

## BIRDS OF PREY AND OWLS IN MADAGASCAR: THEIR DISTRIBUTION, STATUS AND CONSERVATION

by

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Like the flora and fauna of Madagascar generally, the Falconiformes and Strigiformes reveal a high degree of endemism. Only three of the fourteen resident diurnal species are not confined in their range to Madagascar alone and a few other islands of the Indian Ocean. Since Madagascar was formerly completely covered by forest, most of the species have evolved in this biotope. Following extensive deforestation, the majority of the endemic birds of prey are today rare, extremely localised, or both. The two species of eagle are numbered among the most threatened raptor species in the world. Whilst the Madagascar Sea Eagle was still fairly numerous only a few decades ago the population has declined rapidly, and the reasons for its violent decline are not clearly known. There are only a few museum specimens known of the Madagascar Serpent Eagle and Soumagne's or Madagascar Red Owl. Both of these are inhabitants of the eastern rain forest, which in all probability will have disappeared by the end of this century, unless new reserves can be established in what still remains of it. Otherwise both these species, of which there have been no definite sightings since 1930, will vanish for ever, along with countless numbers of other species of flora and fauna.

### General Description

Madagascar, the fourth largest island in the world, is separated from the continent of Africa by the Mozambique Channel, about 400 km wide. From the biological viewpoint, it is one of the most fascinating regions on earth. Today there remains no doubt that Madagascar is a continental, not an oceanic island. Opinions differ as to the exact time when it broke away from the African mainland. Many geologists hold the view that the Mozambique Channel first began to open up in the Permian, about 270 million years ago, its formation being completed in the Cretaceous.

The fauna of Madagascar displays such peculiar features that the island's unique position is still the subject of continued discussion among zoogeographers. Ornithologists have naturally concerned themselves with the endemic bird families; but orders with a worldwide distribution such as the diurnal and nocturnal birds of prey, which are the subject of this paper, are likewise subject to a high degree of endemism. Of the 14 species of diurnal raptors which breed in Madagascar, eight are endemic (Falco zoniventris, Aviceda madagascariensis, Eutriorchis astur, Haliaeetus vociferoides, Buteo brachypterus, Accipiter madagascariensis, Accipiter henstii, Polyboroides radiatus). Four further species of Falconiformes are represented here by a separate race, whilst of the species proper, three of these are found only on Madagascar and on certain other islands in the Indian Ocean (Falco newtoni, Accipiter francesii, Circus maillardi); only Falco peregrinus is widely distributed. Only in two species does the population in Madagascar show no subspecific differentiation (Milvus migrans, Macheiramphus alcinus).

In the wooded areas of Madagascar at least twice as many raptor species are found compared with the open savannah landscapes. On the African continent however, there are about three times as many species in the savannah as there are in the woodlands. It seems probable that in Madagascar raptors evolved in wooded biotopes, which covered virtually the whole of the country until the advent of man. All the true woodland-dwelling species on the island are endemic. The dearth of savannah species is doubtless attributable to the fact that this habitat appeared relatively recently, so that local forms could not evolve and differentiate, nor could there be immigration of continental forms (Thiollay & Meyburg 1981).

By now all the large tracts of natural vegetation have for the most part been removed, to be replaced by a form of dense scrub known as "savoka". Under present climatic and ecological conditions, this represents a subclimax growth. If one takes an aeroplane obliquely down Madagascar from north-west to south-east, one flies over a completely bare, reddish-grey, eroded landscape with weird surface formations. The remnants of natural vegetation are restricted to valley pockets. The whole island was entirely wooded and the destruction of the forest began some 1 000 years ago. The whole surface of the island totals about 580 000 sq km, with 530 000 sq km of forest already destroyed and converted into grassland or "savoka". Of this area, the grass plains alone take up 470 000 sq km, amounting to over 80% of the island (Guichon 1960). It only took a few centuries for this once "green island" to become the "red island" of to-day. More valuable surviving vegetation is being exterminated by annual burning. The basic reason for these fires is to be found in the cattle-cult practised by the natives, narrowly bound up with a widespread and deep-rooted ancestor worship, whereby even to-day the Zebu plays a decisive role as a "sacred cow". Since these beasts cannot graze during the dry season on the extremely tough blades of the savannah grass, the plains are set alight well before the start of the wet season, in order to provide fresh and tender grass with the onset of the rains. These fires annually erode what is left of the existing forest.

