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## The African wild ass (*Equus africanus*): conservation status in the horn of Africa

Patricia D. Moehlman <sup>a,\*</sup>, Fanuel Kebede <sup>b</sup>, Hagos Yohannes <sup>c</sup>

<sup>a</sup> Box 2031, Arusha, Tanzania

<sup>b</sup> Ethiopian Wildlife Conservation Organization, Ethiopia

<sup>c</sup> Wildlife Conservation Section, Ministry of Agriculture, State of Eritrea, Ethiopia



# APPLIED ANIMAL BEHAVIOUR SCIENCE

*An International Scientific Journal reporting on the Application of Ethology to Animals used by Man*

**Aims and scope.** This journal deals with the behaviour of domesticated and utilized animals. The principal subjects include farm animals and companion animals; poultry are, of course, included. In addition, the journal deals with other animal subjects which are involved in any farming system, e.g. deer, rabbits and fur-bearing animals, as well as animals in forms of confinement such as zoos, safari parks and other forms of display. Feral animals and any animal species which impinge on farming operations (e.g. as causes of losses or damage) are also included. In some instances species used for hunting, recreation, etc., may also be considered as acceptable subjects.

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## The African wild ass (*Equus africanus*): conservation status in the horn of Africa

Patricia D. Moehlman<sup>a,\*</sup>, Fanuel Kebede<sup>b</sup>, Hagos Yohannes<sup>c</sup>

<sup>a</sup> Box 2031, Arusha, Tanzania

<sup>b</sup> Ethiopian Wildlife Conservation Organization, Ethiopia

<sup>c</sup> Wildlife Conservation Section, Ministry of Agriculture, State of Eritrea, Ethiopia

### Abstract

From 1989 to 1996, surveys were made in most of the historic range of African wild asses in Somalia, Ethiopia, and Eritrea. From the 1970s to the mid 1990s populations of African wild asses (*Equus africanus*, Fitzinger, 1857) in Somalia and Ethiopia have declined from approximately 6 to 30 per 100 km<sup>2</sup> to 1 or 2 per 100 km<sup>2</sup>. Given the current IUCN criteria, they are Critically Endangered (CR) and face extremely high risk of extinction in the wild in the immediate future, as their populations have been reduced by at least 80% over the last 10 + years (IUCN, 1994). Basic research is needed on this species as scientific information on its reproductive biology, behavior, ecology, and genetics is very limited. Improved support needs to be provided to existing parks and reserves and new multiple use reserves need to be established. © 1998 Elsevier Science B.V. All rights reserved.

*Keywords:* *Equus africanus*; Critically endangered; Extinction

### 1. Introduction

The Equid Specialist Group has designated the African wild ass (*Equus africanus*, Fitzinger, 1857) as the world's most endangered equid (Duncan, 1992; Moehlman, 1992). Historically, there were three recognized subspecies. The Atlas wild ass, *E. africanus atlanticus*, was found in the Atlas region of northwestern Algeria and adjacent

\* Corresponding author. Tel.: +255-57-8070; fax: +255-57-8271; e-mail: tan.guides@habari.co.tz

parts of Morocco and Tunisia. It survived in this area until about 300 A.D. (Antonius, 1938). The Nubian wild ass, *E. africanus africanus*, lived in the Nubian desert of northeastern Sudan, from the Nile River to the shores of the Red Sea, and south to the Atbara River and into northern Eritrea. The Somali wild ass, *E. africanus somaliensis*, was found in the Denkelia region of Eritrea, the Danakil Desert and the Awash River valley in the Afar region of eastern Ethiopia, Djibouti, and northern Somalia to the Nugaal Valley (Ansell, 1971; Klingel, 1980; Moehlman, 1989). The most comprehensive review of the historical literature concerning African wild ass distribution is in Yalden et al. (1986). There is disagreement in the scientific literature as to whether the African wild ass is one continuously distributed species or if there are valid subspecies (Ziccardi, 1970; Ansell, 1971; Groves and Willoughby, 1981; Yalden et al., 1986). A matter of perhaps greater concern is the genetic integrity of the wild stock and determining if wild populations are interbreeding with domestic donkeys (*E. africanus 'familiaris'*, Gentry et al., 1996). This paper provides the most recent information on the status and distribution of the African wild ass.

