Global Cheetah Conservation Action Plan
Introduction and Overview

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The cheetah (*Acinonyx jubatus*) is listed as Vulnerable on the IUCN Red Data List (Hilton-Taylor, 2000) and as an Appendix I species by the Convention on International Trade in Endangered Species (CITES 1992). Historically, cheetah ranged widely throughout Africa and Asia, from the Cape of Good Hope to the Mediterranean, throughout the Arabian Peninsula and the Middle East, from Israel, India and Pakistan through the southern provinces of Russia and the former Commonwealth of Independent States. Today, free-ranging cheetah inhabit a broad section of Africa including areas of North Africa, the Sahel, eastern and southern Africa. Over the past 50 years, cheetah have become extinct in at least 13 countries (Marker, 1999). The two remaining strongholds are in Kenya and Tanzania in East Africa and Namibia and Botswana in southern Africa.

Although the species faces different problems in different parts of its range, the main causes of decline are human-cheetah conflict and interspecific competition. As humans turn more and more land into farmland for livestock production, the cheetah's habitat has become fragmented. Additionally, in some countries cheetah are indiscriminately killed as possible livestock predators. Low genetic diversity further makes cheetah more susceptible to ecological and environmental changes, as well as more vulnerable to disease. There has not been a comprehensive census of cheetah since 1975, when it was estimated that there were from 7,000 to 23,000 animals in 25 countries (Myers, 1975). Today, it is believed that fewer than 15,000 cheetah remain. The number of viable populations, now unknown, may be as important as the number of animals in the wild in determining cheetah survival long-term. It is clear, however, that their continued survival will be enhanced by the coordinated, combined efforts of all stakeholders in a comprehensive conservation action plan.

To address these and other issues, a Global Cheetah Conservation Action Plan workshop was held in South Africa from 27-30 August 2001. Organized by the American Zoo and Aquarium Association's (AZA) Cheetah Species Survival Plan (SSP), the Conservation Breeding Specialist Group (CBSG) of the IUCN's Species Survival Commission and a regional network CBSG South Africa, this workshop represented the largest-ever gathering of experts in cheetah conservation. The goal of the workshop was to honour and unite the work that already has been carried out in the wild and in zoological institutions and to develop a conservation action plan that links these initiatives, enhancing collaboration and providing for the long-term survival of cheetah in the wild. Fifty-three delegates from 10 countries, namely Kenya, Zimbabwe, Namibia, South Africa, Tanzania, the United Arab Emirates, Australia, the United Kingdom, the Netherlands, and the United States attended the workshop (Appendix I). The workshop was generously sponsored by the AZA Cheetah SSP, Birmingham Zoo, Columbus Zoo, CBSG South Africa, De Wildt Cheetah Centre, Endangered Wildlife Trust and the Wildlife Breeding Resource Centre, Fort Worth Zoo, Fossil Rim Wildlife Centre, Kirkpatrick Foundation/ Oklahoma City, Milwaukee County Zoo, Oakhill Centre for Endangered Cats, Oklahoma City Zoo, Saint Louis Zoo, White Oak Conservation Centre / Cheetah

Conservation Fund and the Zoological Society of San Diego. The meeting was facilitated by the CBSG.

At the beginning of the first day, participants introduced themselves and stated their goals for the workshop (Appendix II). The morning's activities were comprised of presentations concerning the status of and threats to the cheetah globally as well as in individual range countries represented at the workshop. Additional overview presentations concerning disease, the demography of the captive population, reproductive biology as well as the goals of the workshop set the stage for the following 2.5 days of activities.

SUMMARY OF RANGE COUNTRY OVERVIEW PRESENTATIONS

The Global Cheetah Population (Laurie Marker)

The status of the cheetah (*Acinonyx jubatus*) varies widely throughout its range with perhaps 32 countries where cheetah are often found (Marker, 1998). 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 (Nowell & Jackson, 1996; Breitenmoser & Breitenmoser-Würsten, 2001). An estimate of the total number of cheetah is less than 15,000, based on a literature review and mail questionnaire surveys (Kraus & Marker-Kraus, 1991; Marker-Kraus and Kraus, 1996; Marker, 1998). These data have been used as the source for the IUCN Cat Specialist group *Wild Cats* (Nowell & Jackson, 1996).

The wild cheetah is nearly extinct in Asia, with approximately 100 surviving in small-pocketed areas through Iran (Nowell & Jackson, 1996; Marker, 1998; UNDP, 2001). Free-ranging cheetah inhabit a broad section of Africa including areas of North Africa, the Sahel, eastern, and southern Africa (Kraus & Marker-Kraus; 1991, Nowell & Jackson 1996; Marker, 1998). Two strongholds remain for the cheetah, Kenya and Tanzania in East Africa and Namibia and Botswana in southern Africa (Kraus & Marker-Kraus, 1991; Nowell & Jackson, 1996; Marker, 1998). In East Africa, 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 (Burney, 1980; Hamilton, 1986). In southern Africa, cheetah are killed regularly in farming areas due to livestock predation and the attitudes of the farmers (Morsbach, 1987; Wilson, 1987; Stuart & Wilson, 1988; Lawson, 1991; Marker-Kraus et al,. 1993; Marker-Kraus et al., 1996; Marker & Schumann, 1998). Over the past few years there is an indication that cheetah populations have increased in Zimbabwe and South Africa as has conflict with livestock and game farmers (A. Van Dyke, 1999; pers. comm., N. Purchase, 2000 pers. comm.).

There has been limited information from North or West Africa and the cheetah's future in these areas is questionable (Marker, 1998; Breitenmoser & Breitenmoser-Würsten, 2001). As part of an IUCN Biodiversity Project, status surveys have been carried out in Algeria, Egypt, Libya, Morocco and Tunisia (Jackson, 2001). Cheetah populations were reported in southern Algeria (O'Mopsan, 1998; Jackson, 2001); in Egypt, cheetah were reported near the Libyan border, but surveys found no evidence in other parts of former range (Saleh, 1997;

Jackson, 2001). Cheetah have been reported in the tri-country W park in Niger, Burkina Faso, and Benin (Van Syckle, 1996).

Cheetah continue to survive in small, pocketed groups in isolated areas throughout the Sahel, with a low estimate of 9,000 animals and an optimistic estimate of 12,000 animals (Marker-Kraus et al. 1996; Nowell & Jackson, 1996; Marker, 1998). More important than the individual numbers of animals may be the numbers of viable populations still existing. Viable populations may be found in only half or less of the countries where cheetah still exist (Marker, 1998).

Over the past 30 years, the cheetah has suffered a devastating decline of available habitat and prey, throughout its range, both of which are necessary for its survival. As reported throughout Africa, cheetah are not doing well in protected wildlife reserves because of to increased competition from other, larger predators such as lion and hyenas (Laurenson, 1991; Morsbach, 1987; Mills pers. comm. 1991, 2001; Caro, 1994; Marker-Kraus et al., 1996; Nowell & Jackson, 1996). Therefore, a large percentage of the remaining, free-ranging cheetah populations are outside of protected reserves or conservation areas (Marker, 1998). The cheetah generally has been considered to inhabit open country and grasslands. More recently, cheetah have been reported to use a wide variety of habitats and are often reported in dense vegetation e.g. Kora Reserve in Kenya, Botswana's Okavango Delta, Serengeti woodlands, and Namibian farmlands (Caro, 1994; Marker-Kraus et al., 1996).

The ability of the cheetah to adapt to a changing ecological system has been brought about primarily by conversion of its preferred habitat to farmland and is perhaps the critical question in estimating the population's survivability in Africa (Myers, 1975). In several studies during the past 25 years, the cheetah was reported to suffer a decrease in numbers as land was developed and suitable habitat converted to agriculture (Wrogemann, 1975; Hamilton, 1986; Myers, 1975; Cambell & Borner, 1988; Wilson, 1988; Morsbach, 1987; Marker-Kraus & Kraus, 1990; Marker-Kraus et al., 1996; Nowell & Jackson, 1996).

Controlling factors determining cheetah survival include small populations, restricted habitats with a limited prey base, conflict with nomadic herders and wars that have supplied guns and ammunition to the populace, which then poach all forms of wildlife for food and profit, poaching for pelts, and conflict with commercial livestock farmers and game farmers (Marker, 1998; Jackson, 2001).

Priorities from the Cat Specialist Group meeting in August 2001 (Breitenmoser & Breitenmoser-Würsten, 2001) include encouraging support for:
- a survey in North Africa, populations critically endangered due to fragmented populations
- a survey in Iran and the development of a conservation action plan
- development of regional programs (S Africa, C Africa, N Africa)
- a pan-African survey to refine population estimates and threats

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- conservation outside protected areas
- conservation efforts to reduce livestock conflict
- a census program in countries where cheetah trophy hunting is conducted
- an increased need to develop prey base management throughout the cheetah range
- a tourism education program in parks to reduce stress (e.g. Kenya)
- the increased cooperation regarding international captive population management
- a global master plan

South Africa (Gus Mills)

In South Africa, cheetah numbers are:
Kruger National Park: 175-200 (Bowland, 1993)
Kalahari Gemsbok National Park: +80 (Knight-Eloff, 1999)
Kgalagadi Transfrontier National Park: +150 (Funston, 2001)
KwaZulu Natal: +30 in Hluhluwe Umfolozi National Park, Phinda and Magudu District (D. Balfour and M. Somers, pers. comm.)
North West Province: +50 in and around Pilanesberg and Madikwe Game Reserves. Cheetah are reported to have become an increasing "problem" over the last 10 years in the Molopo District on the Botswana border (G. van Dyk, pers. comm.).
Northern Province: occurs widely throughout in about 15 small provincial and private reserves of approximately 30,000 to 50,000 ha as well as in game farming areas where they are said to be undergoing a dramatic increase. This is probably as the result of rapid expansion of game farms, many of which are overstocked, often with unsuitable game species and a lack of large carnivores (D. Cilliers, pers. comm.). A population study is being conducted in the Thabazimbi District by Kelly Wilson, University of Pretoria.
Mpumalanga: +10 in Mthethamusha Game Reserve and vagrants from Kruger National Park (K. de Wet, pers. comm.)
Northern Cape: +10 in Tswalu Desert Reserve and vagrants from Botswana (J. Koen, pers. comm.)
Eastern Cape: +10 in Shamwari Game Reserve

In South Africa, there is a National Cheetah Management Programme (NCMP) that involves a wide range of stakeholders representing official nature conservation organisations, the commercial farming community, NGOs and captive breeders. There is a national policy for the utilization of free-ranging cheetah in South Africa. Cheetah can be controlled or reduced on issue of a permit by the relevant conservation authorities. This permit can only be issued after the provincial authority is convinced by means of inspection by field officers that a specific problem exists. In an attempt to redress the problem of cheetah being illegally killed, game farmers are being encouraged to catch what they perceive as problem cheetah so that they can be translocated. Farmers receive R5,000 for a cheetah, which is then held in captivity until such time when a suitable area for reintroduction is found and then the cheetah is sold to the landowner for R10,000.

There are two basic approaches to managing free-ranging cheetah in confined areas:

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1. The extensive management approach, which works only in excessively large areas, entails keeping cheetah under conditions that are as natural as possible within the ecological constraints of the fenced property. The principle that applies is that minimal or no manipulation is allowed of prey populations.   The cheetah population is only manipulated once the maximum number that can be sustained under the prevailing biological conditions and social parameters is obtained.

