

Short communication

Range extension of the Madagascar Red Owl *Tyto soumagnei* in Madagascar: the case of a rare, widespread species?

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Until recently, the geographical range, abundance, habitat preferences and ecology of the Madagascar Red Owl *Tyto soumagnei* were very poorly known. The type specimen (MNHN 1888.640) was collected near Tamatave (Toamasina) in 1876, by M. Soumagne (Grandidier 1878). Subsequent reliable collections and/or sightings between 1895 and 1934 are known from five eastern rainforest localities ranging from Fito to the north (18°01'S, 48°46'E) to Forêt de Lakato to the south (19°18'S, 48°29'E; Fig. 1). An additional two collections from the nearby high plateau are recorded but these are not specific to locality and are treated as dubious (see Halleux & Goodman 1994). This species was not recorded again until 1973, when it was sighted by P. Calabi and J. Pollock in Fierenana (King 1979), north of Moramanga. Since its recent rediscovery in 1993 (Halleux & Goodman 1994), many more sightings have been recorded. Individuals have been sighted at Andapa (a captive individual: Halleux & Goodman 1994) and the Masoala peninsula (15°37'S 49°58'E) in the north-east (Thorstrom *et al.* 1997, Goodman & Thorstrom 1998), Montagne d'Ambre and Tsaratanana (Goodman *et al.* 1996, ZICOMA 1999) in the north, and Zahamena, Marotandrano, Mantadia, and Tsinjoarivo in the east (Powzyk 1995, ZICOMA 1999, Goodman *et al.* 2000).

These sightings cover a fairly wide geographical area and altitudinal range, from sea level (Masoala) to 2000 m (Tsaratanana). Accordingly, some have suggested that this species is reclusive rather than truly rare (Goodman & Thorstrom 1998). However, rarity comes in many forms (cf. Rabinowitz 1981), and if the overall number of surviving individuals is low, due to patchiness in distribution and/or low population density, it would still be appropriate

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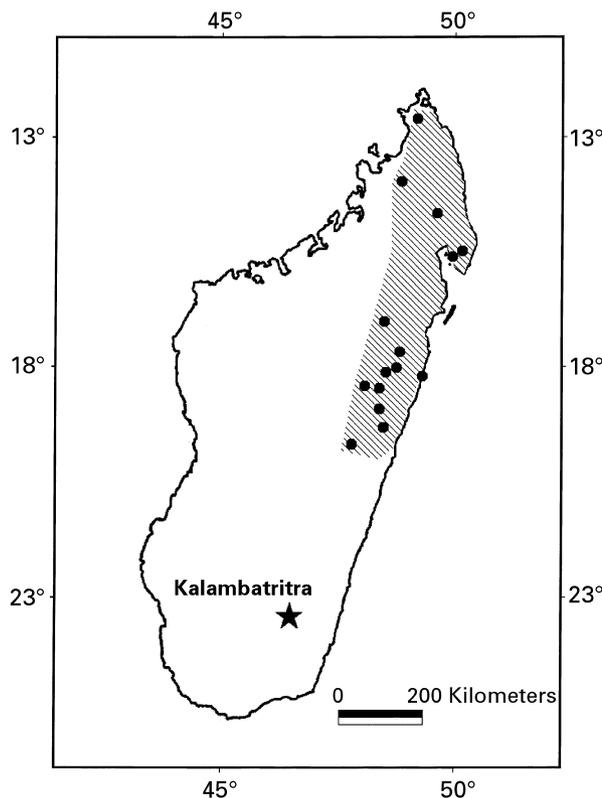


Figure 1. Map of Madagascar showing confirmed Madagascar Red Owl localities to date (within hatched area) and the present sighting (star). Two possible sightings on the high plateau are not included because specific locations are not given (see Halleux & Goodman 1994). Hatched area is for illustrative purposes only and not meant to indicate true geographical range, which is likely to be patchy and discontinuous.

to consider this species endangered (Stattersfield *et al.* 1998). Indeed, the relative paucity of historical sightings throughout its known range, despite extensive survey work, suggests that this may be the case.

Habitat use data collected by Thorstrom *et al.* (1997) in the Masoala peninsula suggest that the Madagascar Red Owl, like the more common Barn Owl *Tyto alba*, prefers to hunt along forest edges, and in rice paddies and tavy (areas in which forest has been cleared and burned to make way for cultivation), rather than primary forest. Goodman and Thorstrom (1998) examined the pellets of two Masoala individuals and found the diet to consist almost exclusively of endemic, non-volant small mammals (particularly *Eliurus webbi*, *Microgale talazaci*, and *Eliurus minor*). Thorstrom and de Roland (1997) describe the nesting behaviour at Masoala.

