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Abstract: The status of the cheetah (*Acinonyx jubatus*) varies widely in the 32 countries listed in the report. All populations are classified as vulnerable or endangered by the World Conservation Union (IUCN) and are regulated by the Convention for International Trade in Endangered Species of Wild Fauna and Flora (CITES) as Appendix I. There are 13 countries listed in this report where the cheetah has become extinct during the past 40 years. The wild cheetah is nearly extinct in Asia, with approximately 100 cheetah surviving in small pocketed areas through Iran. Free-ranging cheetahs inhabit a broad section of Africa including areas of North Africa, Sahel, eastern, and southern Africa. The two strong-holds remain in Kenya and Tanzania in East Africa and Namibia and Botswana in southern Africa. Although there has not been a comprehensive survey of African cheetah since 1975, there is a consensus that the cheetah population is declining throughout Africa. Since 1991, and up-dated regularly, Cheetah Conservation Fund has made contact with researchers in cheetah range countries and has tried to keep communication open about cheetah populations in those countries. From the information gathered, it is approximated that less than 15000 cheetah are found throughout their range, with a low estimate of 9000 animals and an optimistic estimate of 12000 animals. Perhaps for the cheetah, though, individual numbers of animals may not be the important point, but the numbers of viable populations still existing. Viable populations may be found in only half or less of the countries where cheetahs still exist. The cheetah has suffered a devastating decline of available habitat and prey both necessary for its survival. In addition, the species does not do well in protected game reserves due to competition with other large predators, and the captive population is not self-sustaining but is maintained through imports of cheetahs from the wild population.

Le statut du guépard (*Acinonyx jubatus*) est très variable dans les 32 pays listés de ce rapport. Toutes les populations sont classées vulnérables ou menacées par l'Union Mondiale pour la Nature (IUCN) et sont régulés par la Convention sur le Commerce Internationale des Espèces de la Faune et de la Flore sauvages menacées d'extinction (CITES) en Appendice I. Le guépard a disparu de 13 pays de la liste au cours des 40 dernières années. Le guépard est proche de l'extinction en Asie avec approximativement 100 guépards survivant dans de petites zones à travers l'Iran. Le guépard vit sur une large partie de l'Afrique incluant des zones de l'Afrique du Nord, du Sahel et de l'Afrique de l'Est et du Sud. Les deux bastions restent le Kenya et la Tanzanie en Afrique de l'Est et le Botswana en Afrique du Sud. Bien qu'il n'y ait pas eu de vaste enquête du guépard d'Afrique depuis 1975, il fait l'unanimité que la population de guépard est en déclin sur toute l'Afrique. Depuis 1991 et mis à jour régulièrement, le Cheetah Conservation Fund a mis en contact les chercheurs dans les pays abritant du guépard et essaie de rester en contact sur les populations de guépard dans ces pays. D'après les informations récoltées, il reste approximativement moins de 15000 guépards sur toute son aire de répartition avec une estimation minimale de 9000 animaux et une estimation maximale de 12000 animaux. Pour le guépard le nombre d'individus pris isolément n'est pas le plus important, il s'agit plutôt du nombre de populations viables encore existantes. Les populations viables peuvent être trouvées dans la moitié ou moins des pays où le guépard existe encore. Le guépard a souffert d'un déclin dévastateur de l'habitat disponible et des proies, tous deux nécessaires à sa survie. De plus, l'espèce ne se porte pas bien dans les réserves de gibier à cause de la compétition avec d'autres grands prédateurs, et la population captive n'est pas autosuffisante mais elle est maintenue par l'import de guépard des populations sauvages.

## CURRENT STATUS OF THE CHEETAH (*Acinonyx jubatus*)

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**Abstract** - The status of the cheetah (*Acinonyx jubatus*) varies widely in the 32 countries listed in this report. All populations are classified as vulnerable or endangered by the World Conservation Union (IUCN) and are regulated by the Convention for International Trade in Endangered Species of Wild Fauna and Flora (CITES) as Appendix I. There are 13 countries listed in this report where the cheetah has become extinct during the past 40 years. The wild cheetah is nearly extinct in Asia, with approximately 100 cheetah surviving in small pocketed areas through Iran. Free-ranging cheetah inhabit a broad section of Africa including areas of North Africa, Sahel, eastern, and southern Africa. The two strong-holds remain in Kenya and Tanzania in East Africa and Namibia and Botswana in southern Africa. Although there has not been a comprehensive survey of African cheetah since 1975, there is a consensus that the cheetah population is declining throughout Africa. Since 1991, and up-dated regularly, Cheetah Conservation Fund has made contact with researchers in cheetah range countries and has tried to keep communication open about cheetah populations in those countries. From the information gathered, it is approximated that less than 15 000 cheetah are found throughout their range, with a low estimate of 9 000 animals and an optimistic estimate of 12 000 animals. Perhaps for the cheetah, though, individual numbers of animals may not be the important point, but the numbers of viable populations still existing. Viable populations may be found in only half or less of the countries where cheetahs still exist. The cheetah has suffered a devastating decline of available habitat and prey, both necessary for its survival. In addition, the species does not do well in protected game reserves due to competition with other large predators, and the captive population is not self-sustaining but is maintained through imports of cheetahs from the wild population.

### CURRENT STATUS

The status of the cheetah, (*Acinonyx jubatus*), varies widely in the 32 countries listed in this report. All populations are classified as vulnerable or endangered by the World Conservation Union (IUCN) and are regulated by the Convention for International Trade in Endangered Species of Wild Fauna and Flora (CITES) as Appendix I<sup>16</sup>, which bans international commerce and sporting trophies. There are 13 countries listed in this report where the cheetah has become extinct during the past forty years. Only in two or three countries are cheetah populations considered only threatened and are killed legally if found to be in conflict with human interests. In 1992, at the CITES meeting, quotas were set for export of 150 animals from Namibia, 50 animals from Zimbabwe, and 5 animals from Botswana, as live animals or as trophies<sup>16</sup>.

Five subspecies are considered valid by most taxonomists<sup>80</sup>. But this should be changed or condensed in the future, as the validity of the existence of sub-species is questionable. Genetic research has shown the genetic distance between two subspecies, *A. j. jubatus* and *A. j. raineyi*, is trivial, 10 to 100 times less, for example, than the genetic distance between human racial groups<sup>69</sup>.

The recognized subspecies are as follows:

#### North Africa and Asia

*Acinonyx jubatus venaticus* (Griffith, 1821): Algeria, Djibouti, Egypt, Mali (northern), Mauritania

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(northern), Morocco, Niger (northern), Tunisia, Western Sahara.

On the Asian continent: Afghanistan, India, Iran, Iraq, Israel, Jordan, Oman, Pakistan, Saudi Arabia, Syria, Russia and the Commonwealth of Independent States.

#### **West Africa**

*Acinonyx jubatus hecki* (Hilzheimer, 1913): Benin (northern), Burkina Faso, Ghana, Mali (southern), Mauritania (southern), Niger, and Senegal.

#### **Central Africa**

*Acinonyx jubatus soemmeringii* (Fitzinger, 1855): Cameroon (northern), Chad, Central African Republic (northern), Ethiopia, Nigeria (northern), Niger (southern), and Sudan .

#### **East Africa**

*Acinonyx jubatus raineyii* (Heller, 1913): Kenya, Somalia, Tanzania (northern), and Uganda.

#### **Southern Africa**

*Acinonyx jubatus jubatus* (Schreber, 1976): Angola, Botswana, Democratic Republic of Congo (southern), Mozambique, Malawi, South Africa, Tanzania (southern), Zambia, Zimbabwe, ~~Namibia~~

### **HISTORIC DISTRIBUTION**

The cheetah was widely distributed throughout Africa and Asia. Cheetahs were originally found in all suitable habitats from the Cape of Good Hope to the Mediterranean, throughout the Arabian Peninsula, and the Middle East, from Israel to India and Pakistan, and through the southern provinces of the Russia and the former Commonwealth of Independent States.