2. The semi-intensive management approach entails keeping cheetah under conditions that are not as natural as the extensive management approach. Cheetah are not kept in small camps, but are allowed to roam freely, hunt their own prey, interact socially, occupy an area similar to the natural home range of cheetah and are not fed at all. The prey species populations are manipulated (supplemented) to provide adequate numbers of preferred prey species for the cheetah to prey on, but not more often than once every 2 years. The cheetah population is only manipulated once the maximum number that can be sustained under the prevailing biological conditions and social parameters is attained.
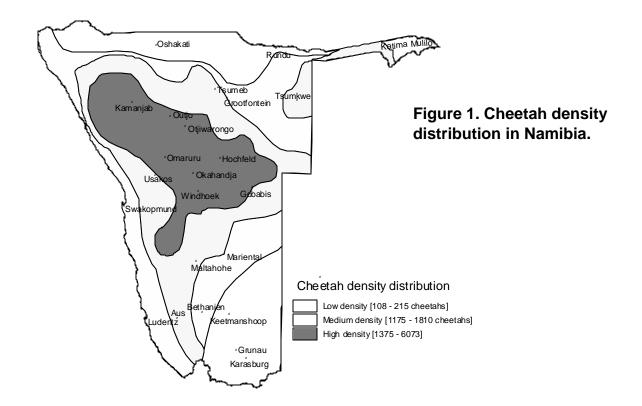

Namibia (P. Stander)

Namibian managers maintain that numbers are important and that accurate population estimates of cheetah are essential for conservation. For example, the frequently quoted statistic of between 2500 to 3000 adult cheetah in Namibia is unsubstantiated. This leads to misconception and perhaps misguided conservation direction. For serious cheetah conservation, many assumptions need to be questioned, and managers must be prepared to go back to the drawing boards to collect sound baseline data. Cheetah are incredibly difficult to count. New methods need to be developed to address this baseline need.

In an attempt to measure cheetah distribution and density in Namibia, the Large Carnivore Atlas Programme was initiated in 1999 based on questionnaire data. In a preliminary analysis, population density estimates for cheetah have been calculated using harmonic mean contouring on a GIS programme, with density estimates based on intensive studies in Etosha National Park, Kaudom Game Reserve, Nyae Nyae Conservancy, Otjiwarongo District and the Kunene Region. Based on the best available estimates, cheetah numbers range from 2,659 to 8,099. Density estimates in low, medium and high density areas in Namibia are presented in Table 1 and in Figure 1.

Table 1. Cheetah density estimates in low, medium and high density areas in Namibia.

Density	Area (km^2)	Density (100 km^2)		Estimated Numbers	
		Minimum	**Maximum**	**Minimum**	**Maximum**
Low	215,473	0.05	0.10	108	215
Medium	235,089	0.50	0.77	1,175	1,810
High	178,629	0.77	3.40	1,375	6,073

Oshakati

Rundu

Katima Mulilo

Tsumeb

Grootfontein

Tsumkwe

Kamanjab

Outjo

Figure 1. Cheetah density distribution in Namibia.

Otjiwarongo

Omaruru Hochfeld

Usakos Okahandja

Windhoek Gobabis

Swakopmund

Mariental

Maltahohe

Cheetah density distribution

Low density [108 - 215 cheetahs]

Medium density [1175 - 1810 cheetahs]

High density [1375 - 6073]

Bethanien

Aus
Luderitz Keetmanshoop

Grunau
Karasburg

Zimbabwe (Bruce Davison)

The number of cheetah in Zimbabwe has never been known with any accuracy, but it has been low enough to qualify as a Specially Protected Species that may not be killed, handled or traded without government permission. Some utilization is allowed through sport hunting, and there is a CITES quota of 50 export tags per year for cheetah trophies. In 1998, the Department of National Parks and Wildlife Management reviewed its cheetah conservation and management through a process of: (1) collating all data on cheetah population trends and status in Zimbabwe, (2) identifying all the issues relating to cheetah through a stakeholders' workshop, (3) producing a cheetah conservation and management plan and (4) implementing that plan.

Today, the Department of National Parks and Wildlife Management estimates that there are 1,500 cheetah in the three main land use areas in Zimbabwe, with only about 300 animals in National Parks. Most cheetah occur on commercial farmlands, where they have been increasing until the recent farm invasions. Average data quality allows an estimate of approximately 1,200 animals, with poor or no data from communal farmlands, where few

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animals are thought to exist because there have been very few reports of problem cheetah from those areas.

Complex interactions affect cheetah conservation and interactions in Zimbabwe, with all issues resting on the land use in existence where cheetah occur, which is mainly in State and private wildlife reserves as well as commercial and communal farmlands. The ecological, biological, research and informational issues primarily relate to the lack of adequate knowledge of cheetah population numbers and trends, what affects these, the number of cheetah needed for a viable population and the nature of human-cheetah interactions.

The stakeholders' meeting identified a seven-point action plan to address the problems affecting their cheetah populations, including strategies to deal with communication, research and monitoring needs, improving the permitting system, producing a cheetah management plan and establishing a formal Cheetah Working Group.

Kenya (M. Mulama /E. Wambwa)

Approximately 7% of Kenya's total land area is comprised of parks and reserves. Within Protected Areas (PAs), numbers remained relatively stable from 1970 through 1990, with no change in Nairobi National Park and an increase in Masai Mara National Reserve (Paule Gros, 1990). In 1990, an estimated 793 cheetah sightings were made in 23 PAs; of these, 55% were in Tsavo East and West National Park. Today, the national status is not well understood, however, it is believed that there are approximately 1,000 cheetah in Kenya. Threats to cheetah in Kenya include disease, tourist pressure, predation, conflict with pastoralists and habitat loss. Habitat loss has been more or less in proportion to the 7.5% annual increase in the human population. Current conservation initiatives include national surveys to identify population numbers, basic demographic trends and threats. The national survey will focus on Masai Mara, Amboseli, the Samburu Shaba complex, Tsavo and Nakuru-Naivasha and the surrounding areas. More intensive research on cheetah populations has been initiated in the Masai Mara National Reserve. This work will focus, in the long term, on identifying key determinants of recruitment and their change in time, ecological parameters in conflict and their mitigation, emerging threats from disease and epidemiological characteristics, management interventions and their impact, as well as stakeholder participation in cheetah conservation.

Tanzania (S. Durant)

In Tanzania, there has been very little progress in refining and updating estimate of cheetah numbers since Myers' survey in the early 1970s. However, considering that there was no long-term study in the Serengeti at the time, Myers' estimate for Serengeti and the Ngorongoro Crater was surprisingly accurate - 300 cheetah total, only slightly higher than the estimate of 200-250 cheetah in the Serengeti ecosystem (Caro and Durant 1992). There currently are no data that can be used to refine the estimates given for other areas.

It is highly likely that the increase in human population density around Arusha has probably all but wiped out the 50 cheetah that were estimated to remain in this area in the 1970s. Further, Maasailand, which covers much of northern Tanzania, is steadily losing land to cultivation. Increasing human densities are forcing Maasai in some areas to turn to cultivation, and hence take land away from cheetah habitat, whilst others are losing or selling their land to outside cultivators. Of particular importance are the wetland areas, or mbugas, as they are known in Swahili, which are disappearing first. These are havens for the prey of cheetah, and it has been suggested that cheetah may be particularly dependent on these areas. The estimate for cheetah in Miombo was approximately 500 animals. We know very little about cheetah in this habitat, however what seems to be a relatively high estimate is merely a reflection of the vast, relatively untouched, expanse of this region across central and southern Tanzania. Cheetah are likely to be at very low densities throughout.

Currently, the main threats cheetah face in Tanzania are similar to those of endangered species everywhere: habitat degradation and loss. Persecution currently is minimal, as there are few large-scale western ranches, and traditional pastoralists are largely tolerant of cheetah. In fact, Tanzania has a particular value for cheetah conservation for several reasons. It has a relatively low human population density, and much of it is as yet unfarmed. Large amounts of land are used for traditional pastoralism and many cheetah coexist with traditional pastoralists on this land. Because of the traditional use of bomas to guard livestock, animals are seldom lost to cheetah, and conflict with cheetah is low.

In summary the situation for cheetah in Tanzania is not yet critical. Tanzania is fortunate in that it still has huge tracts of wilderness, with few fences, and land is under government ownership. However land continues to be lost to cultivation, and this trend is expected to accelerate in the near future. National parks do not provide the safe haven for cheetah that we might expect because of the high densities of other carnivores in these areas. In the long term, if cheetah are to survive in appreciable numbers in Tanzania, there is a need to identify important cheetah areas outside the protected area system, where we can assure partial protection in the form of cultivation restrictions.

IDENTIFICATION OF PROBLEMS, ISSUES AND THEMES

After these plenary presentations, participants worked together to identify the problems, issues and themes affecting successful collaborative management of cheetah, both *in situ* and *ex situ*. Each participant wrote the one or two most important problems/issues/ themes, from their perspective, on a piece of paper, then placed it on an adhesive panel while explaining to the group their definition of the problem(s) listed. After all participants placed their "issues" on the adhesive panel, a small group organized them under common themes, which then formed the basis of discussion for six topic-based working groups (Appendix III). Working groups were: (1) Census, (2) Health, (3) Management of Cheetah Outside of Protected Areas, (4) Coordinating and Collecting *In Situ* and *Ex Situ* Information, (5) Education and Communication and (6) Viability of the *Ex Situ* Population. Each group then further reviewed and refined identified issues and developed promising solutions and action

steps to address them, including designating people responsible and a timeline for completion.

SUMMARY OF WORKSHOP RECOMMENDATIONS FOR ACTION

The **Census Working Group** made several recommendations for action. Among them, was to identify key players in census methodology (field workers, statisticians, tracking experts, etc.) and to coordinate an initial census methodology workshop as soon as possible. Other recommendations were to focus on census techniques and to develop systematic studies to compare the various techniques (e.g., photographic vs. spoor) and also to expand existing photographic surveys. Communication among census experts was seen as key, with several recommendations made for facilitating frequent and regular communication. Finally, training needs were identified, including training of local trackers in Tanzania, training various scientists in range countries and training for photographic recognition.

The **Health Working Group** agreed that disease is a natural component of the ecology of the cheetah and only rarely of concern in viable wild populations. However, because of an increasing number of anthropogenic factors, such as habitat alteration and human interventions, the risk of disease in wild populations may increase. Priority actions identified included standardizing methodologies including necropsy and data recording both in the field and in captivity. The group also identified a need to collate information from published and archived sources and to make it available on a website, with eventual development of a Cheetah Biological Resource Database that would serve as a central repository. Conducting wild population disease surveillance using standardized methods also was a high priority, including training of in-country field personnel in standardized necropsy technique and collection of biomaterials. These initiatives will be organized and overseen by regional coordinators identified in range countries.

In terms of the role of disease in cheetah populations, a disagreement arose between a number of the field ecologists and the veterinarians present. A 1-hour facilitated discussion session, involving about 30 participants, was held during the workshop. Results of that discussion are included as Appendix IV.

The **Protection of Cheetah Outside Protected Areas Working Group** defined unprotected cheetah areas as "areas where people live with cheetah." One of the most important points identified by the group was that there are very different cultural groups using various forms of land management, and each will require a different approach to resolving conflicts that may arise between cheetah and humans. he group developed both short- and long-term solutions for dealing with human-cheetah conflict, in particular, developing new or utilizing existing regional forums to address these issues. The group recommended that a database be compiled of people working with stakeholders in range states, with an aim toward identifying lessons learned in conflict resolution that can be used as different conflicts arise. In addition to conflict resolution information, this database also would contain scientific data, anecdotal, tribal and agricultural information. The group also identified a need for a metapopulation management strategy for cheetah, both within and between range countries. Because so

much of the conflict surrounding cheetah has to do with a lack of information, the group also recommended that educational materials be developed and passed on to people living in cheetah areas.

The **Coordinating Cheetah Conservation Efforts *In Situ* and *Ex Situ* Working Group** identified a need to increase cooperation and networking between captive cheetah breeding organisations, as well as a need to link *in situ* and *ex situ* efforts to conserve cheetah in order to contribute to the continued existence and protection of the cheetah in the wild. The group recommended development of a database of people working on *in situ* and/or *ex situ* cheetah activities, to develop a global programme (demographic and genetic) to manage captive cheetah, and to link databases (scientific as well as people-based) for both *in situ* and *ex situ* cheetah conservation. Further, the group recommended utilisation of assisted breeding with cryopreserved semen from wild cheetah as a strategy for importing new genetic material into ex situ populations, with minimal impact on wild populations.

The **Communication and Education Working Group** noted that the general lack of resources in Africa affects the development and implementation of multi-level education programmes. The group recommended utilising existing NGO networks to distribute resources and noted a need to identify in-country organisations already working on eco-education and to assist them to build capacity. The group strongly recommended that teachers' and other education training workshops be developed throughout range countries, modelled after a recent (2001) teacher-training workshop held in Cape Town through Cheetah Outreach. Additional workshops were planned for 2002.

