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Field Report

African wild dogs from south-eastern Kenya: recent records and conservation issues

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Introduction

Although African wild dogs *Lycaon pictus* were once distributed through much of sub-Saharan Africa, they have declined dramatically over the last century (Woodroffe et al. 1997). They are believed extirpated from most of west and central Africa and populations in the east and the south have been confined to areas where human population density remains low (Woodroffe et al. 1997; Malcolm and Sillero-Zubiri 2001). As part of the Horn of Africa, northern Kenya is one of the more remote areas where wild dogs are known to persist (McCreery and Robbins 2004). This note highlights recent information on the presence and distribution of African wild dogs in the southern part of Kenya's North-Eastern Province - Ijara and Garissa districts - and raises some conservation issues of the species in this area.

Study area and methods

The main source of these data is the Trans-boundary Environmental Project (TEP 2004). Between 2003 and 2007, Terra Nuova (an international NGO www.terranuova.org) together with various national (Kenya Wildlife Service, Arid Lands Resource Management Project) and international (Istituto Oikos, Tanzania) collaborators undertook the *Trans-boundary Environmental Project: Conservation of natural resources and sustainable development in pastoral semi-arid regions of Eastern Africa*. The main study area was the Garissa and Ijara districts, at the south of the vast North-Eastern Province, as well as the neighbouring Afmadow district of Somalia. This vast region is a wildlife-rich pastoral zone where humans and wildlife have coexisted peacefully for long periods of time (Andanje 2002). The two Kenyan districts support a substantial amount of

wildlife especially along the Tana River (Figure 1). Wild dog data were collected during road transect counts of large mammals in four main study sites across the study area, namely: Arawale National Reserve, Boni Forest National Reserve (and the surrounding northern buffer zone), Bour-Algi Giraffe Sanc-

tuary and Ishaqibin Community Conservancy (Figure 1). Transects were surveyed once a month over a complete calendar year (between January 2005 and December 2006) in each site, both by car and on foot, by two trained scouts and a guide from the local community.

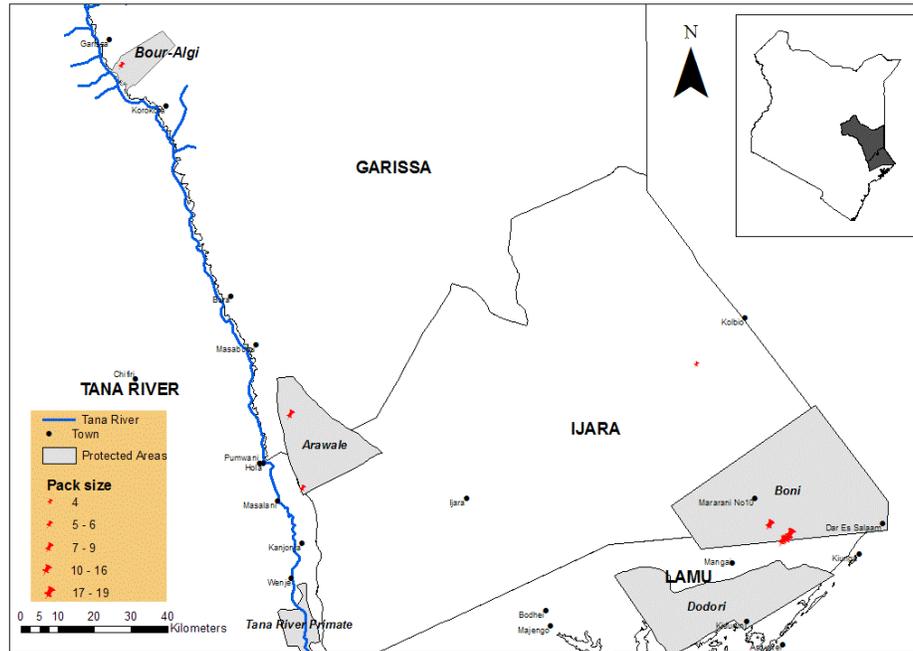


Figure 1: Locations where wild dogs were sighted in the North-Eastern Province in Kenya during the study. Inset is a map of Kenya showing the location of Garissa and Ijara districts. [NB: The proposed Ishaqibin Community Wildlife Conservancy (not shown) is located in Ijara District, and is flanked to the west by the Tana River. Across the river is the KWS-administered Tana River Primate National Reserve (Muchai et al. in prep)].

