Factors in Cheetah Conservation

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Successful cheetah (Acinonyx jubatus) conservation concerns five major areas which are the subject of this paper: status in wild habitats, status in conservation areas, legislation, captive breeding, and research.

STATUS IN WILD HABITATS

Cheetah conservation has historically been hindered by human encroachment, especially with respect to loss of natural habitat. As human population increases, more demands are made upon the cheetah's wild habitat to the disadvantage of the cheetah population. The cheetah will continue to suffer from loss of habitat and natural prey as the human population grows and spreads.

The two strong holds of the cheetah are in eastern and southern Africa, primarily Kenya and South West Africa (hereinafter referred to as Namibia). Very little information is available from Tanzania, a formerly strong habitat. Hearsay reports from there indicate a drastic decline in cheetah population due to lack of protection. In Kenya, the last areas to succumb to 'development' are the vast arid and semi-arid rangelands in the northern part of the country which support a large gazelle population, a favorite prey species of the cheetah. It is generally agreed that the cheetah is holding its own and its prospects look fairly good for the immediate future so long as nomadic pastoralism remains. However, when nomadic pastoralism is replaced by commercial ranching, the cheetah tends to lose its shyness, causing increased problems to the farmers who are prevented from shooting the animals due to governmental protection. Even with this protection commercial poaching has increased over the past ten years. Cheetah skins are said to be more common now than ever. Lack of proper funds makes it hard to protect the vast territories. The illegal spread of firearms is likely to pose the greatest threat to the cheetah, particularly in northern Kenya, as long as there is a value placed on the cheetah skin (Hamilton 1981).

Namibia has the largest remaining wild population of cheetah. Here it is in direct competition with man and his livestock (primarily sheep). Where both livestock and game ranching are practiced as forms of land use, cheetah predation on game and livestock is of significant economic loss to the ranchers. Unless the owner is willing to accept the financial losses due to cheetah predation, the cheetah is removed, either by live capture or by the accepted practice of shooting them. A third management tool has recently been established by the Namibian government for a two year trial period (Joubert 1983). The intended impact of this tool is to encourage livestock owners and game ranchers

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Abstract: Successful cheetah conservation will be dependent upon a series of interrelated needs for survival. A concerted effort must be aimed at reducing the conflict with human population in Africa. Game ranchers and sheep farmers must be shown that the cheetah con become an economically acceptable component of its natural habitat. In Africa the differences between what is desirable for the cheetah and what is feasible is the key problem. Measures must be taken which can realistically be achieved under the given conditions of human needs, resources, motivation, and legislation.
In captivity, communication and cooperation in cheetah management must continue. While major successes in captive breeding have taken place over the past few years, we must leave no stone unturned in our effort to get more offspring from the reservoir of breeding age cheetah in the captive population. Techniques for artificial insemination and embryo transplants should be refined and acted upon. If successful, this will significantly broaden the base of founder representation. Captive cheetah management programs throughout the world must work together by periodically acquiring new animals. It seems that a world-wide legislative effort must be attempted to preserve the cheetah in the wild and in captivity in the most economically feasible way.

to look at the cheetah as an economic benefit for harvest. A trophy hunting permit is issued for a fee, and the monies generated by this will be used for continued cheetah research.

STATUS IN CONSERVATION AREAS

National parks and private game reserves are conservation areas where the cheetah is afforded protection from human encroachment. The population of cheetah in these areas in both eastern and southern Africa is quite low due to the direct competition from the growing populations of lions and other large predators. These predators are responsible for a high mortality among cheetah cubs. In a two year period of study in Kenya's Masai Mara Reserve, it was discovered in the Mara Talek area that no cheetah cubs were raised to maturity (Amman 1984).

Man's appearance in east African national parks has had a strong adverse effect, for here the cheetah's natural shyness does not protect it from the cars and tourist vans which interrupt a kill or even an afternoon nap. People do not respect the roads which wind through the reserves with the drivers often traveling cross country. Fortunately this particular problem is minimal in South African reserves.