One of the most important recommendations from this group was the need for improved communication among all stakeholders (government agencies, NGOs, educators, donors, researchers, etc.). Therefore, it was recommended that a "Cheetah Interest Group" (CIG) be developed to take responsibility for ensuring that the communications, resolutions and action steps initiated at this workshop be kept dynamic and progressive. <u>This idea was thoroughly endorsed by the workshop participants when it was presented in plenary</u>. Prior to the end of the workshop, funds had been committed to develop and keep updated a CIG website through which information on projects, working group discussions and resolutions can be accessed by interested parties. Formation of a Secretariat for the CIG, to be responsible for general coordination and communication, is under discussion. A group of workshop participants met to discuss the CIG at the end of the workshop (notes from this discussion are included as Appendix V), and a follow-up meeting to further organize the CIG is planned for July/August 2002.

The **Viability of the Captive Population** was examined by a small, *ad hoc* working group. At present, the global captive population is not self-sustaining. There is considerable sharing of founder lines among regions -- in order to ensure that if/when genetic material/animals are imported into a region, they help to increase the region's Founder Genome Equivalent, a careful analysis of the International Studbook is necessary.

In addition to identifying key issues, solutions and action steps, each group also identified important cheetah conservation or research projects needed to address key issues within their topic. This list of projects, with estimated budgets, is attached as Appendix VI.

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Censusing Cheetah Working Group Report

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Participants: Arthur Bagot-Smith, Amy Dickman, Sarah Durant, Harald Forster, Lise Hanssen, Martin Mulama, Flip Stander, Vivian Wilson

PROBLEM STATEMENT:

A PROPER AND ACCURATE CENSUS OF CHEETAH HAS NEVER BEEN DONE. THERE SEEMS TO BE NO QUICK AND RELIABLE METHOD OF COUNTING CHEETAH.

Cheetah have a number of characteristics which make them particularly difficult to count:
- They are largely non-territorial. This means that they do not pick prominent locations for scent marking, making it difficult to count signs. In addition a simple estimate of area divided by mean territory size cannot be made.
- They are very mobile, moving many kilometres a day, and have extremely large home ranges. Therefore they can easily move across different farms from one day to another, making it difficult to estimate numbers from questionnaire data.
- They are commonly very shy either because of persecution or because they are not used to vehicles. Habituating cheetah through following in vehicles can be dangerous in many areas as this may render them more vulnerable to persecution.
- They form local transitory hotspots, either due to land-use issues such as game fenced areas, or the position of scent-marking locations such as 'playtrees'. These give an impression of many cheetah in an area, but these hotspots are completely non-representative of overall density.
- They are cryptic and hence are hard to find, and they are at low densities wherever they occur.

Because of these problems which are implicitly associated with cheetah we have identified a number of priorities where we need advances in order to gain reliable estimates of numbers. These are listed in order of priority:

Techniques
Without an easy and accurate technique for counting cheetah we cannot gain any estimate of numbers. There are a number of techniques available:
- Mark-recapture based either on individual recognition or by marking and releasing individuals. This is perhaps the most reliable of methods, but it depends on a sufficient proportion of individuals being identified or marked. Often there are biases in which individuals are identified or marked. Only tame individuals can easily be photographed for individual recognition, whilst trapping for marking tends to target males or young cheetah. Trapping is also likely to be extremely stressful for cheetah. Finally there are violations of the assumptions of mark-recapture analysis, and whilst there are analytical techniques to deal with this, they depend on large sample size, and many years of data.

- Whole population marking or identification. This is the most accurate of methods, but it is extremely labour intensive and expensive. In situations when cheetah are rarely seen, and the technique depends on trapping and radio collaring it is hard to know whether the whole population has been sampled.
- Estimates via spoor frequency. This technique is still under development. It needs calibration under a wide range of conditions.
- Use of DNA techniques, e.g. faecal, hair snare etc. These are difficult to use for cheetah. Because most cheetah are non-territorial, and do not have habitual trails or scent-mark in prominent locations it is likely to often be easier to find a cheetah itself than find its scat or hair. These techniques are likely to result in biases towards males, since these most commonly scent mark. Finally DNA techniques are extremely expensive.
- Camera-trapping techniques. As with DNA techniques, camera trapping works best with species which use habitual trails or scent-marking locations. Cheetah are very mobile, low density, and move fairly randomly through a region.
- Questionnaire data, either from farmers and game wardens, or from tourists or the public. This is the method most commonly used to estimate cheetah densities, but there are a number of problems with these techniques which are related to the aspects of cheetah behaviour listed above. Landowners often have a vested interest in exaggerating the number of cheetah on their land. It is the feeling of the group that results from questionnaire data are fundamentally flawed.

Because of the problems with all these techniques, a new and accurate technique for counting cheetah is the most urgent priority.

Standardisation
Once we have a suitable technique we then will need to standardise it so that results can be compared across different habitats and in different countries. There is currently no established universal method of long-term monitoring, and in many range countries there is a lack of resources and infrastructure for research. In particular there is:
- A lack of in-depth studies in different habitat types
- A lack of knowledge and information in areas where cheetah seem particularly scarce.

Resources
All methods will depend on sufficient resources and personnel.

Co-operation
Once we have a suitable technique that is standardised between countries and habitats, we need access to areas where cheetah occur:
- In many range states most cheetah occur on private land. Permission needs to be obtained to gain access to this land.
- Landowner personalities differ between different range states, and these need to be taken in consideration when asking for co-operation.
- Many range states make use of game fencing, and this can alter densities in particular areas.
- There is often a lack of education/awareness about importance of censusing cheetah.

Education
There is a lack of trained personnel in many range states. There is likely to be a need for specific training in census methodology for each situation.

Summary

There are numerous difficulties associated with the censusing of cheetah, which vary depending on country, region, habitat type, cheetah density, landowner attitudes etc. The aim now is to work together to try to determine the most accurate technique, or combination of techniques, that can give a more standardised and comparable indication of cheetah numbers or trends in different areas. One of the most important steps will be to calibrate existing techniques to find indirect indices which can be used across habitats.

ULTIMATE LONG-TERM AIM

To develop a reliable, cost effective, long-term and repeatable census methodology that can be used across a broad range of habitats and in areas where cheetah are rarely seen, and can be used on a long-term basis to gain accurate data regarding population status and trends, with in-depth information on viability in selected representative habitats.

ISSUE 1.
WE NEED INFORMATION ON NUMBERS AND DEMOGRAPHIC PARAMETERS IN DIFFERENT HABITATS AND TO DEVELOP CENSUS TECHNIQUES.

Solution:
Establish a working group to link interested parties and to discuss and establish techniques. This group must:
- Establish an e-mail chain to keep participants in communication about developments
- Identify key players, including both field workers and advisors such as statisticians and modellers, to get input on all areas of census methodology
- Co-ordinate meetings and communication between all parties to ensure comparability across regions and enable us to work together

ACTION STEP 1:
Establish an e-mail chain for easy communication.
RESPONSIBLE: Arthur Bagot-Smith, Amy Dickman, Sarah Durant, Birgit and Harald Forster, Lise Hanssen, Martin Mulama, Gus Mills, Netty Purchase, Bruce Davison, Flip Stander, Vivian Wilson, Laurie Marker.
TIMELINE: End 2001

ACTION STEP 2:
Identify key players in census methodology, possibilities include field-workers, modellers/statisticians (Ray Hilborn – University of Washington, Lebreton - France, Gary White – USA), tracking expert (to be identified by Flip Stander), professional trappers (to be

identified by Lise Hanssen), computer programmer (Recognition software - Lex Hiby? - to be confirmed by Sarah Durant) and GIS programmers (to be identified by Harald Forster)
RESPONSIBLE: Group action – see individual points (Co-ordinator: Sarah Durant and Amy Dickman)
TIMELINE: End of 2001

ACTION STEP 3:
Co-ordination of meeting and communication
RESPONSIBLE: Harald Forster for initial meeting in November 2001, then ongoing collaboration with Amy Dickman
TIMELINE: Initial meeting in November 2001 and then ongoing

ISSUE 2.
WITHOUT AN EASY AND ACCURATE TECHNIQUE FOR COUNTING CHEETAH WE CANNOT GAIN ANY ESTIMATES OF NUMBERS. CURRENT CENSUS TECHNIQUES INCLUDE:
- Mark-recapture – individual recognition (on ground or tourist photos)
- Spoor frequency
- DNA techniques – faecal, hair snare etc.
- Camera-trapping
- Questionnaire data/tourist sightings or public information

Cheetah have a number of behavioural characteristics which make them particularly difficult to count:
- Non-territorial
- Large home range
- Commonly very shy due to persecution or not used to vehicles – danger of habituation
- Local transitory hotspots – non-representative of overall
- Cryptic and hard to find and low density
- Movement across different farms – large areas

Because of these problems which are implicitly associated with censusing cheetah and due to the problems associated with all of the currently used techniques, a new and accurate technique for counting cheetah is the most urgent priority.

Solution 1:
Testing spoor frequency counting techniques.

ACTION STEP 1:
Planning visit to Serengeti and Masai Mara to check tracks, soil substrate etc.
RESPONSIBLE: Flip Stander, Sarah Durant, Martin Mulama
TIMELINE: Early 2002

ACTION STEP 2:
Identify local trackers in Tanzania.
RESPONSIBLE: Sarah Durant

TIMELINE: February 2002

ACTION STEP 3:
Testing viability of using spoor frequency counting techniques as a method of censusing cheetah in Serengeti.
RESPONSIBLE: Flip Stander, Sarah Durant
TIMELINE: 2-week trip in March-May 2002

ACTION STEP 4:
Extending tracker training to other range states including Kenya and Zimbabwe.
RESPONSIBLE: Flip Stander, Martin Mulama, Vivian Wilson
TIMELINE: 2002-2003

<u>**Solution 2:**</u>
Initiate preliminary spoor surveys.
ACTION STEP:
Initiate survey in Hwange and Motopos National Parks in Zimbabwe.
RESPONSIBLE: Vivian Wilson
TIMELINE: End of 2002

<u>**Solution 3:**</u>
Intensive studies in different habitats.

ACTION STEP:
Initiate 3-year study in four locations in Namibia.
RESPONSIBLE: Harald Forster, Birgit Forster, Lise Hanssen
TIMELINE: End of 2002

<u>**Solution 4:**</u>
Photographic surveys in countries with sufficient numbers of tourists.

ACTION STEP 1:
Initiate a survey in Masai Mara in Kenya.
RESPONSIBLE: Martin Mulama
TIMELINE: End of 2002

ACTION STEP 2:
Expand photograph survey in Tanzania to include the north and west of the Serengeti, Ngorongoro and Tarangire.
RESPONSIBLE: Sarah Durant
TIMELINE: Beginning of 2002

ACTION STEP 3:
Initiate a second photographic survey in Kruger National Park in South Africa.
RESPONSIBLE: Gus Mills
TIMELINE: End of 2002

Solution 5:
Broaden scope of census to include areas where the status of cheetah is unknown.

ACTION STEP:
Establish links in these countries through opportunistic identification of interested researchers in country. Botswana, Zambia, Niger and Iran are suggested as possible priority countries.
RESPONSIBLE: Whole group
TIMELINE: End of 2003

ISSUE 3.
THERE IS CURRENTLY NO ESTABLISHED UNIVERSAL METHOD OF LONG-TERM MONITORING, AND IN MANY RANGE COUNTRIES THERE IS A LACK OF RESOURCES AND INFRASTRUCTURE FOR RESEARCH.

In particular there is:
- A lack of in-depth studies in different habitat types.
- A lack of knowledge and information in areas where cheetah seem particularly scarce.

Standardisation is dependent on two main factors:
- Communication between researchers to ensure that comparable techniques are being used wherever possible.
- Calibration of these techniques across various areas with different habitats, soil substrates and across different seasons.

Solution:
Develop standardised methods of monitoring cheetah populations.