Arawale National Reserve

Arawale National Reserve ($1^{\circ}15'$ to $1^{\circ}34'S$, $40^{\circ}04'$ to $40^{\circ}20'E$) lies 77km south of Garissa town, astride the border of Garissa and Ijara districts (Figure 1). The reserve covers an area of 450km² and is bordered to the west by the Tana River and to the east by the Garissa-Lamu road. Its vegetation consists of a mosaic of grassland, bushland and open woodland dominated by *Acacia*, *Commiphora* and *Combretum* spp. The reserve was gazetted in 1976 as the only main *in-situ* conservation site for the hirola *Beatragus hunteri*, a critically endangered monotypic antelope endemic to north-eastern Kenya and south-west Somalia (Andanje 2002). The reserve is managed by

Garissa County Council with assistance of the Kenya Wildlife Service.

Boni Forest National Reserve and Northern Buffer Zone

The Boni Forest National Reserve and the Northern Buffer Zone are located in Ijara District, north-eastern Kenya (Figure 1). The general area lies between $1^{\circ}76'$ and $1^{\circ}25'S$ and $40^{\circ}83'$ and $41^{\circ}66'E$ (TEP 2005). Boni is 1,283km² and was created in 1976 as a dry season sanctuary for elephants *Loxodonta africana* from Ijara and Lamu districts and also the Somali part of the forest. The area's climate is heavily influenced by the north-east and south-west monsoons blowing from the Indian

Ocean resulting in two wet seasons: April to June and October to December, and two dry seasons: January to March and July to September. Annual rainfall ranges from 750-1,000mm with temperatures ranging from a minimum of 15°C and 38°C (TEP 2005). The vegetation in the reserve includes closed forest, closed shrubs, open and very open forest, closed to open woody vegetation (thickets), open low shrubs, open shrubs and sparse shrubs (FAO 2000). Common tree species in the forest include: *Homalium abdessamadii*, *Croton megalocarpoides*, *Croton polytrichus*, *Excoecaria bussei* and the cycad *Encephalartos hildebrandtii*. About 64% of Boni is composed of open trees (65-40% crown cover), while only 1% is closed to open woody vegetation (thicket) (FAO 2000) (Githiru et al. in prep).

Bour-Algi Giraffe Sanctuary

The Bour-Algi or Garissa Giraffe Sanctuary 0°31' S, 39°41' E is located in the Bour-Algi area, about 5km south of Garissa town. It is about 124km² and borders the Tana River to the south-west (Figure 1). The climate of the wider Garissa district is generally hot and dry. The area receives 200-500mm of erratic and unreliable rain per annum, with the long rains tending to occur between April and June and the short rains between October and December. Annual temperatures range from 20°C to 38°C but can vary widely across seasons. The Sanctuary is a community initiated conservation area established in 1999 to protect wildlife species, particularly reticulated giraffe *Giraffa camelopardalis reticulata*, but also gerenuk *Litocranius walleri*, lesser kudu *Tragelaphus imberbis*, waterbuck *Ellipsyprimmus kobus* and Burchell's zebra *Equus burchelli* (Dahiye 2005).

Ishaqibin Community Wildlife Conservancy

The proposed Ishaqibin Community Wildlife Conservancy is located in Ijara District 01° 55' S, 040° 10' E in the vast North-Eastern Province of Kenya. The conservancy covers an approximate area of 72km² and is flanked to the west by the lower part of the Tana River, the only permanent river in the district. The river has rich riverine vegetation along its banks and areas of alluvial deposits as a result of seasonal flooding. Across the river from Ishaqibin lies the Kenya Wildlife Service's administered Tana River Primate National Reserve (Figure 1). To the south, north and

east are human settlements and rural shopping centres. The area has the following vegetation (land cover) types: closed herbaceous vegetation on permanently flooded land, closed to open woody vegetation (thickets), closed trees on temporarily flooded land, isolated rainfed herbaceous crop, natural water bodies mainly along Tana River and Ishaqibin reservoir, open low shrubs, open to closed herbaceous vegetation, rice fields, trees and shrubs savannah, and very open trees (Africover LCCS: FAO 2000).