In South African reserves there have been a number of wild cheetah reintroduction attempts. Some difficulties with these attempts have been in areas where there are no other large predators, and the reserve is completely fenced. With the exclusion of competitors and an increasing cheetah population preventing the increase of prey populations, the cheetah population itself has to be controlled. One of the most successful reintroductions was the Hluhluwe/Umfolozi Game Reserve Complex (Labuschagne 1983).

Reintroduction of wild cheetah has also been tried in Namibia. Here cheetah have been live trapped in the ranching areas, and released in the Etosha Pan National Reserve. Unfortunately these cats returned to their former ranges. It is thought that their return was due primarily to pressure from the increasing lion population. (Joubert 1983)

LEGISLATION

Political pressure and the consequent governmental legislation in countries dealing with the cheetah, whether wild or captive, plays an important role in the preservation of the species.

In 1973 the United States adopted the Endangered Species Act which banned the legal trade of cheetah skins as well as the importation of live cheetah into the country. This created the necessity of developing captive breeding programs in the United States to maintain the captive cheetah population. Reproduction of cheetah in captivity had not been very successful up to this time.

In east Africa, and particularly in Kenya, the legislation began even before 1973. The exportation of cheetah stopped in the early 1960's

due to the declining wild populations. This left southern Africa as the only area from which cheetah could be exported into other countries around the world. When the United States banned the importation of the cheetah, Namibia was faced with a declining market for live caught animals. Ranchers were faced with an over population of wild cheetah, and saw no economic benefit from maintaining the cheetah due to lack of a market.

CAPTIVE BREEDING

Captive breeding is the most important factor to consider for the future survival of the cheetah. As pointed out, wild cheetah populations are in serious trouble from a management perspective, and in time, captive breeding programs will provide a number of solutions to these management problems.

While the cheetah has been exhibited since the early 1800's, the first documented captive birth did not occur until 1956 at the Philadelphia Zoo. The next litters followed at the Krefeld Zoo in Europe in 1960, Oklahoma City Zoo in 1962 and at Whipsnade, London in 1967. This sporadic pattern of captive births continued until the early 1970's when an increase in productivity took place. The total cheetah reproduction from 1956 to today in North America is 295 cubs in 76 litters.

In September 1983, the first edition of the North American Regional Studbook was published by Wildlife Safari; the second edition followed in January 1985. The current population (March 1985) in North America is 201 cheetah. This represents 86% captive born cheetah and 14% wild caught.

There are two major problems in our captive population. First, our captive breeding population represents a disproportionate number of offspring being produced by a few reproductively active cheetah. During the past four years there have been 26 (12.14) breeding animals. Ten of these animals have produced two-thirds of the offspring, while the other 16 animals produced only one-third of the offspring. These 26 cheetah have produced 131 (51.70.10) cubs in 35 litters and represent 45% of the total number of cubs born in North America since 1956.

The second major problem in captive breeding is the loss of founder representation. During the period 1981-1984, founder cheetah population began with 46 animals and ended with 30 (16 died) and three had been reproductively successful. In addition, only one founder was reproductively successful in 1984. During this four year period 26 cheetah were involved in breeding in North America; of these 26, only three were founders, while 17 were first generation and 6 were second generation.

Zoos in the United States have attempted to correct these problems by acquiring new founder animals. Since permit applications to import wild caught cheeetah from Namibia have met with no success, these zoos

have been able to obtain captive born animals from zoos in other countries. In 1984, eight United States' zoos obtained 13 (7.6) captive born animals from foreign zoos. These animals are: eight (3.5) from Whipsnade; two (1.1) from DeWildt Cheetah Breeding & Research Center, South Africa; and three (3.0) from Dierenpark, Amersfoort, Holland. These 13 cheetah represent new founder animals for our North American gene pool. It will be very important to maximize breeding of these animals as they reach sexual maturity.