ACTION STEP:
Develop standardised methods and indices in e-mail group established above.
RESPONSIBLE: Whole group
TIMELINE: Meeting planned in November 2001

ISSUE 4.
RESOURCES ARE REQUIRED TO FUND THE PRELIMINARY SPOOR SURVEYS, TRAINING, WORKSHOPS AND ANALYSIS OF THE CENSUS RESULTS.

Solution:
Ensure that censusing cheetah becomes a priority for funding, from both *ex situ* and *in situ* funding sources.

ACTION STEP:
Application to *ex situ* and other funding sources.
RESPONSIBLE: Whole group
TIMELINE: Done

ISSUE 5.
THERE IS A LACK OF COOPERATION BETWEEN GOVERNMENTS, LANDOWNERS AND MEMBERS OF THE WORKING GROUP.

Solution:
Encourage frequent and regular communication within the working group and between landowners and government.

ACTION STEP 1:
Encouraging frequent and regular communication within the group.
RESPONSIBLE: Coordinator: Amy Dickman
TIMELINE: Ongoing

ACTION STEP 2:
Produce a document outlining the group's objectives and to highlight the need for census/trend data for distribution to relevant parties such as governments and landowners.
RESPONSIBLE: Sarah Durant
TIMELINE: End of 2001

ACTION STEP 3:
Disseminate results of calibration in the form of frequent updates to governments and landowners.
RESPONSIBLE: Sarah Durant and Flip Stander
TIMELINE: Mid 2002

ISSUE 6.
THERE IS A LACK OF TRAINED PERSONNEL IN MANY RANGE STATES. THERE IS THEREFORE A NEED FOR SPECIFIC TRAINING IN CENSUS METHODOLOGY FOR EACH SITUATION IN ORDER TO ENSURE THAT THE CENSUS TECHNIQUES BECOME PART OF THE LONG TERM MONITORING PLAN.

Solution 1:
Training of local trackers in Tanzania by Namibian San trackers.

ACTION STEP:
San trackers and Flip Stander to visit Tanzania
RESPONSIBLE: Flip Stander and Sarah Durant
TIMELINE: March/April/May 2002

Solution 2:
Training for various scientists in range countries.

ACTION STEP:
Organising workshop in Tanzania in 2004.
RESPONSIBLE: Sarah Durant, Amy Dickman and Flip Stander
TIMELINE: End of 2003

Solution 3:
Training for photographic recognition.

ACTION STEP:
Arranging training of visiting researchers in Arusha and/or Serengeti.
RESPONSIBLE: Sarah Durant
TIMELINE: End of 2002

Health Working Group Report

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Participants: Linda Munson (USA), Elizabeth Wambwa (Kenya), Ulf Tubbesing (Namibia), Rob Hall (South Africa), Jan Louwmann (The Netherlands), Henk Bertschinger (South Africa), Nick Lindsay (United Kingdom), Paul Bartels (South Africa), Nick Kriek (South Africa), Leon Venter (South Africa), Bill Swanson (USA), JoGayle Howard (USA), Glen Carlisle (South Africa)

PREAMBLE

Disease is a natural component of the ecology of the cheetah and only rarely of concern in viable wild populations. However, there are an increasing number of anthropogenic factors, such as habitat alteration and human interventions, that may increase the risk of disease in wild populations. Some *ex situ* populations have high prevalence of unusual diseases (gastritis, hepatic veno-occlusive disease, renal glomerulosclerosis and systemic amyloidosis) that are rare in other species, and these diseases impede the goal of maintaining self-sustaining populations. Although the specific cause of these diseases is not known, the character of these diseases implicate stress as an important underlying factor and genetic predisposition and diet as possible confounding factors. While it is assumed that these diseases did not historically affect wild populations, there is concern that these diseases may arise in wild animals that are trapped, held in captive facilities and translocated. There also is concern that cheetah may transmit or acquire infectious diseases through these actions. To determine if the diseases of captive animals are universal in cheetah or linked to captive management, broader disease surveillance is necessary. Disease surveillance also is needed to assess the risk of infectious disease transmission during animal translocations.

To address these needs, the working group on Cheetah Health identified the following:

ISSUE 1.
LACK OF ADEQUATE INFORMATION ON DISEASE IN WILD AND *EX SITU* POPULATIONS GLOBALLY. THE DISEASES OF WILD POPULATIONS ARE NOT WELL CHARACTERISED, SO THE IMPACT OF DISEASE ON POPULATION DYNAMICS CANNOT BE ASSESSED AND THE DISEASES OF CAPTIVE ANIMALS CANNOT BE PUT IN PERSPECTIVE. IT ALSO IS NOT KNOWN IF THE DISEASES IDENTIFIED IN SOUTH AFRICAN AND UNITED STATES POPULATIONS ARE ALSO PRESENT IN NAMIBIAN, AUSTRALIAN, EUROPEAN AND ASIAN CAPTIVE POPULATIONS. THIS INFORMATION IS ESSENTIAL FOR AN UNDERSTANDING OF THE CAUSES OF DISEASE AND TO MINIMIZE DISEASE RISK AT AN INTERFACE BETWEEN WILD AND CAPTIVE POPULATIONS. THERE ALSO IS A NEED TO EVALUATE GENETIC INFLUENCES ON DISEASE.

Solution 1:
Conduct a retrospective survey to collate information from published sources and archived pathology reports/slides of diseases in wild and captive populations and make this information accessible via a website.

ACTION STEP 1:
Update and collate literature from all databases. The International Studbook and the South African Veterinary Association Wildlife Group maintain fairly complete cheetah bibliographies that can serve as a starting point. Information will be listed on www.cincyzoo.org until the Cheetah Interest Group web site is developed
RESPONSIBLE: Bill Swanson
TIMELINE: February 2002

ACTION STEP 2:
Write proposal and identify funding for a pathologist to conduct retrospective survey on archived pathology slides and reports to add to the existing cheetah pathology database.
RESPONSIBLE: Linda Munson
TIMELINE: June 2002

Solution 2:
Conduct wild population disease surveillance using standardised methods in all range countries. A pilot study collecting gastric, kidney and liver biopsies should be conducted on trapped cheetah in Namibia to determine the prevalence in the wild population of the important diseases found in captive animals. Of particular importance to biopsy are older cheetah, cheetah that have previously been caught, and cheetah with signs of disease. Diseases should be compared among regions/facilities/populations.

ACTION STEP 1:
Necropsy all free-ranging cheetah that die: First regional coordinators (including both veterinarians and ecologists) should be identified in all range countries and collaborative agreements established. Then in-country field personnel should be trained and supplied with protocols. Mortality signals on radio collars should be encouraged to increase fresh sampling of deceased animals by field researchers. Potential regional coordinators suggested at the meeting include:
- Namibia: Laurie Marker, Lise Hanssen and Ulf Tubbesing
- Zimbabwe: Netty Purchase, Viv Wilson with Chris Foggin
- Tanzania: Titus and Sara Durant; Harold Bigg
- Kenya: Elizabeth Wambwa, B. Ngoru (Mara ecologist) and Richard Kock
- South Africa: Gus Mills, Nick Kriek, Deon Cilliers (De Wildt) and Lente Roode (Hoedspruit)
- Botswana: Kathy Alexander or current state veterinarian and local ecologist

RESPONSIBLE: Elizabeth Wambwa
TIMELINE: January 2002

ACTION STEP 2:

Use regional pathologists with expertise in cheetah diseases to conduct a necropsy survey of wild cheetah that die. Archive all findings in a database that will be linked to the main disease database. Potential regional coordinators suggested at the meeting include:

- South Africa: Emily Lane, Rick Last, Mark Williams, Lucy Lange, Wilhelm Botha
- Zimbabwe: Chris Foggin, John Lawrence, Mark Obolo/Nancy Kock
- Namibia: Felix Mettler, Linda Munson
- Kenya: Richard Kock/ University pathologist/ IPR-Idle Farah

RESPONSIBLE: Linda Munson
TIMELINE: June 2002

ACTION STEP 3:

Acquire methods being developed by ecologists (Marker and Mills) to age animals
RESPONSIBLE: Ulf Tubbesing and Linda Munson
TIMELINE: August 2002

ACTION STEP 4:

Conduct opportunistic sampling of live animals. Identify regional coordinators/collaborators in all range countries and supply them with protocols and collection sheets. Regional coordinators suggested at the meeting include:

- Namibia: Laurie Marker, Lise Hanssen, Flip Stander and Ulf Tubbesing
- Zimbabwe: Nettie Purchase, Bruce Davison, Verity Bowman and Viv Wilson?
- Tanzania: Titus and Sara Durant; Harold Bigg
- Kenya: Elizabeth Wambwa and B. Ngoro (Mara ecologist) and others in Nairobi Park, Richard Kock
- South Africa: Gus Mills, Richard Burroughs? Deon Cilliers (De Wildt) and Lente Roode (Hoedstruit)
- Botswana: Kathy Alexander? Current state vet?

RESPONSIBLE: Elizabeth Wambwa
TIMELINE: Jan 2002

ACTION STEP 5:

Develop a plan and a schedule for the training of in-country field personnel in necropsy techniques and collection of biomaterials from live animals. Regional veterinarians will conduct training if possible.
RESPONSIBLE: Regional coordinators.

ACTION STEP 6:

Identify site for banking of samples at the regional site using "BioBank SA" as a model. Develop guidelines for intellectual property, identify funds to courier samples to the bank, and to maintain the bank, contact regional coordinators to recommend sending duplicate samples to the bank.
RESPONSIBLE: Paul Bartels
TIMELINE: July 2002

ACTION STEP 7:
Develop research proposal to biopsy wild-caught cheetah to increase sample size in assessment of veno-occlusive disease, gastritis and glomerulosclerosis. Determine feasibility of project in Namibia.
RESPONSIBLE: Ulf Tubbesing and Linda Munson
TIMELINE: January 2002

Solution 3:
Conduct captive population disease surveillance. Disease data should be collected for comparative purposes from a wide range of African, European and Australian facilities using standardised surveillance methods. Many regions now have zoo organisations that can facilitate data/sample collection among member institutions. Diseases should then be compared among regions and facilities.

ACTION STEP 1:
Identify sites of needed surveillance and a contact person. Initiate surveillance with designated pathologist and coordinate findings with regional coordinator. Regional coordinators suggested at the meeting include:
- Namibia: Ulf Tubbesing, Laurie Marker and Lise Hannsen
- Europe: Chris Walzer, John Lewis and Sean McKeown
- Australia: John Lemmon and Dave Ward
- Kenya: Elizabeth Wambwa / Jim Cavanaugh, Ol Jogi (DeMar)
- Zimbabwe: Viv Wilson, Chris Foggin
- South Africa: PAAZAB, Laurie Marker, Rob Hall, Henk Bertschinger (De Wildt), Lente Roode.

RESPONSIBLE: Leon Venter, Ulf Tubbesing, Linda Munson and Elizabeth Wambwa
TIMELINE: August 2002

ACTION STEP 2:
Continue Cheetah SSP surveillance in the USA.
RESPONSIBLE: Linda Munson
TIMELINE: Ongoing

ISSUE 2.
LACK OF STANDARDISED DATA AND SAMPLE COLLECTION AND ORGANISED COLLABORATION AMONGST INSTITUTIONS. COMPARATIVE DISEASE STUDIES BETWEEN WILD AND CAPTIVE POPULATIONS HAVE BEEN DIFFICULT TO CONDUCT BECAUSE SAMPLE COLLECTION AND ANALYSIS HAVE NOT BEEN DONE CONSISTENTLY, AND INFORMATION IS NOT CENTRALISED. COLLABORATIONS AMONG MANY ORGANISATIONS THAT HAVE BEEN COLLECTING DISEASE DATA HAVE NOT BEEN INITIATED OR MAINTAINED. ADEQUATE GLOBAL ACCESS TO PUBLICATIONS AND NEW INFORMATION ON CHEETAH DISEASES IS ALSO LACKING.

Solution 1:

Standardise protocols, datasheets and sample collection sheets and encourage all personnel handling cheetah to use these protocols whether opportunistically or as part of a research study.