Cheetah have become extinct in at least 13 countries over the past 50 years. These countries and the year of extinction are as follows:

1. **Djibouti:** Believed to be extinct (not a party to CITES), although in 1990 private people could still buy cheetah skins and live cheetah cubs in the market place. These skins and live cheetahs are thought to be coming from Somalia and possibly eastern Ethiopia<sup>81</sup>. Skins are still available in large numbers.
2. **Ghana:** Believed to be extinct. The Mole National Park had a small population in the reserve as of 1975<sup>93</sup>.
3. **India:** Extinct in 1952. Last known cheetah found in Hyderabad in 1951 and Chitoor in 1952. Indians were importing cheetah from Africa to be used as hunting leopards in 1929 due to the rarity of local cheetahs<sup>18, 29, 93</sup>. There has been talk of reintroducing cheetah back to India, but availability of prey species and unsuitable habitat are limiting factors. A captive breeding effort may be launched.
4. **Iraq:** Extinct (not a party to CITES). Last sighting in 1950.
5. **Israel:** Extinct. Last report of cheetah was in 1956<sup>47, 57</sup>. There have been thoughts of re-introduction of cheetah into the Biblical Wildlife Reserve of the Negev Desert<sup>47, 57</sup>.
6. **Jordan:** Extinct. In 1935 many skins were still sold in Be'er Sheva'. May still have been found in Negev Desert, the Palestine Mountains, Sinai Desert, and Trans Jordan until the late 1940's<sup>29</sup>.
7. **Morocco:** Extinct. Were still found up to 40 years ago in the mountainous regions of the country bordering the Sahara<sup>93</sup>.
8. **Nigeria:** Extinct<sup>20</sup>. Skins are found for sale in the public market in Lagos which are probably coming from the countries north of Nigeria<sup>87</sup>.
9. **Oman:** Extinct (not a party to CITES). Last sighting in 1968<sup>93</sup>, probably lived on until the early 1970's on the Jiddat al Harasis Plateau, Dhofar province<sup>71</sup>.
10. **Russia and the former Commonwealth of Independent States:** Considered extinct as of 1989. No confirmed sightings in the past few years. A small expedition looked for cheetah during the summer of 1989 but no animals or tracks were seen<sup>22</sup>. Cheetahs existed in many areas until the

1940's and 1950's when their prey, the goitred gazelle, was reduced drastically from over-hunting. Some cheetahs were believed to have moved down into Afghanistan when the goitred gazelles conducted a permanent move southward. In the 1960's and 1970's the last cheetahs existed in parts of Turkmenia and Uzbekistan (east and west of Murgab, east of the Caspian Sea, and in the Badkhyz Preserve). In these areas they lived mostly on remnant populations of goitred gazelle and arkhar sheep, saiga antelope, kopet-dag sheep and hares<sup>17, 22, 34, 43, 73, 83, 84</sup>. In 1972 it was suggested that the cheetah be listed as a living monument and very strict international laws be proposed to save the last of the Asian cheetah. The Commonwealth would like to reintroduce cheetahs into areas with sufficient prey populations such as the Ustyurt Plateau of Uzbekistan. We have suggested that before they introduce African cheetahs they wait until the genetics have been run on the Asian cheetahs in Iran.

11. **Saudi Arabia:** Extinct (not a party to CITES). Four cheetahs shot in 1950 near Saudi, Jordan, Iraq border intersection<sup>29</sup>; last cheetah in the country probably lived on until the 1970's in the remote parts of Rubrquote Al-Khali desert<sup>71</sup>.

12. **Syria:** Extinct (not a party to CITES). Oil pipeline worker killed one of the last cheetah in the Syrian Desert in 1950<sup>29</sup>. The last cheetahs lived on until the 1960's in the eastern temperate Syrian steppe (Badiyat ash-sham) near Khabur River<sup>71</sup>.

13. **Tunisia:** Believed to be extinct. Formerly found in the region of Chott el Djerid and the desert south of Tatahoume<sup>93</sup>. Last cheetah sighted and killed was in 1968 near Bordj Bowrgiba in the extreme south<sup>19</sup>, 1990. Last Tunisian cheetahs lived until the 1970's in the Alfalfa-endash Acacia steppes at the North of the Hammada El Homra, near the Libyan border<sup>71</sup>. Re-introduction of cheetah back into Tunisia may occur in the next few years in Bou Hedma National Park, which has good prey diversity<sup>71</sup>.

## CURRENT DISTRIBUTION

Reports on the status of cheetahs in the following countries are included in this document:

In Africa: Algeria, Angola, Benin, Burkina Faso, Botswana, Cameroon, Central African Republic, Democratic Republic of Congo, Egypt, Ethiopia, Gambia, Kenya, Libya, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Senegal, Somalia, South Africa, Sudan, Tanzania, Tunisia, Uganda, Western Sahara, Zambia, and Zimbabwe (Fig. 1).

On the Asian continent: Iran and possibly Pakistan.

## POPULATION CENSUS

Censusing such an elusive species as the cheetah is very difficult, particularly since it is largely diurnal and widely roaming. Current information about the status of the cheetah in many countries, especially countries that have been engaged in long civil wars, is lacking. The following material is taken from recent literature, and where noted, from recent communications originating from researchers in the field.

From the information gathered, it is estimated that there are less than 15 000 cheetah throughout their range, with a low estimate of 9 000 animals and an optimistic estimate of 12 000 animals. Perhaps for the cheetah, though, individual numbers of animals may not be the important point, but the numbers of viable populations still existing. Viable populations may be found in only half or less of the countries where cheetahs still exist.

## ASIA

The wild cheetah is nearly extinct in Asia. Once widely distributed throughout Asia, the cheetah has suffered a devastating decline of available habitat and prey. A small number of Asian cheetah still survive in small pocketed areas through Iran, and possibly in the boarding areas of Pakistan.

## AFRICA

Free-ranging cheetah inhabit a broad section of Africa including areas of North Africa, Sahel,

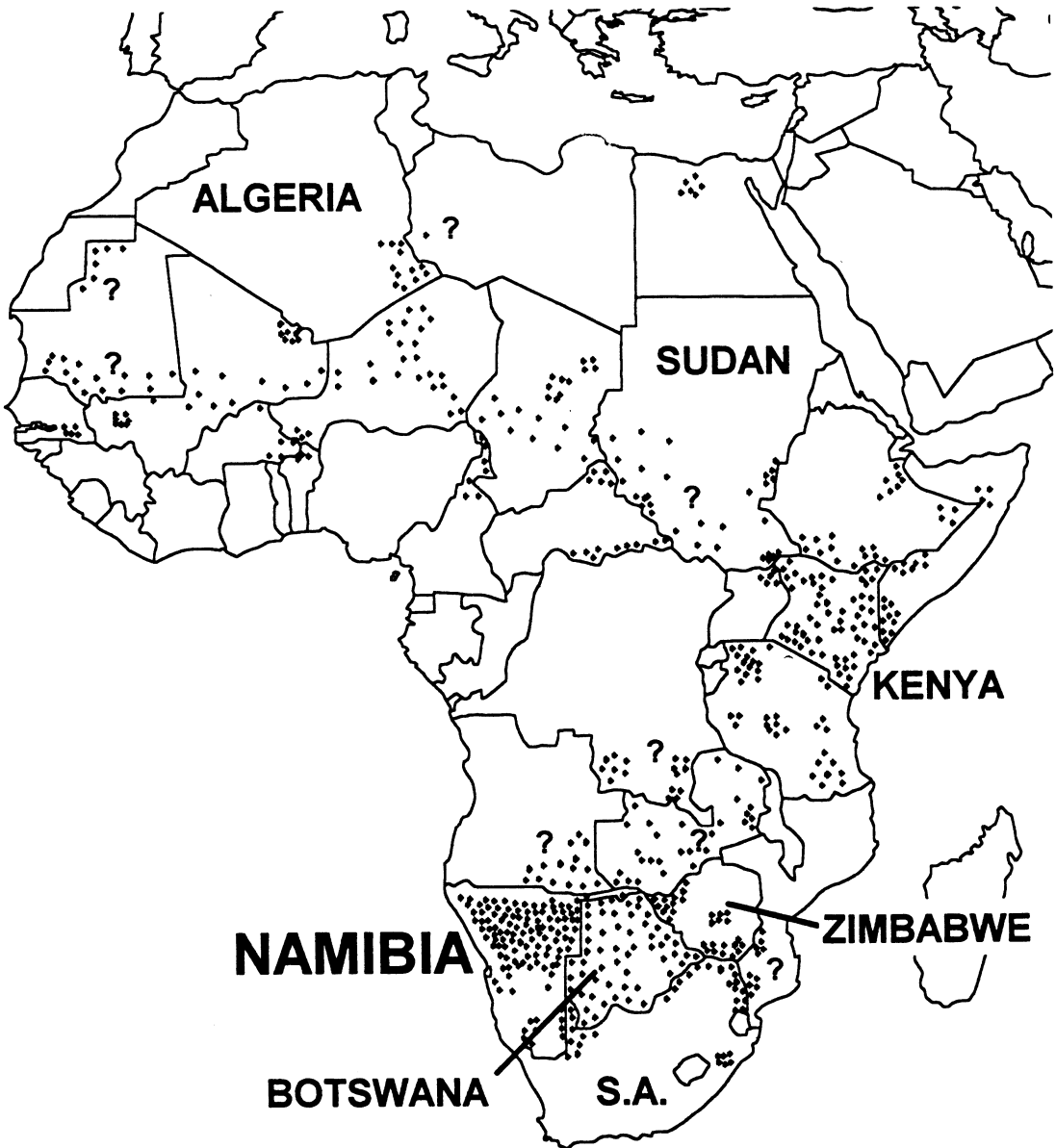


Figure 1: Cheetah distribution in Africa

eastern, and southern Africa. The two remaining strong-holds are Kenya and Tanzania in East Africa, and Namibia and Botswana in southern Africa.

There has not been a comprehensive survey of African cheetah since 1975, when Norman Myers calculated the African population of cheetah to be between 7 000 and 23 000 animals in 25 countries. The population of cheetah in Africa had decreased by half since the 1960's<sup>62</sup>. On the basis of his research, he estimated that there would be less than 10 000 cheetah by 1980. No new information is available to validate or refute this prediction, although there is a consensus that the cheetah population is declining throughout Africa.

Since 1991, and up-dated regularly, Cheetah Conservation Fund has made contact with researchers in range countries and has tried to keep communication open about cheetah populations in those countries<sup>42, 71</sup>.