Wildlife in these sites

Wildlife densities in the area average approximately 0.1 individuals/km², while biomass averages about 30-35kg/km² (Githiru et al. in prep.). Besides livestock, the wild herbivore biomass is dominated by topi *Damaliscus lunatus jimela* and reticulated giraffe, while densities are highest for dik dik *Madoqua sp.* and Grant's gazelle *Gazella granti*. The rest of the herbivore community is composed of both potential prey species for the wild dogs such as gerenuk, warthog *Phacochoerus aethiopicus*, bush pig *Potamochoerus larvatus*, lesser kudu, common duiker *Sylvoicapra grimmia*, and possibly species such as buffalo *Syncerus caffer*, Burchell's zebra, hirola, eland *Taurotragus oryx* and oryx *Oryx beisa*. Common carnivores that are likely to compete with the wild dogs include cheetah *Acinonyx jubatus*, lion *Panthera leo*, black-backed jackal *Canis mesomelas*, caracal *Felis caracal* and spotted hyena *Crocuta crocuta*. This area, like most other rangelands in Kenya, has experienced severe contractions in the size and distribution of wildlife (WRI 2007), attributed to increased human and livestock populations as well as changes in land use. Indeed, habitat degradation and loss due to changing land use is perhaps the greatest single threat facing the large mammals here (de Leeuw et al. 2001; Andanje 2002). Although the endangered wild dog has been repeatedly reported in this area by the local communities (McCreery and Robbins 2004), very little is known about its abundance, distribution and any related conservation issues.

Results

The map indicates locations where wild dogs were reported in the four sites during the

study period (Figure 1). Wild dogs were commonly seen in Boni Forest National Reserve during the survey period with eight out of the 12 sightings being reported from there (Table 1). However, based on sighting areas, dates and pack sizes, the 12 sightings probably consisted of only a maximum of six distinct packs, perhaps even fewer given their vast home ranges (Rasmussen 1997):

- Two in Boni (pack sizes of nine and 19 respectively, with approximately 6km between sightings)
- One in the Northern Buffer Zone (pack size of four)

- One in Bour-Algi (pack size of five)
- Two in Arawale (pack sizes of five and nine, respectively) (Figure 1).

Although the packs in both Boni and Arawale were fairly close to each other and could still constitute the same pack, the consistency which they were seen apart and the number of individuals within each - especially the Boni pair - suggests they were indeed separate (Table 1). The four areas where the six packs were consistently reported from are described in more detail below.

Table 1: All wild dog sightings during the entire survey period of the Terra Nuova's Trans-boundary Environmental Project, NE Kenya; NR: National Reserve; GPS readings are given in UTM format (37S); Landcover classification follows the standard Africover LCCS (FAO 2000).

Site	Date	Transect	Time	Easting	Northing	Pack size	Landcover
Arawale NR	05/11/05	Hola - Desehek	07:00	624911	9827212	5	Open low shrubs (65-40% crown cover)
Arawale NR	05/02/06	Haji Jubas - Kuroley	06:52	621858	9847400	9	Closed to open woody vegetation (thicket)
Boni Forest NR	09/10/05	Sham	10:14	752976	9817280	8	Open trees (65-40% crown cover)
Boni Forest NR	09/12/05	Sham	11:05	752792	9817534	6	Open trees (65-40% crown cover)
Boni Forest NR	09/01/06	Sham	10:58	752957	9817398	9	Open trees (65-40% crown cover)
Boni Forest NR	09/09/05	M'kondoni	07:11	758608	9814730	15	Closed to open woody vegetation (thicket)
Boni Forest NR	09/11/05	M'kondoni	09:15	757043	9813096	15	Closed to open woody vegetation (thicket)
Boni Forest NR	09/12/05	M'kondoni	07:54	758604	9814732	19	Closed to open woody vegetation (thicket)
Boni Forest NR	09/04/06	M'kondoni	07:13	756490	9812766	16	Closed to open woody vegetation (thicket)
Boni Forest NR	09/05/06	M'kondoni	09:25	758023	9813362	13	Closed to open woody vegetation (thicket)
Bour-Algi Giraffe Sanctuary	01/02/06	Jesh	10:20	575350	9943396	5	Shrub savannah
Northern Buffer Zone	05/09/05	Ire - Gudeed Wataa	08:24	732689	9861290	4	Closed shrubs

