur in Afrotropical Africa, a region for which Moreau (1966) estimated that there are 409 forest and 1030 non-forest species. If we accept these figures as being broadly correct (both will be slightly increased by the new species described or established since the mid-1960s), then it emerges that forest species have been over five times more susceptible to serious decline than have non-forest species (15.4 per cent of forest birds are threatened as against 3.0 per cent of non-forest birds, and in total 27.1 per cent of forest birds are threatened or near-threatened as against 6.7 per cent of non-forest birds). Forest species account for 72 per cent of the most threatened species (in the IUCN Red Data Book categories of Endangered and Vulnerable); 33 per cent of these species are forest birds on oceanic islands.

Table 4. The occurrence of threatened and near-threatened forest bird species in Afrotropical Africa and related landbridge islands.

Locations	Number of threatened species	Number of near-threatened species	Total
Upper Guinea lowland forests (Sierra Leone, Guinea, Liberia, Ivory Coast, Ghana)	8	5	13
Western refugium forests (eastern Nigeria, Cameroon, Gabon)			
Central refugium forests (eastern Zaire, Uganda, Rwanda, Burundi, western Kenya, western Tanzania)	16	10	26
Eastern refugium forests (eastern Kenya, eastern Tanzania)	18	11	29
Western Angolan forests	6	5	11

South-west Nigeria	1	0	1
Southern Sudan	1	0	1
Ethiopian highlands	1	0	1
Djibouti	1	0	1
Northern Somalia	1	1	2
Volcanic highlands of Kenya and north-central Tanzania	0	2	2
Malawi and northern Mozambique	4	5	9
Zimbabwe and southern Mozambique highlands	1	2	3
Lowland southern Africa	2	6	8
<b>Total</b>	<b>63</b>	<b>48</b>	<b>111</b>

It should be noted that some threatened and near-threatened species occur in more than one of the locations listed above, and so the total number of species cannot be obtained by simply adding the figures in the columns.

If the distributions of the 63\* threatened Afrotropical forest species are examined further (see Table 4), some clear patterns emerge. The overwhelming majority of these species (88 per cent) have their ranges centred on just five areas, (i) the Upper Guinea lowland forest, from Sierra Leone to Ghana; (ii) the montane and lowland forests of western and southern Cameroon and neighbouring countries; (iii) the lowland and montane forest along the Albertine Rift, in north-eastern Zaire, south-western Uganda and Rwanda; (iv) the forests of eastern Kenya and the mountains of eastern Tanzania; and (v) the forests along the escarpment of western Angola. Near-threatened species show similar distribution patterns. Three of these five areas, Cameroon, the Albertine Rift and eastern Kenya and Tanzania, are well-known as centres of bird diversity and endemism in Africa (Moreau 1966, Hamilton 1976, Diamond & Hamilton 1980). It has been suggested that these three areas form the main forest refugia in Africa, where the forest is believed to have survived through the driest periods of the Pleistocene (Livingstone 1975, Hamilton 1976, Diamond & Hamilton 1980). Whether or not the refugium hypothesis is accepted as an explanation of high bird species diversity and endemism, it is undeniable that these three areas are of critical conservation importance for African birds. In the so-called Western Refugium (Cameroon) perhaps the most important areas are Mounts Cameroon, Kupe and Oku, and the lowland forest around the Dja River. In the Central Refugium (Albertine Rift) the Itombwe Mountains and the Ituri Forest in north-eastern Zaire, the Nyungwe Forest in Rwanda and the Impenetrable Forest (now called Bwindi Forest) in south-western Uganda are of particular importance. In the Eastern Refugium (Kenya, Tanzania) the most crucial areas are the Sokoke Forest in coastal Kenya and the Usambara, Uluguru and Uzungwa Mountains in eastern Tanzania. The escarpment of western Angola has also been suggested as a minor forest refugium, at least for birds (Moreau 1966, Hamilton 1976). Although the forest avifauna of western Angola is not particularly diverse, it contains several species with very limited distributions.

\* In Collar & Stuart (1985) this figure included the Congo Peacock *Afropavo congensis* as a Species of Special Concern but excluded the Fernando Po Speirops *Speirops brunneus* because there it was considered an island form. In this analysis Species of Special Concern are treated as near-threatened and Fernando Po is accounted as part of the African mainland, hence the Peacock and the Speirops swap places.

By contrast, the Upper Guinea forest block is less often considered to be a major refugium. Most of the threatened bird species from this area probably once ranged throughout the forest that formerly existed between Sierra Leone and Ghana. Their rarity today is a reflection of the devastation of forest which has taken place in this area. Some of these species are amongst the most threatened in continental Africa. For most of them their continued survival depends very largely on the adequate conservation of the Tai National Park in south-western Ivory Coast, although several other areas, e.g. Mount Nimba in Liberia, are no less valuable if they could realistically be expected to survive.

On Madagascar a similarly high proportion (55 per cent) of the threatened birds are forest species. Most of these are restricted to the eastern rainforest belt (see Table 2), where the single most important site for conservation is the 'Sihanaka Forest'. The drier Ankarafantsika Forest in north-western Madagascar is also of crucial conservation importance, being the only currently known site for the White-breasted Mesite *Mesitornis variegata*\* and Van Dam's Vanga *Xenopirostris damii*.

Forest birds account for 67 per cent of the threatened species on oceanic islands around Africa. Nearly all the threatened species on the critical islands, such as the Canaries, the Comoros, Mauritius, São Tomé and the Seychelles, are forest birds.

The forests of importance to the survival of threatened bird species in the Afrotropical and Malagasy region are the subject of specific analysis and discussion in a further reworking of our information (Collar & Stuart in prep.).

Table 5. The occurrence of threatened seabirds and shorebirds in Africa and related islands.

Locations	Number of threatened species	Number of near-threatened species	Total
Palaeartic Africa and related landbridge islands	2	1	3
Afrotropical Africa and related landbridge islands	2	5	7
Madagascar and related landbridge islands	5	0	5
Oceanic islands	7	1	8
<hr/>			
Total			

It should be noted that some threatened and near-threatened species occur in more than one of the locations listed above, and so the total number of species cannot be obtained by simply adding the figures in the columns.

\* Appert (1985) has now published a set of new sites (all adjacent) for the White-breasted Mesite, but these are not protected so that the importance of Ankarafantsika is little diminished by this information.

### 2. Terrestrial non-forest species

Of the terrestrial non-forest birds, 84 are considered to be at some risk, this being 28 per cent of the total of 297 threatened and near-threatened species in the area under discussion. This is less than half the number of forest species at risk, and significantly there are more near-threatened than threatened birds among the terrestrial non-forest species, in contrast to the forest species. This ecological unit is very heterogeneous in its habitat requirements and shows no striking trends in its distribution patterns, occurring through all four biogeographical units. Probably the most obvious distributional trend is determined by the presence of 13 species of lark in this group, all but one of them being confined either to southern or to north-eastern Africa, usually in the arid and semi-arid zones.

### 3. Inland water species

Only 23 inland water species figure in this study (7.7 per cent of the total number of species at risk). These are scattered widely through Afrotropical Africa and Madagascar. The most distinct ecological group among them is formed by the papyrus swamp dwellers of central Africa. This includes one threatened species, the Papyrus Yellow Warbler, *Chloropeta gracilirostris*, and four near-threatened birds, the Shoebill *Balaeniceps rex*, Mfumbiri Bush-shrike *Laniarius mufumbiri*, White-winged Warbler *Bradypterus carpalis* and Papyrus Canary *Serinus koliensis*.

### 4. Sea- and shorebirds

Only 19 sea- and shorebirds figure in this study (6.4 per cent of the total number of species at risk; see Tables 1 and 5). These are scattered widely throughout the region under discussion, and comprise a very diverse assemblage of birds. Included in this group are four species of *Pterodroma* petrels, a genus which is particularly susceptible to serious decline on islands (see, e.g., King 1981).

