

Short Communication

Evidence of a dramatic decline of the red-necked ostrich *Struthio camelus camelus* in the Aïr and Ténéré National Nature Reserve, Niger

Stéphane Ostrowski, Mahaman Sani Massalatchi and Mamadou Mamane

Abstract In 1990 the population of the red-necked ostrich *Struthio camelus camelus* in the Aïr and Ténéré National Nature Reserve, Niger, was estimated at c. 1600 individuals. During a 14-day survey carried out in the protected area in October and November 2000 no evidence of recent occurrence of ostriches was found, and it appears that the population size has dramatically declined in its favoured habitat. The species seems to

have been severely persecuted during the civil war of 1991–1997. Although a small population had remained in the protected area after the conflict, the occurrence of further poaching suggests that remaining individuals are threatened with extirpation.

Keywords Aïr and Ténéré reserve, Niger, poaching, red-necked ostrich, *Struthio camelus camelus*.

On 22 January 1988 77,360 sq km of the Aïr mountains and Ténéré sand sea in Niger were gazetted by Ministerial decree no. 88-019/PCMS/MAG/E as a National Nature Reserve (Réserve Naturelle Nationale de l'Aïr et du Ténéré), prohibiting hunting, and controlling use of the reserve's resources. The main reason for establishing the reserve was to conserve threatened Saharo-Saharan fauna. In 1991 the reserve was placed on the United Nations Educational, Scientific and Cultural Organization (UNESCO) List of World Heritage in Danger at the request of the government of Niger.

The ostrich *Struthio camelus* is the largest extant flightless bird. Although records indicate that it was once widely distributed throughout Africa, parts of Arabia and nearby regions in the Middle East, the species is now restricted to only a fraction of its former range (Brown *et al.*, 1982). The nominate *Struthio camelus camelus*, once distributed throughout northern Africa, has been severely persecuted during the 20th century, and populations are believed to be fragmented and in rapid decline (del Hoyo *et al.*, 1992; Dragesco-Joffé, 1993). Causes of decline include intensive hunting, and habitat destruction in the form of overgrazing by domestic and feral livestock (Brown *et al.*, 1982; del Hoyo *et al.*, 1992). Most of these ostrich populations have been listed in Appendix I of CITES and are

protected by law throughout their range (del Hoyo *et al.*, 1992).

In the Sahara, ostriches have found refuge in the less accessible wadis of mountain massifs, and the population in the Aïr massif was recognized as the largest and only viable one within the Saharo-Saharan limits (Poilecot, 1996). Recently, however, local authorities have suggested that the population was extirpated during the Tuareg rebellion of 1991–1997 (S. Seydou, DFPP (Direction de la Faune, de la Pêche, et de la Pisciculture), pers. comm.). We therefore conducted a survey in autumn 2000 of red-necked ostriches in the Aïr mountains with the aim of providing data on the current status of the species. We also examined the literature for any evidence of decline.

We conducted a vehicle-based survey during 14 consecutive days in October and November 2000, following the same route used by Mouddour in 1997 and 1998 (Mouddour, 1998a, b) and working mainly in areas where ostriches were commonly reported before the civil war (Magin, 1990a). In addition, the survey was extended to the north-west and north of Tamgak massif, a poorly surveyed but well vegetated area where we suspected that some ostriches might have found refuge (Fig. 1). Areas further north or south were not visited because there were no recent reports or sightings of birds, and unsuccessful searches were conducted in these areas in 1997 (Mouddour, 1998 a, b).

We searched for ostriches on either side of two linear transects, each surveyed from a four-wheel drive vehicle. Each of the two teams consisted of a driver/observer and three additional observers, with five of the eight observers being Tuareg inhabitants of the protected area. Each team was assigned a daily transect prepared using Geographical Positioning System

Stéphane Ostrowski (Corresponding author) National Wildlife Research Center, PO Box 1086, Taif, Kingdom of Saudi Arabia. E-mail: ostrowski@nwrc-sa.org

Mahaman Sani Massalatchi and **Mamadou Mamane** IUCN, The World Conservation Union, PO Box 10993, Niamey, Republic of Niger