## 2. Methods

### 2.1. Somalia

Field and aerial surveys were made in the Nugaal Valley of Somalia from May 26 to June 2, 1989 and from August 10–13, 1989. The first ground survey covered an area of approximately 1600 km<sup>2</sup>. The ground search consisted of driving roughly north/south transects that were established for oil exploration, stopping at intervals for a point-centered sample, and searching the visible radius with binoculars and spotting scope. A total count was made in an area of approximately 700 km<sup>2</sup>. In addition to actual sightings, records were made of equid tracks in areas not utilized by nomads and their livestock. Tracks were measured and recorded. A 4-h aerial reconnaissance was made in a Supercub on May 31, under good flying conditions, at low altitude, over optimum African wild ass habitat. Aerial transects were not flown. During the August survey, overnight observations were made at water sources in an effort to assess population numbers. However, water was readily available with as many as 10 wells within a 5 km<sup>2</sup> area. The area was not intensively surveyed, but all sightings of African wild asses were recorded. Discussions were held with five groups of elders from the Turkaraq–Carooley and Burowadal areas. With the assistance of an interpreter, it was possible to gain important local information on the historic and present status of the African wild ass.

### 2.2. Ethiopia

Starting in January 1994, Moehlman and Kebede surveyed accessible areas of the Yangudi–Rassa National Park and the Mille–Serdo Wild Ass Reserve. A major deterrent to conducting surveys along the Awash River north of Gewanne was the civil

unrest between the Afar and Issa peoples. Ground surveys were done with four-wheel drive vehicle and on foot. The Yangudi–Rassa National Park was minimally surveyed and discussions were held with local elders. The Mille–Serdo area north of the Awash River was free of civil strife and intensive ground surveys of 3 to 10 days duration were done in January and May 1994, January, April, and November 1995, and March and September 1996. Ground surveys covered an area of approximately 850 km<sup>2</sup>. The terrain is volcanic and much of the ground survey was done on foot. A Trimble Ensign was used to determine the geographic position of all African wild asses sighted and tracks found. Discussions were held with the elders of Serdo as part of each survey and they patiently answered our questions concerning the history and present status of the area's wildlife.

### 2.3. Eritrea

Starting in March 1994, Moehlman and Yohannes surveyed the area from Massawa to the Buri Peninsula to the Denkelia Depression to Thio and Assab. The first survey was a reconnaissance trip and information on the distribution of wild asses in recent years was obtained from local inhabitants and staff at the Ministry of Agriculture. During the subsequent trips in February 1995 and January 1996, the area between the Buri Peninsula and the Denkelia Depression was more intensively surveyed with four-wheel drive vehicle and on foot. Similar to the surveys in Ethiopia, the geographic position of all wildlife observed was determined with a Trimble Ensign and mapped. Further discussions were held with local people and information was obtained on the current and historical status of the African wild ass.

## 3. Results

### 3.1. Somalia

In the Nugaal Valley of northern Somalia, the largest group seen was 10 (Fig. 1). One-third of the animals observed were less than 12 months old. Fresh tracks were found in areas not used by nomads and their livestock, which may have been tracks of African wild asses. During the first survey, seven animals were seen and the tracks of an additional 12 'probable' wild asses were found. During the second survey, 14 asses were seen and tracks of an additional 15 'probable' wild asses were found. At best, this indicates that the Nugaal Valley population may be 2.7 to 4.1 asses per 100 km<sup>2</sup> or approximately 135 to 205 asses in the 5000 km<sup>2</sup> core portion of the Nugaal Valley. During the 4-h aerial survey, not a single African wild ass was spotted. African wild asses are difficult to see from the air, and aerial surveys may not be the optimum method for assessing their population status.

Discussions with elders provided important information for wild ass conservation. They stated that wild asses were killed for medicinal purposes. These medicines are used