## THE CAUSES OF RARITY AND DECLINE

The relative importance of the various threats facing the bird species at risk in Africa and related islands is given in Table 6. The threats facing each species are documented in Appendix 2. Although a large number of threats can be identified, five are of particular importance, these being forest clearance, other habitat alteration, the effects of introduced animals, hunting and exploitation, and human disturbance. In addition to these threats, the great majority of the species under review (74 per cent) must be considered as permanently at risk, simply on account of their very restricted ranges; indeed, for 61 species (21 per cent of the total) no threats are known other than restriction of range. Three species on the Canary Islands, the Dark-tailed Laurel Pigeon *Columba bollii*, the White-tailed Laurel Pigeon *C. junoniae* and the Blue Chaffinch *Fringilla teydea*, have faced a number of serious threats in the past, all of which appear no longer to be operating, with the exception of the constant threat of smallness of range. The other species for which no threats other than smallness of range are known are probably naturally restricted to small areas and some of them might not even be declining. The five most important threats identified above are discussed in turn, while details of more minor threats are given by Collar & Stuart (1985).

### 1. Forest clearance and degradation

This is by far the most common threat to the birds at risk in Africa and related islands and is at present operating (either certainly or very probably) against 157 (53 per cent of the total) of the threatened and near-threatened birds. It is easily the most serious threat to the birds of Afrotropical Africa and Madagascar, and on oceanic islands it comes



second only to the problem of introduced animals. Many forest species appear to be able to survive in areas of secondary habitat but this should not necessarily be considered as evidence for great adaptability on their part. Studies of the Seychelles Kestrel *Falco araea* have shown that although the species occurs in secondary areas, these populations are not viable in themselves and survive (at least in good densities) only as a result of surplus production from the forest areas (Watson 1981). The importance of the conservation of mature forest to prevent species extinction cannot be over-emphasized.

#### 2. Other man-induced habitat alteration

Non-forest birds, including terrestrial, inland water and coastal species, are often subject to the same process of deleterious modification of their habitat by man. A total of 44 species (15 per cent of the species at risk) are threatened, either certainly or very probably, by such activities. Some of this habitat modification results from fire (affecting 15 species) and overgrazing (affecting 11 species), documented in Table 6. It should be pointed out that both fire and overgrazing affect some forest as well as non-forest species.

#### 3. The effects of introduced animals

Other than the cases of a few seabirds and a few species from Madagascar, mainly mesites (Mesitornithidae) and ground-rollers (Brachypteraciidae), introduced animals are a threat to species of oceanic islands. A total of 44 species (15 per cent of the species at risk) are known or believed to be threatened by introduced animals, principally rats *Rattus* and cats, but on some islands several other species, such as feral goats and deer *Cervus timorensis*, the Red-whiskered Bulbul *Pycnonotus jocosus* and the Indian Mynah *Acridotheres tristis*, can present problems (in the case of the first two indirectly through their effect on native habitats, in the case of the second two directly through competition and even nest predation). Introduced animals present the most serious threat to oceanic islands (see Table 6) and have been a major, and perhaps the principal, cause of species extinctions. It should be noted that nearly all of the birds currently facing this threat are already at the full threatened level and 13 of these are in the IUCN Red Data Book category of Endangered (Collar & Stuart 1985). Although the problem of introduced animals is a less widespread threat than forest clearance, and one which affects many fewer species, where it does operate it usually has drastic and often virtually uncontrollable effects.

#### 4. Hunting and exploitation

A total of 41 species (13.8 per cent of the species at risk) face some threat from hunting and exploitation of adult or young birds. However, for relatively few of these species can hunting be considered the primary threat to survival, one possible exception being the White-breasted Guinea-fowl *Agelastes meleagrides*. Nevertheless, hunting does pose an unwelcome additional burden on far too many species already at risk from other more serious threats.

#### 5. Human disturbance

A total of 19 species (6.4 per cent of the species at risk) are threatened by human disturbance, especially at the breeding sites. Once again, this is not a primary threat to many birds, but a notable exception is the Northern Bald Ibis which is frequently disturbed at its breeding colonies in Morocco.

Table 6. The number of threatened and near-threatened bird species in Africa and related islands and the threats which they face

	L O C A T I O N S										Grand total
	Palaeartic		Afro-tropical		Madagascar		Oceanic islands		Total		
	T	NT	T	NT	T	NT	T	NT	T	NT	
1 Forest clearance and degradation	1	-	46	24	15	7	17	1	79	32	111
2 Forest clearance believed to be serious but not proved	-	1	13	21	1	-	7	4	21	25	46
3 Other man-induced habitat alteration and clearance	1	5	10	9	8	-	1	-	20	14	34
4 Other man-induced habitat alteration believed to be serious but not proved	-	-	5	3	2	-	-	-	7	3	10
5 Introduced animals	-	-	-	2	2	-	24	1	26	3	29
6 Introduced animals believed to be a problem but not proved	1	-	1	-	4	-	11	1	15	-	15
7 Hunting and exploitation	2	5	9	5	8	1	12	3	28	13	41
8 Human disturbance	3	1	5	3	1	1	7	3	13	6	19
9 Egg-collecting	1	1	-	-	2	1	1	2	4	2	6
10 Zoo trade	1	-	3	3	-	-	-	-	4	3	7
11 Economic and industrial development	-	-	2	3	-	-	-	-	2	3	5
12 Overgrazing	-	-	7	2	-	-	2	-	9	2	11
13 Fires	1	-	8	2	1	-	3	-	13	2	15
14 Oil pollution	-	-	-	1	-	-	-	-	-	1	1
15 Pesticides	1	-	-	-	-	-	-	-	1	-	1
16 Water pollution	-	-	1	-	-	1	-	1	1	1	2
17 Drowning in reservoirs	-	-	1	-	-	-	-	-	1	-	1
18 Calcium deficiency in diet	-	-	1	-	-	-	-	-	1	-	1
19 Competition for food from fishing industry	-	-	-	1	-	-	-	-	-	1	1
20 Introduced fish reducing vegetation	-	-	-	-	4	1	-	1	4	1	5
21 Competition and hybridization with Little Grebe <i>Tachybaptus ruficollis</i>	-	-	-	-	2	-	-	-	2	-	2
22 Disturbance by seals	-	-	-	1	-	-	-	-	-	1	1

	Palearctic		Afro-tropical		Madagascar		Oceanic islands		Total		Grand total
	T	NT	T	NT	T	NT	T	NT	T	NT	
23 Electrocution on pylons	-	-	1	-	-	-	-	-	1	-	1
24 Late winter food shortages	-	-	-	-	-	-	2	-	2	-	2
25 Migrating birds attracted by lights and killed in collisions	-	-	1	-	-	-	-	-	1	-	1
26 Uneven sex ratio in population	-	-	-	-	-	-	1	-	1	-	1
27 Competition with Herring Gull <i>Larus argentatus</i>	1	-	-	-	-	-	-	-	1	-	1
28 Cyclones & storms	-	-	-	-	1	-	10	-	11	-	11
29 Climatic change	1	-	1	2	-	-	2	-	4	2	6
30 Volcanic eruption	-	-	1	-	-	-	1	-	2	-	2
31 Smallness of range	1	-	81	61	15	2	49	10	147	72	219
32 No threats known, other than smallness of range	-	1	18	30	2	6	4	2	23	38	61

Key: T = Number of threatened species, NT = Number of near-threatened species

It should be noted that some threatened or near threatened species occur in more than one of the four locations listed above and so the total number of species facing a particular threat cannot necessarily be obtained by simply adding the figures in the rows.

