

The Ethiopian wolf is the rarest canid in the world (Sillero 2001), and is one of the world's rarest mammals.

Other Names: Abessinische Wolf, Abessinischen Fuchs, Abyssinian Wolf, Arouaye, Ethiopian Jackal or Wolf, Jedalla Farda, Ky Kebero (Kay Kabaro), Loup d'Abyssinie, Red Jackal or Fox, Simen/Simenian/Simian/Simien Fox or Jackal, Volpe Rossa, Walgie) *Canis simensis* (*Canis semiensis*, *Simenia simensis*)

Status: Endangered

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The Ethiopian wolf has a bright chestnut-colored coat, bushy tail, pointed ears, slender snout, and long legs. It weighs 11 - 19 kg (24 - 42 lb). It is a localized endemic species and is confined to isolated pockets of grasslands and heathlands. The Ethiopian wolf is found above 3000 m (10,000'). It prefers areas with short vegetation less than 0.24 m (10") high. Rodents account for more than 90% of its prey. The giant mole rat is the main food item; other prey includes grass rats and hares. The Ethiopian wolf is mostly diurnal, but it can be nocturnal in areas where it is persecuted. Dens usually consist of a system of burrows beneath a rock overhang or cliffs. Caching prey and scavenged material in shallow holes is common.

Although Ethiopian wolves live in packs that share and defend an exclusive territory, for the most part they forage and feed alone on small rodent prey. This is in contrast to the general tendency in larger carnivores for species that live in groups to hunt cooperatively. In optimal habitat, packs include 3 - 13 adults and, on average, are comprised of 6 adults, 1 - 6 yearlings, and 1 - 7 pups. A typical pack is an extended family group formed by all males born into the pack during consecutive years and 1 - 2 females. All pack members participate in the defense and marking of the territory, and parents and sub-adult helpers contribute to the rearing of pups.

The Ethiopian wolf is endemic to Ethiopia. It was reported from most provinces in Ethiopia in the 19th century. By the 1970's it had declined considerably. The Ethiopian wolf currently is confined to seven isolated subpopulations in different mountain ranges of the Ethiopian highlands. Wolf populations occur north of the Rift Valley in the Simien Mountains, Mount Guna, North Wollo and South Wollo highlands, and Menz. Southeast of the Rift Valley there are populations in the Arsi (formerly "Arussi") Mountains and in the Bale Mountains. More than half of the species' population lives in the Bale Mountains.

Continuous loss of habitat due to high-altitude subsistence agriculture represents the major current threat to the Ethiopian wolf. Sixty percent of all land above 3,200 m (10,000') has been converted into farmland, and all Ethiopian wolf populations below 3,700 m (12,000') are particularly vulnerable to further habitat loss. Habitat loss is exacerbated by overgrazing of highland pastures by domestic livestock, and in some areas habitat is threatened by proposed development of commercial sheep farms and roads. Hybridization of the Ethiopian wolf with domestic dogs could threaten the genetic integrity of the Ethiopian wolf population, but hybridization is currently confined to one valley in western Bale.

*** Unlike most canids, the Ethiopian wolf lives in open country above 3000 m (10,000') where rodent biomass is very high, reaching 3 - 4000 kg/sq km (27 - 36 lb/acre) (Gottelli & Sillero-Zubiri 1992). The Bale Mountains in the southeastern highlands of Ethiopia, where the largest population of Ethiopian wolves occurs, contain the largest contiguous area above 3000 m (10,000') on the African continent (Laurenson et al. 1998).

Status and

Trends

Conservation Status: IUCN Status: 1970's - 1994: Endangered 1996 - 2003: Critically Endangered (Criteria: A1b+2be, C1, E) 2004: Endangered (Criteria: C2a(i), D) (Population Trend: Decreasing) (IUCN 2004)

[Ed. Note: The change in status from "Critically Endangered" in 2003 to "Endangered" in 2004 does not reflect an improvement in the Ethiopian wolf's actual status; rather, it reflects the use of a revised set of IUCN criteria.]

Taxonomy: DNA analysis has shown that Ethiopian wolves are more closely related to grey wolves and coyotes than to any African canid (Sillero-Zubiri et al. 2004).

Population Estimates: [Note: Figures given are for wild populations only.]

History of Distribution: The Ethiopian wolf is endemic to Ethiopia. It was reported from most Ethiopian provinces in the 19th century. It has been rare since it was first recorded by science. By the late 1970's it was thought to survive in only four populations - in the Simien Mountains and northeastern Shoa in the north, and in the Bale Mountains and the Arussi Mountains in the south. In the early 1990's it was still reported from those areas plus Mt. Guna in the Gondar region of the north of Ethiopia and the Somkaro mountains in the south (Gottelli & Sillero-Zubiri 1992). The Ethiopian wolf currently is confined to seven isolated subpopulations in different mountain ranges of the Ethiopian highlands, at altitudes of 3,000 - 4,500 m (10,000 - 15,000'). In the northern highlands wolves are restricted to land above 3,500 - 3,800 m (11,000 - 12,000') by increasing agricultural pressure. Wolf populations occur north of the Rift Valley in the Simien Mountains, Mount Guna, North Wollo and South Wollo highlands, and Menz. Southeast of the Rift Valley there are populations in the Arsi (formerly "Arussi") Mountains and in the Bale Mountains. More than half of the species population lives in the Bale Mountains. (Sillero-Zubiri & Marino 2004)