Until more recently, the cheetah has been generally considered to be an animal of open country and grasslands. This impression is probably due to the ease of sighting the cheetah in the shorter grass, and the long-term studies conducted on cheetah in East Africa<sup>14</sup>. However, cheetah use a wider variety of habitats and are often found in dense vegetation, i.e. the Kora Reserve in Kenya, Botswana's Okavango Delta, and the Namibian farmlands<sup>54</sup>.

As reported throughout Africa, cheetahs are not doing well in protected wildlife reserves due to increased competition from other, larger predators such as lion and hyenas<sup>44, 54, 59, 61, 67</sup>. Therefore, a large percentage of the remaining, free-ranging cheetah populations are outside of protected reserves or conservation areas.

There has been limited information from North or West Africa in the form of personal correspondence with field researchers and the cheetah's future in these areas is questionable<sup>19, 26, 64, 71, 76</sup>. Cheetahs continue to survive in small, pocketed groups in isolated areas throughout the Sahel. Most of these populations though can not be considered viable for long-term survival. Controlling factors are small populations, restricted habitats with a limited prey base, conflict with nomadic herders and wars that have supplied guns and ammunition's to the populace, which then poach all forms of wildlife for food and profit.

A few regional studies do exist: David Burney reported on cheetah in Kenya in 1980; P.H. Hamilton did a survey on the cheetah in Kenya in 1981; Norman Myers reported on the status of cheetah in Africa, 1981; Dieter Morsbach reported on the cheetah in Namibia, 1986; Marker-Kraus *et al.*, followed up on the Namibian cheetah in 1996; Vivian Wilson on the status of cheetah in Zimbabwe, 1985; and Christopher Stuart and Vivian Wilson on the status of cheetahs in southern Africa, 1988, and Paula Gross conducted surveys in several African countries from 1989-1996.

In East Africa both Burney and Hamilton found the cheetah adapting in the agriculture land in the Masai Mara region outside the national parks and were co-existing with the Narok Masai, whose stock they left alone<sup>12, 30</sup>. In Southern Africa, it has been reported that cheetahs are killed regularly in farming areas due to their raiding of livestock and the attitudes of the farmers<sup>11, 45, 53, 54, 61, 82, 91</sup>.

Hamilton predicted that cheetah prospects in Kenya in the 1981-2000 period looked reasonable in the vast arid and semi-arid rangelands (primarily in the north) which would be the last areas to be developed. Hamilton's premise seems to be that the cheetah is a "remarkably successful predator ... supremely adapted to surviving at low densities over large expanses of often waterless arid and semi-arid lands." Elsewhere the spread of commercial and group ranching is likely to bring the cheetah into greater conflicts with man. The spread of illegal and legal firearms is also likely to pose a threat so long as the cheetah's skin has any value<sup>30</sup>.

Myers believes the cheetah is less adaptable. He says, "if its ecological circumstances start to experience persistent perturbation, the specialized nature of the species ecology and behaviour, and its genetic make-up, could leave it little able to adapt to the disruptive conditions imposed by human communities in emergent Africa"<sup>62</sup>.

In fact, the ability of the cheetah to adapt to a changing ecological system brought about principally by conversion of its preferred habitat to farmland is perhaps the critical question in estimating the population's survivability in Africa. In several studies over the last decade, the cheetah was reported to suffer declining numbers as land was developed and suitable habitat converted to farmland<sup>13, 30, 52, 54, 61, 62, 91, 93</sup>. In Namibia, the population of cheetah was halved by farmers from 1975-1987<sup>61</sup>, and conflict with the farming community continues<sup>54</sup>. In 1996, the Cheetah Conservation Fund hosted a Population and Habitat Viability Analysis Workshop (PHVA), for Namibian cheetah, in cooperation with the IUCN's Conservation and Breeding Specialist Group (SBSG), the Ministry of Environment and Tourism (MET) and local Namibia farmers. A working strategy was developed and formed the basis for MET's conservation strategy for cheetah<sup>66</sup>. In 1997, a working group of MET and Namibian NGO's formed the Large Carnivore Management Forum. In 1998, a country-wide census for cheetah will commence.

Wild cheetahs in Africa need help. Suitable prey is becoming scarce and habitat is disappearing. They are suffering from the consequences of human encroachment, from competition with other large predators in game reserves, and not least, from the complication of a limited genetic make-up. The wild population continues to sustain the captive population<sup>49</sup>.

## HISTORY OF CAPTIVE CHEETAH

The similar experiences of the world's zoos have reaffirmed the traditional difficulties of breeding cheetah in captivity. Despite the capturing, rearing and public display of cheetah for thousands of years, one litter was reported in the 16th century by the son of Akbar the Great, an Indian mogul. The next documented captive reproduction did not occur until 1956<sup>55</sup>.

The history of the captive population of cheetah as of 1955, when it became one of the major animals exhibited throughout the world, is presented in Table 1. From 1955 to 1994, the number of world zoos holding cheetah increased from 29 to 211, and the number of animals during this 40-year period increased from 33 to 1 218. Since 1955, 1 440 cheetah have been imported from the wild and there have been 2 517 births and 3 436 deaths<sup>55</sup>.

**Table 1: History of the Captive Cheetah Population<sup>55</sup>.**

	1955-64	1965-74	1975-84	1985-94	Total
No. of facilities	29-92	87-80	87-150	152-211	
No. of cheetahs	33-206	215-401	423-848	856-1218	
No. of imports	142	491	419	388	1440
No. of births	16	178	967	1356	2517
No. of deaths	121	382	1244	1689	3436

The captive population as of 31 December 1996, was 1 217 (608 males, 602 females, 7 unknown) animals in 240 facilities in 50 countries<sup>49</sup>. Of the 1 217 animals, 27% were wild-caught and 73% captive born<sup>49</sup>. The captive population is currently maintained by a combination of imports and captive breeding<sup>49</sup>.

The breeding programmes of our world's zoos, though, are not self-sustaining. Data indicates that a high proportion of cheetah propagation has occurred in a handful of the zoos with a majority of these facilities having only limited success; and half of the successful breeding facilities have had only a single breeding pair, or a single male or female. The captive population has had a low effective breeding size ( $N_e$ ), 17 % in 1994<sup>55</sup>. The fecundity of wild-caught versus captive-born animals is higher than captive-born animals and both are low, 17 % and 9 %, respectively.

## STATUS OF THE CAPTIVE SOUTH AFRICAN CHEETAH POPULATION

As of 31 December 1996, the southern African cheetah population represented 30 % of the captive world population<sup>51</sup>. South Africa has the only recognized breeding facilities in Africa. The progress achieved in acquisitions and breeding, as well as the incidence of mortality and sales for the South African captive cheetah population from 1970 to 1996 are presented in Table 2.

The number of facilities holding cheetah has varied between 4 in 1970 to 11 in 1996. A summary of the numbers of imports and captive births from 1970 to 1996 is presented in Table 2. In total, 244 animals have been imported from the wild into South Africa, 29 % have come from South Africa and 71 % have come from Namibia. There have been 772 captive births in 254 litters, 497

**Table 2: History of the South African captive cheetah population<sup>51</sup>.**

	1970-75	1976-80	1981-85	1986-90	1991-96	Total
No. imported	29	26	31	82	76	244
No. of births	37	184	127	133	291	772
No. of deaths	23	88	78	111	197	497
No. of exports	0	29	49	83	116	277
No. of sales	0	5	16	17	57	95
No. of facilities	4	5	9	12	11	
No. alive at end of period	46	143	204	166	221	

deaths occurred and 277 animals were exported out of the country's recognized South African population. Within South Africa, 95 animals were transferred, primarily due to the creation of the new Hoedspruit cheetah breeding facility<sup>51</sup>.

Examination of Table 2 shows that the majority of the increase in the captive population prior to 1985, when the population reached 204 animals, can be attributed to captive births. Prior to 1985, deaths and exports remained relatively low in comparison to births. From 1986 to 1996 deaths and exports increased to offset the population growth from births during those same years. Therefore, from 1986 to 1996 the captive population increased primarily due to imports, as during this time 65 % of the total wild-caught animals (primarily from Namibia) were imported into South African facilities. As of 31 December 1996, the population was 262 (124.138) animals in 12 facilities, of which 30 % were wild caught and 70 % were captive born<sup>51</sup>.

## REGIONAL BREEDING PROGRAMMES AND GLOBAL CAPTIVE MANAGEMENT

Regional breeding success is important to monitor as the need for cooperation increases in order to facilitate movement of animals within the regions. The success of the individual regions is important in relation to the number of animals actually living in the population. In 1996, 30 % of the world's captive population was in southern Africa, of which 41 % were wild-caught animals<sup>49</sup>. By comparison, 26 % percent of the 1996 population was in North America and 2 % of these were wild-caught animals. A larger percentage of the North American facilities were reproductively successful in part due to the American Zoo Association's (AZA) Species Survival Plan (SSP) cooperative management programme which was developed in 1984.

Internationally, 14 facilities (15 %) have had continuous breeding success and have produced 63% of all cubs born in captivity<sup>55</sup>. Thus, a relatively small number of cheetahs have made a disproportionately large contribution to the captive population gene pool, for example eight males have sired 21 % of all cubs born and 12 females have produced 24 % of all cubs born<sup>55</sup>. Several of these breeding animals are from breeding facilities in South Africa and they have produced 28% of the captive births in the world<sup>55</sup>.