Extra description of the wild dog locations and sightings

1. Boni Forest National Reserve: Sham and M'kondoni
2. Northern Buffer Zone: Gudeed Wataa

3. Bour-Algi Giraffe Sanctuary: Jesh
4. Arawale National Reserve: Hola and Haji Jubas Kuroley

1. Boni Forest National Reserve

Transect 3B (Sham) was 5.7km long and ran to the north-west of Mararani town approximately following an ancient footpath leading to an abandoned campsite named Sham. This campsite is in the middle of the forest and was used by foreign companies in the 1970s while prospecting for petroleum. This transect ran through two areas - Jijanole and Jau Minde; it also had a relatively large permanent water pond along it. Transect 4B (M'kondoni) was approximately 6.2km long and ran to the north-east of Mararani starting from a small village called Nyabarat. It had a markedly high number of natural water ponds all along it. It ran through dense vegetation, big open areas, probably ancient campsites and farming grounds of the Awer community. While 64% of Boni is composed of open trees (65-40% crown cover), only 1% is closed to open woody vegetation (thicket) (FAO 2000), the larger pack was consistently found in this latter vegetation, suggesting it could have been preferentially selecting it either for foraging or other uses such as denning.

2. Northern Buffer Zone

Transect 1B (Ire-Gudeed Wataa) was approximately 16km long and was located in the general Ire area, to the south of Hulugho location. About 7.3km of this transect ran through closed to open woody vegetation while the rest traversed open trees (4.0km) and shrubs (4.7km) (Githiru et al. in prep). Pastoralists use this area much more intensely for grazing their livestock compared to the adjacent Boni (Githiru et al. in prep), perhaps due to a combination of better grazing sites there, and higher legal protection - hence restrictions - at Boni. There is probably a greater chance for human-wild dog conflicts in this area, if the dogs are (perceived as) a threat to the domestic stock (but see McCreery and Robbins 2004).

3. Bour-Algi Giraffe Sanctuary

Wild dogs were seen around Jesh village in a shrub savannah habitat feeding on a dik dik. Increasing numbers of livestock in this conservancy could produce human-wildlife conflicts in the near future.

4. Arawale National Reserve

The two wild dog packs spotted in this site were in closed to open woody vegetation and

open low shrubs habitats. The area is inhabited by the nomadic Somali pastoralists also implying potential for human-wild dog conflict.

Discussion

Depending on whether they are considered four or six packs (and considering the largest pack size recorded for each pack), between 37 and 51 individual wild dogs were counted in these areas over the duration of the study. As was previously reported for this area (McCreery and Robbins 2004), pack size was variable, ranging between four and 19 individuals. While the potential area that they can occupy is extensive, the total area under some form of protection (and where searches were mainly conducted) is only 1,929 km² (combining Boni, Bour-Algi, Arawale and Ishaqibin sizes, albeit none were recorded at Ishaqibin). Given a pack's territory usually ranges from about 750km² in southern Africa to 1,500km² in east African ecosystems (Rasmussen 1997), often covering both woodland and savannah habitats, it is yet possible that the Boni packs were indeed discrete, only seen around the same general area due to use of a specific resource (such as water in this area rich with water ponds) but ranging more widely across the reserve.

A recent survey suggested that a large area in southern and eastern Ethiopia probably supports wild dogs, the population extending into Kenya to the south and Somalia in the east. The population found in the current study may be the extension referred to in that article (Malcolm and Sillero-Zubiri 2001), and was almost certainly part of the packs described by McCreery and Robbins (2004). This study area contributes to the more than 2,000,000km² of possible wild dog habitat in the Horn of Africa (Malcolm and Sillero-Zubiri 2001), which, albeit largely unprotected, could be a very important refuge for the species in east Africa. It may also serve as a critical link/corridor for the Kenya population and neighbouring Somalia (McCreery and Robbins 2004).

Wild dogs are considered generalist predators, occupying a range of habitats including short-grass plains, semi-desert, bushy savannahs and upland forest. Recent findings indicate

that wild dogs may not be primarily an open plains species, but reach their highest densities in thicker bush (McNutt et al. 2004). Although supported by very few sightings, the wild dogs in our study area seemed to use the closed-to-open woody vegetation (thickets) the most, but this requires more data to ascertain. Nonetheless, packs were also recorded in other habitat types, corroborating the view that their current distribution is probably limited primarily by human activities and the availability of prey, rather than by the loss of a specific habitat type (McNutt et al. 2004).