Each of the Ethiopian wolf's habitat "islands" is surrounded by agricultural land occupied by farmers and their livestock. Associated domestic dogs either live in wolf habitat or make incursions into it and are the most likely reservoir of diseases that Ethiopian wolves could contract. (Haydon et al. 2002)

Threats and Reasons for Decline: Continuous loss of habitat due to high-altitude subsistence agriculture represents the major current threat to the Ethiopian wolf. Sixty percent of all land above 3,200 m (10,000') has been converted into farmland, and all Ethiopian wolf populations below 3,700 m (12,000') are particularly vulnerable to further habitat loss. Habitat loss is exacerbated by overgrazing of highland pastures by domestic livestock, and in some areas habitat is threatened by proposed development of commercial sheep farms and roads. Hybridization of the Ethiopian wolf with domestic dogs could threaten the genetic integrity of the Ethiopian wolf population, but hybridization is currently confined to one valley in western Bale. (Sillero-Zubiri & Marino 2004)

In the late 1980's, domestic dogs were recognized as a threat because they compete with the Ethiopian wolf for food; transmit diseases (such as rabies and canine distemper) and mate with the Ethiopian wolf, thereby hybridizing the species. The dogs are used by local pastoralists to protect their herds from hyenas. The dogs are irregularly fed and roam the highlands freely. They may be the most immediate threat faced by the Ethiopian wolf in Bale Mountains National Park, home of its largest remaining population (Gottelli & Sillero-Zubiri 1994).

Data on Biology and Ecology

Size and Weight: The head and body length of an Ethiopian wolf is about 1 m (3.3'). Female Ethiopian wolves average 12.8 kg (11.2 - 14.2 kg) (average 28.2 lb (24.6 - 31.2 lb)); males average 16.2 kg (14.0 - 19.3 kg) (average 35.6 lb (30.8 - 42.5 lb)).

Habitat: The Ethiopian wolf is confined to isolated pockets of alpine grasslands and heathlands above 3,000 m (10,000') in Ethiopia, where they prey on rodents, such the giant mole rat (*Tachyoryctes macrocephalus*). Rodent biomass varies several-fold between different habitats, and the abundance of these prey is closely correlated with that of the wolves. Suitable habitats extend from above the tree-line at about 3,200 m (10,500') up to 4,500 m (14,000'), with some wolves present in montane grasslands at 3,000 m (10,000'). However, subsistence agriculture extends up to 3,500 - 3,800 m (11,500' - 12,500') in many areas, restricting wolves to higher ranges. Wolves appear to utilize all available habitats, but they prefer open areas with short (less than 24 cm (10") high) herbaceous and grassland communities where rodents are most abundant, along flat or gently sloping areas with deep soils and poor drainage in parts. Rainfall at high altitude varies between 1 - 2 m/year (3.3 - 6.6'/year), with one pronounced dry period from December to February/March. (Sillero-Zubiri & Macdonald 1997, Sillero-Zubiri & Marino 2004)

The Ethiopian wolf lives in both the Eastern Afromontane Biodiversity Hotspot (Cons. Intl. 2005) as well as in the Ethiopian Highlands Global 200 Ecoregion. (Olson & Dinerstein 1998, Olson & Dinerstein 1999)

Age to Maturity: Both sexes mature during their second year.

Gestation Period: Approximately 60 days.

Birth Season: In the Bale Mountains, mating generally occurs between August and November, with pups born 2 months later (Haydon et al. 2002).

Birth Rate: 2 - 6 pups per litter. Females breed no more than once a year. Only about 60% of dominant females breed successfully each year (Sillero-Zubiri & Macdonald 1997).

Generation time: mean: 4.5 years, range: 3 - 8 years (Sillero-Zubiri & Marino 2004).

Early Development: Development of the young is divisible into three stages: 1) early nesting (week 1 to week 4), when the young are entirely dependent on milk; 2) mixed nutritional dependency (week 5 to week 10), when milk is supplemented by solid foods regurgitated by all pack members until pups are completely weaned; and 3) post-weaning dependency (week 10 to 6 months), when the pups subsist almost entirely on solid foods supplied by helpers. (Sillero-Zubiri & Macdonald 1997)

Dispersal: Dispersal movements are tightly constrained by the scarcity of suitable unoccupied habitat. Males do not disperse; two-thirds of the females disperse at two years of age and become "floaters", occupying narrow ranges between pack territories until a breeding vacancy becomes available. Breeding females typically are replaced after death by a resident daughter. This results in a high potential for inbreeding which may be circumvented via inter-pack mating. (Sillero-Zubiri & Macdonald 1997)

Diet: Analysis of fecal samples in one study revealed that rodents account for 96% of all prey (Sillero-Zubiri & Macdonald 1997). The endemic giant mole rat (*Tachyoryctes macrocephalus*) is the main food item. Other prey includes grass rats and hares. In the alpine meadows of Bale Mountain National Park, rodent biomass was estimated at 3 - 4000 kg/sq km (27 - 36 lb/acre) (Gottelli & Sillero-Zubiri 1992).