There is a substantial need to continue enhancing captive management to ensure optimal captive breeding. The implementation of management programmes such as the African Preservation Programme (APP) within the Pan African Association of Zoos, Aquariums, and Botanical Gardens (PAAZAB) are designed to facilitate cooperative management to the benefit of the population as a whole. As free-ranging populations of cheetah continue to decline, and a large amount of genetic diversity of the wild population is lost, the captive and wild populations should be managed in cooperation. In the future, in the absence of further imports from the wild, the size of the world's captive population could be expected to decline, unless there is continued improvement in captive breeding efficiency. This trend, coupled with the continuing decline of the wild population, leaves the species extremely vulnerable.

## CONSERVATION

No one knows what constitutes a minimum viable population for wild cheetah. Unquestionably, the larger the population and the more broadly it is dispersed, the better placed it will be to avoid genetic failings and to endure localized epidemic mortality or widespread episodic catastrophe.

An important factor that must be taken into account, when considering the long-term conservation of the cheetah, is its lack of genetic variation. In 1981 an extensive genetic and physiological analysis of captive and free-ranging cheetah revealed that the cheetah appears to be unique among felids and other mammals in having an extreme paucity of genetic variation<sup>68</sup>. The combined genetic, reproductive, and morphological data places the cheetah in a status similar to deliberately inbred mice or livestock, and prompted the hypothesis, that in its recent natural history (perhaps dating back 10 000 years), the species had probably suffered a demographic contraction or population bottleneck necessarily followed by inbreeding<sup>55, 69, 70, 88</sup>. The consequences of this lack of genetic variation include reproductive abnormalities<sup>89, 90</sup>, high infant mortality, morphological abnormalities, and a weakened immune system<sup>32, 38, 48, 56, 69</sup>, making the species more susceptible to ecological and environmental changes.

Although the species tolerates a broad range of habitat types, its essential requirements for long-



term survival is for suitable prey and the reduction of conflict with humans and other large predators. These components are essential to its conservation.

## CURRENT STATUS - COUNTRY BY COUNTRY

### 1. Afghanistan

*Population:* No information at this time. Possibly still a few animals in the south-west above Baluchistan, Pakistan and the Iranian border region. There is no protection for cheetah.

### 2. Algeria

*Population:* Still to be found in a few areas of south-east Algeria, between  $3\frac{1}{2}^{\circ}\text{E}$  and the Libyan border and between  $27\frac{1}{2}^{\circ}\text{N}$  and  $20\frac{1}{2}^{\circ}\text{N}$ , with possible concentrations in Tassili N'Ajjer Range, Tassili Attoqgar, and Tassili Teffedest. Females with two cubs are seen regularly by tribesmen complaining that cheetah attack their camels. Rainfall was good from 1987-1990 in these areas, and there were increasing populations of Dorcas gazelle and Barbary sheep for cheetah to prey upon<sup>19</sup>. It is thought that the majority of the remaining Algerian cheetahs are living in Tassili nr'Azger, because this plateau is far more rich in water and vegetation<sup>71</sup>. It is difficult to see the last Algerian cheetahs: native people know their presence only through their traces<sup>71</sup>. This country could be a very important area for saving the North African cheetah.

*Principal Threats:* Restricted habitat, effects of drought on prey, and conflict with nomadic herders.

### 3. Angola (Not a party to CITES)

*Population:* No recent information due to the long-standing civil war. Estimate of 500 with a range of 200-1000 animals<sup>62</sup>. Range was confined to the drier, arid areas in the central and southern parts of the country. In 1975 cheetah were reported in the following parks and protected areas: Iona National Park (14 500 km<sup>2</sup>), Bicuar National Park (7 900 km<sup>2</sup>), Cameia National Park (14 450 km<sup>2</sup>), Luando National Park (8 280 km<sup>2</sup>), Quicama National Park<sup>93</sup>. The cheetah was declared protected game in 1957, but legislation is difficult to enforce, and the military community is exempt from these provisions of the law<sup>62</sup>.

*Principal Threats:* Large-scale poaching which has helped support the long civil war, cultivation and over-grazing of cattle in the arid areas will contribute to the elimination of cheetah habitat.

### 4. Benin

*Population:* Thought to be extinct outside of the tri-country national park in the north of Benin, the Park National du W, which adjoins Niger, Burkina Faso and Benin. In this park, a very small population of 2 or 3 pairs may exist<sup>26, 23</sup>. A few cheetah exist in and around the Pendjari complex of protected areas in northwestern Benin<sup>23</sup>.

*Principal Threat:* Insufficient numbers of cheetah to sustain a viable population and lack of habitat.

### 5. Botswana:

*Population:* Estimates vary between 1 000 and 1 500<sup>11, 27, 52, 53</sup>. Cheetahs have a wide distribution throughout Botswana, but are absent from areas of dense human settlement in the extreme south. In the northern districts of Ngami West, Ngami East, and Tutume areas, the cheetah is found throughout and is often in conflict with communal farmers who graze livestock and the commercial farmers of the Botswana Livestock Development Corporation<sup>11</sup>. Freehold lands make up a small percentage of the overall land base in Botswana, but appear to harbour relatively large cheetah populations<sup>53</sup>. This is especially true in the commercial farming areas of Ghanzi district and the Tuli Block and communal livestock areas in the south central Ghanzi district<sup>45, 53</sup>. Cheetahs have been reported in the following protected parks and reserves: Chobe National Park (11 000 km<sup>2</sup>), Moremi Wildlife Reserve (3 880 km<sup>2</sup>), Nxai Pan National Park (2 100 km<sup>2</sup>), Makgadikgadi Pans Game Reserve (3 900 km<sup>2</sup>), Kalahari Game Reserve (24 800 km<sup>2</sup>). Cheetahs have been protected game since 1968 but can be shot for livestock defense even before any damage has been noted. Recent quotas set by CITES in 1992 allows for five animals for export.

*Principal Threats:* Livestock farming and poaching.

### 6. Burkina Faso

*Population:* Extremely low; estimated at 100<sup>62</sup>. Perhaps only found, now, in the complex of national parks and protected areas and the tri-country national park in the eastern point of the country that borders Niger and Benin where 2 or 3 pairs exist<sup>23, 26</sup>. A few cheetahs exist in the Singou Fauna Reserve and the adjacent proposed Arlin National Park<sup>23</sup>. Cheetahs may now be extinct in the vicinity of Kabore Tambi National Park and the Natinga Game Ranch in southern Burkina Faso<sup>23</sup>. The

cheetah is totally protected but enforcement is likely to be inadequate.

*Principal Threats:* The country is under growing invasion by large numbers of nomads from the north, which has increased the pressure on the cheetah's range. Loss of habitat, poaching and insufficient numbers of cheetah to sustain a viable population.

#### 7. Cameroon

*Population:* Population very small. In 1975, small populations of cheetah were still found in Benoue National Park<sup>62, 93</sup>. Between 1974 and 1976, a census was carried out in Bouba Nr'dijida National Park, which resulted in finding no cheetah<sup>62</sup>.

*Principal Threats:* Decline of prey species, poaching and environmental degradation<sup>62</sup>.

#### 8. Central African Republic

*Population:* Still found in the south-eastern area of the country, bordering Sudan and in the southern middle of the country, bordering Democratic Republic of Congo<sup>71, 85</sup>. A small population still existed in Saint Floris National Park bordering Chad and the hunting domains in the north<sup>9, 71, 93</sup>.

*Principal Threats:* Extensive poaching and limited prey species.

*Taxonomy:* North Central African Republic listed as *A.j. soemmeringii*, there is no listing for southern Central African Republic.

#### 9. Chad

*Population:* Possibly a small population still exists in the Tibesti Highlands where prey species still are abundant, and there may also be a small population in Ennedi mountains<sup>71</sup>. As of 1975, there was a small population of cheetah in the Zakouma National Park<sup>93</sup>.

*Principal Threats:* Changing climate conditions have reduced the carrying capacity of the land and have over-burdened the sensitive environment<sup>62</sup>. Currently, the many years of war have armed the general population, which puts all wildlife in danger of poaching for food and profit.

#### 10. Democratic Republic of the Congo (Zaire)

*Population:* No current information. Estimated at 300 and could decline below 100 by 1980<sup>62</sup>. Small populations found in parts of Shaba, Kasai and Kwango Provinces in the southern and southeastern part of country<sup>62</sup>. Kundelungu National Park (7 600 km<sup>2</sup>) and Upemba National Park (10 000 km<sup>2</sup>) did contain a few cheetah<sup>62</sup>.

*Principal Threats:* Agricultural development, poaching and loss of habitat.

*Taxonomy:* There is no listing for the Northern Congo population.

#### 11. Egypt

*Population:* Cheetah tracks have been seen and at least five animals were seen around the Sitra water source in the Qattara Depression in the western and northwest parts of the country, and north of Qara Oasis. It is believed there is still a small population that remains there<sup>3, 24, 78</sup>. In 1994, tourism was banned in Marsa Matruh Province (where the Qattara depression is situated) for five years to protect wildlife from poaching<sup>71</sup>. A proposed cheetah-gazelle sanctuary in northwest Qattara has been prepared<sup>78</sup>. The cheetah is totally protected, although enforcement is likely to be inadequate.

