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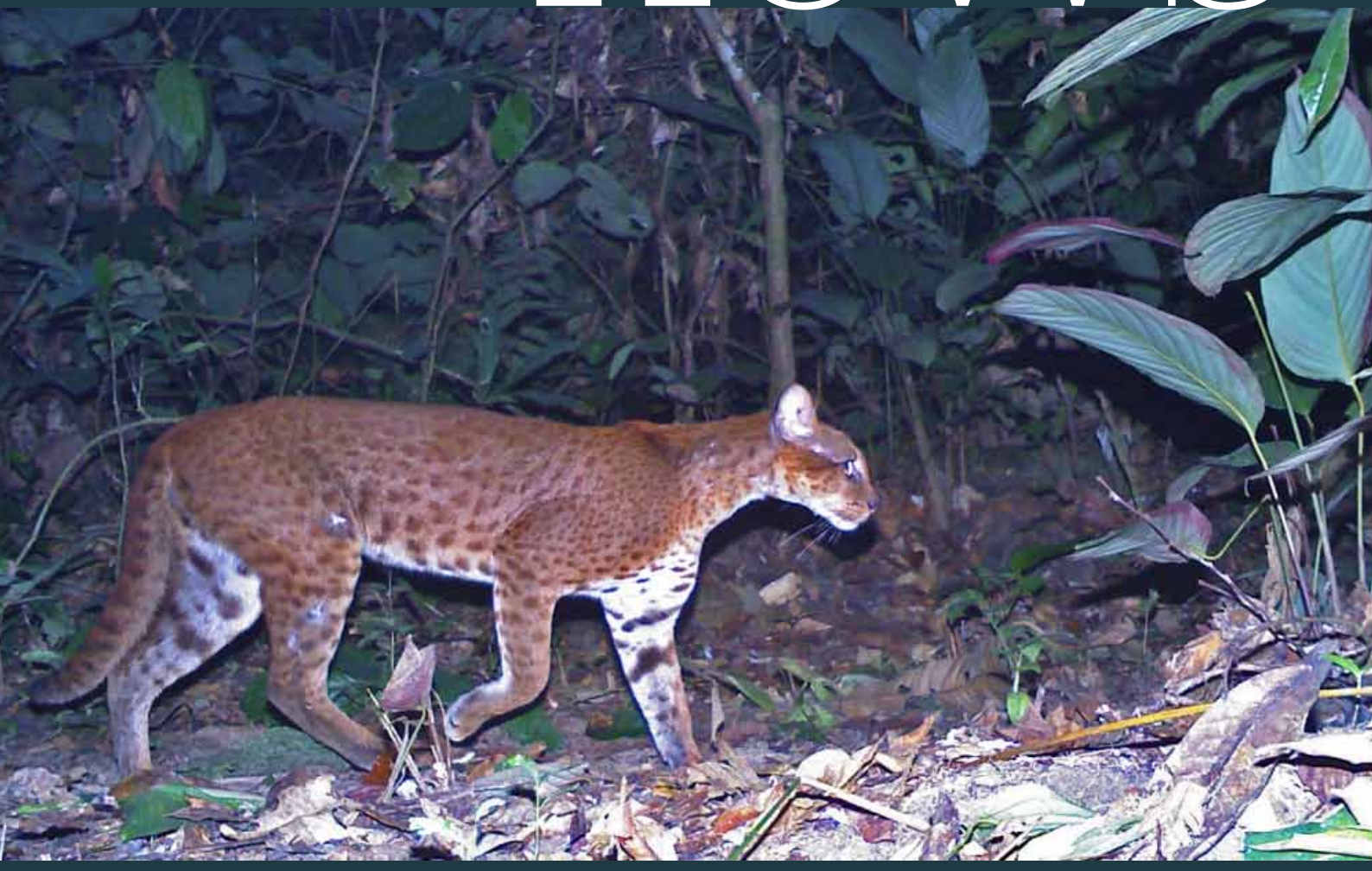