Here we report a new sighting of the Madagascar Red Owl which dramatically extends its known geographical range.

STUDY SITE AND METHODS

Kalambatritra Special Reserve (23°15'–23°29'S, 46°23'–46°36'E; 28 250 ha; elevation 740–1680 m) is located in south central Madagascar, and straddles the boundary between Fianarantsoa and Toliara provinces (Figs 1 and 2; see Nicoll & Langrand 1989 for detailed description). It lies considerably further west than any comparable rainforest in south-eastern Madagascar, and spans the continental divide between eastern (Mananara) and western (Mangoky/Onilahy) drainages. Approximately 45% of the reserve is covered by largely continuous primary rainforest (elevation 1200–1680 m). This forest is not directly continuous with the main eastern rainforest corridor (a non-forested break of c. 16 km exists between forests extending south-east from Kalambatritra and Midongy-Sud National Park). The remainder of Kalambatritra's land area is covered with grassland containing an extremely low human population density and very little cultivated land. It is difficult to determine whether this grassland is natural or anthropogenic (e.g. MacPhee *et al.* 1985); however, a comparison of topographic maps reporting land cover from aerial photographs taken in the 1950s (FTM 1972,

1974) with a Landsat-7 satellite image from October 1999 reveals that little or no deforestation has taken place within this time (M. Irwin unpubl. data). In addition, our survey found no land conversion taking place within the southern and central parts of the reserve.

Very little research has been conducted within Kalambatritra Special Reserve, and few published details are known about its flora and fauna (Nicoll & Langrand 1989, Intercoopération Suisse/Marie E.R.T.A. 1999, ZICOMA 1999). The purpose of our visit to the reserve was to conduct a survey of primates and birds within 'Ambalabe', a large forest block occupying most of the northern half of the reserve (Fig. 2). At Ambalabe, the forest canopy is c. 25 m in height (with emergents exceeding 30 m), with a high (3 m) herbaceous understorey in lower-lying regions. Diameter at breast height (dbh) routinely exceeds 2 m. Two 2-km trails were censused simultaneously for birds and primates (details in Irwin *et al.* 2000) during a 7-day expedition (20–26 June 2000). To the best of our knowledge, we were the first scientific group to work in this portion of the reserve. In fact, although signs of human disturbance were seen in the smaller forest blocks in the east and south-west portions of the reserve,

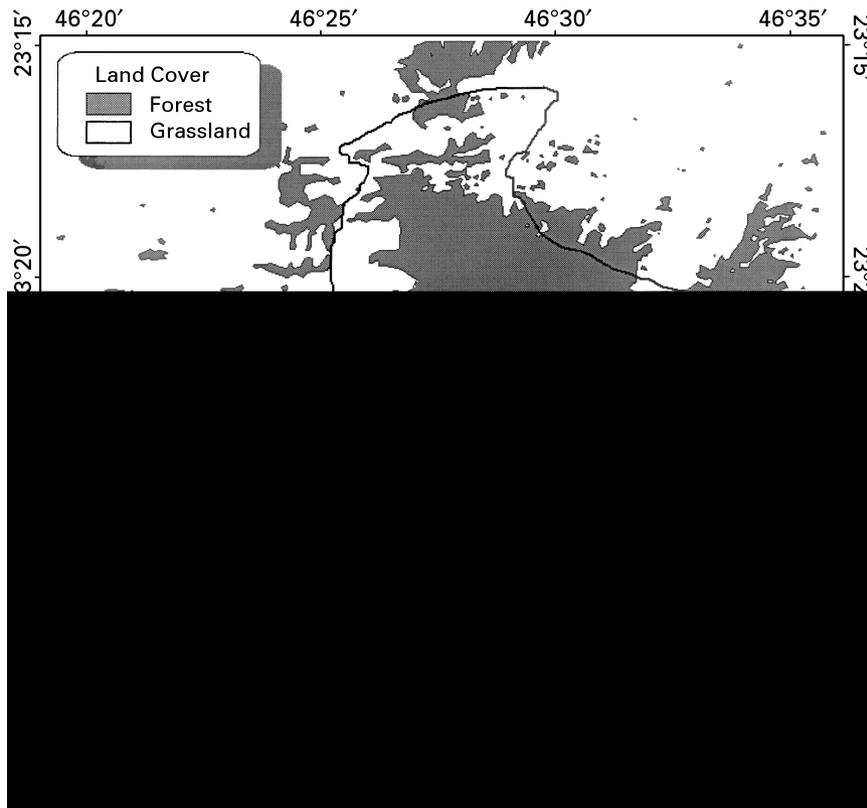


Figure 2. Map of Kalambatritra Special Reserve, Madagascar. (1) and (2) indicate the locations of sightings 1 and 2 (see text). Solid line indicates reserve boundary. Land cover derived from supervised classification of a Landsat-7 satellite image acquired in October 1999 (M. Irwin unpubl. data).

we encountered no existing trails or human signs of any kind within Ambalabe forest. Nicoll and Langrand (1989) report small-scale disturbance and extraction of forest products elsewhere within the reserve.