#### CONCLUSIONS

Two inevitable conclusions arise from this analysis. The first is the overriding importance of forest conservation as a means of preventing the extinction of birds in Africa and related islands. This is particularly crucial since the destruction of a relatively small number of forests would result in the extinction of a relatively large number of species, and conversely the adequate protection of these same forests (see Tables 2 and 4) would safeguard the great majority of threatened and near-threatened forest species on the African mainland, Madagascar and the associated oceanic islands (this theme is elaborated in Collar & Stuart in prep.). We cannot therefore overstate the importance to be attached to the development of forest protection as the principal instrument of bird species conservation within our region (indeed, from the evidence we possess, this perception has global application). Governmental, inter-governmental and non-governmental agencies concerned with species survival should be in no doubt where their priorities ought to lie.

The second conclusion to be drawn concerns the vulnerability of island forms to introduced animals (this, too, must prove true not only of the particular islands under review but of islands throughout the world). The control of introduced animals, and especially rats (which are, unlike the others, wild animals accidentally allowed to colonize), is inevitably far more complex and costly than the prevention of initial introduction. Sensitivity of birds to introduced animals naturally depends on the period of isolation which they have endured, and some islands have very much worse records of extinction or threatened birds than others. However, the principle must hold that introductions to any island constitute a clear risk to the native fauna and (usually) flora.

Possibly the only islands free of introduced animals in our region are in the Tristan da Cunha group; apart from counselling in the strongest terms that every care be taken that they remain so, we can only otherwise plead for an increase in research to develop humane means of eliminating various species of animal that are commonly introduced to islands, so that effective measures may yet become available to secure the future of island forms of bird.

#### ACKNOWLEDGEMENTS

We record our thanks to the staff at the ICBP Secretariat in Cambridge for their help and co-operation in many ways, and especially to Gina Pfaff for typing this paper so speedily and accurately.

#### POSTSCRIPT, AUGUST 1985

In the last stages of preparing Collar & Stuart (1985) for publication in late 1984 and early 1985, we became aware that three species currently listed in Appendix C, the Socotra Cisticola *Cisticola haesitata*, White-winged Apalis *Apalis chariessa* and Abbott's Starling *Cinnyricinclus femoralis*, ought probably to have been given full treatment as threatened species; however, considerations of time did not allow for alterations of such nature at that stage. Subsequent to publication (March 1985) we have found reason to believe that one further species, the Yellow-breasted Pipit *Anthus chloris* also deserves recognition as a threatened species; and a fifth bird, the Spot-winged Greenbul *Phyllastrephus leucolepis*, newly described from a single forest locality in Liberia (Gatter 1985), must automatically be added to the threatened avifauna of the Upper Guinea forest block. The incorporation of these five birds as fully threatened species would obviously alter the figures in this paper slightly, but we have preferred to leave them aside to simplify the analysis. Additions and corrections to Collar & Stuart (1985) are, however, planned in due course.

#### REFERENCES

- APPERT, O. (1985) Zur biologie der Mesitornithiformes (Nakas oder "Stelzenrallen") Madagaskars und erste fotografische Dokumente von Vertretern der Ordnung. *Orn. Beob.* 82: 31-54.
- COLLAR, N.J. & STUART, S.M. 1985. *Threatened birds of Africa and related islands. The ICBP/IUCN red data book.* Cambridge: International Council for Bird Preservation and International Union for Conservation of Nature and Natural Resources.
- CRAMP, S. & SIMMONS, K.E.L. (eds.) 1977. *The birds of the western Palearctic* 2. Oxford: Oxford University Press.

- CRAMP, S. & SIMMONS, K.E.L. (eds.) 1980. *The birds of the western Palearctic*, 2. Oxford: Oxford University Press.
- CRAMP, S. & SIMMONS, K.E.L. (eds.) 1983. *The birds of the western Palearctic*, 3. Oxford: Oxford University Press.
- DIAMOND, A.W. & HAMILTON, A.C. 1980. The distribution of forest passerine birds and Quaternary climatic change in Africa. *J. Zool., Lond.* 191: 379-402.
- FRY, C.H. & SMITH, D.A. 1985. A new swallow from the Red Sea. *Ibis* 127: 1-6.
- GATTER, W. 1985. Ein neuer Bülbül aus Westafrika (Aves, Pycnonotidae). *J. Orn.* 126: 155-161.
- GREENWAY, J.C. 1967. *Extinct and vanishing birds of the world*. 2nd revised edition. New York: Dover Publications.
- HAMILTON, A.C. 1976. The significance of patterns of distribution shown by forest plants and animals in tropical Africa for the reconstruction of Upper-pleistocene palaeoenvironments: a review. *Palaeoecol. Afr.* 9: 63-97.
- KING, W.B. 1981. *Endangered birds of the world: the ICBP bird red data book*. Washington D.C.: Smithsonian Institution Press/ICBP.
- LIVINGSTONE, D.A. 1975. Late Quaternary climatic change in Africa. *Ann. Rev. Ecol. Syst.* 6: 249-280.
- MOREAU, R.E. 1966. *The bird faunas of Africa and its islands*. London: Academic Press.
- MORONY, J.E., BOCK, W.J. & FARRAND, J. 1975. *Reference list of the birds of the world*. New York: American Museum of Natural History.
- OLSON, S.L. (1973). Evolution of the rails of the South Atlantic islands. *Smithsonian Contrib. Zool.* 152.
- WATSON, J. (1981). Population ecology, food conservation of the Seychelles Kestrel (*Falco araea*) on Mahé. Ph.D. thesis, University of Aberdeen.
- S.N. Stuart and N.J. Collar, International Council for Bird Preservation, 32 Cambridge Road, Girton, Cambridge, CB3 0PJ; S.N. Stuart's present address: SSC-IUCN, Avenue du Mont-Blanc, CH-1196, Gland, Switzerland

(Received 20 March 1985; postscript received August 1985)

APPENDIX 1

THREATENED AND NEAR-THREATENED BIRD SPECIES IN AFRICA AND RELATED ISLANDS

1. *Palearctic Africa and related landbridge islands*

a. Forest species

i. Threatened: Algerian Nuthatch *Sitta ledanti*

b. Terrestrial non-forest species

i. Threatened: Northern Bald Ibis *Geronticus eremita*

ii. Near-threatened: Red Kite *Milvus milvus*

Little Bustard *Tetrax tetrax*

Great Bustard *Otis tarda*

Houbara Bustard *Chlamydotis undulata*

Red-necked Nightjar *Caprimulgus ruficollis*

- c. Inland water species  
 ii. Near-threatened: Marbled Teal *Marmaronetta angustirostris*  
 White-headed Duck *Oxyura leucocephala*
- d. Sea- and shorebirds  
 i. Threatened: Audouin's Gull *Larus audouinii*  
 Roseate Tern *Sterna dougallii*  
 ii. Near-threatened: White-eyed Gull *Larus leucophthalmus*
2. Afrotropical Africa and related landbridge islands
- a. Forest species  
 i. Threatened:
- Djibouti Francolin *Francolinus ochropectus*  
 Mount Cameroon Francolin *F. camerunensis*  
 Swierstra's Francolin *F. swierstrai*  
 Nahan's Francolin *F. nahani*  
 White-breasted Guinea-fowl *Agelastes meleagrides*  
 Bannerman's Turaco *Tauraco bannermani*  
 Prince Ruspoli's Turaco *T. ruspolii*  
 Itombwe Owl *Phodilus prigoginei*  
 Sokoke Scops Owl *Otus ireneae*  
 Usambara Eagle Owl *Bubo vosseleri*  
 Rufous Fishing Owl *Scotopelia ussheri*  
 Albertine Owlet *Glaucidium albertinum*  
 Schouteden's Swift *Schoutedenapus schoutedeni*  
 Yellow-footed Honeyguide *Melignomon eisentrauti*  
 African Green Broadbill *Pseudocalyptomena*  
*graueri*  
 Sokoke Pipit *Anthus sokokensis*  
 Western Wattled Cuckoo-shrike *Campephaga lobata*  
 Prigogine's Greenbul *Chlorocichla prigoginei*  
 Yellow-throated Olive Greenbul *Criniger*  
*olivaceus*  
 Gabela Helmet-shrike *Prionops gabela*  
 Green-breasted Bush-shrike *Malaconotus*  
*gladiator*  
 Monteiro's Bush-shrike *M. monteiri*  
 Uluguru Bush-shrike *M. alius*  
 Mount Kupe Bush-shrike *M. kupeensis*  
 Swynnerton's Forest Robin *Swynnertonia*  
*swynnertoni*  
 Gabela Akalat *Sheppardia gabela*  
 East Coast Akalat *S. gunningi*  
 White-headed Robin-chat *Cossypha heinrichi*  
 Dappled Mountain Robin *Modulatrix orostruthus*  
 Usambara Ground Robin *Dryocichloides montanus*  
 Iringa Ground Robin *D. lowei*  
 Thyolo Alethe *Alethe choloensis*  
 Forest Ground-thrush *Turdus oberlaenderi*  
 Kibale Ground-thrush *T. kibalensis*  
 Spotted Ground-thrush *T. fischeri*  
 Taita Thrush *T. helleri*  
 White-throated Mountain Babbler *Lioptilus*  
*gilberti*  
 White-necked Picathartes *Picathartes gymno-*  
*cephalus*  
 Grey-necked Picathartes *P. oreas*  
 Kungwe Apalis *Apalis argentea*  
 Kabobo Apalis *A. kaboboensis*