A Species Survival Plan (S.S.P.) is underway for the cheetah. Unlike some other species for which master plans have been developed, the cheetah will be one of the most difficult to manage. Because of its difficulty in captive breeding, no guarantees can be made that the master plan will work. Good cooperation has developed among the facilities which have cheetah, as shown in 1984, where 47 animals were transferred between 30 facilities. Of these transfers, two produced three litters; one at Albuquerque and two at San Diego Wild Animal Park.

The continued cooperation between our United States' zoos and foreign zoos will contribute to the survival of the species. Continued development of management techniques is needed to further support propagation of the cheetah.

RESEARCH

Results of a major research project, undertaken in 1981 at DeWildt Research Center in South Africa and continued in 1983 at Wildlife Safari will be published in March Science (O'Brien, et al. 1985) This United States' research team gave us new insight into problems of captive cheetah breeding. As the project developed, it became apparent that the species is faced with major genetic and physiological problems including neonatal vigor, infertility and disease resistance. These researchers have theorized that the cheetah may have experienced a severe population bottleneck sometime in its recent history resulting in increased in-breeding demonstrated by the lack of genetic variation in the present day cheetah population (O'Brien, et al., 1983).

Indications of such genetic uniformity to the species include high numbers of abnormal sperm. Semen samples taken from cheetah in Africa and in zoos in the United States showed concentrations per ejaculate at ten-fold less in cheetah than the domestic cat. In addition, an average of 71% of all cheetah sperm were abnormal, compared to 29% in domestic cats (Wilt, et al., 1983).

Another possible consequence of genetic uniformity is the high degree of juvenile mortality in captivity and in the wild. The cheetah infant mortality was compared to that of 28 other captive bred mammalian species in a survey of 40 breeding facilities. The frequency of captive cheetah infant mortality was 29.1%, a value comparatively greater than most exotic animal species. Furthermore, there was no difference shown between infant mortalities of in-bred vs. non in-bred matings of the cheetah.

The major histocompatability complex (MCH) is a group of genes coding for proteins involved in cell surface characteristics which are responsible for rejections of allogenetic tissue grafts. Reciprocal skin grafts were surgically performed on 14 cheetah, four at DeWildt, two at Johannesburg Zoo, and eight at Wildlife Safari. None of the 14 cheetah experienced acute graft rejection. The apparent similarity of these MHC genes demonstrates genetic uniformity. Researchers believe this uniformity is likely present in many areas in addition to the MHC.

The consequences of such genetic uniformity would include a rather high level of vulnerability. Such a consequence is revealed by the great sensitivity in two cheetah colonies (one in the United States and the other in Ireland) to the viral pathogen in an outbreak of feline infectious peritonitis (FIP) and a subsequent number of deaths. This mortality rate is thought to be an immunological problem related to the lack of genetic variation demonstrated at the major histocompatability complex.

It is rather amazing that despite the low levels of genetic variation, the cheetah has continued to compete and survive. This lack of genetic variation is a major consideration when looking at all aspects of cheetah conservation.

The east African cheetah has not been studied for any of these parameters. This summer a cooperatively planned research project will be conducted in east Africa. It is hoped this continued research may provide a new source of genetic variation which could be introduced into our captive breeding programs.

SUMMARY

In conclusion, successful cheetah conservation will be dependent upon a series of interrelated needs for survival. A concerted effort must be aimed at reducing the conflict with human population in Africa. Game ranchers and sheep farmers must be shown that the cheetah can become an economically acceptable component of its natural habitat. In Africa the differences between what is desirable for the cheetah and what is feasible is the key problem. Measures must be taken which can realistically be achieved under the given conditions of human needs, resources, motivation, and legislation.

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Many individuals and institutions have helped create this recent surge in knowledge and information about the cheetah. The time has come for us all to work together and carry out a program to save the species.

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