ACTION STEP 1:

Develop a general datasheet that will be used for all sample collection using CCF/Africat/Biobank SA/MedArks/UCDWHC Necropsy Book forms as a prototype and edit for specific needs. Add tick box for what was taken, what was analysed and what was stored. Include separate instructions for taking sampling, handling, storing and shipping samples using UCD WHC Necropsy book as the prototype. These instructions will form the curriculum for training. Reviewing by all interested parties can occur over e-mail.
RESPONSIBLE: Ulf Tubbesing and Paul Bartels
TIMELINE: June 2002

ACTION STEP 2:

Update existing protocols for necropsy /biopsy and distribute to the Cheetah Interest Group over e-mail for comments and editing.
RESPONSIBLE: Linda Munson and Nick Kriek
TIMELINE: November 2001

ACTION STEP 3:

Identify equipment needs and possible funding sources. Liquid nitrogen containers, supplies, shipping containers, etc. that will be needed for surveillance should be listed.
RESPONSIBLE: Ulf Tubbesing, Paul Bartels, Linda Munson and Nick Kriek
TIMELINE: January 2002

Solution 2:

Identify sites for sample submission and analysis: Samples should be submitted to appropriate diagnostic laboratories / scientific collaborators for serology, infectious disease surveillance, genetics, etc. The standardised forms (see 2a) should be submitted to these labs with the samples. Data from the analysis should be sent to submitters of samples who will then forward this information to appropriate collaborators and officials. All data should be proprietary until published.

ACTION STEP 1:

Select regional labs for sample analysis. Labs with ongoing Quality Analysis and expertise in felid tests will be selected.
E.g.   RSA: Golden Lab and University of Pretoria.
        USA: Cornell University and Washington State Diagnostic Lab.
Regional veterinarians will select.
RESPONSIBLE: Leon Venter (with Emily Lane and Willem Botha) and Glen Carlisle, Chris Walzer? Linda Munson, Richard Kock?
TIMELINE: January 2002

ACTION STEP 2:
Develop e-mail group of people interested in corresponding on cheetah health. Develop mechanism of reporting new findings on an Internet based discussion group and posting existing documents.
RESPONSIBLE: Leon Venter in conjunction with Steve Hines and the proposed CIG website
TIMELINE: January 2002

Solution 3:
A Cheetah Biological Resource Database should be established and maintained by a full time secretariat. Lists of samples, projects, and current investigators should be submitted to the Database. Data should be compiled from standardised forms. Archival information from the Database should be made available via a website. There also is a need for a third party biological bank to maintain biological samples for field scientists and provide samples to other researchers with approval of submitters.

ACTION STEP 1:
Link existing databases of disease information or archived samples with BioBank SA. Use their Secretariat to enter information from archived samples. Contact all researchers with cheetah samples and encourage submission of information of archived samples to BioBank SA
RESPONSIBLE: Paul Bartels
TIMELINE: January 2004

ACTION STEP 2:
Work with Cheetah Interest Group to develop a website for a newsletter of important new health findings as a means for the Health Working Group to communicate with other groups.
RESPONSIBLE: Steve Hines and designated web master.
TIMELINE: January 2002

ACTION STEP 3:
Contribute ongoing information on health research projects to the website.
RESPONSIBLE: Whole group
TIMELINE: Dependant on point above

Solution 4:
Write a multi centre, multinational collaborative research proposal for high priority disease research projects. Blanket CITES permits should be obtained to facilitate international movement of samples for this project.

ACTION STEP:
Write a proposal for multi-centre, multinational grant to survey cheetah diseases. Use Multinational Rhinderpest project as prototype. Investigate the possibility of acquiring blanket CITES permits.
RESPONSIBLE: Elisabeth Wambwa, Linda Munson, Nick Lindsay, Ulf Tubbesing and JoGayle Howard
TIMELINE: January 2003

ISSUE 3.
LACK OF UNDERSTANDING OF THE IMPACT OF CURRENT MANAGEMENT PRACTICES ON HEALTH, REPRODUCTION AND LONGEVITY IN WILD AND *EX SITU* POPULATIONS. THERE IS A NEED TO EVALUATE MANAGEMENT PRACTICES FOR CAPTURE, TRANSPORTATION, AND HOLDING OF WILD AND CAPTIVE CHEETAH AND CORRELATE WITH DISEASE PREVALENCES THROUGH EPIDEMIOLOGICAL ANALYSES. THERE ARE CONCERNS THAT FACTORS SUCH AS SMALL ENCLOSURE SIZE, INAPPROPRIATE DIET, HUMAN CONTACT OR PROXIMITY TO OTHER PREDATORS MAY CAUSE STRESS IN *EX SITU* ANIMALS AND POSSIBLY THEREFORE INCREASE THE PREVALENCE AND SEVERITY OF DISEASE. THERE IS A NEED TO EVALUATE OTHER MEASUREMENTS OF STRESS AND TO ASSESS RELATIONSHIPS BETWEEN STRESS, MANAGEMENT AND DISEASE. THERE IS A NEED TO SET PROTOCOLS/GUIDELINES FOR OPTIMAL MANAGEMENT WHEN ANALYSES ARE COMPETE.

Solution 1:
A comprehensive assessment of management conditions of captive cheetah should be conducted using a standardised evaluation form that includes exhibit (proximity to predators, size, substrate, design, public access, enrichment), diet, staff expertise, veterinary care, etc. A similar assessment of management of wild and translocated animals, including information on population density, proximity to predators and domestic dogs, climatic conditions, proximity to people, etc. should be conducted. A system of scoring stress should be designed and correlated to faecal corticoid measurements in both captive and wild populations.

ACTION STEP 1:
List the potential management factors to be assessed and possible categories to score these factors. Collaborate with ecologists in selection of *in situ* factors. Consider the guidelines developed for AZA survey (Jill Mellen) for *ex situ* factors. Criteria will be reviewed by e-mail.
RESPONSIBLE: Ulf Tubbesing
TIMELINE: January 2002

ACTION STEP 2:
Conduct risk factor assessment using the criteria developed above and correlate with pathology findings from retrospective survey and prospective pathology survey results. Disease prevalence or reproductive success should be analysed with respect to age, facilities, enclosure privacy, exposure to public, diet, exercise, genetic background, level of stress and exposure to environmental toxins such as estrogens.
RESPONSIBLE: Linda Munson
TIMELINE: August 2004

Solution 2:
Conduct a diet analysis, assessing the prey composition of wild cheetah diets through qualitative scat analysis. A crude analysis of nutritional content of these prey can be used to assess the adequacy of existing captive diets and to make an ideal diet. Existing diets should be correlated with disease prevalence and reproductive success.

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ACTION STEP 1:
Contact people who have been working on captive and wild diets to determine status of current information and source of that information. These people include:
- Wilhelm Schultheiss
- Ellen Dierenfeld
- Mary Allen

Link with Laurie Marker / Gus Mills on planned project to determine prey species from faecal analysis. Determine current information on prey species from field ecologists. Collate all information to determine if further work should be done.
RESPONSIBLE: Glen Carlisle
TIMELINE: June 2002

ACTION STEP 2:
If prey species nutritional content (including vitamins and minerals) has not been conducted, then initiate project to analyse these factors.
RESPONSIBLE: Henk Bertschinger
TIMELINE: June 2003

Solution 3:
Identify factors affecting reproductive success by critically evaluating different breeding management methods to identify the most important factors affecting reproductive behaviour, breeding success and cub survival.

ACTION STEP:
Detail the factors to be assessed and correlated with reproductive success. Link with information derived from the proposed workshop in the USA on factors affecting reproductive success in wildlife
RESPONSIBLE: JoGayle Howard

Protection of Cheetah Outside Protected Areas
Working Group Report

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Participants: Ann Van Dyk (South Africa), Gus Mills (South Africa), Laurie Marker (Namibia), Deon Cilliers (South Africa), Thys de Wet (South Africa), Nettie Purchase (Zimbabwe), Bonnie Schumann (Namibia), Vanessa Bouwer (South Africa), Birgit Forster (Namibia) and Gerhard Verdoorn (South Africa).

Additional input from: Sarah Durant (Tanzania) and Martin Mulama (Kenya)

DEFINITION OF UNPROTECTED CHEETAH AREA: *"Areas where people live with cheetah."*

Discussion around this topic:
- Adequately fenced
- Management plans
- Large enough to sustain viable population
- Does not require incentive to keep cheetah
- Not free roaming/restricted movement

IUCN PARKS AND PROTECTED AREAS COMMISSION:
> Category Ia: Strict Nature Reserve / Wilderness Area
> Category Ib: Wilderness Area
> Category II: National Park
> Category III: Natural Monument
> Category IV: Habitat / Species Management Area
> Category V: Protected Landscape / Seascape
> Category VI: Managed Resource Protected Area

Use of natural resources must be sustainable to qualify as a protected area.

Cheetah are currently unprotected on commercial and communal farmlands and in areas that do not have conservation as their prime activity. These are mainly areas owned by private individuals or communities.

Area where management is not needed ?
An area where animals are not managed for intrinsic value, but for economic value.
The conservation area is where biodiversity is the main issue.
"Protected" in the sense that it is protected, whether or not in a Park.

Any area where the landowner (private or government) requires an incentive to have cheetah.

Ultimate aim of this working group:
Cheetah should live in the wild, and in certain areas there is potential for conflict resolution to result in co-existence between humans and cheetah.

PREAMBLE

All issues discussed need to consider the fact that there are very different cultural groups practicing various forms of land management, therefore each requires a specific approach to conflict resolution. In some cases however, no conflict exists. Recommended solutions and actions need to be adapted by regional committees to suit the local requirements.

Cultural groups include:
- Traditional hunter/gatherers on state-owned land.
- Traditional pastoralists on land that is state-owned but farmed communally.
- Commercial and subsistence farmers – Private landowners running commercial and subsistence ventures.
- Communal farmers on land that is state-owned but farmed on a communal basis.

In East Africa, the lifestyle of some of the cultural groups (traditional pastoralists) promotes cheetah conservation. These cultural groups live in harmony with the wildlife. This lifestyle/culture is being lost. Where governments still own land, pastoralist activities should be supported through lobbying to retain control over land management practices.

ISSUE 1.
CONFLICT EXISTS BETWEEN PEOPLE AND CHEETAH OCCUPYING THE SAME AREA.

Solution:
Conflict resolution, recognizing that human needs play a key role, needs to be applied to communities where people and cheetah occupy the same area. Resolution of conflicts should be divided into short- and long-term solutions.

SHORT-TERM SOLUTIONS
Short-term solution 1:
Identifying stakeholders in the range states from which sub-regional and regional cheetah forums can be set up to address the issues of conflict within and between countries and work towards resolving conflict.

ACTION STEP:
Establish regional forums to address conflict issues. Otherwise, use existing forums within range states to help form new groups within other countries that will then be incorporated into regional forums.
RESPONSIBLE: Forums already been formed in South Africa, Namibia and Zimbabwe which can lead this process:
- SA -Mozambique and Botswana
- Namibia - Central Africa and North Africa
- Zimbabwe - Zambia

- Sarah/Martin-Tanzania
- Kenya and Uganda?

TIMELINE: Mid-2002.

Short-term solution 2:
Use these forums to identify and develop key people to act as role models and spokespersons.

ACTION STEP 1:
Identify these people to pass on the message.
RESPONSIBLE: Botswana - Deon Cilliers and Mozambique – Thys de Wet

TIMELINE: End 2002

ACTION STEP 2:
Development of these key people.
RESPONSIBLE: Botswana and Mozambique – National Cheetah Management Programme (South Africa, Deon Cilliers)
TIMELINE: Ongoing

Short-term solution 3:
Compile a database comprising people working with stakeholders in range states, data they have collected and conflict resolution successes and failures. Make this data available to representatives in all range states and update it regularly.

ACTION STEP:
Set up the database using people and information on conflict resolution.
RESPONSIBLE: Nettie and Duncan Purchase
TIMELINE: Mid 2002

Short-term solution 4:
Where no immediate co-existence is possible cheetah should be removed and relocated into parks or reserves and captive situations where they will have to be managed as meta-populations and become part of a global management plan (captive/meta-population).

ACTION STEP 1:
List areas in each country where cheetah can be relocated, incorporating cross-border movement.
RESPONSIBLE: Each forum will have the role of identifying areas and coordinating the movement of cheetah within a country. These forums will communicate with other country forums when cheetah have to be moved across border.
TIMELINE: 2 years or sooner

ACTION STEP 2:
Identification of regulations pertaining to holding centres or captive properties in each country if it is not possible to release the animals into the wild.