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HANS H. DE IONGH[1*], BARBARA CROES[1], GREG RASMUSSEN[2], RALPH BUIJ[3] AND PAUL FUNSTON[4]

The status of cheetah and African wild dog in the Bénoué Ecosystem, North Cameroon

Here we present the results of a research programme on large carnivores implemented in the Bénoué Ecosystem of North Cameroon. The area comprises three national parks (Bénoué, Bouba-Ndjidda and Faro, with a total surface of 7,300 km^2) and a large area comprising 28 hunting zones (with a total surface of 15,700 km^2) that is contiguous and surrounds all three parks. Three years of surveys (2007-2010) covered 4,200 km of spoor transects, 1,200 camera-trap days, 109 interviews with local villagers, and direct observations. From these data we conclude that cheetahs *Acinonyx jubatus* and African wild dogs *Lycaon pictus* are functionally extinct in the Bénoué Ecosystem and probably also in other areas of the country. Spotted hyenas *Crocuta crocuta* and leopards *Panthera pardus* were found in hunting zones and national parks in similar densities, but lion *Panthera leo* densities were significantly lower in hunting concessions than in national parks. Our immediate recommendation is that local authorities drastically improve management strategies in both national parks and hunting concessions, to facilitate restoration of wild dog and cheetah populations by immigration from neighbouring countries Central African Republic and Chad.

Whereas the cheetah was once found throughout Africa and into India, the species is now only scattered in Iran and various countries in sub-Saharan Africa. Remaining cheetah populations are estimated to be between 10,000 and 12,500 animals located in 24 to 26 African countries, with a small population of less than 100 animals in Iran (Nowell and Jackson 1996, Faradinia 2004). In West and Central Africa cheetahs still survive in small pockets, but they are extinct through much of their historical range in these regions. The cheetah is listed as Vulnerable on the IUCN global Red List and is listed in CITES Appendix I. A great majority of cheetahs live in small, isolated populations outside protected game reserves where they are often in conflict with humans and livestock, and therefore most of these populations continue to decline. (Nowell & Jackson 1996). Cheetahs were last reported from Cameroon by Esser and van Lavieren (1979). The last observations of cheetahs in Cameroon are from the late 1970s when a female with two cubs was observed in Waza National Park (L. P. van Lavieren, pers. comm.). In 1973 a cheetah skin, reportedly from North Cameroon, was confiscated by the Wildlife Management and Control Section (North Eastern State of Nigeria) in Maiduguri (Colquhoun 1974). This was not the only case reported. During the 1970s several cheetah skins were confiscated in northern Nigeria (P. Wit, pers. comm.). Also, in 1985 a cheetah skin was seen by the principal author hanging on the wall of a hotel in Maroua, which also confirms that cheetahs were hunted for trophies.

In order to determine the status of cheetahs and wild dogs in the Bénoué ecosystem in the North Province of Cameroon a three-year project started in 2007 (Croes et al. 2010). Additional objectives of the survey programme included research into methods of monitoring these species in the region, training local field staff in monitoring methods and ultimately raising awareness among local stakeholders.

Study area

The North Province of Cameroon (Fig. 1) is covered (44%) by natural woodland and contains three national parks and 28 hunting zones. Poaching is a threat to wildlife and is mainly related to rapid human encroachment in this area. Human population growth is relatively high in the area at around 2.6 % p.a. and mostly results from immigration from other provinces or neighbouring countries with a diverse ethnic background (De longh et al. 2010)

The Bénoué Ecosystem (BE) is part of an extensive protected area complex, the Bénoué-Gashaka Gumti area, of about 30,000 km^2 in North Cameroon and Nigeria. The Bénoué-Gashaka Gumti area consists of these National Parks (from east to west): Bénoué, Bouba-Ndjidda and Faro in Cameroon and Gashaka-Gumti in Nigeria. Referring to the BE in this study we mean the three national parks in the Bénoué Valley (Bénoué, Bouba-Ndjidda and Faro). These parks are connected and surrounded by 28 hunting zones, and the total area of the BE covers 23,500 km^2. None of the parks are fenced and wildlife can wander freely in and out of the national parks. Inside the parks hunting is prohibited, while inside the hunting zones quotas are allocated for hunting a wide range of large mammal species (Mayaka 2002).