- Long-billed Apalis *A. moreaui*  
 Mrs Moreau's Warbler *Bathmocercus winifredae*  
 Turner's Eremomela *Eremomela turneri*  
 Pulitzer's Longbill *Macrosphenus pulitzeri*  
 Nimba Flycatcher *Melaenornis annamarulae*  
 Chapin's Flycatcher *Muscipapa lendu*  
 Banded Wattle-eye *Platysteira laticincta*  
 Amani Sunbird *Anthreptes pallidigaster*  
 Banded Green Sunbird *A. rubritorques*  
 Rufous-winged Sunbird *Nectarinia rufipennis*  
 Marungu Sunbird *N. prigoginei*  
 Rockefeller's Sunbird *N. rockefelleri*  
 Fernando Po Speirops *Speirops brunneus*  
 Warsangli Linnet *Acanthis johannis*  
 Bannerman's Weaver *Ploceus bannermani*  
 Bates's Weaver *P. batesi*  
 Clarke's Weaver *P. golandi*  
 Golden-naped Weaver *P. aureonucha*  
 Yellow-legged Weaver *P. flavipes*  
 Tanzanian Mountain Weaver *P. nicolli*  
 Ibadan Malimbe *Malimbus ibadanensis*  
 Gola Malimbe *M. ballmanni*
- ii. Near-threatened:
- Southern Banded Snake Eagle *Circaetus fascio-*  
*latus*  
 Grey-striped Francolin *Francolinus griseo-*  
*striatus*  
 Congo Peacock *Afropavo congensis*  
 White-naped Pigeon *Columba albinucha*  
 Etchécopar's Barred Owlet *Glaucidium (capense)*  
*ethecopari*  
 Chestnut Barred Owlet *G. (capense) castaneum*  
 Thyolo Green Barbet *Stactolaema (olivacea)*  
*belcheri*  
 Ngoye Green Barbet *S. (olivacea) woodwardi*  
 Rondo Green Barbet *S. (olivacea) hylophona*  
 Pygmy Honeyguide *Indicator pumilio*  
 Cameroon Mountain Roughwing *Psalidoprocne*  
*fuliginosa*  
 Cameroon Mountain Greenbul *Andropadus montanus*  
 Grey-headed Greenbul *Phyllastrephus polio-*  
*cephalus*  
 Sassi's Olive Greenbul *P. lorenzi*  
 Braun's Bush-shrike *Laniarius (luehderi) brauni*  
 Amboim Bush-shrike *L. (luehderi) amboimensis*  
 Kivu Ground-thrush *Turdus tanganjicae*  
 Somali Olive Thrush *T. (abyssinicus) ludoviciae*  
 Rufous-winged Illadopsis *Trichastoma rufescens*  
 Red-collared Flycatcher-babbler *Lioptilus*  
*rufocinctus*  
 Chapin's Flycatcher-babbler *L. chapini*  
 White-eyed Prinia *Prinia leontica*  
 Forest Prinia *P. robertsi*  
 White-winged Apalis *Apalis chariessa*  
 Rudd's Apalis *A. ruddi*  
 Bamenda Apalis *A. (sharpii) bamendae*  
 Taita Apalis *A. (thoracica) fascigularis*  
 Namuli Apalis *A. (thoracica) lynesi*

Chirinda Apalis *A. chirindensis*  
 Black-headed Stream Warbler *Bathmocercus cerviniventris*  
 Margaret's Batis *Batis margaritae*  
 Woodward's Batis *B. fratrum*  
 Gabon Batis *B. minima*  
 White-fronted Wattle-eye *Platysteira albifrons*  
 Bedford's Paradise Flycatcher *Terpsiphone bedfordi*  
 Plain-backed Sunbird *Anthreptes reichenowi*  
 Uluguru Violet-backed Sunbird *A. neglectus*  
 Ursula's Mouse-coloured Sunbird *Nectarinia ursulae*  
 Moreau's Sunbird *N. moreaui*  
 Neergaard's Sunbird *N. neergaardi*  
 Loveridge's Sunbird *N. loveridgei*  
 Kulal White-eye *Zosterops (poliogastra) kulalensis*  
 Taita White-eye *Z. (poliogastra) silvanus*  
 South Pare White-eye *Z. (poliogastra) silvanus*  
 Thick-billed Seed-eater *Serinus (burtoni) melanochrous*  
 Shelley's Crimson-wing *Cryptospiza shellei*  
 Copper-tailed Glossy Starling *Lamprotornis cupreocauda*  
 Abbott's Starling *Cinnyricinclus femoralis*

b. Terrestrial non-forest species

i. Threatened:

Southern Bald Ibis *Geronticus calvus*  
 Cape Vulture *Gyps coprotheres*  
 Somali Pigeon *Columba oliviae*  
 Black-cheeked Lovebird *Agapornis nigrigenis*  
 Fernando Po Swift *Apus sladeniae*  
 White-chested Tinker-bird *Pogoniulus makawai*  
 Ash's Lark *Mirafra ashi*  
 Degodi Lark *M. degodiensis*  
 South African Long-clawed Lark *Heteromirafra ruddi*  
 Somali Long-clawed Lark *H. archeri*  
 Sidamo Long-clawed Lark *H. sidamoensis*  
 Botha's Lark *Spizocorys fringillaris*  
 White-tailed Swallow *Hirundo megaensis*  
 Red Sea Cliff Swallow *H. perdita*  
 Hinde's Pied Babbler *Turdoides hindei*  
 Dja River Warbler *Bradypterus grandis*  
 Tana River Cisticola *Cisticola restricta*  
 Karamoja Apalis *Apalis karamojae*  
 Yellow-throated Serin *Serinus flavigula*  
 Ankober Serin *S. ankoberensis*  
 Anambra Waxbill *Estrilda poliopareia*  
 Black-lore'd Waxbill *E. nigriloris*  
 Black-chinned Weaver *Ploceus nigrimentum*  
 Ethiopian Bush-crow *Zavattariornis stresemanni*

ii. Near-threatened:

Black Harrier *Circus maurus*  
 Taita Falcon *Falco fasciinucha*  
 Harwood's Francolin *Francolinus harwoodi*  
 Finsch's Francolin *F. finschi*  
 Nubian Bustard *Neotis nuba*