This destruction of vegetation is resulting in a grave risk to and final extinction of many species of fauna; and the birds of prey are equally affected by it. Only four or five species are relatively numerous and widespread, whereas the remainder are either rare, extremely localised, or both.

During 1978, 1980, 1981 and 1982, we spent 18 months overall in Madagascar, during which time we devoted ourselves exclusively to field work. The length of stay of the first author considerably exceeded that of the second.

The most important places visited and respective lengths of stay were: Diego-Suarez and Ambre Forest, 4 weeks; Nosy Be and Nosy Komba, 2 weeks; Analalava, 2 days; Port-Berge, 2 days; Majunga, 2 days; Sambava, Andapa, Antalaha, 1 week; Maroantsetra and Masoala Peninsula, 33 weeks; Mitsinjo, Lake Kinkony, 2 weeks; Ambato-Boeni and Ampijoroa, 3 weeks; Ile Sainte-Marie, 2 days; Maintirano, Barren Isles, 1 week; Maevatanana and Ankazobe, 2 days; Ambatondrazaka and Lake Alaotra, 2 weeks; Tamatave and Foulpointe, 3 weeks; Antsalova and Lakes Bemamba and Masama, 2 weeks; Antananarivo, 4 weeks; Perinet, 4 weeks; Morondava, Analabe, 1 week; Morombe, Lake Ihotry, 1 week; Tulear, Manombo, 1 week; Sakaraha, 1 day; Ihosy, Isalo Massif, 1 day; Anakao, 1 week; Amboasary, Lake Erombo, 2 weeks; Fort-Dauphin, 2 days.

To obtain estimates of the relative abundance of different species, we carried out roadside counts over a period of 75 hours and a distance of 2 524 km, whereby we listed 379 birds belonging to six species i.e. one bird on an average every 12 min or every 6,6 km. These roadside counts were made between Antananarivo and Perinet or Majunga respectively, as well as between Majunga and Mitsinjo, between Antalaha, Sambava and Andapa, and also on Nosy Be.

#### Status and distribution of species.

##### PEREGINE FALCON Falco peregrinus

Probably breeds in suitable places all over the island, albeit very sparsely. One eyrie was found on the upland plateaux in August which contained a clutch of 4 eggs. At other localities, a total of eight sightings were made, including one immature. The birds were always seen singly. The biotope was variable, ranging from rocky islets off the coast near Diego-Suarez to thorn scrub savannah in the far south, and even degraded zones in the east and west.

One individual observed near Diego-Suarez was on a rocky islet near the coast. It was hunting Kittlitz's Sand Plovers Charadrius pecuarius, which fled into hiding between the cliff and shoreline, sometimes even diving into the water to escape attacks. Two instances of domestic fowl being taken were recorded, in both cases small chickens a few days old. The falcon ate them on a dead tree in the middle of the village. According to the natives, this occurs frequently and includes the taking of Anatidae up to species as large as the Knob-billed Goose Sarkidiornis melanotos.

##### ELEONORA'S FALCON Falco eleonora

This species, which breeds in the Mediterranean, overwinters in Madagascar and was observed there between 16 October and 2 May. Three specimens ringed in Crete by Ristow and Wincre (pers. comm.) were recovered in the northern most part of the island. They were nearly always in parties ranging from three to 21 in number and often in the company of Sooty Falcons. In Antananarivo they were hunting insects in the glare of the railway station lights a half-hour after nightfall. This species does not appear to favour any particular habitat in Madagascar; we encountered it equally over dense rain forest, on the bare upland plateaux, in wetlands, built-up areas and in the dry forest of the west.