Methods

The status surveys consisted of (1) combined track survey and camera-trapping techniques; (2) structured interviews with 109 family heads in 19 villages; (3) interviews with 24 village heads; and (4) opportunistic interviews with five hunting zone managers.

Five park guides were trained as large-carnivore trackers and conducted the track surveys either in teams of two on a motorbike or singly on a tracker seat mounted on the front of a Toyota Land Cruiser vehicle. Trackers were equipped with a Super Track Stick III device that registered GPS locations during surveys. This enabled verification by project leaders and mapping of all surveyed roads.

In total, 4,200 km of transects on dirt roads were conducted throughout the complex, both in the three national parks (Faro, Bénoué and Bouba-Ndjida) and in adjacent hunting zones. For each large carnivore track encountered we recorded GPS location, species, number of individuals in the group and an estimate of their ages. In addition 12 Stealth Cam camera

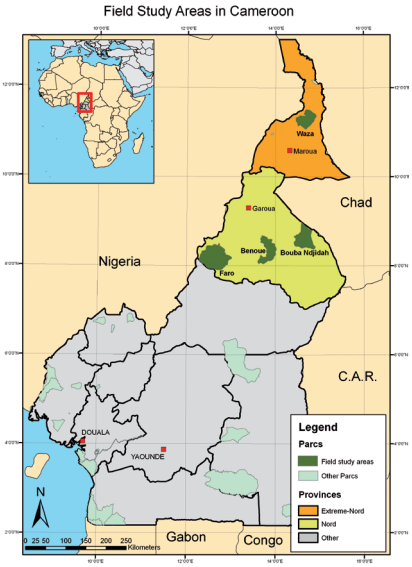

Fig.1. Survey area and its location in North Cameroon.

Fig.2. Large carnivores were represented by lion (A, B), leopard (C) and spotted hyena (D; Photos B.M. Croes and M. de Jager).

traps were installed along selected stretches of the same road transects at 2.5 km intervals during survey periods of 2-3 weeks.

In 2006 structural interviews with open-ended questions focused on the national parks and the presence of carnivores were held with 109 family heads in 19 different villages in the central Bénoué Ecosystem (between Guidjiba and Koti Manga). The interviews were conducted with the help of a French- and Fulfuldé-speaking interpreter. Additional interviews took place with 24 village chiefs between January 2008 and May 2010. Finally, on an opportunistic basis, five hunting zone managers (HZM) were interviewed about their knowledge of the past and present occurrence of wild dogs, cheetahs and other large carnivores.

Results

During spoor transect surveys, tracks of lion (N=103), leopard (N=80) and spotted hyena (N=338), were commonly recorded, but no confirmed tracks of cheetahs or wild dogs were encountered during the survey. Although distinguishing spotted hyena tracks from striped hyena tracks is extremely difficult, a zero photographing rate of striped hyenas by the camera traps suggested that striped hyenas were also either absent or extremely rare in the study area. Photographs of lions, spotted hyenas, leopards and smaller carnivores, as well as porcupines and aardvarks were obtained throughout the survey area (Fig. 2). An extensive database has been created for each species with GPS location data, and a picture with a size indication of each track. These data are currently being analyzed and will be published together with the results of the combined track and camera trapping surveys (B. M. Croes, pers. comm.).