*Principal Threats:* Restricted habitat, possible conflict with nomadic herdsman, and insufficient numbers of cheetah to sustain a population.

#### 12. Ethiopia

*Population:* In 1975 the population was estimated to be 1 000 animals and it was believed that the populations could decline to 300 animals by 1980<sup>62</sup>. The cheetah was widely distributed from Addes to Djibouti in eastern Ethiopia. Also widely distributed through the southern parts of the country, between 200-1500 m elevation, absent from the low lands of the Ogaden in the east, and no sightings in the north since 1937<sup>94</sup>. A small population was known to be in the Danakil Reserve<sup>62</sup>. In 1995, cheetahs were sited near Dolo<sup>40</sup>. Two cheetahs were seen in the dry desert scrub on a rocky plateau, 100 km from Dolo, by American oil company employees. This area has a fairly large antelope prey population<sup>40</sup>. Other cheetah sightings have recently been in the Afder Zone, in and around the CherriHi/El Kere area, and in the Dolo region skins and live cheetah are offered for sale<sup>40</sup>. One cheetah from the Dolo region is in captivity at the Royal Palace as of 1996<sup>40</sup>. Cheetahs are protected against hunting and capture although legislation is difficult to enforce.

*Principal Threats:* Civil war, habitat loss, extensive poaching, decline of prey, and fur trade.

#### 13. Gambia

*Population:* Reported that cheetah may wander into Gambia from Senegal<sup>6</sup>.

#### 14. Iran

*Population:* Estimates of 100-200<sup>39</sup> and less than 100<sup>7</sup>. Under the reign of the Shah of Iran the population was estimated at 400-450<sup>7, 28, 37</sup>. As of 1998 cheetah are still to be found in very small groups in a variety of areas of this large country. A recent survey has been conducted by Hormoz Asadi showing six areas in the country where cheetah still exist.

1. Evidence indicates definite dispersal of cheetah from the Koshe-Yeilagh and Miandasht protected areas towards the southern Khorasan. The survey indicates that there are at least 15 to 20 cheetah in southern Khorasan and groups of 5-8 cheetah have been reported to be hunting wild sheep.
2. Cheetahs are surviving in the unprotected areas in Bafgh region of Yazd province. Much of this region consists of arid mountains and population estimates are still 10 to 15 animals including the Kalmand protected area.
3. A population is in the unprotected area of eastern Isfahan where the terrain consists of vast expanses of desert, unpopulated except for herdsmen grazing goats and camels. Here livestock numbers have increased and the past gazelle population has decreased, but this region may still support 5-10 cheetah that are widely scattered.
4. A population is found in Kavir National Park and reports are frequent in this vast desert with arid mountains. The population corresponds with a gazelle population and there may still be 10 to 15 cheetahs here.
5. A population exists in the Garmsar, Damghan and Semnan unprotected areas in the northern part of the plateau. Here, 5 to 10 cheetahs are in conflict with growing agriculture and human populations.
6. A population is found in the Khar Touran National Park and protected area, which may possess the highest cheetah density in Iran. Cheetah reports are frequent in this vast expanse of desert where there may be 15 to 20 cheetahs still alive<sup>7</sup>.

*Principal Threats:* Loss of habitat, poaching, limited numbers of prey species. Direct persecution by humans, either shepherds or local hunters. They are easy targets for people in four-wheel drive vehicles and motorbike riders who chase cheetah if they see them, causing them to die of exhaustion or leave the area.

#### 15. Kenya:

*Population:* Estimation of 1 200 animals<sup>30</sup>. Species still occurs throughout the country, except in forests, montane moorland, swamps, and areas of dense human settlement and cultivation. Cheetahs are absent in western Kenya, the more densely populated parts of Central Province, and most parts of the coastal strip. Its distribution coincides with the distribution of Thomson's gazelle, Grant's gazelle, and gerenuk. Cheetah occur throughout most of the arid northern and north eastern parts of Kenya. Although this area is vast and mostly unpatrolled and poaching is on the increase<sup>30</sup>. Populations of cheetahs are found in the following national parks and reserves: Nairobi National Park (114 km<sup>2</sup>), Tsavo National Park (20 821 km<sup>2</sup>), Amboseli National Park (329 km<sup>2</sup>), Meru National Park (870 km<sup>2</sup>), Samburu-Isiolo Reserve (504 km<sup>2</sup>), Kora Reserve (1500 km<sup>2</sup>), Masai Mara Reserve (1 510 km<sup>2</sup>), Marsabit Reserve (2 088 km<sup>2</sup>), Tana River Reserve (165 km<sup>2</sup>). All hunting of cheetah is completely banned. Exports of live cheetah stopped in the 1960's.

*Principal Threats:* Poaching, habitat loss, competition with agriculture and farming development.

#### 16. Libya (Not a party to CITES)

*Population:* Cheetahs may still live around Fezzan oasis, SE of the country<sup>71</sup>. Little information is available. Formerly found across the south of the country, but last seen in 1980, possibly still exist in the south west corner where the country borders Algeria, in the Tassili National Park<sup>19</sup>. Until 1969 still found sparsely throughout the country except for the south and southeast<sup>79</sup>.

*Principal Threats:* Unknown; lack of information, presumed lack of prey species and habitat loss.

#### 17. Mali (Not a party to CITES)

*Population:* Estimated to be 200 to 500<sup>62</sup>, believed to be much less than this currently<sup>71</sup>. Probably a small population still exists in the north west of the country bordering Mauritania and in the south part of Adghagh nquote Ifoga chain, where cheetah have been reported in late 1970's<sup>71</sup>. In 1990 skins were found for sale in Tibuta, north Mali<sup>46</sup>. There were a few cheetahs in Gurma National Park in the 1970's<sup>71</sup>.

*Principal Threats:* Decline of prey, poaching, environmental desiccation and reduction of habitat due to drought conditions.

## 18. Malawi

*Population:* Estimated at 50<sup>62</sup>. Absent in southern part of the country. A small population still exists in the western parks and a few individuals around Chiperi area south of Kasungu Park. Animals seen to be coming and going from Zambia into parks with very few resident individuals in Malawi parks. There have been sightings of individual cheetah in Nyika National Park (3 134 km<sup>2</sup>), Vwaza Marsh Game Reserve (986 km<sup>2</sup>), and Kasungu National Park (2 316 km<sup>2</sup>)<sup>27</sup>.

*Principal Threats:* Human population growth, loss of habitat and poaching.

## 19. Mauritania (not a party to CITES)

*Population:* Estimated at 100 to 500<sup>62</sup>. Possible small population and isolated individuals still exists in Aouker Plateau, Mauritania Adghagh, at the NE of Banc drquote Arguim National Park, in the northwest of the country (thought to be extinct due to the disappearance of their main prey, the Mhorr gazelle and decrease of dorcas gazelle) and Tidjika. No cheetahs exist in conservation areas<sup>71</sup>.

*Principal Threats:* Decline of prey, poaching, environmental desiccation and reduction of habitat.

*Taxonomy:* Northern Mauritania are *A.j. venaticus* and in the south, *A.j. hecki*.

## 20. Mozambique

*Population:* Estimated at 100<sup>62</sup>. Once widely distributed, now relic populations perhaps survive in parts of Gaza and Inhambane Provinces and south of the Zambezi River, and in the southern regions of Tete Province<sup>93</sup>. The Tete Region is believed to be absent of cheetah now<sup>82</sup>. The Gorongosa National Park (3 770 km<sup>2</sup>) had a small population of cheetah<sup>93</sup>.

*Principal Threats:* Poaching due to civil war situation, lack of enforced protection.

## 21. Namibia

*Population:* Estimated at 2 000-3 000 animals<sup>54, 61</sup>. Still widely spread throughout the country, although only small populations are found in the southern part of the country due to smallstock farming, jackal-proof fences and eradication of predators. Ninety-five percent of the population is on commercial farmlands to the north of the Tropic of Capricorn. Apart from farmlands, very small numbers of animals still occur in communal farming areas of Damaraland, Hereroland, Bushmanland, and Kaokoland. Individual animals are seen in Kavango and Caprivi. Only two conservation areas have populations of cheetah Etosha and the Namib/Naukluft, but only 1.4-4 % of the population lives in proclaimed conservation areas<sup>52, 61, 82</sup>. Possibly less than 100 animals live in the two conservation areas, Etosha National Park (22 270 km<sup>2</sup>) because high predator competition, and Namib/Naukluft National Park (49 768 km<sup>2</sup>), because of low prey density. Although protected game, cheetahs can be killed if livestock is threatened. In January 1992, at the CITES meeting a quota of 150 animals was given to Namibia for live export and trophy hunting<sup>16</sup>.

*Principal Threats:* Live capture and shooting by livestock farmers and game farmers. Cheetahs are easily trapped, in large numbers, on farms that have "cheetah play trees". The trapping is indiscriminate. These animals are then shot as there is little export market for live animals. The majority of the current world's captive population of cheetah has originated from Namibia<sup>53</sup>.