Little Brown Bustard *Eupodotis humilis*  
 White-winged Dove *Streptopelia reichenowi*  
 Red-faced Barbet *Lybius rubrifacies*  
 Chaplin's Barbet *L. chaplini*  
 Angola White-headed Barbet *L. (leucocephalus) leucogaster*  
 Stierling's Woodpecker *Dendropicos stierlingi*  
 Williams's Bush Lark *Mirafra williamsi*  
 Friedmann's Bush Lark *M. pulpa*  
 Short-clawed Lark *M. chuana*  
 Red Lark *M. burra*  
 Sclater's Lark *Spizocorys sclateri*  
 Obbia Lark *Calandrella obbiensis*  
 Blue Swallow *Hirundo atrocaerulea*  
 Grey-crested Helmet Shrike *Prionops poliophaga*  
 Turati's Boubou *Laniarius turatii*  
 Herero Chat *Namibornis herero*  
 Angola Cave-chat *Xenocopsychus ansorgei*  
 Bamboo Warbler *Bradypterus alfredi*  
 Pearson's Warbler *Apalis melanura*  
 Somali Short-billed Crombec *Sylvietta philippae*  
 Gurney's Sugarbird *Promerops gurneyi*  
 Salvadori's Serin *Serinus xantholaema*  
 Lemon-breasted Canary *S. citrinipectus*  
 Drakensberg Siskin *S. symonsi*  
 Protea Serin *S. leucopterus*  
 Pink-throated Twinspot *Hypargos margaritatus*  
 Neumann's Waxbill *Estrilda thomensis*

c. Inland water species

i. Threatened:

Slaty Egret *Egretta vinaceigula*  
 White-winged Flufftail *Sarothrura ayresi*  
 Grauer's Swamp Warbler *Bradypterus graueri*  
 Papyrus Yellow Warbler *Chloropeta gracilirostris*  
 River Prinia *Prinia "fluviatilis"*  
 Loango Slender-billed Weaver *Ploceus subper-  
 sonatus*

ii. Near-threatened:

Lake Lufira Weaver *P. ruweil*  
 Shoebill *Balaeniceps rex*  
 Wattled Crane *Bugeranus carunculatus*  
 Mfumbiri Bush-shrike *Laniarius mufumbiri*  
 White-winged Warbler *Bradypterus carpalis*  
 Papyrus Canary *Serinus koliensis*  
 Fox's Weaver *Ploceus spekeoides*

d. Sea- and shorebirds

i. Threatened:

Damara Tern *Sterna balaenarum*

Roseate Tern *S. dougallii*

ii. Near-threatened:

Jackass Penguin *Spheniscus demersus*

Crowned Cormorant *Phalacrocorax coronatus*

Bank Cormorant *P. neglectus*

African Black Oystercatcher *Haematopus moquini*

White-eyed Gull *Larus leucophthalmus*

3. Madagascar and related islands

a. Forest species

i. Threatened:

Madagascar Serpent Eagle *Eutriorchis astur*

White-breasted Mesite *Mesitornis variegata*

Brown Mesite *M. unicolor*

- Snail-eating Coua *Coua delalandei*  
 Madagascar Red Owl *Tyto soumagnei*  
 Short-legged Ground-roller *Brachypteracias leptosomus*  
 Scaly Ground-roller *B. squamiger*  
 Rufous-headed Ground-roller *Atelornis crossleyi*  
 Yellow-bellied Sunbird-*asity* *Neodrepanis hypoxantha*  
 Appert's Greenbul *Phyllastrephus apperti*  
 Dusky Greenbul *P. tenebrosus*  
 Grey-crowned Greenbul *P. cinereiceps*  
 Van Dam's Vanga *Xenopirostris damii*  
 Pollen's Vanga *X. polleni*  
 Madagascar Yellowbrow *Crossleyia xanthophrys*  
 Red-tailed Newtonia *Newtonia fanovanae*  
 ii. Near-threatened: Madagascar Crested Ibis *Lophotibis cristata*  
 Pitta-like Ground-roller *Atelornis pittoides*  
 Bernier's Vanga *Oriolia bernieri*  
 Wedge-tailed Jery *Hartertula flavoviridis*  
 Brown Emu-tail *Dromaeocercus brunneus*  
 Rand's Warbler *Randia pseudozosterops*  
 Ward's Flycatcher *Pseudobias wardii*
- b. Terrestrial non-forest species  
 i. Threatened: Subdesert Mesite *Monias benschi*  
 Long-tailed Ground-roller *Uratelornis chimaera*  
 Benson's Rockthrush *Monticola bensoni*  
 ii. Near-threatened: Madagascar Cuckoo-falcon *Aviceda madagascariensis*  
 Réunion Harrier *Circus maillardi*  
 Henst's Goshawk *Accipiter henstii*  
 Madagascar Sparrowhawk *A. madagascariensis*  
 Banded Kestrel *Falco zoniventris*  
 Verreaux's Coua *Coua verreauxi*
- c. Inland water species  
 i. Threatened: Madagascar Little Grebe *Tachybaptus pelzelinii*  
 Alaotra Grebe *T. rufolavatus*  
 Madagascar Heron *Ardea humbloti*  
 Madagascar Teal *Anas bernieri*  
 Madagascar Pochard *Aythya innotata*  
 Madagascar Fish Eagle *Haliaeetus vociferoides*  
 Sakalava Rail *Amaurornis olivieri*  
 Slender-billed Flufftail *Sarothrura watersi*  
 ii. Near-threatened: Madagascar Pond Heron *Ardeola idae*
- d. Sea- and shorebirds  
 i. Threatened: Madagascar Heron *Ardea humbloti*  
 Madagascar Teal *Anas bernieri*  
 Madagascar Fish Eagle *Haliaeetus vociferoides*  
 Madagascar Plover *Charadrius thoracicus*  
 Roseate Tern *Sterna dougallii*
4. Oceanic islands  
 a. Forest species  
 i. Threatened: Dwarf Olive Ibis *Bostrychia bocagei*  
 Mauritius Kestrel *Falco punctatus*  
 Madeira Laurel Pigeon *Columba trocaz*  
 Dark-tailed Laurel Pigeon *C. bollii*  
 White-tailed Laurel Pigeon *C. junoniae*

- Maroon Pigeon *C. thomensis*  
 Pink Pigeon *Nesoenas mayeri*  
 Mauritius Parakeet *Psittacula eques*  
 Grand Comoro Scops Owl *Otus pauliani*  
 Seychelles Scops Owl *O. insularis*  
 São Tomé Scops Owl *O. hartlaubi*  
 Mauritius Cuckoo-shrike *Coracina typica*  
 Réunion Cuckoo-shrike *C. newtoni*  
 Mauritius Black Bulbul *Hypsipetes olivaceus*  
 São Tomé Fiscal Shrike *Lanius newtoni*  
 Seychelles Magpie Robin *Copsychus sechellarum*  
 Rodrigues Warbler *Acrocephalus rodericanus*  
 Seychelles Warbler *A. sechellensis*  
 São Tomé Short-tail *Amaurocichla bocagii*  
 Grand Comoro Flycatcher *Humblotia flavirostris*  
 Seychelles Black Paradise Flycatcher *Terpsiphone corvina*  
 São Tomé White-eye *Zosterops ficedulinus*  
 Seychelles White-eye *Z. modestus*  
 Mount Karthala White-eye *Z. mouroeniensis*  
 Mauritius Olive White-eye *Z. chloronothus*  
 Grosbeak Bunting *Nesospiza wilkinsi*  
 Blue Chaffinch *Fringilla teydea*  
 São Tomé Grosbeak *Neospiza concolor*  
 Mauritius Fody *Foudia rubra*  
 Seychelles Fody *F. sechellarum*  
 Rodrigues Fody *F. flavicans*  
 Grand Comoro Drongo *Dicrurus fuscipennis*  
 Mayotte Drongo *D. waldeni*
- ii. Near-threatened: Seychelles Kestrel *Falco araea*  
 São Tomé Thrush *Turdus olivaceofuscus*  
 Mrs Benson's Warbler *Nesillas mariae*  
 São Tomé Paradise Flycatcher *Terpsiphone atrochalybea*  
 Giant Sunbird *Dreptes thomensis*
- b. Terrestrial non-forest species
- i. Threatened: Inaccessible Rail *Atlantisia rogersi*  
 Gough Moorhen *Gallinula comeri*  
 St. Helena Plover *Charadrius sanctaehelenae*  
 Seychelles Swiftlet *Collocalia elaphra*  
 Raso Lark *Alauda razae*  
 Fuerteventura Stonechat *Saxicola dacotiae*  
 Aldabra Warbler *Nesillas aldabranus*  
 Gough Bunting *Rowettia goughensis*  
 Tristan Bunting *Nesospiza acunhae*
- ii. Near-threatened: Réunion Harrier *Circus maillardi*  
 Red Kite *Milvus milvus*  
 Mascarene Swiftlet *Collocalia francica*  
 Socotra Cisticola *Cisticola haesitata*  
 Pagalu White-eye *Zosterops griseovirescens*  
 Aldabra Drongo *Dicrurus aldabranus*
- c. Inland water species
- ii. Near-threatened: Madagascar Pond Heron *Ardeola idae*