##### SOOTY FALCON Falco concolor

Together with Eleonora's Falcon, the only migratory species of raptor which winters in Madagascar. We encountered birds between 16 October and 2 May, and found them regularly in the company of Eleonora's Falcon. They frequently hunted in parties of up to 11 individuals, and remained clearly active until nightfall. In Antananarivo, along with Eleonora's Falcons, they were hunting insects in the glare of the railway station lights.

The birds were regularly found near water, both along the large rivers in the east and on lakes (e.g. Lakes Kinkony and Mitsinjo) in the west. Their prey here consisted of large dragonflies. However, the species was also observed in a variety of habitats ranging from humid tropical rain forest to towns.

MADAGASCAR KESTREL Falco newtoni newtoni

Next to the Black Kite, this is the most widespread and abundant raptor; it occurs over the whole island and has adapted itself to almost every biotope. In roadside counts we counted an average of one individual every 21,6 km, or every 38 minutes. It is the only raptor on the island to have profited from the deforestation. It occurs regularly in the uplands, on telegraph poles or other suitable perches. In October 1980 we located several broods in old kite's nests and in stone quarries. On 7 October, one female was already feeding young.

BANDED KESTREL Falco zoniventris

The only species of falcon confined to Madagascar, and at the same time very rare. It does not only inhabit the humid rain forest of the east, as Cade (1982) states, but also the dry forest of the west, the dry regions of the south-west and even degraded zones. In all, we saw 10 individuals.

In addition to its rather distinctive appearance, large head, heavy beak and brilliant eyes, it is surprisingly tame and allows itself to be approached to within 4 m. One individual was seen in Perinet sitting in a treetop only 20 m from a house.

On 7 October 1980 and 6 February 1982 we watched this falcon hunting in the eastern rain forest. From a perch on a bare treetop it would suddenly swoop down and dash headlong through the trees, returning after about 30 s to the same perch with an insect. About a minute later it had devoured its prey.

Although very kestrel-like, this species lacks the bobbing head movements typical of this group.

MADAGASCAR CUCKOO FALCON Aviceda madagascariensis

Seven individuals were seen in four different places, three of which were in rain forest (forests of Ambre, Nosy Be and Perinet), whilst one bird was seen perched on a coconut palm in the middle of the town of Maintirano in the west. From this perch it made a successful sortie, gliding down 70-90 m to take a chameleon about 15 cm long in a bushy tree (Litchi chinensis). The bird then flew heavily with its prey to another tree, where it proceeded to devour it. On 25 November 1982 we watched a pair feeding their young with insects in Perinet. This species never soars over the dense forest canopy like the Madagascar Buzzard, preferring clearings and other open spaces in the forest.

BLACK KITE Milvus migrans parasitus

This was the most abundant bird of prey on the island and occurred in all habitats. Following roadside counts, this species accounted for half of all the raptors seen. Over 2 524 km, 184 individuals were counted in just under 75 hours, i.e. one every 13,7 km, or every 24 min. In addition to this, several large flocks were encountered: about 300 birds on the ground at the sewage discharge outlet of Diego-Suarez on 4 August 1980; 40 birds at a tree roost on the bank of the Mandrare River on 2 July 1982. On 9 July 1982 a dozen kites at the same site were following a tractor working on a sisal field and picking up grubs. This kite was also common over the ricefields near Antananarivo, at Majunga, Maintirano, Antsalova and on Lake Alaotra. In the

humid east, e.g. at Maroantsetra, Antalaha, Sambava and Andapa, we saw this bird comparatively seldom.

Several nests were located, on which in October the females were sitting tight.

**BAT HAWK Macheiramphus alicinus anderssoni**

This species was only seen in one place, near Morombe in the south-west. At nightfall, two individuals of the dark phase were flying in rapid zigzag flight over a dry forest in the west, snatching small bats and eating them on the wing.

**MADAGASCAR SERPENT EAGLE Eutriorchis astur**

This species, if not already extinct, is the rarest bird of prey on the island, and one of the six most threatened raptor species in the world. According to the criteria laid down by CITES, it and the Guadalupe Caracara Polyborus lutosus, are the only raptors to fall into the category of "extinct", since for over 50 years no specimen has been seen by any zoologist.