SIGHTINGS

1 While conducting a survey of nocturnal lemurs on 20 June 2000 at 18 : 15 h, M.T.I. and ornithologist/research guide Loret Rasabo encountered a solitary *Tyto soumagnei* within primary forest at Ambalabe, about 825 m from the research camp and 700 m from the nearest forest edge (23°22'S, 46°28'E; elevation *c.* 1550 m; Fig. 2). This individual, which appeared, from its body size, to be adult, was discovered *c.* 5 m from the census trail, clinging to a vertical tree trunk *c.* 3 m above the ground. We observed the owl for several minutes during which it repeatedly moved its head from side to side and stared at us.

2 On 23 June 2000 at 08 : 45 h, K.E.S. and research guide Raymond Ratsimbazafy encountered a solitary *T. soumagnei* individual *c.* 375 m from our camp (450 m from the first sighting and *c.* 500 m from the nearest forest edge; Fig. 2). This individual was discovered 5 m from the census trail, sleeping in the dense cluster of leaves of a Vakoana tree (Pandanaeae: *Pandanus* sp.), *c.* 4 m above ground. It awoke but did not move, and was still present when the team passed the site at 12 : 26 h. There were no definitive indications that this individual differed from the one viewed 3 days earlier.

The species was identified (and distinguished from the Barn Owl, *Tyto alba*) on the basis of its overall orange-red colour and dark grey/brown facial disk (see Morris & Hawkins 1998, Sinclair & Langrand 1998). The Barn Owl is grey/buff in colour with a whitish facial disk. In addition, the call of the Madagascar Red Owl was heard in the vicinity of the sightings on several nights during the survey. This characteristic call, a long screeching hiss (1.5–2 s) which descends in frequency towards the end of the note (see sonagram in Thorstrom *et al.* 1997), differs from that of the Barn Owl, which lacks a downward inflection.

DISCUSSION

This sighting extends the southern limit of the known distribution of the Madagascar Red Owl by *c.* 500 km (a greater than 50% increase in its latitudinal range), effectively removing it from the list of species supposedly restricted to the northern half of eastern Madagascar. If this apparently large geographical range is truly continuous, it is indeed puzzling why this bird has historically been so difficult to detect. This species may have been overlooked in previous surveys for three possible reasons: (1) it is reclusive; (2) it is mistaken for the Barn Owl (Thorstrom *et al.* 1997), to which it is similar in appearance, vocalization and habits; or (3) it exists patchily

and/or at low population densities (perhaps due to poorly understood aspects of its ecology and life history). It is therefore important to determine whether this species exists in the eastern rainforest in the large gaps between confirmed sightings, and in general to attain a better understanding of its true abundance and distribution (and the underlying ecological basis for these).

The two Kalambatritra sightings were within primary rainforest, more than 500 m from the forest edge. Thorstrom *et al.* (1997) conducted a radio-tracking study of this species on the Masoala peninsula and found that within a 210-ha home range, birds spent 50% of their time at the ecotone between forest edge and tavy habitat, 36% in rice paddies, and 14% within large tavies (*n* = 22 locations). On the basis of our very limited information from Kalambatritra, it appears that this species occurs within undisturbed forest. However, it is also possible that roost sites are within the forest, but most hunting takes place along edges or in grassland.

Given the habitat use observations in the Masoala peninsula (Thorstrom *et al.* 1997), it may seem tempting to classify the Madagascar Red Owl as an edge specialist, and as such, less in need of monitoring and conservation management. However, such a conclusion may overestimate its chances of survival in the increasingly degraded and fragmented eastern rainforests. The apparent rarity of this species and its underlying mechanisms should be properly investigated (cf. Rabinowitz 1981) before its conservation status can be adequately addressed (for example, it may hunt at forest edges but remain reliant on undisturbed forest for roosting sites).

Clearly, more research is required on two fronts:

1 Survey work should be undertaken in order to determine more accurately the geographical distribution, local population densities and overall population size of this highly endangered bird (especially in the south-eastern rainforest between Kalambatritra and Tsinjoarivo).

2 Ecological studies of geographically disparate populations should be undertaken in order to understand better this species' ecology and habitat preferences, and how these contribute to the observed range and distribution.

