

Wild zebra, asses and horses
are being killed for meat,
medicine and money.
Combined with vanishing
habitats and naturally slow
reproduction, such predation
threatens remaining
populations



By Patricia D. Moehlman

Endangered

AFRICAN WILD ASSES pause on a rocky slope in Eritrea. These young males display the unique pattern of leg stripes that allows researchers to identify individuals.



Wild Equids

FROM THE TIME OUR ANCESTORS FIRST PAINTED ON CAVE WALLS,

the beauty and speed of horses have captured our imagination. During this period, some 20,000 to 25,000 years ago, equids were among the most abundant and ecologically important herbivores on the grasslands of Africa, Asia and the Americas. Today only seven species of wild equids remain—three asses, three zebra and one wild horse—

and IUCN-The World Conservation Union now lists most of these as endangered [see box on opposite page].

Wildlife biologists, including the Equid Specialist Group of the IUCN, which I chair, study the dwindling populations to learn as much as possible about these historically important animals while they still roam free. We also search for ways to stem their disappearance and have recently developed a plan that prioritizes the actions that should be taken.

Two Styles of Life

OUR WORK, which builds on that of an early researcher, Hans Klingel of the University of Braunschweig in Germany, distinguishes two distinct patterns of social organization in wild equids. All the animals live in open lands, but their habitats can range from arid desert to grassy plains favored by moderate rainfall. It is the ease of obtaining food and water that determines how these potentially gregarious animals organize themselves for foraging and for mating and rearing their foals.

In the grasslands, such as the Serengeti Plain of Tanzania, abundant forage and water allow females to feed together and thus to form stable groups. A male that can block other males from access to this group gains exclusive mating rights with all the females, and thus this system is referred to as a “harem” or “family.” In dry environments, such as the Danakil Desert of Ethiopia and Eritrea, the scattered supply of food and limited water usually do not permit females to forage

close to one another or to form consistent groups. Each adult is on its own to find nourishment, and a male will establish a territory near a critical source of water or food; he then controls mating rights with all females that come onto the territory to drink or feed.

In the harem type of organization, groups usually consist of one adult male and one or more females and their offspring. Other males live in “bachelor” groups. The adult females often remain together throughout their lives, but the harem stallion may be displaced by another male, depending on his age and fighting ability and the number of competitors he has to contend with. Foals born into a group stay with it for two to three years before they disperse. Young females usually leave during their first estrus and join other families. Young males tend to stay on for several more years before they depart to find bachelor groups.

The harem strategy, generally followed by plains and mountain zebra as well as by feral horses, often provides a relatively safe environment in which mothers and their foals can thrive. The presence of the dominant stallion markedly reduces harassment from bachelor males, which might otherwise chase and attempt to copulate with the females. Such harassment can be deadly: it hinders the females’ ability to feed and can end in abortion or even infanticide. Stable groups and the presence of the stallion also help to fend off predators such as wolves, lions and hyenas.