"The giant mole rat lives underground and just pops out to house-clean its burrow and gather grass to eat. That's enough opportunity for the Ethiopian wolf to snatch its prey with its long, slender snout, clearly adapted for such crafty hunting." (Verde 2002)

Behavior: Ethiopian wolves are

diurnal; peaks of foraging activity suggest that they synchronize their activity with that of rodents above the ground. Digging prey out is common. Kills are often cached and later retrieved. Although the Ethiopian wolf is a pre-eminent rodent hunter on its own, it can also be a cooperative hunter. Occasionally, small packs have been seen chasing and killing young antelopes, lambs, and hares. Wolves congregate for social greetings and border patrols at dawn, noon and evenings, and rest together at night, in the open. They break up to forage individually in the morning and early afternoon. ♦ In Bale, there is little nocturnal activity, with wolves seldom moving far from their evening resting site. They may become more crepuscular and nocturnal where human interference is severe. (Sillero-Zubiri & Macdonald 1997)

Pups are born in a den dug by the female in open ground, under a boulder or inside a rocky crevice. Pups are regularly shifted between dens, up to 1300 m (4300') apart. (Sillero-Zubiri & Macdonald 1997) Dens usually consist of a much-used system of burrows beneath a rock overhang or cliffs; other burrows located in a flat, grassy area have several entrances, possibly interconnected (Ginsberg & Macdonald 1990).

Social Organization: Although Ethiopian wolves live in packs that share and defend an exclusive territory, for the most part they forage and feed alone on small rodent prey. This is in contrast to the general tendency in larger carnivores for species that live in groups to hunt cooperatively. ♦ In optimal habitat, packs include 3 - 13 adults and, on average, are comprised of 6 adults, 1 - 6 yearlings, and 1 - 7 pups. A typical pack is an extended family group formed by all males born into the pack during consecutive years and 1 - 2 females.

During the breeding season, social gatherings among different packs are more common and take place next to the den. The interactions are highly vocal and always end with the smaller group fleeing from the larger. Home range overlap and aggressive encounters between neighboring packs are highest during the mating season. Courtship may take place between adult members of a pack or with members of neighboring packs. Mate preference within a pack is shown, with the female discouraging attempts from all but the pack's dominant male. In contrast, she is receptive to any visiting male from a neighboring pack. Up to 70% of matings involve males from outside the pack. All pack members guard the den, chase potential predators, and regurgitate or carry rodent prey to feed the pups. Subordinate females may assist the dominant female in suckling the pups. (Sillero-Zubiri & Macdonald 1997)

Age and Gender Distribution: In optimal habitat, pack adult sex ratio was biased toward males by a ratio of 2.6:1. ♦ In an area of lower prey productivity, the adult sex ratio was 1:1. (Sillero-Zubiri & Macdonald 1997)

Of all adult males in a population, 31% are alpha males and thus reproductive individuals. Some adult males who are subordinate at a particular time may be able to reproduce subsequently, either by replacing the alpha male or by mating outside of the pack. Of all adult females in a population, 57% are alpha females and thus reproduce. Of the subordinate adult females, some may be able to reproduce in their lifetime. (Sillero-Zubiri & Marino 2004)

Density and Range: The highest population density was perhaps 2 individuals/sq km (5.2 individuals/sq mi) (Nowak & Paradiso 1983).

In the Bale Mountains, wolf density is high for a social carnivore of its size and is positively correlated with density of rodent prey and negatively with vegetation height. Highest wolf densities are found in short alpine herbaceous communities (1.0 - 1.2 adults/sq km (2.6 - 3.1 adults/sq mi)). Lower densities are found in dwarf scrub (0.2 adults/sq km (0.5 adults/sq mi)), and in heathlands and barren peaks (0.1 adults/sq km (0.3 adults/sq mi)). Wolves are also present at low density (0.1 - 0.2/sq km (0.3 - 0.6 /sq mi)) in montane grasslands at lower altitudes. Elsewhere, overall wolf density is relatively lower. In Menz, wolf

density was estimated at 0.2/sq km (0.6/sq mi). (Sillero-Zubiri & Marino 2004)

Annual home ranges of eight packs in optimal habitat monitored for four years averaged 6.4 sq km (2.5 sq mi), and home ranges in an area of lower prey biomass averaged 13.4 sq km (5.2 sq mi), with some overlap between home ranges. An additional 4 - 7% of the population was composed of non-resident females, inhabiting larger ranges (average 11.1 sq km (4.3 sq mi)). Home ranges of neighboring packs were largely discrete, forming a mosaic of packs occupying all available habitat. Pack home ranges were stable in time, shifting only during major pack readjustment after the disappearance of a pack or significant demographic changes. (Sillero-Zubiri & Macdonald 1997)

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