Finally, it is worthy of note that Kalambatritra has been found to contain two additional rare and threatened Malagasy birds: the Grey-crowned Greenbul *Bernieria cinereiceps* (observed during this survey) and the Slender-billed Flufftail *Sarothrura watersi* (not observed during this survey; Marc Rabenandrasana, Projet ZICOMA, pers. comm.). The presence of these three vulnerable and poorly understood bird species within Kalambatritra Special Reserve means that continuing protection of this reserve may be of great importance for bird conservation in Madagascar.

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REFERENCES

- FTM.** 1972. *Tsanerena (Feuille L-58). 1:100 000 Topographic Map.* Antananarivo, Madagascar.
- FTM.** 1974. *Begogo (Feuille M-58). 1:100 000 Topographic Map.* Antananarivo, Madagascar.
- Goodman, S.M., Andrianarimisa, A., Olson, L.E. & Soarimalala, V.** 1996. Patterns of elevational distribution of birds and small mammals in the humid forests of Montagne d'Ambre, Madagascar. *Ecotropica* **2**: 87–98.
- Goodman, S.M., Rakotondravony, D., Raherilalao, M.J., Rakotomalala, D., Raselimanana, A.P., Soarimalala, V., Duplantier, J.-M., Duchemin, J.-B. & Rafanomezantsoa, J.** 2000. Inventaire biologique de la forêt de Tsinjoarivo, Ambatolampy. *Akon'ny Ala* **27**: 18–27.
- Goodman, S.M. & Thorstrom, R.** 1998. The diet of the Madagascar Red Owl (*Tyto soumagnei*) on the Masoala Peninsula, Madagascar. *Wilson Bull.* **110**: 417–421.
- Grandidier, A.** 1878. Note sur un nouveau Strigidé de Madagascar. *Bull. Soc. Philomat., Paris* **7** (2) (for 1877–1878): 65–66.
- Halleux, D. & Goodman, S.M.** 1994. The rediscovery of the Madagascar Red Owl *Tyto soumagnei* (Grandidier 1878) in north-eastern Madagascar. *Bird Conserv. Int.* **4**: 305–311.
- Intercoopération (Organisation Suisse pour le Développement et la Coopération), Marie E.R.T.A. (Etude et Réalisation de Travaux d'Amenagement).** 1999. *Rapport des Etudes Physico-bio-écologiques de la Réserve Spéciale de Kalambatritra.* Unpublished report to ANGAP.
- Irwin, M.T., Samonds, K.E. & Raharison, J.-L.** 2000. *A biological inventory of Réserve Spéciale de Kalambatritra, Madagascar, with Special Emphasis on Lemurs and Birds.* Antananarivo, Madagascar. Unpublished Report to ANGAP, p. 9.
- King, W.B.** 1979. *Red Data Book, 2: Aves.* Morges: International Union for the Conservation of Nature and Natural Resources.
- MacPhee, R.D.E., Burney, D.A. & Wells, N.A.** 1985. Early Holocene chronology and environment of Ampasambazimba, a Malagasy subfossil lemur site. *Int. J. Primatol.* **6**: 463–489.
- Morris, P. & Hawkins, F.** 1998. *Birds of Madagascar: A Photographic Guide.* New Haven: Yale University Press.
- Nicoll, M.E. & Langrand, O.** 1989. *Madagascar: Revue de la Conservation et des Aires Protégées.* Gland, Switzerland: World Wide Fund for Nature.
- Powzyk, J.** 1995. Sighting of Madagascar Red Owl (*Tyto soumagnei*) in Mantadia National Park. *Work. Group Birds Madagascar Reg. Newsl.* **6** (1): 9–12.
- Rabinowitz, D.A.** 1981. Seven forms of rarity. In Syngge, H. (ed.) *The Biological Aspects of Rare Plant Conservation*: 205–217. Chichester: Wiley.
- Sinclair, I. & Langrand, O.** 1998. *Birds of the Indian Ocean Islands.* Cape Town: Struik.
- Stattersfield, A.J., Crosby, M.J., Long, A.J. & Wege, D.C.** 1998. *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation.* Cambridge: Birdlife International.
- Thorstrom, R. & de Roland, L.A.** 1997. First nest record and nesting behaviour of the Madagascar Red Owl *Tyto soumagnei*. *Ostrich* **68**: 42–43.
- Thorstrom, R., Hart, J. & Watson, R.T.** 1997. New record, ranging behaviour, vocalization and food of the Madagascar Red Owl *Tyto soumagnei*. *Ibis* **139**: 477–481.
- ZICOMA.** 1999. *Les Zones d'Importance Pour la Conservation Des Oiseaux à Madagascar.* Antananarivo, Madagascar.

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