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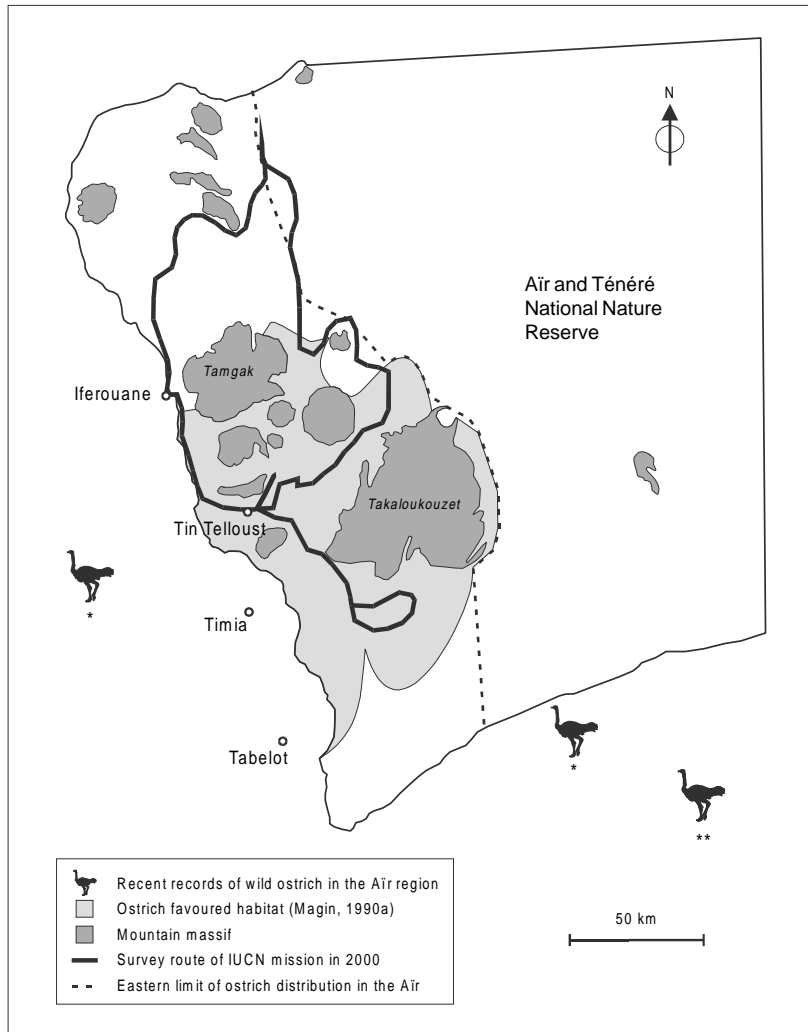


Fig. 1 Map of the Aïr and Ténéré National Nature Reserve showing the eastern limit of ostrich distribution, the survey route of the IUCN mission in 2000, and locations of last reported ostriches in the Aïr region. Records of ostriches outside the reserve: *M. Mouddour, IUCN, and N. Gohé, Direction de la Faune, de la Pêche, et de la Pisciculture (DFPP) (pers. comm.), **A. Tchouli and M. Mouddour, IUCN (pers. comm.).

software (Mapsource, Garmin Corporation, Olathe, KS, USA). With an approximate mean distance of 1000 m between the vehicles, and assuming that 500 m either side of the vehicle could be surveyed, a total of c. 2200 sq km was surveyed during the 1100 km long trip. This is 17 per cent of the total known ostrich habitat of c. 13,000 sq km (Magin, 1990a). We also questioned 37 adults (three IUCN staff members, three wildlife guards, two tour operator guides and 29 local people in Iferouane, Tin Telloust and along our transect routes) about the presence of ostriches in the area and in neighbouring secondary wadis that we could not investigate. Interviews were in Tamachek or French, following a standardized questionnaire (available from S.O.) and with the help of two or three interpreters as necessary.

Apart from a pair of ostriches captured as chicks in 1996 and kept captive in Iferouane, we did not locate any ostriches nor any recent sign, such as footprints, faeces or feathers, of their presence. Everyone inter-

viewed stated that they had not observed any ostriches in the area during 1999–2000. Wildlife guards and IUCN staff members suggested that the disappearance of the species from the protected area had occurred ‘some time’ after the end of the Tuareg rebellion in 1997. Two nomads stated that a small number of ostriches (<10) might still occur east of the Takaloukouzet massif (Fig. 1), an area that we did not survey during our visit. One tour operator guide observed an individual of unknown sex south-east of the protected area in autumn 1999 (A. Tchouli, IUCN, unpublished data). One adult male and one adult female were still present south-west of Iferouane and south-east of the protected area, respectively (M. Mouddour, IUCN and N. Gohé, DFPP, unpublished data). A small number of ostriches were reported to the south-east of the reserve (A. Tchouli and M. Mouddour, IUCN, unpublished data).

Comparing our survey with previous counts provides evidence for a dramatic decline in numbers. Until 1990, red-necked ostriches, although heavily poached

Table 1 Population estimates of red-necked ostrich in the Aïr and Ténéré Reserve between 1986 and 2000.