We did not manage to locate it either, although this was one of our main objectives and a total of 33 weeks were spent in the north-east, where it was last seen in 1930. Neither had our friend Dominique Halleux, who lives in Maroantsetra, seen it in the course of five years; moreover, questions put by him to the natives and forest officers procured no practical information. This contradicts the view, occasionally expressed, that the bird is merely extremely difficult to observe in tropical rain forest, and thus is not necessarily very rare. The local forest officer, Alfred Martin Ranjokiny, was the only person to have seen it four or five times in the course of 13 years, in the nature reserve of Marojezy (pers. comm.). He recognised illustrations of the eagle and from his description of its behaviour and appearance (e.g. erection of the crest when excited), any confusion with the only other possible species - Henst's Goshawk - seems somewhat improbable.

Only a few specimen skins are in museums (Tring, Paris, Grenoble, New York, Berlin). Their provenance shows that, at least in earlier times, the species was not confined to the north-east, as reported by Milon et al. (1973), but also occurred in humid eastern regions down to the southern central part of the island, where the type specimen was obtained, near Ampasimanary (a hamlet in the forest, one day's march from Andakana village, in the Mangoro valley between Antananarivo and Mahanoro).

During the XII World Conference of the International Council for Bird Preservation (ICBP) in Yugoslavia in 1978 a sum of SFr.20 000 was allocated for a survey and conservation effort concerning this monospecific genus in the World Conservation Strategy for Birds of Prey and Owls, and the project was included in the ICBP Conservation programme 1981 as Project No. 19. The objective was to ascertain whether the species still exists and, if so, to collect all necessary information and advise the government on immediate conservation measures. In 1978 the World Wildlife Fund had already given this project a Project number (1368), but despite the fact that the Swiss WWF had collected over half a million US dollars towards birds of prey projects, that a private individual had donated almost as large a sum towards nature conservation in Madagascar, and that the conservation of tropical rain forests had been the subject of a huge WWF campaign, this project has not so far been funded. It remains a vital task for the World Working Group on Birds of Prey to strive towards achieving this.

In 1958 Guichon (1960) surveyed the whole island and concluded that some 61 500 sq km in the east were still covered by rain forest. According to Delord (1965), the area cleared and burnt every year in the eastern forest is about 1 500 sq km. Taking this as a basis, a simple calculation shows that by 1999 the rain forest will have totally vanished. At present there is in practice no large reserve in which the eastern rain forest is protected. The 300 sq km "Reserve naturelle integrale" No. 2 of Masoala was disaffected in 1964. To-day this peninsula still holds the largest remaining composite body of rain forest, on which the survival of this and of many other rare endemic fauna and flora may depend.

MADAGASCAR SEA EAGLE Haliaeetus vociferoides

Towards the end of the last century, this bird was to be found in all the coastal regions of the island, but whereas Grandidier & Milne Edwards (1882) stated that it was to be found on the east coast, it has not been seen there for a very long time now. According to Rand (1936), it was still fairly common on the north-west part of the coast in 1930. To-day this eagle must be regarded as one of the world's rarest raptors, but until our first visit in October 1978 its almost complete disappearance had remained virtually unnoticed. The species was thereafter included in the Red Data Book (King 1978/79).

For this reason we became anxious to initiate a survey and conservation project for the species, in response to which an ICBP project was prepared, but up to now has remained unfunded. On the other hand, with the help of the Fonds d'Intervention pour les Rapaces, an information leaflet in French and Malagasy has been printed in a run of several thousands and distributed among the natives.

Today the range of the species is confined to a strip along the west coast, from Diego-Suarez southwards to around Morondava. The bird has clearly disappeared only in recent times from the adjoining southern region. Already Milon et al. (1973) searched in vain for it between the Mangoky and Fiherana rivers. We in turn failed to observe it on Lakes Ihotry and Kiliolio, etc. The older natives, however, could still remember this eagle.