RESPONSIBLE: Forums within each country will address this issue. In South Africa, this will be done by the National Cheetah Management Programme – Deon Cilliers and Thus de Wet.
TIMELINE: Mid 2002

ACTION STEP 3:
Draft a meta-population management plan both within countries and between countries using a "stud-book" approach at both scales. When possible, all cheetah that have been removed are recorded and if cheetah are to be moved, it can be decided where they will be most productive.
RESPONSIBLE: Forums within each country to develop their own meta-population management plan. The studbook keeper can be a local committee or a manager (individual).
TIMELINE: Meeting of interested parties in the Southern African region will be convened by Gus Mills at the end of Dec 2002 with Luke Hunter as advisor. Development of plans will be ongoing and possibly communicated through the CIG proposed website.

LONG-TERM SOLUTIONS:

Long-term solution 1:
Cheetah removal and relocation into parks or reserves or captivity and managed as meta-populations.

ACTION STEP:
See short-term solution 4, action steps 1.2 and 3 above
RESPONSIBLE: See short-term solution 4, action steps 1.2 and 3 above
TIMELINE: See short-term solution 4, action steps 1.2 and 3 above

Long-term solution 2:
Ongoing research to understand more about the role of a cheetah in the ecosystem outside protected areas

ACTION STEP 1:
Identify ecosystems where research is taking place and tap into the data being collected.
RESPONSIBLE: Country forums
TIMELINE: Sept 2002

ACTION STEP 2:
Where no research is being done, identification of key ecosystems should be carried out and feasibility studies should be done.
RESPONSIBLE: Country forums
TIMELINE: Sept 2002

ACTION STEP 3:
Ecosystems should have priorities assigned in terms of the usefulness of the research into cheetah biology in resolving conflict.
RESPONSIBLE: Regional committees. In South Africa, this will be done by the National Cheetah Management Programme – Deon Cilliers and Thus de Wet.

TIMELINE: Sept 2003

Long-term solution 3:
Compensation to farmers for capture / damage using insurance policy compensation with community verification or specialist group verification.

ACTION STEP:
Assess and consolidate models (as examples: SA Eagle compensation fund – verified by field staff; Eastern Cape, farmers paid into kitty and compensate for crop loss – to encourage kudu in area, allowed hunting to raise money) in terms of their usefulness in different land use types.
RESPONSIBLE: Deon Cilliers
TIMELINE: December 2001

Over time models will be developed that are appropriate to regions where there is presently limited knowledge.

ISSUE 2.
THE KNOWLEDGE BASE REGARDING CHEETAH OUTSIDE PROTECTED AREAS IS LACKING AND MORE INFORMATION MAY LEAD TO IDENTIFYING OTHER ISSUES.

Solution:
The knowledge base must be expanded to more effectively conserve cheetah outside of protected areas. There are many sources of available information and it is necessary to access as much of this knowledge as possible (scientific, anecdotal, tribal and agricultural).

ACTION STEP 1:
Set up an information database and allow access to other researchers. The database will also enable analysis of patterns and the impact of cheetah on people in different areas and *vice versa*.
RESPONSIBLE: Netty Purchase
TIMELINE: end of 2002

ACTION STEP 2:
Investigate problem, solutions, make recommendations, investigate solutions and monitor effectiveness.
RESPONSIBLE: Various regional committees, In South Africa this will be done by the National Cheetah Management Programme through Thys de Wet and Deon Cilliers.
TIMELINE: end of 2002

ISSUE 3.
THERE IS A NEED TO EDUCATE STAKEHOLDERS ABOUT CHEETAH BIOLOGY, THE ROLE THAT CHEETAH PLAY IN THE ECOSYSTEM AND WAYS TO LIVE WITH CHEETAH. BUILDING ON THAT WILL BE THE NEED TO ACCEPT CHEETAH THROUGH MARKETING INITIATIVES WITH A VIEW TO EXPANDING THE RANGE OVER WHICH CHEETAH AND HUMANS CAN COEXIST.

Solution 1:
Improve the information available to educate people living with cheetah about the basic ecology of cheetah, the importance of cheetah as a species in an ecosystem, livestock management, game management, the value of conservancies and identification of predators responsible for killing a stock animal (livestock or game).

ACTION STEP:
Investigate what education materials are available (brochures, pamphlets etc.) and what further developments of these materials are necessary.
RESPONSIBLE: Vanessa Bouwer
TIMELINE: October 2001

Solution 2:
Education material needs to be passed onto to the people living with cheetah but in an active manner. This will require individuals involved in nature conservation (extension workers, agricultural people, biology students, farmers / farmers wives, sociologists and community based NGO's) to be made aware of the issues and shown how to explain them to people living on the land. Each type of person / group needs suited to the task of getting the information across to the various groups of people living with cheetah.

ACTION STEP:
- Identify target individuals/groups of peoples who are available
- Identify who will put education packages on conflict resolution together using media resources available – radio, TV, magazines, multiple languages
- Decide on content of packages <u>for each</u> target group
RESPONSIBLE: Country forums
TIMELINE: June 2002

* Video on conflict resolution could be produced – offer made by Neil Herman

Solution 3:
Develop a marketing strategy that emphasises the:
1. Value of cheetah (for farmers): economic, intrinsic, ecological.
2. Basic economic benefit of sound land management (includes game/livestock).
3. Benefits of conservancies.
4. Change in perception of the real economic impact of cheetah on farming – relays success stories.
5. Benefits of tourism
6. Concept that cheetah contribute to a healthy ungulate population.
7. Value of trophy hunting in true wilderness area.
8. Value of marketing ethical hunting.
9. <u>Marketing of cheetah as a flagship species in conservation</u>. Market steps to become a cheetah conservation farmer.
10. Increased value of cheetah through marketing

ACTION STEP:
Investigate the possibility of having an advertising company adopt the concept of telling the story of cheetah and how wonderful an animal it is to as many people as possible.
RESPONSIBLE: Laurie Marker and Vanessa Bouwer
TIMELINE: September 2002

ISSUE 4.
CHEETAH ARE COMPATIBLE WITH SOME LAND USES AND NOT WITH OTHERS.

<u>**Solution:**</u>
Identify land management practices that are compatible with cheetah and those that are thought not to be, and try to obtain maximum area of the former as well as change the incompatible land use practices where possible.

ACTION STEP:
A basic document on sound land management is available from Birgit Forster that can be sent to authorities/cheetah forums in all range states. This will then give these states a baseline from which to start working.
RESPONSIBLE: Birgit Forster
TIMELINE: December 2001

ISSUE 5.
THE CHEETAH HAS AN ECONOMIC, ECOLOGICAL AND INTRINSIC VALUE, AND WE NEED TO WORK TOWARDS HAVING THE PERCEIVED AND ACTUAL COSTS OUTWEIGHED BY THESE VALUES. THE VALUE AND COST OF CHEETAH IS AN INDIVIDUAL, COMMUNITY AND INTERNATIONAL RESPONSIBILITY AND ASSET. WE NEED TO RECOGNISE DIFFERENT CULTURAL UNDERSTANDINGS OF COST AND VALUE.

<u>**Solution:**</u>
In order to determine if the value of a cheetah to a person outweighs the cost, cost benefit analyses should be carried out in the following different scenarios:
- Commercial farming with the option of trophy hunting and ecotourism
- Commercial farming without the option to harvest the cheetah
- Communal sedentary farming
- Nomadic pastoralist areas
- Hunter-gatherer areas

ACTION STEP 1:
Compile a basic document that:
- Details the problem on a regional basis.
- Promotes the direct and indirect values of cheetah (if it pays it stays).
- Changes the perception of the cost of having cheetah on a property.
- Promotes the concept of "predator friendly meat" and

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- Involves national and international politicians to provide tax relief (or other economic incentives) for farmers with sustainable land and livestock management practices.

RESPONSIBLE: Thys de Wet and Deon Cilliers
TIMELINE: March 2002

ACTION STEP 2:
Take document to suitable organisations and outsource this as a research project.
RESPONSIBLE: Each country's forum.
TIMELINE: End 2002

ISSUE 6.
GLOBAL, NATIONAL AND REGIONAL POLICY AND LEGISLATION REGARDING LAND USE AND CONSERVATION IS FRAGMENTED, INAPPROPRIATE AND UN-ENFORCED. THERE IS VERY LITTLE REGIONAL AND COUNTRY-TO-COUNTRY AGREEMENT.

<u>**Solution:**</u>
The working group made the following recommendations:

1. Governments in range states should be given information that will lead to the formulation of policies of sound land use and leading to the drawing up of suitable legislation.
2. Countries that have in the past experienced fragmented policy and legislation must be encouraged to formulate new policies to include all stakeholders and that take into account the status of cheetah throughout the country.
3. Changes in policy will only come about through education and lobbying of internal and external governments.
4. Politicians that have an influence on policy formation must be given up-to-date and accurate information regarding the status of cheetah in their countries.
5. When drawing up new policy and legislation, international conventions must be adhered to in order to prevent conflict between stakeholder countries.
6. Begin dialogue between range states on a regional basis with the view to formulating regional policy that will enable cheetah to be conserved across national boundaries.
7. Without effective enforcement of new and past laws resulting from policy, no progress will be made. It is important to identify suitable law enforcement agencies within range states.

ISSUE 7.
FUNDING IS CRITICAL IF WE ARE TO ACHIEVE SUCCESS IN PROTECTING CHEETAH OUTSIDE PROTECTED AREAS.

<u>**Solutions:**</u>
1. Develop overall funding strategy.
2. Identify donors/partners.
3. Identify proposals within overall strategy.
4. Endorsement from international body (IUCN Cat Specialist Group).

5. Form a Cheetah Interest Group.
6. Fundraise country-by-country.

Coordinating Cheetah Conservation Efforts *In Situ* and *Ex Situ* Working Group Report

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Participants: Jack Grisham – facilitator (USA), Luke Hunter (Australia), Bruce Davison (Zimbabwe), Mary Jo Stearns, Steve Bircher, Dusty Lombardi, Kevin Willis (all USA), Sean McKeown (UAE), Alan Strachan (South Africa), Laurie Binghaman – recorder (USA).

ISSUE 1.
COORDINATING *EX SITU* EFFORTS TO CONSERVE CHEETAH -- THAT IS, INCREASING COOPERATION AND NETWORKING BETWEEN CAPTIVE CHEETAH BREEDING ORGANISATIONS, IMPROVING COMMUNICATIONS AND FACILITATING THE MOVEMENT OF CHEETAH BETWEEN FACILITIES GLOBALLY.

<u>Solution 1</u>:
Develop a database of people working in *ex situ* cheetah activities and not just people publishing their data. Identify contact people starting at this meeting and request areas of expertise, their activities and projects, including a list of their needs. A facilitator (regional programme manager) of collection data needs to be appointed.

ACTION STEP 1:
Use the database designed by Luke Hunter. Send this form for comment to regional coordinators.
RESPONSIBLE: Luke Hunter
TIMELINE: 30 October 2001

ACTION STEP 2:
Luke Hunter and Dusty Lombardi need to update the database and Dusty needs to send it out to regional coordinators
RESPONSIBLE: Dusty Lombardi
TIMELINE: 30 November 2001

ACTION STEP 3:
Regional coordinators send the database out to their participants for input and need to get it returned.
RESPONSIBLE: Regional coordinators: Luke Hunter, Dusty Lombardi, Sean Mc Keowan, Laurie Marker, John Lemon, Japanese person to be designated
TIMELINE:
   a) Database returned to regional coordinators by 28 February 2002 and
   b) Updating completed 31 March 2002

Solution 2:
Disseminate information in a usable updateable format (regional and international programme managers). Review and update this resource guide on a regular basis every 2 to 3 years.

ACTION STEP:
Place information on appropriate website
RESPONSIBLE: Duncan Purchase and Steve Hines
TIMELINE: 28 May 2002

Solution 3:
Develop a global programme (genetic and demographic) for managing captive cheetah.