## 22. Niger

*Population:* Estimated at 50 to 406<sup>2</sup>. Still found in the Niger Sahel running from Mali to Chad with concentrations of 10 to 15 pairs in the L'Air Tenere Reserve in the northwest central park of the country. A few remain in the Termit Area. In Niger's Park W (the entire tri-country park is over 11 000 km<sup>2</sup> of which Niger's portion is about 2 200 km<sup>2</sup>) in the extreme south west of the country bordering Benin and Burkina Faso there are still cheetah<sup>25, 26, 64, 65</sup>. In a study between 1993 and 1995, 22 cheetah were seen in this park in eight sightings with an estimation of at least nine cheetahs living in the park<sup>86</sup>. Small populations of cheetahs have been recorded in Reserve Naturelle Nationale de L'Air et du Tenere (20 or 30 animals) (77 360 km<sup>2</sup>).

*Principal Threats:* Poaching, lack of prey species, conflict with livestock.

*Taxonomy:* *A.j. venaticus* in northern Niger and *A.j. hecki* in southern Niger.

## 23. Pakistan (Possibly extinct)

*Population:* Information collected suggests that there are no more cheetahs in northern Baluchistan from Quetta westward. This was thought to be the last area claiming cheetah in Pakistan<sup>2</sup>. Possibly some still exist in southwest Baluchistan on the Iranian border. It is very difficult for Pakistan officials to get information from these semi-autonomous areas. Specimens of hides were collected in the early 1970's<sup>1, 2, 8, 58</sup>. There is a current proposal to conduct a survey in Baluchistan and the Nushki desert region close to Iran for the potential occurrence of the cheetah<sup>67</sup>.

*Principal Threats:* Loss of habitat, competition with livestock and poaching.

#### 24. Senegal

*Population:* No current information. Possibly still a few animals in Parc National Du Niokolo-Koba (8 000 km<sup>2</sup>)<sup>26</sup>

*Principal Threats:* Lack of habitat.

#### 25. Somalia

*Population:* Only proof of existence is from cubs being sold by locals in the Kismajo area<sup>33</sup>. The situation for cheetah in the country is at a critical point. They have been on the decline since the 1970's, in the north the records are old and not current and in the south of the country the civil war has caused an impact on the species<sup>4</sup>. Estimated at 300<sup>62</sup>. A traveller reported seeing eight animals in one day's travel in the south of the country along the main road from Kenya, suggesting some numbers still occur in this region<sup>10</sup>. Formerly found throughout the entire country, reduced by half to two thirds as of 1975<sup>62</sup>. Previously found along the Ethiopian border in the north west and central areas of Somalia<sup>94</sup>. Live cheetahs and skins for sale in Djibouti market place and thought to come from Somalia<sup>81</sup>.

*Principal Threats:* Civil war, agriculture expansion caused reduction of prey, and poaching for skins and live trade. Due to Shifta bandits and civil war, enforcement is inadequate.

#### 26. South Africa

*Population:* Estimated at 500-800<sup>27, 52</sup>. Individuals occur sporadically in the northern parts of the Northern Cape Province. In the Kalahari Gemsbok National Park there is a small population of ca. 50 animals. A small population is found on the extensive commercial farmlands in North-west Province, Northern Province and Mpumalanga, to the southern border of the Kruger National Park and along the Zimbabwe and Botswana borders. They were exterminated in KwaZulu-Natal by the 1930's. Since 1965, 64 animals from Namibia were reintroduced to Hluhluwe-Umfolozi Park, 33 into Mkuzi Game Reserves, 18 into Eastern Shores, 13 into Itala, and 14 into Ndumu<sup>79, 77</sup> and more than 10 into Phinda Resource Reserve. Other reserves contain isolated groups too small to be considered as viable populations. The population in the Kruger National Park is ca. 250 animals. Many cheetahs are imported to South Africa from Namibia for zoos, parks and private facilities, as well as for trophy hunting in small camps. South Africa does have several successful captive breeding facilities<sup>51</sup>. Only two parks hold large enough populations: Kruger National Park (19 485 km<sup>2</sup>) and the Kalahari Gemsbok National Park (9 591 km<sup>2</sup>). The cheetah was taken off the South African endangered species list in 1989. Permits are issued to control problem animals through shooting and live capture. Trophy hunting is allowed, but there is no legal export of the trophy.

*Principal Threats:* Livestock farming, small populations in unconnected conservation areas, and the believed success of captive breeding programmes in South Africa, which has eliminated the need to put much effort into the conservation of the remaining wild populations.

#### 27. Sudan

*Population:* Recent reports indicate that cheetah are mainly distributed in southern Sudan<sup>31</sup>. Estimates of 1 200 animals, which could have declined by half by 1980<sup>62</sup>. Recent information in the north indicates that cheetah skins are used to make slippers and these are in great demand by rich Sudanese<sup>46, 76</sup>. Populations may still be present where adequate prey and livestock exist in semi-arid areas below the true desert in the central middle of the country<sup>76</sup>. Widely distributed throughout the south, as of 1982<sup>35</sup>. Recent information is lacking from the south of the country due to the long civil war. The population there could be greatly affected by the eight years of war. All wildlife has been severely affected by the availability of guns and ammunition<sup>76</sup>. Were very rare or non-existent in all parks and reserves<sup>62</sup>. Sightings of 10 animals in the southern reserve, Southern National Park<sup>b</sup> (23 000 km<sup>2</sup>), sightings also made in Boma National Park<sup>b</sup> (22 800 km<sup>2</sup>), Boro Game Reserve<sup>b</sup> (1 500 km<sup>2</sup>), Meshra Game Reserve<sup>b</sup> (4 500 km<sup>2</sup>), Badingile Game Reserve<sup>b</sup> (8 400 km<sup>2</sup>), Ashana Game Reserve (900 km<sup>2</sup>), Chelkou Game Reserve (5,500 km<sup>2</sup>), Kidepo Game Reserve (1 400 km<sup>2</sup>), Numatina Game Reserve (2 100 km<sup>2</sup>), and Shambe Game Reserve (620 km<sup>2</sup>)<sup>35</sup>. The cheetah has been a protected species since 1972. Effective 1 January 1989 Wildlife Conservation and National Park forces of Sudan issued a 3-year notice banning the hunting and capture of mammals, birds and reptiles in the Republic of Sudan.

*Principal Threats:* Poaching, loss of prey, indirect affects of the long civil war in the south of the country.

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<sup>b</sup> Proposed; not yet gazetted (1998)

## 28. Tanzania

*Population:* Estimated at 1 000, with a range of 500-1500<sup>62</sup>. Found in the grasslands of Masailand and a few localized areas of woodlands. Populations do exist in the Serengeti/Ngorongoro Conservation Area (25 000 km<sup>2</sup>), possibly as many as 500<sup>14,44</sup>, however, the population suffers due to competition with lions and hyenas. There have been sightings in Mikumi National Park (3 230 km<sup>2</sup>), Tarangire National Park (2 600 km<sup>2</sup>), Katavi National Park (2 250 km<sup>2</sup>), and Ruaha National Park (10 200 km<sup>2</sup>)<sup>15,27</sup>.

*Principal Threats:* Poaching, predation and competition with other large predators.

## 29. Uganda

*Population:* Estimated less than 200<sup>62</sup>. No current information available. Small numbers are thought to be found in the north east sector of the country and a few may still found in Kidepo National Park (1 400 km<sup>2</sup>)<sup>93</sup>.

*Principal Threats:* Poaching and loss of habitat.

## 30. Western Sahara (Possibly extinct) (Not a party to CITES)

*Population:* Presumed extinct. Last individual caught in 1976 and given to the zoo of Beni Abbes Scientific Research Centre<sup>71</sup>. A possible population may still live in the upper lands of East Tiris (south east of the country), a region of abundant vegetation<sup>71</sup>.

## 31. Zambia

*Population:* Although cheetah records are very scant, the species distribution in the last three decades is encouraging<sup>75</sup>. The species is uncommon in many areas, however, as of 1969 cheetahs were still widely distributed in various parts of the country, but in low densities<sup>5</sup>. Populations were concentrated in the flood plains and along dry river beds. It was thought that the majority of the suitable habitats would disappear by the 1980's<sup>5,62</sup>. Recently cheetah occur in relatively low numbers in Kufe National Park (22 400 km<sup>2</sup>), South Luangwa National Park and Sioma Ngwezi National Park. In Lower Zambezi National Park, one or two have been sighted by tour operators at Jeki plain since 1990<sup>75</sup>. Experimental re-introduction of three male cheetah into the Lower Zambezi took place in 1994<sup>75</sup>.

*Principal Threats:* Poaching, loss of habitat, and expanding human population.