- d. Sea- and shorebirds
- i. Threatened Amsterdam Albatross *Diomedea amsterdamensis*  
 Mascarene Black Petrel *Pterodroma aterrima*  
 Gon-gon *P. feae*  
 Freira *P. madeira*  
 Ascension Frigatebird *Fregata aquila*  
 Canary Black Oystercatcher *Haematopus meadewaldoi*  
 Roseate Tern *Sterna dougallii*
- ii. Near-threatened: Barau's Petrel *Pterodroma barau*

## APPENDIX 2

THE THREATS FACING THE THREATENED AND NEAR-THREATENED BIRD SPECIES IN AFRICA AND RELATED ISLANDS (THE NUMBERS AFTER EACH SPECIES REFER TO THE THREATS ENUMERATED IN TABLE 6)

*Threatened species*

- Madagascar Little Grebe *Tachybaptus pelzelni* 3, 20, 21  
 Alaotra Grebe *T. rufolavatus* 3, 20, 21  
 Amsterdam Albatross *Diomedea amsterdamensis* 5, 13, 31  
 Mascarene Black Petrel *Pterodroma aterrima* 6, 31  
 Gon-gon *P. feae* 5, 7, 31  
 Freira *P. madeira* 5, 7, 9, 31  
 Ascension Frigatebird *Fregata aquila* 5, 8, 31  
 Slaty Egret *Egretta vinaceigula* 3, 31  
 Madagascar Heron *Ardea humbloti* 3, 7  
 Northern Bald Ibis *Geronticus eremita* 3, 7, 8, 10, 15, 29  
 Southern Bald Ibis *G. calvus* 3, 7, 8, 12  
 Dwarf Olive Ibis *Bostrychia bocagei* 2, 6, 31  
 Madagascar Teal *Anas bernieri* 3, 7, 9, 20  
 Madagascar Pochard *Aythya innotata* 3, 7, 20  
 Madagascar Fish Eagle *Haliaeetus vociferoides* 3, 7  
 Cape Vulture *Gyps coprotheres* 7, 8, 11, 13, 17, 18, 23  
 Madagascar Serpent Eagle *Eutriorchis astur* 1  
 Mauritius Kestrel *Falco punctatus* 1, 5, 7, 28, 31  
 Djibouti Francolin *Francolinus ochropectus* 1, 8, 12, 13, 29, 31  
 Mount Cameroon Francolin *F. camerunensis* 7, 30, 31  
 Swierstra's Francolin *F. swierstrai* 1, 31  
 Nahan's Francolin *F. nahani* 1, 7, 31  
 White-breasted Guineafowl *Agelastes meleagrides* 1, 7  
 White-breasted Mesite *Mesitornis variegata* 1, 6, 31  
 Brown Mesite *M. unicolor* 1, 6  
 Subdesert Mesite *Monias benschi* 3, 5, 7, 31  
 Inaccessible Rail *Atlantisia rogersi* 5, 13, 31  
 White-winged Flufftail *Sarothrura ayresi* 4  
 Slender-billed Flufftail *S. watersi* 4, 31  
 Sakalava Rail *Amaurornis olivieri* 4, 9  
 Gough Moorhen *Gallinula comeri* 5, 31  
 Canary Black Oystercatcher *Haematopus meadewaldoi* 6, 31  
 Madagascar Plover *Charadrius thoracicus* 31, 32  
 St. Helena Plover *C. sanctaehelenae* 5, 8, 31  
 Audouin's Gull *Larus audouinii* 8, 27  
 Damara Tern *Sterna balaenarum* 3, 7, 8, 11  
 Roseate Tern *S. dougallii* 6, 7, 8  
 Somali Pigeon *Columba oliviae* 4, 31

- Madeira Laurel Pigeon *C. trocaz* 1, 5, 7, 31  
 Dark-tailed Laurel Pigeon *C. bollii* 31, 32  
 White-tailed Laurel Pigeon *C. junoniae* 31, 32  
 Maroon Pigeon *C. thomensis* 2, 7, 31  
 Pink Pigeon *Nesoenas mayeri* 1, 5, 7, 24, 28, 31  
 Black-cheeked Lovebird *Agapornis nigrigenis* 10, 31  
 Mauritius Parakeet *Psittacula eques* 1, 5, 7, 24, 26, 28, 31  
 Bannerman's Turaco *Tauraco bannermani* 1, 12, 13, 31  
 Prince Ruspoli's Turaco *T. ruspolii* 2, 31  
 Snail-eating Coua *Coua delalandei* 2, 6, 31  
 Madagascar Red Owl *Tyto soumagnei* 1, 31  
 Itombwe Owl *Phodilus prigoginei* 2, 31  
 Sokoke Scops Owl *Otus irenae* 1, 31  
 Grand Comoro Scops Owl *O. pauliani* 1, 31  
 Seychelles Scops Owl *O. insularis* 1, 31  
 São Tomé Scops Owl *O. hartlaubi* 2, 6, 31  
 Usambara Eagle Owl *Bubo vosseleri* 1, 31  
 Rufous Fishing Owl *Scotopelia ussheri* 1, 16, 31  
 Albertine Owlet *Glaucidium albertinum* 1, 31  
 Seychelles Swiftlet *Collocalia elaphra* 7, 31  
 Schouteden's Swift *Schoutedenapus schoutedeni* 2, 31  
 Fernando Po Swift *Apus sladeniae* 31, 32  
 Short-legged Ground-roller *Brachypteracias leptosomus* 1  
 Scaly Ground-roller *B. squamiger* 1, 5, 7, 31  
 Rufous-headed Ground-roller *Atelornis crossleyi* 1  
 Long-tailed Ground-roller *Uratelornis chimaera* 3, 7, 31  
 White-chested Tinkerbird *Pogoniulus makawai* 31, 32  
 Yellow-footed Honeyguide *Melignomon eisentrauti* 1  
 African Green Broadbill *Pseudocalyptomena graueri* 1, 31  
 Yellow-bellied Sunbird-asity *Neodrepanis hypoxantha* 1, 31  
 Ash's Lark *Mirafra ashi* 4, 31  
 Degodi Lark *M. degodiensis* 31, 32  
 South African Long-clawed Lark *Heteromirafra ruddi* 3, 12, 13, 31  
 Somali Long-clawed Lark *H. archeri* 3, 31  
 Sidamo Long-clawed Lark *H. sidamoensis* 31, 32  
 Botha's Lark *Spizocorys fringillaris* 4, 31  
 Raso Lark *Alauda razae* 5, 29, 31  
 White-tailed Swallow *Hirundo megaensis* 4, 31  
 Red Sea Cliff Swallow *H. perdita* 31, 32  
 Sokoke Pipit *Anthus sokokensis* 1, 31  
 Mauritius Cuckoo-shrike *Coracina typica* 1, 5, 28, 31  
 Réunion Cuckoo-shrike *C. newtoni* 1, 6, 7, 8, 28, 31  
 Western Wattled Cuckoo-shrike *Campephaga lobata* 1  
 Prigogine's Greenbul *Chlorocichla prigoginei* 1, 31  
 Appert's Greenbul *Phyllastrephus apperti* 1, 13, 28, 31  
 Dusky Greenbul *P. tenebrosus* 1, 31  
 Grey-crowned Greenbul *P. cinereiceps* 1  
 Yellow-throated Olive Greenbul *Criniger olivaceus* 1  
 Mauritius Black Bulbul *Hypsipetes olivaceus* 1, 5, 31  
 Gabela Helmet-shrike *Prionops gabela* 2, 31  
 Green-breasted Bush-shrike *Malaconotus gladiator* 1, 31  
 Monteiro's Bush-shrike *M. monteiri* 2, 31  
 Uluguru Bush-shrike *M. alius* 31, 32  
 Mount Kupe Bush-shrike *M. kupeensis* 31, 32  
 São Tomé Fiscal Shrike *Lanius newtoni* 2, 6, 31  
 Van Dam's Vanga *Xenopirostris damii* 1, 31  
 Pollen's Vanga *X. polleni* 1  
 Swynnerton's Forest Robin *Swynnertonia swynnertonii* 1, 31