O. Appert (pers. comm.), who has lived in south-west Madagascar for many years, most generously placed his records at our disposal:-

30 September 1959:		1 Bird on a cliff ledge on the coast near Andavadoaka (about 40 km SSW of Morombe).
14 March 1962	:	1 bird about 30 km SSW of Morombe, flying high over a small lake.
17 March 1962	:	1 bird perched on a bare tree among mangroves, Baie des Assassins, about 50 km SSW OF Morombe.
3 July 1964	:	1 bird calling in mangroves at the northern end of Baie des Assassins.
9 April 1966	:	1 bird in the mangroves near Andranopasy, northern end of the Mangoky delta.
9 October 1975	:	1 bird soaring over Didiera forest, 10 km NE of Morombe
2 June 1975	:	1 bird over wetlands near Mangolovo, 20 km NE of Morombe

In the years since then, Appert has recorded no further sightings. In his view, the reasons for this decline are not clear, since the bird can scarcely be hunted at all in this region, nor can insecticides have played any part in its decline.

We were fortunate to discover an occupied nest, clearly the first to have been found by ornithologists for many decades. It was situated on a small island about 30 km west of Diego-Suarez, directly off the West coast, on a cliff 6-8 m high. On 2 August the nest contained a 1-2 days old chick and a white egg, already chipping, measuring 68 x 54 cm. The nest had an external diameter of 120 cm, whilst the bowl measured 70 x 50 cm. Fifteen days later there was no further trace of the second chick (or egg). Milon et al. (1973) suggested the existence of cannibalism in this species, as occurs among at least 27 species of eagle (Meyburg 1974). This suggests that it may be profitable to make use of cannibalism for conservation purposes, whereby the death of the sibling can be prevented. This technique has been successfully used for other raptor species (Meyburg 1983). Much more research needs to be undertaken into this problem, however, as into all other aspects of this eagle's biology.

The following sightings were subsequently made:- Lake Ambato (Antsalova district), one adult and one immature; Lake Masama (Ansalova), two juveniles and four adults on 2 June 1982. The eagle is reputed to occur here in the greatest density. Albignac (1970) also reported the highest density in this area, where he recorded eight individuals. Since this region is also of great importance for many water birds, e.g. the rare Madagascar Teal Anas bernieri, it should be placed under complete protection, as was already called for in Resolution No. 8 of the International Conference on the Conservation of Nature and Natural Resources in 1970.

We saw one adult flying 15 km north of Maintirano. We also learned of five specimens shot in this region, one of them on Lake Amboloando, 12 km west of Maintirano. A local proverb has it that only he has the right to kill a Sea Eagle who has first killed a man.

On Lake Kinkony, Langrand observed one adult. East of the nearby Mahavavy River, Meyburg and Thiollay saw two adults in the neighbourhood of the village of Anaborengy on 22 October 1980. They were perched close together at the edge of a wood. According to the natives, they had bred there for a number of years, but efforts to find the nest at the site indicated failed. The following day we came across an adult not far from here, standing in the shallow water of the river; two hours later it flew, to settle in a tree on the river bank.

A Malagasy correspondent from Mitsinjo, who in the following weeks and months had undertaken to search the Mahavavy River upstream as far as Bekipay, managed to locate an occupied nest in a tree which had been used for several years. This pair was reported to repair its nest at the end of October, the eggs being laid in November. According to the information he gave us, the young should finally leave the nest by the end of January.

Today the best-known place to observe this species is the small Lake Ampijoroa, south-east of Majunga. In 1978 one pair could be found there. On 19 October 1978 both birds spent the whole afternoon sitting in a dead tree in the middle of the lake. At 16h07, one bird swooped down to the surface of the water but failed to capture a fish. At 17h07, both birds flew to roost in a tall tree by the lakeside, where they sat calling for some time.

In 1980 we failed to locate the birds on this lake. A survey of the remaining lakes between Ambolobongo and Boeni, most of which have dried up, also produced no sighting. In April 1982, on the other hand, one eagle was again seen on Lake Ampijoroa.

There was in addition, convincing evidence of the eagle on Nosy-Be. From the natives there we received repeated accounts of the species breeding in this region, without actually obtaining concrete proof of this. In the 1930's, according to Rand (1936), it was still possible for eight eagles to be killed there in an inlet only half a mile wide within a period of two weeks, which illustrates the scale of its decline within a few decades, although no satisfactory explanation for this has so far been found.