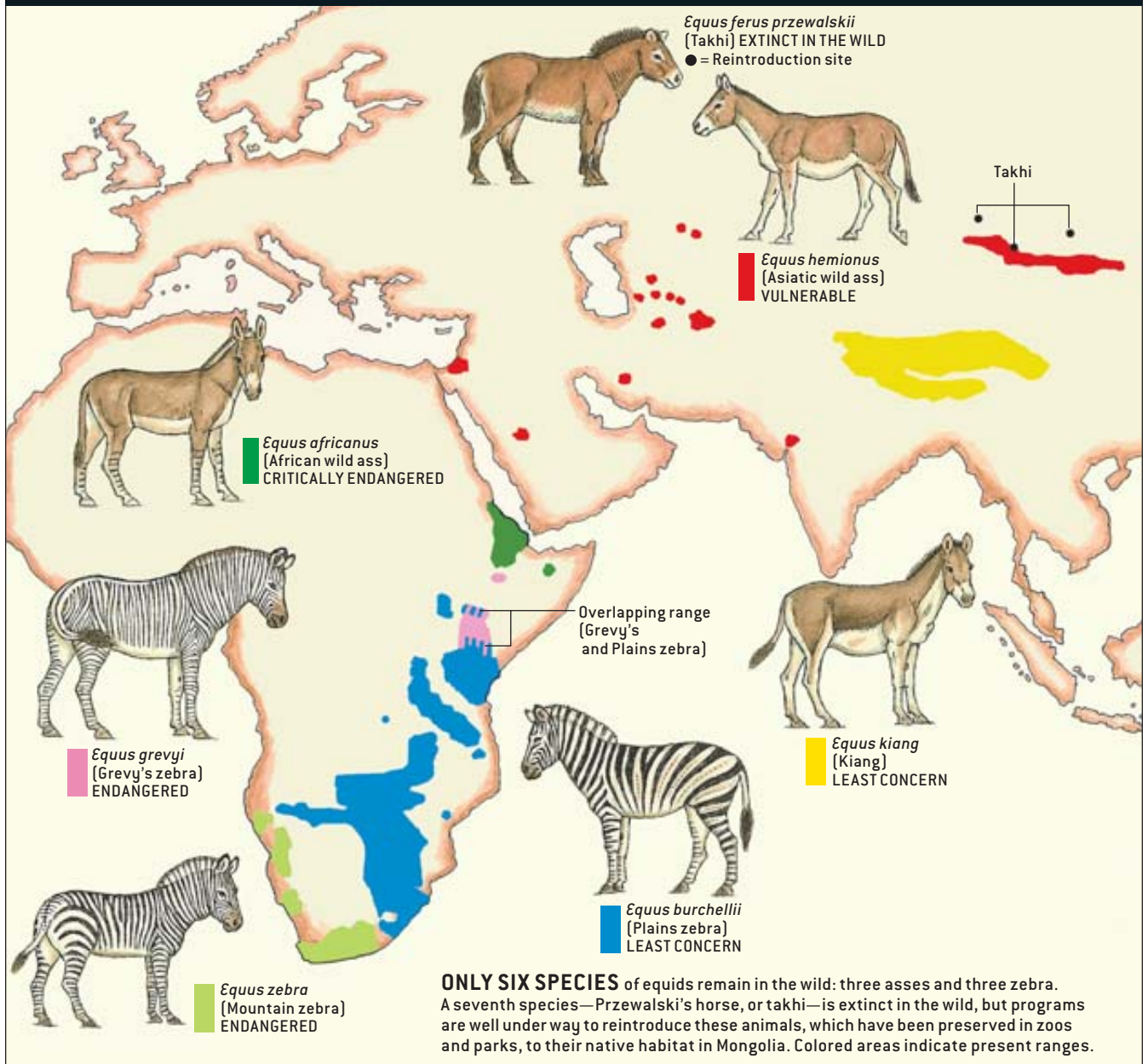
By contrast, in dry environments, the only long-term assemblages are a female and her offspring, sometimes just a foal, sometimes a foal and a yearling. No permanent bonds persist between adults, although they sometimes form temporary groups. African wild and feral asses, Grevy’s zebra and Asiatic wild asses organize themselves in this more socially ephemeral way, with a dominant male controlling a territory near a critical resource. The territorial stallion can dominate his area for years. He tolerates both males and females on his land, but he alone can mate with any female that ventures into his realm.

Controlling access to water is critical. Lactating females need to drink at least once a day, and so they will stay as close to a pond or stream as possible. A female comes into estrus a week or two after giving birth and, if she is not fertilized then, again about a month later. Thus, the territorial male has several

Overview/*Equid Conservation*

- Wild horses, asses and zebra were once one of the most abundant herbivores in Africa and Asia. Now only seven species remain, and most of these are endangered.
- Human populations, themselves struggling to survive, can be their greatest threat, killing them outright and encroaching on their habitat.
- Extinction is a real possibility for these endangered animals because wild equids reproduce slowly.
- Researchers are stepping up efforts to learn about the animals’ way of life and are seeking ways to conserve them in their natural habitats.

THE LAST WILD EQUIDS



chances to father a new foal. The females, in turn, gain not only access to water, they may also benefit from reduced harassment from bachelor males and better protection from predators.

Whichever mating system they follow, the territorial or the harem, all wild equids tend to have their first offspring only after reaching four or five years of age; subsequently, they then reproduce only every other year until the end of their lives at about 16 years of age. Although they have the biological potential to produce a foal every year, they seldom do so in the wild, where the struggle to find food and water restricts reproduction. They nurture their relatively rare offspring with a large investment of parental care—milk, shared food and water, and protection from predators. This kind of trade-off can be a good reproductive strategy, and it worked

well for equids for millennia. But the strategy fails the animals when conditions lead to high death rates—such as those that hunters currently levy on equids in their pursuit of food, medicine and the commercial sale of hides.

Death rates are also affected today by loss of habitat and reduced access to forage and water. Females with young foals often have to live farther away from water now, which means that fewer of the foals survive to replenish the population. A small population is more vulnerable than a larger one, because an episode of severe weather or disease can wipe out a geographically isolated group.

Those of us who try to monitor these population trends face a complicated task. Not only do the frequently low numbers of equids in an area make normal sampling techniques



AFRICAN WILD ASS population, which is critically endangered, is beginning to increase in Eritrea because of government support and the conservation ethic of the local Afar people, who share their resources with wildlife.

less effective, but many species live in difficult terrain, which makes finding them a challenge. My own research on the African wild ass (*Equus africanus*) offers a case in point.