Of 109 family heads interviewed in 2006, 60% indicated that large carnivore numbers had declined in the BE in the past 20 years, while 21% indicated an increase, and 19% had no opinion. No confirmed sightings of cheetahs were reported from 1996 to 2006. Of the additional people interviewed in 2008-2010, no person reported sightings of cheetahs. With respect to wild dogs only one person suggested that they had observed them. This was claimed to be of a group of three crossing a dirt road in the central Bénoué area. However, no evidence of wild dog presence was found after visiting the site during a two-week field survey period in May 2009.

Opportunistic interviews with five HZMs revealed that their perception of cheetahs and wild dogs was generally negative. Most HZMs believed that the cheetah had become extinct in the area several decades ago. Two HZMs indicated that they did not wish to have either species, but especially wild dogs, in their area as they tended to 'destroy all valuable game'. A general lack of understanding of wild dog behaviour and ecology was further highlighted by the belief of one HZM that a 'hybrid species' of wild and domestic dogs existed in the area until not long ago. Although hybridisation between wolves and domestic dogs has been reported, wild dogs are a separate monotypic genus and thus hybridisation cannot be deemed a possibility.

Three HZMs also reported that nomadic cattle owners have persecuted cheetahs and wild dogs in the past and suggested that this was probably the main reason for their absence now. However there was no evidence for losses due to this cause from the interviews with village heads, while there was evidence for loss caused by lions and hyenas. One HZM

reported the presence of a wild dog carcass and presented a headless and clawless fresh skeleton of a carnivore. Since this carcass showed feline characteristics we investigated whether this might have been a cheetah. Morphological examination of the dimensions of the carcass at the Natural History Museum Naturalis in Leiden, the Netherlands, revealed that the carcass was actually a leopard (Fig. 3). The interviews with HZMs revealed a poor understanding of the ecology of other large carnivore species and in particular their densities. For example, lions were perceived to occur in much higher densities than is actually the case (B. M. Croes, pers.com.).

Fig. 3. Ribcage of a leopard at Naturalis next to a picture of the Cameroon leopard ribcage (Photo H.H. de Iongh)

Discussion

We conclude that lions, leopards and spotted hyenas occur throughout the entire BE, in a variety of habitats. Our data further suggest that lions occur in lower densities in hunting zones than in national parks, which could have important implications for management practices in the hunting concessions (B. M. Croes, pers. comm.). Analysis of these data is ongoing and will be published together with the results of the combined track- and camera- trapping surveys. However, the absence of photographs and tracks of both cheetahs and wild dogs, along with the answers from the questionnaire surveys, leads us to conclude that both cheetah and wild dog are no longer present in the BE. As there are no other areas in North Cameroon where either species could occur or have been reported, we conclude that both are functionally extinct there.

From a regional perspective there is no evidence of any viable population of either species surviving in Nigeria. There is some information on the existence of cheetahs in the Central African Republic (CAR) and Chad (P. Chardonnet, pers. comm.), and also in Algeria, Niger, Benin and Senegal (Croes et al. 2008). It seems unlikely that cheetahs and wild dogs will be able to migrate from these countries into suitable habitat in Cameroon. The last hope for possible remigration rests with remnant populations in Chad and CAR. Efforts need to be made to regulate the activities of HZMs to improve the conservation of large carnivores like the lion and to prepare for a possible re-migration of cheetahs and wild dogs while at the same time clarifying their role and importance in the ecosystem and helping managers to secure benefits from their presence, such as through ecotourism.

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[1] Institute of Environmental Sciences, Einsteinweg 2, POB 9518, 2300 RA Leiden, The Netherlands *<Iongh@cml.leidenuniv.nl >

[2] Wildlife Conservation Research Unit (WildCRU), Department of Zoology, Oxford University, Tubney, Abingdon Road, OX13 5QL, UK

[3] Department of Nature Conservation, Tshwane University of Technology, Pretoria, South Africa

[4] Department of Nature Conservation, Tshwane University of Technology, Pretoria, South Africa