## 32. Zimbabwe:

*Population:* Estimated at 500-1 000<sup>52,82,91</sup>. A 1991 Department of National Parks and Wildlife Management (DNPWLM) report estimated cheetah numbers using a computer model. This model predicted there were over 600 cheetah within the Parks and Wildlife Estates, nearly 200 in communal lands, 400 on alienated land and nearly 200 on other state land, resulting in a total of 1391 cheetah throughout Zimbabwe. These estimates should be treated with caution, however, as they are not based on actual data<sup>95</sup>. Farmers on private and commercial land in southern Zimbabwe have indicated an increase in the cheetah population and are concerned over the loss of valuable game and livestock to cheetah. According to a 1997 report from the Ministry of Environment and Tourism DNPWLM, the amount of commercial ranchland with permanently resident cheetah populations has more than doubled in the last decade, with an estimate of 5 000 animals. Cheetah are largely absent from the northeast part of the country. Two main populations are found in the southern commercial farming areas and in the northwest conservation areas. These two areas account for about 400 animals. The remainder of about 100 animals is distributed over the middle Zambezi Valley, the Midlands and Gonarezhou<sup>91</sup>. Over 50 % of the population occur on privately owned farmland<sup>95</sup>. Less than 200 animals are thought to be in the conservation areas including Hwange National Park (14 650 km<sup>2</sup>), Matetsi Safari Area (2 920 km<sup>2</sup>), Kazuma National Park (313 km<sup>2</sup>) and Zambezi National Park (564 km<sup>2</sup>). Occasional sightings are reported in Matobo National Park (432 km<sup>2</sup>) and 10-20 animals are in the National Park and Safari area around Lake Kariba Valley. Small numbers occur in the Mana Pools National Park (2 196 km<sup>2</sup>) and the lower Zambezi area, unknown number in the Gonarezhou National Park (5 053 km<sup>2</sup>)<sup>91</sup>. Cheetahs are on the sixth schedule of the Parks and Wildlife Act and are also specially protected, which means that it is illegal to kill a cheetah under any circumstance without a Section 37 permit. This includes trophy hunting a cheetah, killing one as a problem animal or live capture. The Government opened trophy hunting on the cheetah in 1990, which is monitored by "hunting returns". Quotas set at the January 1992 CITES meeting allows for the export of 50 animals<sup>16</sup>.

*Principal Threats:* Conflict with farmers and livestock and illegal killing of cheetah.

## CONCLUSION

During the past 25 years, the world's cheetah population has declined by over 50 %, from ca. 30 000 animals, to less than 15 000, whereas the human population has doubled during this time. The majority of the remaining cheetah populations are found outside protected reserves and are increasingly in conflict with humans. This is due to conflict experienced with lions and hyenas, by cheetahs in game reserves. As human populations increase, the reduction of prey species available to cheetah and the loss of habitat are the biggest threats facing the cheetah today. Another major problem facing the species is its lack of success in captivity, as the captive population is not self-sustaining but maintained by the wild population of cheetah, which is under increasing pressure.

In order for the cheetah to survive into the 21<sup>st</sup> century, some simple and yet economically hard decisions will have to be made. The survival of the cheetah depends on the ability of range countries discussed in this paper to develop a Global Master Plan for the cheetah in its remaining ranges of Africa. A Global Master Plan will hopefully be developed with the assistance of the IUCN SSC's Conservation and Breeding Strategy Group (CBSG) during the next year.

Having been revered by humans for over 5 000 years, the cheetah is now facing extinction caused by human factors. In order to ensure this species' survival, we have to look critically at the political, social and economic issues facing wildlife conservation in Africa today. Countries like Namibia, Botswana and Zimbabwe, which have key remaining populations, urgently need to set the example with integrated conservation management programs to ensure the survival of the cheetah.

## REFERENCES

1. Ahmad, A. 1990. (personal communication) Wildlife Management Specialist, Pakistan Forest Institute, Peshawar - 25130, Pakistan.
2. Ahmad, M.F. 1990. (personal communication) Director, Zoological Survey Department, Government of Pakistan, Block No. 61, Pakistan, Secretariat, Shahrah-e-Iraq, Karachi-I, Pakistan.
3. Amer, M.H. 1990. (personal communication) Under Secretary of the States for Zoos and Wildlife Services, Giza Zoo, Cairo, Egypt.
4. Amir, O.G. 1996. (personal communication) Institute of Biogeography, Centre for Environmental Research, University of Saarland, D-66041, Saarbrücken, Germany.
5. Ansell, W.F.H. 1978. *Mammals of Zambia*. Chilanga: National Parks and Wildlife Service
6. Ansell, W.F.H. 1995. (personal communication)
7. Asadi, H. 1998. (personal communication) University of Mainz, Department of Environment of Iran c/o Peter Jackson, Route des Macharettes, 1172 Bougy, Switzerland.
8. Auffenburg, W. 1990. (personal communication) Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA
9. Blom, I.A. 1995. (personal communication) World Wildlife Fund, Inc. Central African Republic B.P. 1053, Bangui, CAR.
10. Burling, K. 1991. (personal communication) The Namibian Newspaper, Windhoek 9000, Namibia.
11. Bulger, J. 1990. (personal communication) Division of Environmental Studies, University of Davis, Davis, CA 95616, USA
12. Burney, D.A. 1980. The effects of human activities on cheetah (*Acinonyx jubatus*, Schreber) in the Mara region of Kenya. MSc thesis, University of Nairobi, Nairobi
13. Cambell, K. & Borner, M. 1988. Cited In: Jackson, P. (ed.) *Cat News* 8. Gland, Switzerland. IUCN Publications
14. Caro, T. 1994. *Cheetahs of the Serengeti Plains, Group Living of an Asocial Species*. Chicago: University of Chicago Press
15. Caro, T. 1989. (personal communication) Wildlife and Fisheries Department, University of California at Davis, Davis, CA, USA.
16. CITES. 1992. Quotas for trade in specimens of cheetah. Eighth meeting of the convention of International Trade in Endangered Species of Wild Fauna and Flora. Document 8.22 (rev.):1-5.
17. Denisor, I. 1990. (personal communication) Zoological Director, Zoo Riga, Meza Ave. 1, Riga, 26014, Latvia
18. Divyabhanusinh. 1984. The origin, range and status of the Asiatic (or Indian) cheetah or hunting leopard (*Acinonyx jubatus venaticus*). Unpublished Report

19. de Smet, K. 1990. (personal communication) Delftstraat, 4, 2140 Borgerhout, Belgium
20. Farri, R.I. 1990. (personal communication) Nigerian Conservation Foundation, Plot 5, Moseley Road, P.O. Box 74638, Victoria Island, Lagos, Nigeria
21. Firooz, S. 1974. Environment and nature conservation in Iran. *Environmental Conservation* 3: 33-42
22. Flint, V. 1990. (personal communication) Head of Department, All Union Research Institute of Nature Conservation and Reserves, Lomonosovskii, Prospekt 14, Apt. 492, Moscow 117296, Russia
23. Frame, G.W. 1992. (personal communication) C/o African Wildlife Husbandry Development Association, 01 B.P. 5570, Ouagadougou 01, Burkina Faso.
24. Giegengak, B. 1991. (personal communication) Department of Geology, University of Pennsylvania, Philadelphia, PA 19104, USA
25. Grettenberger, J. 1987. W National Park in Niger - a case for urgent assistance. *Oryx* 18: 230-236
26. Grettenberger, J. 1990. (personal communication). United States Fish and Wildlife Service, Rock Island Field Station, 1830 Second Ave, Rock Island, IL 52803, USA
27. Gross, P. 1989, 1990, 1991. (personal communication). Wildlife and Fisheries Department, University of California at Davis, Davis, CA 95616, USA
28. Greulick, H. 1990. (personal communication). D-4005 Meerbusch-3, Am Oberen Feld5, Germany
29. Guggisberg, C.A.W. 1975. *Wild Cats of the World*. New York: Taplinger Publ Co. pp 266-289
30. Hamilton, P.H. 1986. Status of the cheetah in Kenya, with reference to sub-Saharan Africa. In: Miller, S.D. & Everett, D.D. (Eds.) *Cats of the World: Biology, Conservation, and Management*. Washington, DC: National Wildlife Federation
31. Hashim, I.M. 1995. (personal communication). Wildlife Research Centre, P.O. Box 30, Khartoum North, Sudan.
32. Heeney, J.F., Evermann, J.F., McKeirnan, A.J., Marker-Kraus, L., Roelke, M.E., Bush, M., Wildt, D.E., Meltzer, D.G.A, Colly, L., Lucas, J., Manton, V.J., Caro, T. & O'Brien, S.J. 1990. Prevalence and implications of coronavirus infections of captive and free-ranging cheetahs (*Acinonyx jubatus*). *Journal of Virology* 64: 1964-1972
33. Heckel, J-O. 1996. (personal communication) Veterinarian, Zoological Society for Conservation of Species and Populations, Kissinger Strasse 54B, D-70372, Stuttgart, Germany
34. Heptner, V.G. & Sludskii, A.A. 1972. *Mammals of the Soviet Union*, Vol II, (2), Carnivores. Higher School, Moscow (translated by Hoffman) pp 901-942
35. Hillman, J. 1982. *Wildlife Information Booklet*, Dept of Wildlife Management, Democratic Republic of the Sudan, Ministry of Wildlife Conservation and Tourism, Southern Region, Sudan
36. Hoogstraal, H. *et al.* 1968. The cheetah, *Acinonyx jubatus*, Schreber, in Egypt. *Bulletin of the Zoological Society of Egypt* 21: 63-68
37. Joslin, P. 1989. (personal communication). 16219 17th Place West, Edmonds, Washington, 98020, USA
38. Junge, R.E., Miller, R.E., Boever, W.J., Scherba, G. & Sundberg, J.R.E. 1991. Persistent cutaneous ulcers associated with feline herpesvirus type 1 infection in a cheetah. *Journal of the American Veterinary Medical Association* 198: 1057-1058
39. Karami, M. 1990. (personal communication). Assistant Professor of Wildlife Ecology, University of Tehran, home address, P.O. Box 31585-188, Karaji, Iran
40. Kelly, T. 1995, 1996. (personal communication). MSF Holland, P.O. Box 34357, Addis Ababa, Ethiopia
41. Kingdon, J. 1977. Cheetah (*Acinonyx jubatus*). *East African Mammals*, Vol. 3A. New York: Academic Press. pp 396-413
42. Kraus, D. & Marker-Kraus, L. 1992. Current Status of the cheetah (*Acinonyx jubatus*). In: Marker-Kraus, L. (ed.). *1991 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
43. Knystautas, A. 1977. *The Natural History of the USSR*. London: Century
44. Laurenson, K. 1991. Cheetahs never win. *BBC Wildlife Magazine*, Feb: 99-105
45. Lawson, D. 1991. (personal communication). Department of Wildlife and National Parks, P.O. Box 131, Gaborone, Botswana
46. Mackie, A. 1991. (personal communication). USAID, 963 N. Rochester St., Arlington, VA 22205-1524 USA