In one instance we saw a series of attacks on other birds: one adult swooped down on a Spoonbill Platalea alba, which dodged its attacker, whereupon the eagle turned on a Madagascar Heron Ardea humbloti which saved itself by diving under the water.

#### MADAGASCAR BUZZARD Buteo brachypterus

We encountered this endemic species regularly in all wooded regions, where it was surprisingly common in many places. There were eight pairs in about 20 sq km on the Masoala peninsula. At the beginning of October we watched nest-building activity and copulation. On 1 November, one nest already contained two chicks. Based on roadside counts, this proved to be the third most common raptor, with 1 bird every 56,1 km, or every 1 h 40 min. It was absent from the high, deforested plateaux.

#### MADAGASCAR SPARROW HAWK Accipiter madagascariensis

This species was seldom seen and only found in two places. The supposition of Thiollay & Meyburg (1981), that from their experience its range was restricted to the southern half and west of the island, proved incorrect. We had five sightings near Maroantsetra (15 January 1982 (m), 25 January 1982 (f), 26 January 1982 (f), 6 February 1982 (f) and 10 February 1982 (f)) and one on 24 June 1982 (m) at Lake Ampijoroa in the west. The female on 25 January 1982 was devouring a small bird and on the following day probably the same individual took a cricket on the wing. All these birds were observed in the forest.

#### HENST'S GOSHAWK Accipiter henstii

This, the largest of the three Accipiters on the island, occurs both in the humid rain forest of the east and in the dry forest of the west. It is very rare and, apart from a pair observed at Lake Ihotru, we only saw it once, in October 1980, on the Masoala peninsula.

#### FRANCE'S SPARROW HAWK Accipiter francesii

This small and comparatively tame raptor is the commonest of the three Accipiters on the island. Except in the South, we came across it in all types of forest, including plantations of coffee, cloves and mangoes. A nest near Maroantsetra at a height of 4,5 m contained one egg on 16 October 1980. Another nest 7 m up in a mango tree Mangifera indica in the neighbourhood of a village contained three white eggs (370 x 290 mm) on 28 December 1981: overall diameter 35 cm; diameter of the shallow cup, lined with green sprigs of clove,



15 cm. A third nest in the same area, found on 21 October 1982, contained four eggs; it was similarly built 7 m high in a mango tree in a plantation outside a village.

MADAGASCAR GYMNOGENE Polyboroides radiatus

This endemic species strongly resembles in appearance and behaviour the closely related African species Polyboroides typus. It is well established in all wooded areas, both in the east and in the west, and was locally common; in the palm savanna between Majunga and Mitsinjo we counted an average of one bird every 8 km. Judging from roadside counts, this species proved to be the fourth commonest of all raptors after M. migrans, F. newtoni and B. brachypterus, although in terms of real numbers possibly exceeded by A. francesii, which cannot easily be counted by this method. Overall we saw one individual every 105 km or 3 h 7 min; however, the bird was absent from the high, deforested plateaux.

In their search for food we watched these birds poking about in palm trees, epiphytes and ant-heaps. As a result of sparse vegetation in the southernmost region near Fort-Dauphin they foraged on the ground. Here they systematically searched around stones and lumps of cow dung and investigated rotten tree stumps and termite mounds. Before completely shifting or overturning a lump of cow dung or a stone, the bird would peer beneath it presumably to take cockroaches and beetles by surprise. If a stone proved too heavy, it would use its wing as an additional lever.

MADAGASCAR HARRIER Circus maillardi macrosceles

An uncommon species in Madagascar, although suitable biotopes are abundant. We only saw it in four places:- frequently near Maroantsetra, where there was at least one pair breeding; on Lake Alaotra (five individuals); one in the region of Antsalova; and one bird twice near the heronry 20 km east of Antananarivo. The natives have scarcely any knowledge of this species.