1. It is recognised that many cheetah in captivity are privately owned, and that these private facilities and/or individuals may have either no ability or interest in participating in regional or global captive cheetah management plans.

2. Animals in these facilities need to be identified and excluded from population analysis, and when necessary recorded as "Lost to Follow-up."

3. Those facilities that choose to participate need to commit to timely communication of changes to their collection (births, deaths, illness).

4. It should be recognised that the primary benefit of globalisation of captive management is information sharing. Movement of animals among regions when considered necessary for demographic or genetic reasons should be done in coordination with global population analyses.

5. The International Studbook should be analysed at least every three years, not to make animal-by-animal recommendations but rather to track the status of the population. On an as-needed basis analyses can be done to help regional coordinators locate suitable animals for import/export.

6. Regional studbooks should be analysed at least annually and used to help guide decisions on breeding and animal moves. Regions may have different levels of expected participation in the captive breeding programmes, and that needs to be respected. Regional programme coordinators need to let the International Studbook Keeper know when they believe they have a need to import or export animals for genetic or demographic reasons.

ACTION STEP 1:
Improve accuracy of International Studbook
RESPONSIBLE: Laurie Binghaman-Lackey
TIMELINE: End of 2001

ACTION STEP 2:
Formalisation of captive management programmes within regions. If regions do not already have a formalised captive management programme (Asia?), it needs to be determined whether there is the possibility of those regions being able to participate at some time in the future.
RESPONSIBLE: Regional coordinators
TIMELINE: December 2002

ACTION STEP 3:
Each region should identify a regional studbook keeper so that data collection can be more proactive (i.e. multiple contacts to get information) and occur on a timelier basis. Regional studbook keepers should send data to the International Studbook Keeper on a regular basis.
RESPONSIBLE: Regional coordinators
TIMELINE: December 2002

ACTION STEP 4:
If a region currently lacks the expertise in studbook keeping and/or population management, options include obtaining copies of training manuals, attending courses offered in other regions, and/or hosting training workshop(s) within the region.
RESPONSIBLE: Regional Coordinators
TIMELINE: December 2002

ISSUE 2.
COORDINATING *IN SITU* EFFORTS TO CONSERVE CHEETAH -- THAT IS, ENHANCING THE CONSERVATION OF CHEETAH IN NORTH AFRICA AND ASIA, CONDUCTING RESEARCH INTO NORTH, WEST AND CENTRAL AFRICAN AND IRANIAN CHEETAH, COORDINATING REINTRODUCTION AND TRANSLOCATION PROJECTS AND IDENTIFYING *IN SITU* PROJECTS IN NEED OF SUPPORT.

<u>**Solution 1:**</u>
Develop a database of people working on *in situ* cheetah activities and not just of people publishing their data. A facilitator (regional programme manager) of collection data needs to be appointed.

ACTION STEP:
Design a database, identify contact people starting at this meeting and request areas of expertise, their activities and projects, including a list of their needs (link with other databases formed from this meeting).
RESPONSIBLE: Luke Hunter
TIMELINE:
  a) Design a database by 30 September 2001
  b) Send out form, survey for comment from field researchers at this meeting by 30 October 2001
  c) Modify design after responses by 15 November 2001
  d) Send out database by 30 November 2001 to all *in situ* researchers compiled previously
  e) Return to Duncan Purchase / Steve Hines by 28 February 2002 (pending funding)

Solution 2:
Disseminate information in a usable updateable format (Cat Specialist Group / Cheetah Interest Group web sites?) and review and update this resource guide regularly (every two to three years?).

ACTION STEP:
Compile information that was sent to Duncan Purchase / Steve Hines by the 28 May 2002. Disseminate information as appropriate based on the size of the database. For example, if the database is relatively small and in a commonly used software package, it could be sent via e-mail as well as be posted on the web (e.g., IUCN Cat Specialist Group and the Cheetah Interest Group). If the database is both large and complex other methods may be more appropriate.
RESPONSIBLE: Luke Hunter
TIMELINE: 28 May 2002

Solution 3:
Develop a regional programme for managing small isolated wild cheetah populations as a meta-population

ACTION STEP 1:
Start dialogues on a national basis to establish the need for and benefit of managing cheetah among isolated areas. This may be primarily an issue for South Africa, and should be championed by a South African governmental agency, NGO, or researcher.
RESPONSIBLE: Possibly the National Cheetah Management Programme through Deon Cilliers?
TIMELINE: end of 2002

ACTION STEP 2:
Knowledge of translocations, past and future, is critical to developing any kind of meta-population profile that could lead to meta-population management. Existing information needs to be combined and centrally stored so that it is not lost.
RESPONSIBLE: Cheetah Interest Group
TIMELINE: Meeting December 2002 (Non-protected areas group action)

ACTION STEP 3:
Develop integrated management programmes for populations that exist across borders
RESPONSIBLE: Cheetah Interest Group
TIMELINE: December 2002

ISSUE 3.
LINKING *IN SITU AND EX SITU* EFFORTS TO CONSERVE CHEETAH. THE GOAL OF THE CHEETAH CONSERVATION ACTION PLAN WORKSHOP (CAP) IS THE CONTINUED EXISTENCE AND PROTECTION OF THE CHEETAH IN THE WILD. GOALS SHOULD BE IDENTIFIED TO AVOID OVERLAP AND TO MESH THE INTERESTS OF BOTH FACTIONS. IMPROVED EDUCATION AND INCREASED POLICY ARE REQUIRED

TO ENCOURAGE REMOVAL OF BARRIERS TO PROMOTE COLLABORATION. ISSUES SUCH AS HEALTH, BEHAVIOUR, HUSBANDRY, EDUCATION, CENSUS ETC. NEED TO BE LINKED ON A PERSON-TO-PERSON BASIS - WITHOUT ESTABLISHING THESE CLOSE PERSONAL BONDS, THIS LINKING OF *IN SITU* AND *EX SITU* EFFORTS WILL NOT PROGRESS.

Solution 1:
The data facilitators previously mentioned will integrate *in situ* and *ex situ* databases.

ACTION STEP:
Combine both databases for *ex situ / in situ* cheetah conservation
RESPONSIBLE: Duncan Purchase and Steve Hines
TIMELINE: 31 December 2002

Solution 2:
Distribute database to all who are involved in cheetah conservation.

ACTION STEP:
Duncan will send the databases to Luke Hunter and Dusty Lombardi who will send it to regional coordinators and field biologists. Regional coordinators will send it to the appropriate websites

RESPONSIBLE: Duncan Purchase, Luke Hunter, Steve Hines and Dusty Lombardi
TIMELINE: 15 January 2003

Solution 3:
Coordinate and integrate *in situ / ex situ* conservation education programmes messages to present an accurate and consistent message on cheetah conservation.

ACTION STEP:
The education document developed by the education working group should be distributed to the regional coordinators and field researchers
RESPONSIBLE: Education working group
TIMELINE: Up to the group, hopefully before January 2002

Solution 4:
Public awareness and public relations should help fund raise for support of *ex situ* and *in situ* needs.

ACTION STEP:
Institutions and regional coordinators cooperating in cheetah management programmes should promote the document to their fund raising personnel.
RESPONSIBLE: Regional coordinators
TIMELINE: 15 April 2003

Solution 5:
Educate and include policy makers should encourage the removal of barriers that impede collaboration.

ACTION STEP:
Distribute the final document distributed by CBSG from this workshop.

RESPONSIBLE: Contact person from each country will be responsible for sharing the document with their appropriate policy makers and CITES.
TIMELINE: Open

ISSUE 4.
GENETIC MANAGEMENT OF *EX SITU* POPULATIONS WITHOUT THE NEED TO IMPORT WILD CHEETAH FROM RANGE COUNTRIES.

Solution:
Utilise assisted breeding (such as artificial insemination) with cryo-preserved semen from wild cheetah as a strategy for importing new genetic material into *ex situ* populations.

ACTION STEP:
Continue improving semen cryopreservation and artificial insemination methods to maximize reproductive success after assisted breeding.
RESPONSIBLE: JoGayle Howard, Budhan Pukazhenthi, Adrienne Crosier, David Wildt (Conservation & Research Centre, National Zoological Park, USA) and Paul Bartels (wBRC – South Africa)
TIMELINE: Continued research in 2002 and beyond.

Education and Communication Working Group Report
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Participants: Annie Beckhelling (South Africa), Hu Berry (Namibia), Verity Bowman (Zimbabwe), Steve Hines (USA), Angela Lemon, John Lemon (Australia), Kelley Snodgrass (USA), Diana Twining (USA) and David Wildt (USA)..

Additional input from Elizabeth Wmambwa (Kenya), Bruce Davison (Zimbabwe), Sarah Durant (Tanzania) and Laurie Marker (Namibia).

ISSUE 1.
THE GENERAL LACK OF RESOURCES IN AFRICA IS AFFECTING THE DEVELOPMENT AND IMPLEMENTATION OF MULTI-LEVEL EDUCATION.

Solution 1.
Seek and establish partnerships with developed countries to acquire resources.

ACTION STEP:
Acquire and circulate data on:
a) funding organisations
b) teaching materials and ideas emphasising interactivity
c) information to initiate capacity building
RESPONSIBLE: Steve Hines
TIMELINE: a) end 2001
　　　　　　　　 b) 8/2002
　　　　　　　　 c) 3/2003

Solution 2:
Utilise existing NGO networks to distribute resources and identify in-country organisations already working on eco-education and assist them in capacity building.

ACTION STEP 1:
Identify suitable NGOs already working on eco-education.
RESPONSIBLE: Angela Lemon (Australia), Verity Bowman (Zimbabwe/Zambia), Hu Berry (Namibia/Angola), Martin Malama and Elizabeth Wambwa (Kenya), Annie Beckhelling (South Africa), Sarah Durant (Tanzania), Diana Reuter Twining (North America/France/ Turkey/India, Cheetah Conservation Fund (Western and Northwest Africa, Iran and Botswana), Nick Lindsay (United Kingdom/Iran/Western Africa/Ethiopia/Saudi Arabia/United Arab Emirates.
[Note that additional resources are the IUCN Cat Specialist Group and the Antelope Specialist Group.]
TIMELINE: All information to be gathered by the end 2001 and relayed to Marwell Zimbabwe Trust.

ACTION STEP 2:
Prepare a survey for mailing to possible participants to gather data on their needs.

RESPONSIBLE: Steve Hines to co-ordinate and Smithsonian Institution to provide administrative assistance in survey preparation.
TIMELINE: By the end of 2001

ACTION STEP 3:
Mail follow-up, tabulate, analyse and disseminate information which may ultimately result in a workshop.
RESPONSIBLE: Steve Hines and Kelley Snodgrass
TIMELINE: June 2003

Solution 3:
Facilitate teacher workshops to bring environmental issues into existing school curriculum.

ACTION STEP:
Take recent Cape Town (July 2001) Teacher Training Model developed by Cheetah Outreach (Cape Town) and the Smithsonian National Zoological Park (USA) into Namibia. Venue to be decided. Listen to what the Teachers perceive their needs to be.
RESPONSIBLE: Cheetah Conservation Fund, Cheetah Outreach, AfriCat, CBSG and the Smithsonian National Zoological Park (USA).
TIMELINE: Depending on funding, August 2002.

Solution 4:
Establish, implement and share "in house " educational programmes for children using outside resources and expertise to assist development. Emphasis should be placed on field trips to enhance the learning experience.

ACTION STEP 1a:
Follow-up to ensure development of materials relevant to the country as identified in workshops.
ACTION STEP 1b:
Duplicate throughout range countries.
RESPONSIBLE: Teachers identified in the workshop with appropriate expertise provided by CCF and AfriCat.
TIMELINE: After the 2002 workshop

ISSUE 2.
LACK OF CO-OPERATION BETWEEN ALL STAKEHOLDERS AT ALL LEVELS.

Solution:
Promote communication and co-operation between key stakeholders to ensure a strong dialogue between the following groups: Government agencies; NGO's, educators and donors; researchers, captive animal facilities and field workers; commercial and subsistence farmers.

ACTION STEP 1:
Establish a Cheetah Interest Group (CIG), using the address list from the present workshop. Consider enhancing the permanence of this group by developing a CIG Secretariat.
RESPONSIBLE: To be identified by end of this meeting (see CIG discussion notes, this report).
TIMELINE: By the end of this meeting.