Wild dogs mostly hunt medium- and small-sized antelope. Their main potential prey species in this area include Grant's gazelle, lesser kudu, gerenuk, warthog, bush pig, dik dik and common duiker. Very small prey such as hares (*Lepus capensis* and *L. saxatilis*) which were locally abundant could also supplement their diet. Therefore, there seems to be diverse potential prey for the dogs, besides domestic stock. This is crucial because the principal threats to wild dogs are considered to be conflict with human activities and infectious disease from domestic animals (Woodroffe et al. 1997; McNutt et al. 2004). Both of these are mediated by habitat fragmentation, which increases contact between wild dogs, people and domestic dogs. In this area where the local communities are predominantly pastoral peoples, it is practically impossible to separate humans and wildlife. Yet, despite negative attitudes from the local people, wild dogs in this area do not appear to be persecuted presently, possibly due to religious beliefs and the infrequency with which they take livestock (McCreery and Robbins 2004).

In theory, human-wild dog conflicts suggest that, outside protected areas, wild dogs may be unable to cope with the increasing human population unless better protection and local education programmes are implemented. Perhaps as a sign of this, although data were insufficient to make concrete conclusions, we found far more wild dogs within the protected Boni National Reserve (where no livestock were recorded during the study duration) than in the surrounding northern buffer zone where high livestock densities were found. Potentially high wild dog density in Boni suggests that they may be seeking refuge in this reserve. If so, this underlines the crucial role of the protected areas scattered across this vast

region (for instance the four under this study; Figure 1), as refugia for wild dog (and wild-life) protection.

Even in large, well-protected reserves, wild dogs are known to live at low population densities, with predation by lions and competition with hyaenas contributing to keeping their numbers below the level that their prey base might support (McNutt et al. 2004). The presence of these large predators living in sympatry with the wild dogs could well have had an added impact on their population sizes and density. In addition, this wild dog population could be suffering the problems associated with small population sizes. The obligate cooperative behaviour in this species characterized by a reliance on helpers - e.g. for cooperative hunting, defence from klepto-parasitism, pup-feeding and baby-sitting - makes it more sensitive to anthropogenic fragmentation and mortality. Indeed, a pack in which membership drops below a critical size may be caught in a positive feedback loop: poor reproduction and low survival further reduce pack size, culminating in failure of the whole pack (Courchamp and MacDonald 2001).

Crucially, any improvement in the conservation status of these dogs is unlikely to occur in the absence of improved economic incentives for the local pastoral community, which is quickly growing in both human and livestock numbers. Fortunately, a recent study has shown that tourists are willing to pay substantial amounts to view large carnivores such as wild dogs in their natural habitats (Lindsey et al. 2005). Non-consumptive ecotourism in this area has the potential to offset costs of wild dog conservation (especially if there are direct livestock losses) and create incentives for their conservation. In addition to ecotourism, conservation programmes for wild dogs should include other strategies, such as educational and awareness programmes aimed at instilling a conservation ethic, and ensuring that the pastoral communities consider the ecological benefits associated with wild dogs (Lindsey et al. 2005). In this area, local people have a strong interest in protecting wildlife and the environment, and improving their living conditions (McCreery and Robbins 2004). A collaborative effort is underway to establish a community-based wildlife conservation program in this region, which will help with local

capacity building for conservation (McCreery and Robbins 2004 and references therein).

Various pieces of ecological information are still needed for effective conservation and management of wild dogs in this study area. There is a need to photograph these packs for individual identification to enable identification of different packs and their movement patterns. It is also important to determine the true impact of wild dogs on livestock and the effectiveness of techniques to reduce this, given that human wild dog contact is inevitable in many areas, including those with protection. Establishing the true impact of wild dogs on wildlife is also necessary. Finally, several aspects of wild dogs' basic biology, including mechanisms of ranging and dispersal, dispersal-related mortality, mechanisms of sex-ratio biasing, pack-size effects, denning sites and breeding success still need addressing. Recently initiated research by the African Wild Dog Conservancy <http://www.awdconservancy.org/> may help unravel some of these questions.

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