

Short Communication

Discovery of a relict breeding colony of northern bald ibis *Geronticus eremita* in Syria

Gianluca Serra, Mahmud Abdallah, Adeeb Assaed, Ahmed Abdallah, Ghazy Al Qaim, Talal Fayad and Douglas Williamson

Abstract The eastern population of the northern bald ibis *Geronticus eremita* had been presumed extinct following the loss of the colony in Birecik, Turkey, in 1989. However, occasional sightings of birds in Yemen, Eritrea, Saudi Arabia and Israel during the 1980s and 1990s suggested that there was still a colony somewhere in the Middle East. Intensive field surveys in spring 2002, based on the knowledge of Bedouin nomads and local hunters, revealed that the species has never become completely extinct on the Syrian desertic steppe. Following systematic searches 15 old nesting sites were found, one of them

still hosting an active breeding colony of seven individuals. The species appears to have been relatively common in the area until 20 years ago, when a combination of overexploitation of rangelands and increasing hunting pressure initiated a dramatic decline.

Keywords *Geronticus eremita*, local knowledge, Middle East, northern bald ibis, Syria.

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Until early spring 2002 the only known population of the northern bald ibis *Geronticus eremita*, a colonial cliff-nesting bird, was in Morocco (about 70 breeding pairs confined to two colonies; Bowden, 1998). Following the extinction of the colony at Birecik, Turkey, in 1989, the last known eastern population of the species, and its disappearance from most of its former range in North Africa (Bowden, 1998), the northern bald ibis became one of the world's rarest birds (Everett, 1994). It is categorized as Critically Endangered on the IUCN Red List (BirdLife, 2000; IUCN, 2002).

The northern bald ibis has undergone a continuous decline over the last 4–5 centuries throughout its range, i.e. the Alps, south-eastern Europe, Middle East and North Africa (Hirsch, 1979; Lawton, 1989). Probably at least 400 years ago the species split into two populations, which since then have been diverging morphologically, ecologically (Cramp & Simmons, 1998) and genetically (Broderick *et al.*, 2001). During the 20th century the

species declined by 98% between 1900 and 2002 (Collar & Stuart, 1985). Causes of the decline are thought to be pesticides (Hirsch, 1980), human persecution (Hirsch, 1979; Aharoni, 1911, 1928, 1929), habitat loss (Collar & Stuart, 1985) and long-term global fluctuations in rainfall (Safriel, 1980).

At the beginning of the 20th century the northern bald ibis was found throughout the Syrian desertic steppe (Aharoni, 1911, 1929), but was believed to have become extinct from the area some time after 1928 (Safriel, 1980; Collar & Stuart, 1985). However, occasional sightings of birds in Yemen, Eritrea, Saudi Arabia and Israel during the 1980s and 1990s (Bowden, 1998; Cramp & Simmons, 1998), suggested that there was still a colony somewhere in the Middle East. However, searches in the Syrian steppe from 1960 to the 1990s were unable to locate the birds (Kumerloeve, 1967, 1984; Baumgart, 1995). In this paper we describe our survey methodology for detecting old nesting sites and an extant colony in Syria, and analyse the causes of the decline and current threats. This study was undertaken within the framework of an Italian-funded, FAO-implemented project (GCP/SYR/009/ITA) based in Palmyra, Syria, with the aim of assisting the Syrian authorities in promoting biodiversity conservation and developing the first operational protected area, Al Talila, in the country.

The search for a possible northern bald ibis colony began in March 2002 on the basis of an account given by a local hunter. A total of 33 field surveys were carried

Gianluca Serra (Corresponding author) Mahmud Abdallah, Adeeb Assaed, Ahmed Abdallah, Ghazy Al Qaim and Talal Fayad Al Talila Reserve project, c/o FAO Representation, P.O. Box 10709, Damascus, Syria.
E-mail gianlu@scs-net.org

Douglas Williamson Wildlife and Protected Area Management, Forestry Department, Food and Agriculture Organisation of the UN, V. le Terme di Caracalla, 00100 Rome, Italy.

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out, involving three trained local observers, over an area of c. 18,000 km². On the basis of available literature and directions provided by nomads, careful inspection was made of cliffs potentially suitable for ibis nesting. A standard questionnaire, including a photo-recognition test, was used for interviewing nomads and hunters (Appendix 1); the questionnaire was designed so as not to give any clue about the possible expectations of the interviewer. If all the questions were satisfactorily answered, it was assumed that the person had probably seen a northern bald ibis at some time in the past. Old ibis nesting sites were recognized by the combination of niches and ledges on sheer cliffs with the marks of bird droppings (Aharoni, 1911), and a number of nests clustered together.

The responses of 16 local hunters and 31 nomadic shepherds to the questionnaire (Appendix 2) indicated a degree of both recent and older local knowledge of the species. The 68 sightings reported during the interviews date from the 1930s to 2002. Our field surveys based on this information resulted in the recognition of 15 old nesting sites of varying size (Appendix 3). Nests were located in niches and holes and on ledges on limestone cliffs. In some cases a considerable amount of stratified guano bordered the nests, suggesting long-term use. Based on their local name and location, and of the number of birds reportedly seen in the past by local people, two of the old nesting sites appeared to match the description given by Aharoni (1911) of two colonial sites containing 500 and 300 breeding pairs in 1910 (#11 and #12, Appendix 3; Collar & Stuart, 1985). The extinction of the latter of these two large colonies (reportedly during 1930–40) may have been due to its proximity to a densely inhabited village, while birds at the former were still abundant during the 1970s until a military facility was built nearby. Of the other 13 old nesting sites, we discovered a colony of seven ibises at one of them (#5, Appendix 3), on 21 April 2002, on a small and remote cliff containing 10–15 old nests. It was composed of three breeding pairs and one non-breeding adult. The characteristics of this nesting site were similar to the those described by Aharoni (1911) and to those currently used by northern bald ibis in Morocco (C. Bowden, pers. comm.). The precise location of the colony is not provided here, in order to safeguard it.