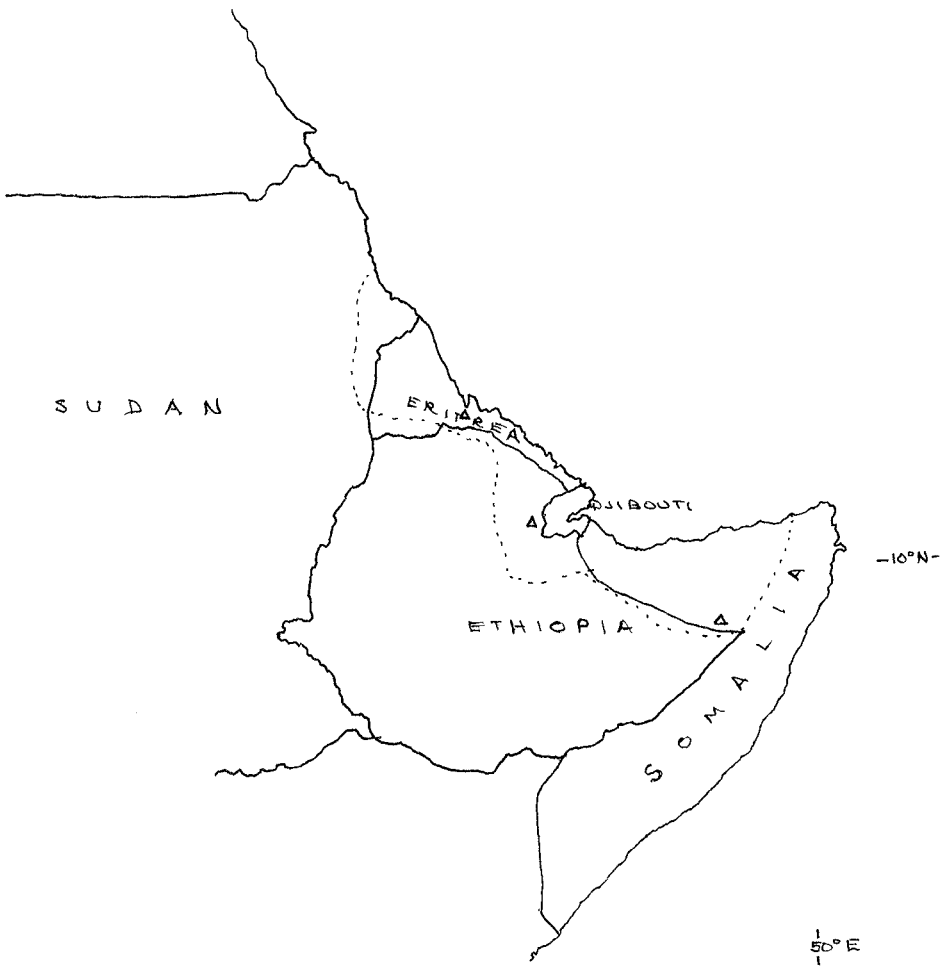


Fig. 1. Historic range of the African wild ass. A  $\Delta$  indicates a population that has been observed since 1989.

by the people to treat tuberculosis, backache, rheumatism, bone ache, and constipation. They feed the soup to their livestock to alleviate mineral deficiencies. In recent years, poor people have killed the wild ass for food. When guns and bullets were rare and expensive it was difficult to shoot the wild ass. The current ready availability of automatic weapons now makes it easy to shoot them. Several elders said that the killing of the wild ass was the work of a few people. If this could be stopped then the wild ass population would grow swiftly. In 1989, the elders estimated that 10 years previously there were 1000 + wild asses, but their present estimate was 100 + . The elders thought that the wild ass population had been severely reduced during the 1974 drought. During periods of drought there might be increased competition with livestock for forage and water. Several elders spoke of a strong commitment to conservation, and the community

felt very protective/possessive towards the wild ass. They did not like the 1969 Hunt expedition which captured five African wild asses for sale to a zoo.

### 3.2. Ethiopia

Starting in January 1994, Moehlman and Kebede did surveys of the Yangudi–Rassa National Park and the Mille–Serdo Wild Ass Reserve (Fig. 1). Issa nomads near Adaitu saw five wild asses near the Awash River in 1993. This was considered to be many wild asses. They said that along the Awash River there were wild asses, but these were few in number. This is also a disputed area between the Afar and Issas. No wild asses were seen and oral reports from local inhabitants indicate that wild asses are rare and probably exist at a density of well below 1 per 100 km<sup>2</sup>.

In the Serdo–Mille area, the largest group seen was six. Approximately 30% of the wild asses seen were individuals less than 12 months old. In the 350 km<sup>2</sup> area to the northwest of Serdo, we found the tracks of perhaps three wild asses. From 1994 to 1996 that was the most sign found of wild asses in the area, indicating a density of less than 1 per 100 km<sup>2</sup>. In the 500 km<sup>2</sup> to the south of Serdo, the largest number of individual wild asses observed during any one survey was 10, indicating a density of perhaps 2 per 100 km<sup>2</sup>. One male wild ass was always found in the same area and probably is a territorial male as described by Klingel (1977).