- Gabela Akalat *Sheppardia gabela* 2, 31  
 East Coast Akalat *S. gunningi* 1  
 White-headed Robin Chat *Cossypha heinrichi* 2, 31  
 Dappled Mountain Robin *Modulatrix orostruthus* 1, 31  
 Usambara Ground Robin *Dryocichlodes montanus* 1, 31  
 Iringa Ground Robin *D. lowei* 1, 13, 31  
 Thyolo Alethe *Alethe choloensis* 1, 31  
 Seychelles Magpie-robin *Copsychus sechellarum* 3, 5, 28, 31  
 Fuerteventura Stonechat *Saxicola dacotiae* 6, 8, 29, 31  
 Benson's Rockthrush *Monticola bensoni* 31, 32  
 Forest Ground-thrush *Turdus oberlaenderi* 1, 31  
 Kibale Ground-thrush *T. kibalensis* 1, 31  
 Spotted Ground-thrush *T. fischeri* 1, 25  
 Taita Thrush *T. helleri* 1, 31  
 Hinde's Pied Babbler *Turdoides hindei* 3, 31  
 White-throated Mountain Babbler *Lioptilus gilberti* 31, 32  
 Madagascar Yellowbrow *Crossleyia xanthophrys* 31  
 White-necked Picathartes *Picathartes gymnocephalus* 1, 7, 10  
 Grey-necked Picathartes *P. oreas* 1, 7, 10  
 Grauer's Swamp Warbler *Bradypterus graueri* 3, 31  
 Dja River Warbler *B. grandis* 31, 32  
 Rodrigues Warbler *Acrocephalus rodericanus* 1, 5, 8, 12, 28, 31  
 Seychelles Warbler *A. sechellensis* 5, 31  
 Aldabra Warbler *Nesillas aldabranus* 5, 12, 31  
 Papyrus Yellow Warbler *Chloropeta gracilirostris* 3, 31  
 Tana River Cisticola *Cisticola restricta* 31, 32  
 River Prinia *Prinia "fluviatilis"* 31, 32  
 Karamoja Apalis *Apalis karamojae* 3, 12  
 Kungwe Apalis *A. argentea* 1, 13, 31  
 Kabobo Apalis *A. kaboboensis* 2, 31  
 Long-billed Apalis *A. moreaui* 1, 31  
 Mrs Moreau's Warbler *Bathmocercus winifredae* 1, 31  
 Turner's Eremomela *Eremomela turneri* 1, 31  
 Pulitzer's Longbill *Macrosphenus pulitzeri* 2, 31  
 São Tomé Short-tail *Amaurocichla bocagii* 2, 6, 31  
 Nimba Flycatcher *Melaenornis annamarulae* 1, 31  
 Chapin's Flycatcher *Muscipapa lendu* 1, 31  
 Grand Comoro Flycatcher *Humblotia flavirostris* 1, 31  
 Red-tailed Newtonia *Newtonia fanovanae* 1, 31  
 Banded Wattle-eye *Platysteira laticincta* 1, 12, 13, 31  
 Seychelles Black Paradise Flycatcher *Terpsiphone corvina* 1, 8, 31  
 Algerian Nuthatch *Sitta ledanti* 1, 12, 13, 31  
 Amani Sunbird *Anthreptes pallidigaster* 1, 31  
 Banded Green Sunbird *A. rubritorques* 1, 31  
 Rufous-winged Sunbird *Nectarinia rufipennis* 1, 31  
 Marungu Sunbird *N. prigoginei* 1, 12, 31  
 Rockefeller's Sunbird *N. rockefelleri* 2, 31  
 São Tomé White-eye *Zosterops ficedulinus* 2, 31  
 Seychelles White-eye *Z. modestus* 31, 32  
 Mount Karthala White-eye *Z. mouroniensis* 30, 31  
 Mauritius Olive White-eye *Z. chloronothus* 1, 5, 31  
 Fernando Po Speirops *Speirops brunneus* 2, 31  
 Gough Bunting *Rowettia goughensis* 5, 31  
 Tristan Bunting *Nesospiza acunhae* 5, 13, 31  
 Grosbeak Bunting *N. wilkinsi* 1, 5, 28, 31  
 Blue Chaffinch *Fringilla teydea* 31, 32  
 Yellow-throated Serin *Serinus flavigula* 31, 32  
 Ankober Serin *S. ankoberensis* 31, 32

- São Tomé Grosbeak *Neospiza concolor* 2, 6, 31  
 Warsangli Linnet *Acanthis johannis* 2, 31  
 Anambra Waxbill *Estrilda poliopareia* 31, 32  
 Black-lored Waxbill *E. nigriloris* 31, 32  
 Bannerman's Weaver *Ploceus bannermani* 1, 13, 31  
 Bates's Weaver *P. batesi* 2, 31  
 Black-chinned Weaver *P. nigrimentum* 31  
 Loango Slender-billed Weaver *P. subpersonatus* 31, 32  
 Lake Lufira Weaver *P. ruweti* 31, 32  
 Clarke's Weaver *P. golandi* 1, 31  
 Golden-naped Weaver *P. aureonucha* 1, 31  
 Yellow-legged Weaver *P. flavipes* 1, 31  
 Tanzanian Mountain Weaver *P. nicolli* 1, 31  
 Ibadan Malimbe *Malimbe ibadenensis* 1, 31  
 Gola Malimbe *M. ballmanni* 1, 31  
 Mauritius Fody *Foudia rubra* 1, 5, 28, 31  
 Seychelles Fody *F. sechellarum* 6, 31  
 Rodrigues Fody *F. flavicans* 1, 5, 28, 31  
 Grand Comoro Drongo *Dicrurus fuscipennis* 1, 31  
 Mayotte Drongo *D. waldeni* 2, 31  
 Ethiopian Bush-crow *Zavattariornis stresemanni* 3, 31