Year	Estimated population size	Area surveyed (sq km)	Survey effort	Reference
1986	c. 400	8000–10,000	12 months	Watkins (1986)
1990	1600 (± 950)	13,000	22 months	Magin (1990a, b)
1996	20–30	800–1100	10 days	Mouddour (1998a)
1997	<15	800–1100	7 days	Mouddour (1998a)
1998	<20	800–1100	9 days	Mouddour (1998b)
2000	0	2200	14 days	This study

throughout their range, were found in the reserve in reasonable numbers (Watkins, 1986; Magin, 1990b; Table 1). Even the combination of drought between 1983 and 1985 and the over-utilization of *Acacia* trees by browsing livestock did not seem to affect ostrich population growth in the short term (Watkins, 1986). In 1990 Magin estimated the ostrich population at 1600 (± 950) individuals using a strip transect survey method over the entirety of the ostrich habitat (Magin, 1990a). Between August 1988 and May 1990 Magin estimated that ostrich densities in large wadis and diffuse water drainages were 0.12–0.18 birds per sq km (Magin, 1990a, b). We estimate that 55 per cent (1210 sq km) of the area that we surveyed corresponded to these habitats and yet, where we should have seen 145–218 ostriches, we found none.

During the civil war of 1991–1997 no population estimates were made, but it appears that the ostriches suffered massive losses. Entire flocks of ostriches in easily accessible wadis were shot by government military forces (M. Mouddour, IUCN, pers. comm.). Individual ostriches probably left the area and others may have found refuge in satellite wadis, where the habitat is sub-optimal, but which were rarely accessed by military personnel because the areas were controlled by Tuareg rebels. Between 1993 and 1997 ostriches were extirpated from these secondary wadis, mainly by Tuareg rebels who hunted them as a source of abdominal and bone marrow fat which, according to ex-rebel sources (A. Tchouli, IUCN, pers. comm.), was sold to Algerian and Libyan dealers to be used as traditional rheumatism medicine by Arab customers.

After the rebellion the ostriches that survived in the reserve continued to be poached (Mouddour, 1998a). In 1996, 1997 and 1998 Mouddour (1998a, b) surveyed 800–1100 sq km (12.3–16.1 per cent) of the ostrich's range (Magin, 1990a), and counted 20–30, <15, and <20 individuals, respectively. Because Mouddour used a different method to our own, any comparison has to be made cautiously. However, if we assume that we investigated an area twice the size of that surveyed by Mouddour (1998a, b), the fact that we saw no ostriches at all suggests that the population has further declined.

Although we were eight observers and ostriches are large birds that are relatively easy to detect, it is possible that we might have missed a small number of individuals, and it is also possible that the sound of our vehicles could have scared the ostriches away before we had a chance to see them. However, previous surveys (Magin, 1990a; Mouddour, 1998a, b) were also from vehicles, and the nature of the terrain makes it unlikely that these birds could have moved out of sight before they were seen.

Although our survey route covered only 17 per cent of the described ostrich range in the protected area, it was centred on the species' preferred habitats: major wadis and diffuse water drainage areas where 95 per cent of the ostrich population existed before the civil war (Watkins, 1986; Magin, 1990a). Although it is possible that during the civil war a number of birds were driven into more remote parts of the Reserve, it seems improbable that they could have survived hunting pressure from the Tuareg rebels who were controlling these areas.

Other evidence for a dramatic decline comes from verbal reports. None of the people that we interviewed had observed live ostriches or signs of their presence in the protected area since 1999. This was confirmed by a top ranked military officer we met in Niamey, who informed us of his failure to capture the last reported specimens during a 4200 km long search of the protected area in 1999 (M. Ousseini, pers. comm.).

The confirmed occurrence of individuals at the fringes of the reserve (Fig. 1) suggests that a small number may have fled the reserve during or shortly after the rebellion. Ostriches may also survive in remote areas of the protected area (east of Takaloukouzet massif for example). Although occupying sub-optimal habitat, they might have benefited from the relatively good rainfall that has occurred in this area since 1997 (PAGRAT, 1999). However, the occurrence of poaching of ostriches since the rebellion suggests that they must be very few. Poaching remains the major threat to any surviving individuals, and unless Nigerien conservation authorities are able to implement protection measures it is likely that the red-necked ostrich will be extirpated in the Aïr and Ténéré National Nature Reserve within the near future.

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Biographical sketches

Stéphane Ostrowski is a wildlife veterinarian with a strong interest in international wildlife conservation. He is also an independent nature conservation consultant working mainly in arid environments. Since 1995 he has been involved in the Arabian oryx, red-necked ostrich and houbara bustard reintroduction programmes in Saudi Arabia. He is currently head of the Veterinary and Mammal departments at the National Wildlife Research Center, Taif, Saudi Arabia.

Mahaman Sani Massalatchi is a wildlife and range manager working for the IUCN in Niger. He is currently responsible for the Air and Ténéré National Nature Reserve IUCN management programme.

Mamane Mamadou is the head of the IUCN mission in Niger. He is based at Niamey.