The elders of Serdo said that when bullets became cheap a lot of wildlife got shot. In particular, people who were poor could only survive by hunting wildlife. In the Danakil Desert most herdsmen carry an automatic rifle.

### 3.3. Eritrea

During the March 1994 survey, no wild asses were seen, but local people had observed them near the Buri peninsula and the Denkelia depression. During the February 1995 survey, the coastal area north of Massawa was surveyed and no wildlife was seen. Local nomads said that during the war, Ethiopian soldiers had shot all the wildlife and that only hares were left. During the February 1995 and the January 1996 surveys, African wild asses were found in the area between the Buri peninsula and the Denkelia depression (Fig. 1). They were difficult to locate and in a density of less than 1 per km<sup>2</sup>. In the same areas where wild asses were seen, relatively large numbers of Soemmering's gazelle (12–70) and some Dorcas gazelle (2–3) were present. Local inhabitants say that soldiers shot a lot of wildlife in the late 1970s, but that since then there had been little killing of the wildlife and slowly the populations are increasing. They also say that severe droughts can cause the death of many wildlife. At the end of the war for independence, the Eritrean population turned in all their guns. Hence, in all the rural areas where wildlife exists, there are no guns. However, even with the lack of shooting, local people estimated that the wild ass population was less than 100 animals. Of the nine wild asses observed in the two surveys, there was one adult male, two pregnant adult females with a yearling each, and two adult females with foals. This indicates that reproduction and early survivorship is reasonably good and there is potential for population increase.

## 4. Discussion

### 4.1. Somalia

In 1978–1980, Watson (1982) did aerial surveys in northern Somalia and estimated that there was a population of 4000–6000 wild asses in the area from the Nugaal Valley to the Djibouti border. Given the area covered by the survey, this would indicate approximately wild asses of 6 per 100 km<sup>2</sup>. In 1979–1982, Simonetta and Simonetta (1983) estimated that there were about 250 wild asses in the northwestern Nugaal Valley and that there were about 50 wild asses near Meit, with scattered groups along the coast in the Erigavo region. The 1989 ground and limited aerial reconnaissance in the Nugaal Valley yielded population estimates of roughly 135 to 205 wild asses or approximately 2.7 to 4.1 asses per 100 km<sup>2</sup>. This indicates that there has been perhaps a 50% reduction in the wild ass population during the decade between these surveys. The present status of the African wild ass and other wildlife in the Nugaal Valley is not known.

### 4.2. Ethiopia

In 1970–1971, Klingel and Watson did an aerial survey of the Teo area (5280 km<sup>2</sup>), the Tendaho–Serdo area (4270 km<sup>2</sup>), and the Lake Abbe area (6550 km<sup>2</sup>). Klingel estimated a total of 3000 wild asses, or 18.6 per 100 km<sup>2</sup> (Klingel, 1972). The Teo area, which is now part of the Yangudi–Rassa National Park, had the highest density, 30 wild asses per 100 km<sup>2</sup>. In May–June 1972, the Catskill Game Farm captured 12 wild asses in the valleys to the northwest of Serdo. During the 8-day period a total of four more wild asses were captured and released, and an additional 37 wild asses were observed. This is within an area of approximately 350 km<sup>2</sup>. Thus, there were approximately 10.6 African wild asses per 100 km<sup>2</sup>. In 1976, Stephenson (1976) did an aerial survey in an area similar to Klingel's Teo area and in an area of 3990 km<sup>2</sup> had an estimated wild ass density of 21 per 100 km<sup>2</sup>. In July–August 1995, Thouless (1995) did aerial surveys of the Yagudi–Rassa National Park (Teo area), and the adjoining wildlife reserves and observed no African wild asses.

Starting in January 1994, Moehlman and Kebede did surveys of the Yangudi–Rassa National Park and the Mille–Serdo Wild Ass Reserve (Moehlman, 1994a; Kebede, 1994, 1995; Kebede and Ayele, 1994). Issa nomads were utilizing the Yangudi–Rassa National Park and in some areas their herds of sheep and goats were in excess of 50 per km<sup>2</sup> (Thouless, 1995). No wild asses were seen and oral reports from local inhabitants indicated that wild asses were rare and probably existed at a density of well below 1 per 100 km<sup>2</sup>. Thus, in an area where Klingel and Stephenson had observed approximately 20–30 wild asses per km<sup>2</sup> in the 1970s, 20 years later the population is at a critically low level.