MADAGASCAR MARSH OWL Asio helvola hors

We had seven sightings at three different localities; three of the sightings were in the centre of Antananarivo. On 29 March 1982 one individual at about 23h00 was hawking insects attracted to the street lights in the main street. On 9 August 1982 one owl carrying a rat Rattus norvegicus perched on a roof in the middle of the town. On 6 December 1982, around 18h00 when it was already dark, three different individuals were seen over the freshly ploughed ricefields near Lake Alaotra. On 28 August 1982 one bird was seen over grassland near Lake Ihotry.

MADAGASCAR LONGEARED OWL Asio madagascariensis

This species was only seen near Maroantsetra; on 15 October 1982 three young birds were observed in the forest and on 10 November 1982 a dead adult was seen nailed up on the outskirts of a village.

WHITEBROWED OWL Ninox supercillares

This species was seen in the savannah near Antsalova in the west, and four times near Amboasary in the south. On 12 July 1982 we watched a bird capture a night flying insect. On 16 July 1982 we heard it call at about 05h00.

MADAGASCAR SCOPS OWL Otus rutilus rutilus

A species very frequently both seen and heard. We encountered it in the various forest biotopes of the island in four different localities: in Ambre forest in the north (frequently heard and one sighting of a calling owl on 31 July 1982); on the Masoala peninsula near Maroantsetra in the north-west (five sightings and also heard a number of times); near Amboasary in the south-east (seen three times and commonly heard at night); and near Antsalova in the west (one specimen found dead in the dry forest).

AFRICAN BARN OWL Tyto alba affinis

According to Milon et al. (1973), this owl occurs in eastern Madagascar and on the high plateaux. We came across it over practically the whole island except for the south, where according to local reports it nevertheless also occurs. It occurred in very varied biotopes, such as the centre of the towns of Tamatave and Antananarivo, hawking over ricefields near Maroantsetra, and by Lake Aloatra. Altogether we sighted 16 individuals, four of which probably formed two pairs. According to the natives this owl has a bad reputation everywhere, being dubbed ("Vorondolo"), a bird of ill omen.

MADAGASCAR RED OWL Tyto soumagnii

This is the rarest species of owl in Madagascar and apart from a fairly reliable sighting in 1973, 65 km north of Perinet (A. Forbes-Watson in King 1978/79), has not been seen since 1930. The few specimen skins in museums all come from the northern half of the eastern rain forest; when this disappears it will inevitably become extinct. It is therefore vital that the World Wildlife Fund activate its programme, formed many years ago, and motivate for large reserves of rain forest, e.g. on the Masoala peninsula.

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## REFERENCES

- ALBIGNAC, R. 1970. Rapport O.R.S.T.O.M. sur la mission conjointe Armee Française-O.R.S.T.O.M. dans la region de Bekopaka Antsalova. Tananarive: ORSTOM.
- CADE, T.J. 1982. The Falcons of the World. Ithaca: Comstock & Cornell University Press.
- DELORD J.M. 1965. Monographie de la Côte Est de Madagascar. Bull techn. Eaux et Forêts et de la Conserv. des Sols 2.
- GRANDIDIER, A. & MILNE-EDWARDS, A. 1882. Histoire Physique Naturelle et Politique de Madagascar. Vol. XII, Histoire Naturelle des Oiseaux. Paris.
- GUICHON, A. 1960. la superficie des formations forestieres de Madagascar. Rev. forest. française 6: 408-411.
- KING, W.B. 1978/79. Red Data Book. Volume 2: Aves. Morges: IUCN.

MEYBURG, B-U. 1974. Sibling aggression and mortality among nestling eagles. Ibis 166: 224-228.

MEYBURG, B-U. 1983. The significance for captive breeding programmes of fratricide and cannibalism in birds of prey. Int. Zoo Yb. 23: in press.

MILON, PH., PETER, J-J. & RANDRIANASOLO, G. 1973. Faune de Madagascar XXXV Oiseaux. Tananarive, Paris: ORSTOM, CNRS.

RAND, A.L. 1936. The distribution and habits of Madagascar birds. Bull. Am. Mus. Nat. Hist. 77: 143-499.

THIOLLAY, J-M. & MEYBURG, B-U. 1981. Remarques sur l'organisation d'un peuplement insulaire de rapaces: Madagascar. Alauda 49: 216-226.

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