*Near-threatened species*

- Jackass Penguin *Spheniscus demersus* 5, 8, 11, 14, 19, 22  
 Barau's Petrel *Pterodroma barau* 6, 31  
 Crowned Cormorant *Phalacrocorax coronatus* 31, 32  
 Bank Cormorant *P. neglectus* 31, 32  
 Madagascar Pond Heron *Ardeola idae* 8, 9, 16, 20  
 Shoebill *Balaeniceps rex* 3, 7, 8, 10, 15, 29  
 Madagascar Crested Ibis *Lophotibis cristata* 1, 7  
 Marbled Teal *Marmaronetta angustirostris* 3, 7  
 White-headed Duck *Oxyura leucocephala* 3, 7  
 Madagascar Cuckoo-falcon *Aviceda madagascariensis* 32  
 Southern Banded Snake Eagle *Circaetus fasciolatus* 1  
 Réunion Harrier *Circus maillardi* 32  
 Black Harrier *C. maurus* 32  
 Red Kite *Milvus milvus* 2, 7  
 Henst's Goshawk *Accipiter henstii* 32  
 Madagascar Sparrowhawk *A. madagascariensis* 32  
 Seychelles Kestrel *Falco araea* 5, 7, 31  
 Banded Kestrel *F. zoniventris* 32  
 Taita Falcon *F. fasciinucha* 32  
 Harwood's Francolin *Francolinus harwoodi* 31, 32  
 Finsch's Francolin *F. finschi* 32  
 Grey-striped Francolin *F. griseostriatus* 2, 31  
 Congo Peacock *Afropavo congensis* 2, 7, 10  
 Wattled Crane *Bugeranus carunculatus* 3, 7, 8, 10, 11, 12, 13  
 Little Bustard *Tetrax tetrax* 3  
 Great Bustard *Otis tarda* 3, 7  
 Houbara Bustard *Chlamydotis undulata* 3, 7  
 Nubian Bustard *Neotis nuba* 7, 29  
 Little Brown Bustard *Eupodotis humilis* 29  
 African Black Oyster Catcher *Haematopus moquini* 7, 31  
 White-eyed Gull *Larus leucophthalmus* 8, 9  
 White-naped Pigeon *Columba albinucha* 1, 31  
 White-winged Dove *Streptopelia reichenowi* 32  
 Verreaux's Coua *Coua verreauxi* 31, 32  
 Etchecopar's Barred Owlet *Glaucidium (capense) etchecopari* 1, 31

- Chestnut Barred Owlet *G. (capense) castaneum* 1, 31  
 Red-necked Nightjar *Caprimulgus ruficollis* 32  
 Mascarene Swiftlet *Collocalia francica* 7, 8, 31  
 Pitta-like Ground-roller *Atelornis pittoides* 1  
 Thylo Green Barbet *Stactolaema (olivacea) belcheri* 1, 31  
 Ngoye Green Barbet *S. (olivacea) woodwardi* 1, 31  
 Rondo Green Barbet *S. (olivacea) hylophona* 2, 31  
 Angola White-headed Barbet *Lybius (leucocephalus) leucogaster* 31, 32  
 Red-faced Barbet *L. rubrifacies* 3, 31  
 Chaplin's Barbet *L. chaplini* 31, 32  
 Pygmy Honeyguide *Indicator pumilio* 1, 31  
 Stierling's Woodpecker *Dendropicos stierlingi* 32  
 Williams's Bush Lark *Mirafra williamsi* 31, 32  
 Friedmann's Bush Lark *M. pulpa* 31, 32  
 Short-clawed Lark *M. chuana* 3, 31  
 Red Lark *M. burra* 31, 32  
 Sclater's Lark *Spizocorys sclateri* 31, 32  
 Obbia Lark *Calandrella obbiensis* 31, 32  
 Blue Swallow *Hirundo atrocaerulea* 3  
 Cameroon Mountain Roughwing *Psalidoprocne fuliginosa* 31, 32  
 Cameroon Mountain Greenbul *Andropadus montanus* 1, 31  
 Grey-headed Greenbul *Phyllastrephus poliocephalus* 1, 31  
 Sassi's Olive Greenbul *P. lorenzi* 2, 31  
 Grey-crested Helmet-shrike *Prionops poliolopha* 31, 32  
 Turati's Boubou *Laniarius turatii* 31, 32  
 Braun's Bush-shrike *L. (luehderi) brauni* 2, 31  
 Amboim Bush-shrike *L. (luehderi) amboimensis* 2, 31  
 Mfumbiri Bush-shrike *L. mufumbiri* 3  
 Bernier's Vanga *Oriolia bernieri* 1  
 Herero Chat *Namibornis herero* 31, 32  
 Angola Cave Chat *Xenocopsychus ansorgei* 31, 32  
 Kivu Ground-thrush *Turdus tanganjicae* 2, 31  
 Somali Olive Thrush *T. (abyssinicus) ludoviciae* 2, 31  
 São Tomé Thrush *T. olivaceofuscus* 2, 31  
 Rufous-winged Illadopsis *Trichastoma rufescens* 1  
 Wedge-tailed Jery *Hartertula flavoviridis* 1  
 Red-collared Flycatcher-babbler *Lioptilus rufocinctus* 2, 31  
 Chapin's Flycatcher-babbler *L. chapini* 2, 31  
 White-winged Warbler *Bradypterus carpalis* 3  
 Bamboo Warbler *B. alfredi* 32  
 Mrs Benson's Warbler *Nesillas mariae* 1, 31  
 Socotra Cisticola *Cisticola haesitata* 31, 32  
 White-eyed Prinia *Prinia leontica* 2, 31  
 Forest Prinia *P. robertsi* 2, 31  
 White-winged Apalis *Apalis chariessa* 1, 31  
 Rudd's Apalis *A. ruddi* 2, 31  
 Bamenda Apalis *A. (sharpii) bamendae* 1, 31  
 Taita Apalis *A. (thoracica) fascicularis* 1, 31  
 Namuli Apalis *A. (thoracica) lynesii* 2, 31  
 Chirinda Apalis *A. chirindensis* 2, 31  
 Pearson's Warbler *A. melanura* 32  
 Brown Emu-tail *Dromaeocercus brunneus* 1, 31  
 Black-headed Stream Warbler *Bathmocercus cerviniventris* 2  
 Somali Short-billed Crombec *Sylvietta philippae* 32  
 Rand's Warbler *Randia pseudozosterops* 1  
 Ward's Flycatcher *Pseudobias wardi* 1  
 Margaret's Batis *Batis margaritae* 2  
 Woodward's Batis *B. fratrum* 1



- Gabon Batis *B. minima* 31, 32  
 White-fronted Wattle-eye *Platysteira albifrons* 2, 31  
 São Tomé Paradise Flycatcher *Terpsiphone atrochalybea* 2, 31  
 Bedford's Paradise Flycatcher *T. bedfordi* 2, 31  
 Plain-backed Sunbird *Anthreptes reichenowi* 1  
 Uluguru Violet-backed Sunbird *A. neglectus* 1  
 Giant Sunbird *Dreptes thomensis* 2, 31  
 Ursula's Mouse-coloured Sunbird *Nectarinia ursulae* 1, 31  
 Moreau's Sunbird *N. moreaui* 1, 31  
 Neergaard's Sunbird *N. neergaardi* 2, 31  
 Loveridge's Sunbird *N. loveridgei* 31, 32  
 Kulal White-eye *Zosterops (poliogastra) kulalensis* 1, 12, 31  
 Taita White-eye *Z. (poliogastra) silvanus* 1, 31  
 South Pare White-eye *Z. (poliogastra) winifredae* 2, 31  
 Pagalu White-eye *Z. griseovirescens* 31, 32  
 Gurney's Sugarbird *Promerops gurneyi* 3  
 Papyrus Canary *Serinus koliensis* 3  
 Salvadori's Serin *S. xantholaema* 31, 32  
 Lemon-breasted Canary *S. citrinipectus* 32  
 Protea Serin *S. leucopterus* 4, 31  
 Drakensberg Siskin *S. symonsi* 4, 31  
 Thick-billed Seed-eater *S. (burtoni) melanochrous* 1, 31  
 Shelley's Crimson-wing *Cryptospiza shelleyi* 1, 31  
 Pink-throated Twinspot *Hypargos margaritatus* 32  
 Neumann's Waxbill *Estrilda thomensis* 31, 32  
 Fox's Weaver *Ploceus spekeoides* 4, 31  
 Copper-tailed Glossy Starling *Lamprotornis cupreocauda* 1  
 Abbott's Starling *Cinnyricinclus femoralis* 1, 31  
 Aldabra Drongo *Dicrurus aldabranus* 31, 32