In the Mille–Serdo area, Moehlman and Kebede surveyed the area to the northwest of and to the south of Serdo. In areas where Klingel and the Catskill Game Farm personnel had observed 10.6 to 18.6 wild asses per 100 km<sup>2</sup>, only one or two wild asses were seen. Near Mt. Korup, Klingel (1977) had observed temporary groups of 43 and 49 individuals. The largest group observed from 1994 to 1996 was six. Similar to Klingel's



observations, there is a solitary male that occupies a consistent territory. The small groups are composed of females and their offspring, and occasionally an adult male. At present, observations indicate that mother and offspring are the only stable groups. This is the only area in Ethiopia where it has been possible to consistently see African wild asses, but they are very low in density, and it requires days of walking the volcanic mountains to see these very wild and shy animals. Since most local pastoralists carry automatic rifles, wildlife continues to be at risk to predation by man.

#### 4.3. Eritrea

Due to Eritrea's 30-year war for independence, there are little long-term data on African wild ass populations. The recent surveys indicate that viable populations exist in the area between the Buri peninsula and the Denkelia Depression. The population density is very low and African wild ass conservation is critical. However, given the absence of guns among the rural people, Eritrean wildlife has good potential for recovery.

### 5. Conclusions

From 1989 to 1996, surveys were made in most of the historical range of the African wild ass in Somalia, Ethiopia, and Eritrea (Moehlman, 1989, 1994a,b; Kebede, 1994, 1995). In Somalia, Ethiopia, and Eritrea, African wild asses persist in low density (1–2 per 100 km<sup>2</sup>). Their status is critical, and known populations have declined significantly in the last 20 years. Given the current IUCN criteria they are Critically Endangered (CR) and face extremely high risk of extinction in the wild in the immediate future, as their populations have been reduced by at least 80% over the last 10 + years (IUCN, 1994).

The major threats to the survival of the African wild ass are (1) hunting for food and medicinal purposes in Ethiopia and Somalia, (2) potential competition with livestock for vegetation and water during drought periods, and (3) possible interbreeding with the domestic donkey.

Basic research is needed on this species as scientific information on its reproductive biology, behaviour, ecology, and genetics is very limited. The genetic and taxonomic status of the African wild ass is not clear. It appears to be a continuously distributed population from Sudan to Eritrea and Ethiopia to Djibouti and northern Somalia. There may be no real subspecific differentiation. Interbreeding with domestic donkeys (*E. africanus* 'familiaris') might be a serious threat to the genetic integrity of the wild populations.

Information is needed on the reproductive biology and population dynamics of the extant populations of African wild ass in the Afar region of Ethiopia, the Denkelia Desert of Eritrea, and the Nugaal Valley of the Somali Democratic Republic. Data are limited, but indicate that female wild asses have their first foal at age 3 to 4 years and will typically have a surviving foal every other year. In terms of population dynamics, this means that African wild asses are particularly sensitive to predation. Computer simulations for equids indicate that if all females of 4 years or older regularly produced

foals, that the survival rate would have to be 70% for foals and 85% for adults to enable the population to increase at a rate of 4% per year. This would allow the population to double in 18 years (Wolfe, 1980). If mortality is high, due either to hunting and/or drought, the population will decline and it may be difficult or impossible for it to recover.

The formation of new reserves in Eritrea in the Buri Peninsula and adjacent Denkelia Desert and in Somalia in the Nugaal Valley are an important conservation priority. In Ethiopia, the Yangudi–Rassa National Park and the Mille–Serdo Wild Ass Reserve need better management and support. New reserves should be multiple-use areas with special protection for wildlife and appropriate development and extension support for local nomads. Throughout their range, African wild asses occur in arid habitats where the local human populations are at risk. Conservation of wildlife will not be possible unless local nomadic pastoralists have an opportunity to participate in and benefit from the conservation management of their areas. This should involve discussions and education concerning the conservation of natural resources and rare species, the employment of local personnel as rangers, and providing medical and veterinary care. In all three countries, providing further training for wildlife scientists and managers is fundamental to optimizing conservation management of natural resources and endangered species.

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