The World's Most Endangered Equid

THE DANAKIL DESERT in the Horn of Africa presents an austere and daunting landscape. Even by desert standards, it is extremely dry; rainfall measures only four inches in a good year. Mountains and ridges of rough lava are furrowed with narrow valleys of alkaline soil sheltering a few grasses and shrubs.

When I set out to search for the African wild ass in the Danakil in 1994, no sightings had been documented for 20 years. Ever since my early research in California during the 1970s on the feral ass in Death Valley, I had been interested

DIFFERENT WILD ASS species, the Kiang, lives on the steppes of the Tibetan Plateau, at a higher altitude than any other equid.



in their ancestors in the desert mountains of Africa. At last I was setting out to find them or, more accurately, to find out whether they still existed.

I worked with local conservationists—Faniel Kebede of the Ethiopian Wildlife Conservation Organization and Hagos Yohannes of the Eritrean Wildlife Conservation Unit. It soon became clear to us that although very few wild asses remained, the local Afar pastoralists knew where we could find these elusive animals. In Eritrea, accompanied by an Afar guide, Omar, we trekked for days, and many hot, dry miles, through the volcanic landscape. Finally, one morning Omar led us up through the basalt ridges of the Messir Plateau. There we found a female, her foal and a male grazing near Afar shepherds tending their sheep and goats.

Since that exciting day, my colleagues and I have identified at least 45 asses that inhabit the plateau. They owe their continued existence and relatively high density in great part to the Afar pastoralists of Eritrea. These people traditionally share their lands and resources with the wildlife and do them no harm. Once they understood the work my colleagues and I were doing, they set out to help. Now when we arrive at their village for a research trip, they round up three camels to carry our camping equipment, food and water, and we all walk to the top of the plateau and set up camp. Thereafter, every other day a man and camel bring us four plastic jerricans with 160 liters of water. This assistance allows us to do our fieldwork on foot in the midst of the best area for the African wild ass.

Just to find this rare and elusive animal ranked as an accomplishment. In the 20 years since wild ass populations were documented in the Danakil, our surveys revealed that their numbers had dropped by more than 90 percent, and the IUCN has designated them as critically endangered; probably fewer than 1,000 (including our 45) remain in the wild. We can tell that the 45 we have located are different individuals, because each animal has a unique pattern of stripes on its legs. Thus, we have been able to follow their movements, social interactions and survival. We can also track a female's reproductive



GREVY'S ZEBRA mother and foal constitute the only stable social unit among these endangered equids that live in the arid habitat of northern Kenya and Ethiopia.

status, how often she gives birth, and the fate of her foals.

What we have uncovered so far tells us that their behavior is typical for equids living in arid habitats: the dominant males maintain mating territories, and the only socially stable group is a mother and her offspring. Occasionally they form small temporary groups made up of fewer than five adults. The composition of these groups varies widely—from single-sex adult groups to mixed groups of males and females of all ages. Females in the same reproductive stage—lactating mothers with foals, for example—may temporarily move and forage together. But competition among females for the sparse forage probably limits their ability to form long-term associations.

Once the male foals reach two to three years of age, we do not see them again in the study area. Presumably they disperse to other areas, suggesting that inbreeding is unlikely. Female foals, in contrast, usually remain with their mother until they produce their own foals.

Our findings about reproductive biology are still limited, but they indicate that females have their first foal at five or six years of age, rather than the more common four or five years, and then may give birth every other year. During prolonged periods of drought, the age at which a female first gives birth may be delayed. Similarly for mature females, a year in which forage is scarce will see few births and few of the foals that do make it into the world will survive. If adult mortality was also high for any reason—because of inadequate nutrition, lack of water or overhunting—the population could decline to such a degree that recovery would be difficult or even impossible.

The years of 1997 and 1998 provided a vivid illustration of how closely reproduction is linked to rainfall. A severe drought on the Messir Plateau in 1997 meant that none of the females had foals. The following year an El Niño brought abundant rainfall to this parched area. All the females had foals, and at

least 80 percent of them survived. The potential for such high birth rates and survivorship in good years indicates that the Messir Plateau may be a critical habitat for reproduction. And in fact this area has the highest population density of this species ever recorded—approximately 50 asses per 100 square kilometers. But the highly sporadic rainfall means that the continued existence of the population is precarious.