47. Malka, R. 1989. (personal communication). Director, Hai-Bar The Biblical Wildlife Reserve, POB 667, Eilat 8800, Israel
48. Marker, L.L. & O'Brien, S.J. 1989. Captive breeding of the cheetah (*Acinonyx jubatus*) in North American Zoos (1871-1986). *Zoo Biology* 8: 3-16
49. Marker, L. 1998. *1996 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
50. Marker, L. 1997. *1994/1995 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
51. Marker, L. 1998. The role of Southern African zoos in the survival of the cheetah. *In: Marker, L. (ed). 1996 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
52. Marker-Kraus, L. & Kraus, D. 1990. Investigative trip to Zimbabwe and Namibia. Jackson, P. (ed.) *Cat News* 12 (1): 16-17. Gland, Switzerland: IUCN Publications
53. Marker-Kraus, L., Kraus, D., Carpenter, M. 1993. The cheetah in Botswana: An overview. *In: Marker-Kraus, L. (ed) 1992 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
54. Marker-Kraus, L., Kraus, D., Barnett, D., Hurlbut, S. 1996. *Survival of cheetah on Namibian Farmlands*. Windhoek: Cheetah Conservation Fund Publication
55. Marker-Kraus, L. 1997. History of the cheetah (*Acinonyx jubatus*) in zoos 1829-1994. *International Zoo Yearbook* 35: 27-43
56. Marker-Kraus, L. 1998. Morphological abnormalities reported in Namibian cheetahs (*Acinonyx jubatus*). *In: Marker, L. (ed) 1996 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
57. Mendelsohn, H. 1989. (personal communication). Tel-Aviv University, Department of Zoology, Ramat-Aviv 69976, Tel-Aviv, Israel
58. Mian, A. 1990. (personal communication). Institute of Biology, B Z University, Multan, Pakistan.
59. Mills, G. 1991. (personal communication). Kruger National Park, P.O. Box 125, Skukuza 1350, South Africa
60. Ministry of Environment and Tourism, Department of National Parks and Wildlife Management, Zimbabwe. 1997. *Leopard and Cheetah Management in Zimbabwe*. Brochure.
61. Morsbach, D. 1987. Cheetahs in Namibia. *In: Jackson, P. (ed.) Cat News* 6: 15-26. Gland, Switzerland: IUCN Publications
62. Myers, N. 1975. The cheetah, *Acinonyx jubatus*, in Africa. *IUCN Monograph* 4. Morges, Switzerland, International Union for Nature and Natural Resources.
63. Myers, N. 1986. Conservation of Africa's cats: Problems and opportunities. *In: Miller, S.D. & Everett, D.D. (eds.) Cats of the World: Biology, Conservation, and Management*. Washington, DC: National Wildlife Federation
64. Newby, J. 1990. (personal communication). WWF/IUCN, Gland, Switzerland.
65. Newby, J. & Grettenberger, J. 1986. The human dimension in natural resource conservation in a Sahelian example from Niger. *Environmental Conservation* 13: 249-256
66. Nowell, K. 1996. *Namibian Cheetah Conservation Strategy, Review Draft*. Ministry of Environment and Tourism, Namibia
67. Nowell, K. & Jackson, P. 1996. *Wild Cats*. Cambridge: Burlington Press
68. O'Brien S.J., Wildt, D.E., Goldman, D., Merrill, C.R. & Bush, M. 1983. The cheetah is depauperate in genetic variation. *Science, NY* 221 (4609): 459-62
69. O'Brien, S.J., Roelke, M.E., Marker, L., Newman, A., Winkler, C.A., Meltzer, D., Evermann, J.F., Bush, M. & Wildt, D.E. 1985. Genetic basis for species vulnerability in the cheetah (*Acinonyx jubatus*). *Science, NY* 227 (4693): 1428-34
70. O'Brien, S.J., Wildt, D.E., Bush, M., Caro, T., Fitzgibbon, C. & Leakey, R. 1987. East African cheetahs: Evidence for two population bottlenecks? *Proceedings of the National Academy of Sciences of the USA* 84: 508-511
71. O'Mopsan, L.K. 1998. The status of the cheetah - an update. *In: Marker, L. (ed) 1996 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
72. O'Mopsan, L.K. 1998. The cheetah in Algeria. *In: Marker, L. (ed) 1996 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
73. Ognev, S.I. 1935. *Mammals of USSR and adjacent countries. Carnivora*, Vol 3. Jerusalem: Israel Program for Scientific Translations (1962).

74. Osborn, D.J. & Helmy, I. 1980. The contemporary land mammals of Egypt (including Sinai). *Fieldiana, Zoology* 5: 455-459. Chicago: Field Museum of Natural History
75. Phiri, C. 1995. (personal communication). National Parks and Wildlife Service, Private Bag 1, Chilanga, Zambia.
76. Plowes, D. 1991. (personal communication) 963 N. Rochester St., Arlington, VA 22205-1524, USA
77. Rowe-Rowe, D.T. 1992. *Carnivores of Natal*. Pietermaritzburg: Natal Parks Board
78. Saleh, M. 1997. Conservation of the Cheetah. *Egypt's National Report*, an IUCN Report. Egyptian IUCN National Commission, Project No. 7519E/DDA/ASR/Africa Program.
79. Skinner, J.D. & Smithers, R.H.N. 1990. *Mammals of the Southern African Subregion*. Pretoria: University of Pretoria. pp 393-97
80. Smithers, R.H.N. 1975. Family Felidae, 8.1: 1-10, *In: Meester, J. & Setzer, H.W.* (eds) *Mammals of Africa: an Identification Manual*. Washington, DC: Smithsonian Press
81. Sol, H. 1990. (personal communication). 6 E. impasse Bellevue, 06400 Cannes, France
82. Stuart, C. & Wilson, V. 1988. *The cats of Southern Africa*. IUCN Cat Specialist Group, African Carnivore Survey, Chipangali Wildlife Trust, Bulawayo
83. Shaymardanov, R.T. 1990. (personal communication). Zoology Institute of the Kazakh SS Academy of Sciences, 480032, Alma-Ata, Kazakhstan
84. Spitsan, V. 1990. (personal communication). Director Moscow Zoo, 123820 Moscow, B. Gruzins Kava, Russia
85. Stephenson, D. & Stephenson, A. 1991 (personal communication). P.O. Box 11199, Windhoek 9000, Namibia.
86. Van Syckle, S. 1996. The cheetah in W National Park, Niger, West Africa. *In: Marker-Kraus, L.* (ed) *1994/1995 International Cheetah Studbook*. Washington, DC: NOAHS Centre, National Zoological Park, Smithsonian Institution
87. Watkins, V. 1990. (personal communication). Regional Director of the Eastern Hemisphere, 106 Jermyn St., London, SW1Y 6EE, United Kingdom
88. Wayne, R.K., Modi, W.S. & O'Brien, S.J. 1986. Morphological variability and asymmetry in the cheetah (*Acinonyx jubatus*), a genetically uniform species. *Evolution* 40: 78-85
89. Wildt, D.E., Bush, M., Howard, J.G., O'Brien, S. & Meltzer, D.G.A. 1983. Unique seminal quality in the South African cheetah and a comparative evaluation in the domestic cat. *Biology of Reproduction* 29: 1019-1025
90. Wildt, D.E., O'Brien, S.J., Howard, J.G., Caro, T., Roelke, M.E., Brown, J.L. & Bush, M. 1987. Similarity in ejaculate-endocrine characteristics in captive versus free-ranging cheetahs of two subspecies. *Biology of Reproduction* 36: 351-360
91. Wilson, V.J. 1988. Cheetah in Zimbabwe. *In: Jackson, P.* (ed) *Cat News* 8: 9. Gland, Switzerland: IUCN Publications
92. Wilson, V.J. 1987. *Distribution and status of cheetah in Zimbabwe*. Unpublished report, National Parks Advisory Board, Zimbabwe.
93. Wrogemann, N. 1975. *Cheetah Under the Sun*. Johannesburg: McGraw-Hill
94. Yalden, D.W., Largon, M.J. & Kock, D. 1980. Catalog of Ethiopia Mammals, Carnivora. *Italian Journal of Zoology* 8: 207-209
95. Zank, C. 1995. *Population viability analysis for cheetah (Acinonyx jubatus) in Matusadona National Park, Zimbabwe*. Thesis, Department of Biological Sciences, University of Zimbabwe.