The three active nests were located on an easterly oriented, vertical 40–50 m high limestone cliff, at c. 15 m from the ground, protected from both the dominant westerly/north-westerly wind and the midday sun. Immediately following the discovery of the colony a round-the-clock guard was established at the cliff. Daily observations were made, and dry droppings and pellets were collected. At the time of the discovery the three pairs were almost at the end of the incubation period.

One pair lost their chicks shortly after hatching, a chick disappeared at another nest for unknown reasons over 10–14 May and the surviving chick took 43–44 days to fledge, while the two chicks raised at the third nest took 36 days to fledge. Fledglings followed the adults to feeding grounds for the first time on 10 June, and a month later all birds disappeared from the breeding area. The breeding success recorded in 2002 was comparable to that recorded in the colonies in Morocco (Bowden *et al.*, in press).

The birds were observed to feed at seven sites, from the base of the nesting cliff to 28 km away. The feeding areas were of three types (cf. Hirsch, 1979): micro-ridges separating a complex system of micro-wadis of a large drainage area dominated by dwarf *Salsola* spp. shrubs, cultivated areas, and an irrigation reservoir. Due to unusually late rainfall in 2002 the dwarf shrubland only started to dry up at the end of June. The fact that the birds were feeding up to 28 km away from the nests could be an indicator that the nearby rangelands are an inadequate food source, as the species has previously been reported to travel not more than 5 km away from nests with young (Hirsch, 1979).

Analysis of droppings and pellets and direct observation suggest that tenebrionid ground beetles and acridid grasshoppers formed the bulk of the prey taken within the drainage and cultivated areas. At the irrigation reservoir ibises were observed feeding on juvenile frogs *Pelobates syriacus* (Serra *et al.*, unpub. data). The need for a mixed diet based on both steppe and marsh fauna (Collar & Stuart, 1985; Cramp & Simmons, 1998) is confirmed by our observations of ibises moving daily between fields and the irrigation reservoir during June, and by pellet analysis (Serra *et al.*, unpub. data). The ibises left the area just as the reservoir dried up. The construction of two small dams in the area during the 1960s–1970s might have compensated, in terms of food availability, for increasing degradation of the rangelands.

Information from those interviewees familiar with the ibis (Appendix 2) indicates that the species was common on the Syrian steppe until 20 years ago and relatively abundant 30 years ago, and that the individuals located in 2002 are the last remnant of a once large population, rather than individuals from the semi-wild population in Birecik, Turkey. These seven survivors of the eastern population of northern bald ibis are the only individuals presently known to be migratory, as the western wild population does not migrate (Everett, 1994).

The explanation for the widespread belief that the Syrian population of northern bald ibis was extinct is that sufficient survey efforts were not undertaken since the time of Aharoni (1911, 1929). In addition, our rediscovery of the colony would not have been possible without the use of the knowledge of Bedouin nomads

and local hunters. Although Baumgart (1995) noted that the folkloric memory of ibises had been lost, most of the elderly interviewees, especially from the Palmyra area, repeatedly reported a specific local name, *an-nuq*, for the bald ibis. The combination of a questionnaire and adequate field surveys were crucial to the location of the relict colony.

Information collected during the interviews suggested that uncontrolled hunting, the removal of chicks for food and habitat degradation have all contributed to the decline of the northern bald ibis on the Syrian steppe. Uncontrolled hunting and habitat degradation have intensified in the last 30–40 years, prompted by the increased use of motorized vehicles. The productivity of the rangelands in the survey area has declined by 20–50% during 1993–1999 (Mirreh *et al.*, 2000), and the increasing population of nomadic Bedouin herders has made the practice of firewood collection unsustainable.

The future survival of the northern bald ibis in Syria will depend on a programme of efficient protection and data collection during each breeding season, the reversal of habitat destruction on the feeding grounds, provision of assistance for sustainable development to local communities, protection of the species on its wintering grounds (to be located using satellite telemetry), and raising the ecological awareness of the local community, civil society and decision makers. During the 2002 breeding season significant results were achieved by Al Talila project in terms of protecting the birds in their breeding habitat with the involvement of nomads, and raising the ecological awareness of the local community in general. This work is continuing.

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Appendices 1–3

The Appendices for this article are available online at <http://journals.cambridge.org>

Biographical sketches

Gianluca Serra's research interests focus on applied conservation, biodiversity monitoring, protected area management and local community participation. He has been working with Al Talila Reserve project since 2000.

Mahmud Abdallah, Adeeb Assaad, Ahmed Abdallah, Ghazy Al Qaim and Talal Fayad are rangers and ecotourist and birdwatching guides with Al Talila Reserve project.

Doug Williamson has extensive experience in nature conservation from his work in Africa and the Middle East. He is working as a wildlife and protected area management officer with the Food and Agriculture Organization of the UN.