A Plan for Survival

IN CONTRAST TO the African wild ass searching for food in their arid habitat, the plains zebra (*E. burchellii*) roam the productive grasslands of Kenya and Tanzania and south to the tip of Africa. They are the most widespread and abundant equid in the world today, although their welfare depends on conservation programs aimed at maintaining their habitat and preventing overhunting. As one would expect, their social organization follows the harem model rather than the territorial. Another species of these striped equids, the Grevy's zebra (*E. grevyi*), lives in a more arid habitat and has the territorial social organization and mating system typical of such land-

THE AUTHOR

PATRICIA D. MOEHLMAN received her Ph.D. from the University of Wisconsin–Madison. She has studied the behavioral ecology and the evolution of mating systems in equids and canids for the past 35 years. Since 1989 she has worked with wildlife department personnel and local pastoralists in Somalia, Ethiopia and Eritrea to find and conserve the critically endangered African wild ass. A significant part of her work has involved securing training and postgraduate education for her Ethiopian and Eritrean colleagues. A member of the Wildlife Trust Alliance, she has served as chair of the IUCN-The World Conservation Union/Species Survival Commission Equid Specialist Group since 1997. Mary Pearl and the Wildlife Trust have provided critical support for the conservation of wild equids. The Whitley Laing Foundation, Saint Louis Zoological Park, Wildlife Conservation Society and African Wildlife Foundation have also provided important funding for the protection of these endangered species.

The Return of the Takhi



PAINTING of early horse from Lascaux Cave in France.



TAKHI STALLION rounds up mares in his group.

Once thousands of wild horses ranged from Europe through central Asia and China to Mongolia. Today only a scattering of one species exists—the takhi, or Przewalski's horse (*Equus ferus przewalskii*), as it is known in the West. And this species is actually extinct in the wild; the last confirmed sighting was in the Gobi Desert of southwestern Mongolia in 1969. The takhi that survive—numbering about 1,500 in zoos and private parks throughout the world—have been bred in captivity and descend from 12 ancestors captured early in the 20th century. Now, however, efforts are under way to reintroduce these magnificent horses to the wild.

In 1992 captive takhi chosen to represent as much genetic diversity as possible (to avoid the hazards of inbreeding) were flown by transport plane from Europe to two sites in Mongolia: Takhin Tal and Hustain Nuruu.

Initially placed in fenced enclosures so that they could adapt to “semiwild” conditions, the horses are now foraging and mating on their native turf. Subsequent transports and births, plus an additional reintroduction site established at Khomin Tal in 2004, have brought the total number of takhi in Mongolia to roughly 250. Since the time of Genghis Khan, the horse has played an integral role the country's culture, and today's Mongolians have welcomed these living symbols of their heritage and have been instrumental in the success of the programs.

Although the takhi is similar to the wild horses that people began to tame some 6,000 years ago, recent DNA research has shown that it is not ancestral to the modern domestic horse. Przewalski's horse has two more chromosomes than occur in modern

domestic horses. The two can interbreed, however, and produce fertile offspring, so the reintroduction programs need to guard against this possibility.

The reintroductions have taught us the critical importance of teaching once confined animals how to avoid predators, such as wolves. And they have alerted us to unexpected problems such as exposure to tick-borne diseases. Even more sobering, we have learned how much it costs to transport and reestablish populations. Saving a species before it goes extinct in the wild would make much better sense. —P.D.M.

TAKHI MOTHERS and foals graze at Takhin Tal, Mongolia, one of the sites where these horses have been brought back to their native land. Many foals have been born, but severe winters, exposure to tick-borne diseases, and predatory wolves challenge their survival.





PLAINS ZEBRA live in stable family groups composed of a male and several females with their offspring. The African savannas where they live provide abundant forage, which allows the long-term groups to form.

scapes; these creatures are endangered—only 2,500 to 3,000 remain in northern Kenya and Ethiopia.

Can we then conclude that one system of social organization is more likely to benefit survival than the other? Not necessarily. The Przewalski's horse, or takhi (*E. ferus przewalskii*), shared the harem social system of the plains zebra. Yet these horses are now extinct in the wild [see box on opposite page].

Habitat degradation and hunting pressure turn out to present far higher barriers to survival. In its plan for actions to counter these problems, the Equid Specialist Group of the IUCN gives top priority to finding out more about the animals themselves—basic biology, seasonal movements, interactions with livestock, and the dynamics of the arid ecosystems in which they live. Also important are the protection of water supplies, the control of poaching, and improved monitoring of equid populations.

And the Afar pastoralists of Eritrea, with their long-standing practice of sharing resources with wildlife, offer a model for an additional—and essential—component. No attempt to conserve wildlife will succeed without the involvement of the local people. If they have a vital stake in protecting and benefiting from their resources—land, water, vegetation as well as wildlife—then they will have a rationale for investing in the long-term management of this habitat. The income from tourists who come to view the animals in their natural setting may

turn out to offer the greatest financial incentive for conserving the environment, but each locale will need to figure out the best strategy for its own constellation of resources and needs. Any revenue from such programs can then be invested in schools, health and veterinary care.

The challenges are formidable, but these steps offer the best chance for the survival of these wonderful animals that have struck awe in the hearts of our own species for thousands of years. SA

MORE TO EXPLORE

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Equid Specialist Group at the IUCN:
www.iucn.org/themes/ssc/sgs/equid/