ACTION STEP 2:
Establish a communication network to reach all stakeholders, via platforms, such as conferences, websites, email, newsletters, magazine articles and electronic media. Radio ownership is widespread in communities and should also be used.
RESPONSIBLE: CIG Secretariat
TIMELINE: 2002

ISSUE 3.
DEFECTS IN THE CURRENT EDUCATIONAL SYSTEM INHIBIT THE AWARENESS OF AND TRAINING OPPORTUNITIES FOR CONSERVATION CAREERS FOR PEOPLE FROM MARGINALIZED COMMUNITIES.

Solution 1:
Involve Ministries of Education and Environment and Tourism in all initiatives.

ACTION STEP:
Nominate an individual to attend the SADC Environmental Educators' workshop in Maseru, Lesotho 1-5 Oct 2001. The nominee will present and distribute a paper on the existence of the Cheetah Interest Group (CIG) and the value of the cheetah as a" flagship" species for conservation education. It is likely that Ministry officials will be attending this workshop**.**
RESPONSIBLE: Annie Beckhelling
TIMELINE: 5 October 2001

Solution 2:
Facilitate opportunities to work with organisations such as the Peace Corps to "jump start" sustainable capacity building programmes for the purpose of training teachers through the medium of workshops.

ACTION STEP 1:
Identify a CIG Education Coordinator, who will pursue methods and strategies for training teachers.
RESPONSIBLE: Annie Beckhelling and the CIG Coordinator with committed support from North America, (Smithsonian, Fossil Rim, Oklahoma City Zoo, among others), Australia and Pan African colleagues
TIMELINE: Immediately

ACTION STEP 2:

Continue with at least one teacher training workshop annually (first one scheduled for July 2002).

Solution 3:
Identify key educators and ensure that they get international exposure.

ACTION STEP:
Identify star teachers from the workshops (two for 2002) for broad-scale exposure to environmental sciences at the Smithsonian Institution (USA) per programme implemented in 2001.
The education co-ordinator will solicit other educational organisations for interest in providing training opportunities. (AfriCat, CCF, North American Zoos).
RESPONSIBLE: Annie Beckhelling and the CIG Co-ordinator.
TIMELINE: After 2002 workshop.

ISSUE 4. THE QUALITY OF INFORMATION PROVIDED TO TOURISTS VISITING PROTECTED AREAS AND CULTURAL SITES IS POOR

Solution 1:
   a) Create a training programme for tour guides at the formal (commercial level) and the informal (community level).
   b) Test and certify candidate tour guides for competency in wildlife.
   c) Register certified tour guides under a government agency with annual renewal and disciplinary authority.

ACTION STEP:
Create a description of existing training for tour guides that ensure accuracy with respect to cheetah conservation issues. This document will be made available on the CIG website with Hu Berry identified as the contact person for those interested in this type of training.
RESPONSIBLE: Hu Berry
TIMELINE: End of 2001

ISSUE 5.
INAPPROPRIATE POLITICAL APPOINTMENTS AT DECISION-MAKING LEVELS IN CONJUNCTION WITH THE EXCLUSION OF INPUT BY INDIGENOUS PEOPLE LEADS TO LACK OF IMPLEMENTATION OF POLICY.

Solution 1a:
Encourage the appointment of individuals sympathetic to conservation principles wherever possible.

Solution 1b:
Identify and lobby for appropriate policy decisions.

ACTION STEP:
Widely distribute this document to government departments involved in environmental issues.

RESPONSIBLE: Government representatives present at this meeting – Hu Berry for Namibia.
TIMELINE: As soon as final document from this workshop is completed.

ISSUE 6.
DIVERSITY OF THE COMMUNITY BASE AND THEIR ENVIRONMENT COMPLICATES THE DEVELOPMENT OF A COMPREHENSIVE EDUCATIONAL EFFORT.

Solution 1:
Adapt the education package to accommodate urban and rural communities including subsistence and commercial farmers.

Solution 2:
Employ local interpreters to deliver programmes in the appropriate language.

Solution 3:
Promote a sense of awareness of the custodianship of the indigenous fauna and flora.

Solution 4:
Focus on training local scientists and appropriate agricultural extension staff.

ACTION STEP:
Develop a workshop to identify strategies that will enable the training of potential indigenous scientists in conservation.
RESPONSIBLE: Gus Mills, Hu Berry, Elizabeth Wambwa, Martin Mulama, Dave Wildt, Diana Reuter-Twining.
TIMELINE: 2003

ISSUE 7.
MULTICULTURAL BACKGROUNDS GOVERN THE ATTITUDES OF THE INDIGENOUS POPULATION TOWARDS CERTAIN SPECIES, OFTEN RESULTING IN ANIMAL PHOBIA AND MISCONCEPTIONS.

Solution 1:
Facilitate workshops to reduce the phenomenon of animal phobia through direct exposure to live animals and to impart a better understanding of their role in the ecosystem.

ACTION STEP:
Include these topics in the Teacher Training workshops to be held in 2002.
RESPONSIBLE: Annie Beckhelling
TIMELINE: 2002

Viability of the Captive Population Working Group

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Participants: Laurie Binghaman-Lackey, Kevin Willis, Laurie Marker

Overall aim: This group examined the status of the global captive cheetah population as estimated from the International Cheetah Studbook (1985-2000).

The total number of living animals listed in the International Studbook in Australasia, Europe, Japan, North America and Southern Africa, is 1065 in 161 different facilities. These numbers do not represent all animals and institutions with living animals in the studbook, but is rather a subset of animals that are more likely to be in a managed programme now or in the near future. The various regional programmes have different concerns, and the regional populations have different characteristics. Below is a brief description of the status of these populations.

Demography

Overall, using data from the past 15 years, the global captive population has not been self-sustaining (i.e., life table lambda λ] is less than 1.00). However, success in reproducing cheetah varies greatly both among (Table 1) as well as within regions. In Table 1 the estimates of lambda are based on data from 01/01/1985-01/01/2001. The Census λ is the average annual growth rate of the population. It is based on the total number of living animals at the end of each year and does not take into account the source of those animals. The Life Table λ is an estimate of what the annual growth rate would be in the absence of importation/exportation, and is based on the age specific estimates of survival and fecundity. The difference between these two estimates of the annual growth rate is important. If the census λ is greater than 1 and the Life Table λ is less than 1 (as is the case in all regions outside of the species' range), it suggests that the population has grown more because of importation than captive breeding and that the populations, as managed during that time period, are unlikely to be self-sustaining. Based on Table 1, only the Southern African region has produced sufficient offspring to be considered a self-sustaining population; however, there are also some significant differences among facilities within regions. For example, although the North American population as a whole has a Life Table λ of 0.96, the Life Table λ for this time period for three North American Facilities (Fossil Rim Wildlife Centre, White Oak Conservation Centre, and the San Diego Wild Animal Park) was 1.10. This large difference within a region may be an important indicator as to how cheetah could be managed so that a population could become self-sustaining.

Genetics

Table 1 contains the number of Founder Genome Equivalents (FGE) in each regional population. FGE is a convenient method of expressing Gene Diversity (GD), and is equal to:

$$FGE = 1/(2*(1-GD))$$

Table 1 also contains the potential FGE (pFGE) for each regional population. The pFGE is the maximum possible FGEs for the region if all extant founder alleles in the region could be brought to the same frequency in the regional population. While this potential number is not actually attainable, the difference between the actual and potential FGEs in a population gives an indication as to whether importation of additional founder lines would be required to increase the amount of gene diversity in a regional population. As can be in Table 1, most regions may be able increase their amount of gene diversity by a considerable extent by preferentially breeding underrepresented founder lines.

Whereas the numbers of animals in Table 1 can be summed to determine the total number of animals, the same is not true of FGEs. The total FGE would only equal the sum of the Regional FGEs if there were no founder lines shared among regional populations. The sum of the Regional FGEs is 75, whereas total FGE is 42. This suggests that there is considerable sharing of founder lines among regions, and that to ensure that genetic material/animals imported into a region can help to increase the region's FGE, a careful analysis of the International Studbook is necessary.

Table 1: Status of Regional Populations

Region	# Animals	# Facilities	Census λ	Life Table λ	FGE	pFGE
Australia/ New Zealand	27	8	1.08	0.88	9	13
Europe	357	72	1.02	0.97	20	71
Japan	62	9	0.99	0.91	8	25
North America	260	62	1.01	0.96	17	56
Southern Africa	359	10	1.05	1.05	21	214

APPENDIX I

Participant List, Global Cheetah Conservation Action Plan Workshop
August 2001 - South Africa

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APPENDIX II

Participant Goals for Workshop Outcomes:

- I would like to see the development of a coordinated plan for the re-introduction of cheetah into areas of former range.
- Increased collaboration amongst delegates, especially in terms of sharing information and data, so that decisions of how wild and captive populations should be managed are based on the best possible information.
- Improved communications and cooperation from all who are working on cheetah, with the ultimate goal of the continued long term survival of the cheetah with a plan that is holistic and realistic.
- To see more emphasis placed on field research of wild cheetah populations and captive populations and captive facilities increasing support of field projects that are collecting baseline data that will assist in the management of the species.
- To develop a well-designed, practical management plan for both the captive bred cheetah and the free-roaming cheetah that don't only occur in the protected areas but also in open farmlands.
- Strong, productive worldwide cooperation and collaboration for cheetah issues with support and feedback to all range states.
- To develop an international consortium that cooperates on management of cheetah in the wild and in captivity to maximize the conservation of healthy viable populations.
- Draw greater attention to the survival of cheetah on commercial farming land in Zimbabwe in view of the new land tenure system at present underway in the country.
- Reality check on the problems and issues that face the conservation of cheetah and to understand the link between *in situ* and *ex situ*.
- To enhance communications between European and American regions, to network with major players in field research and conservation and to enhance education and fund raising initiatives used globally.
- Improved cooperation and communication within cheetah holding facilities in South Africa. A conduit for the sharing of information on disease in captive cheetah populations and nutrition for captive held cheetah.
- To obtain a broad picture of the research that is being undertaken in the diagnosing, treatment and prevention of disease in captive and free-ranging cheetah (specifically, renal disease).
- Everyone working together and sharing information, forgetting politics, for the betterment of the cheetah.
- Cheetah health problems, including renal failure and gastritis. I am looking forward to hearing collective views on the problems and possible management

considerations (captive). Pooling of data between South African organisations. Expanding the network of contacts, and gaining a better understanding of current wild cheetah population status.

▪ Defining strategies for reducing the conflict between humans and cheetah in the field.

▪ Personal interests include gaining an overview of *ex situ* and *in situ* cheetah conservation that is presently being done, meeting people and sharing information and gaining new ideas for future work and conservation of cheetah.

▪ Better global management of the captive cheetah population with greater interaction between the various zoo regions. Greater research into the status of wild cheetah in the Northern region of Africa and Iran.

▪ To gain a clear understanding of the role that zoos <u>will</u> play in cheetah conservation, whether it be captive breeding, education, provision of funds etc. To learn more of what is happening in the wild.

▪ To ensure that cheetah remain a healthy and viable population for generations to come, to better link *in situ* and *ex situ* cheetah conservation efforts, and to improve communicating and networking between captive cheetah breeding facilities globally.

▪ To identify ways that the captive community can assist the field researchers in conservation, research and education.

▪ To get various people and organisations working with the cheetah to know each other, see <u>eye-to-eye</u> on the various issues at hand and <u>cooperate</u> with the ultimate aim of the survival of this species both in the wild and in captivity (but especially in the field).

▪ To acknowledge and complement the work which has accrued to date and to develop a more comprehensive cheetah management programme for *in situ* and *ex situ* and education.

▪ Better communication between *in situ* and *ex situ* groups, improved understanding between captive and wild cheetah interest groups and to exchange ideas and experience between all involved.

▪ Cheetah conservation in the wild by creating new habitat for free-ranging animals. Captive breeding can never be a substitute for this. Game ranches also need to learn to live with cheetah and accept that they have an equal right to survival along with their prey species.

▪ To foster a stronger bond between all those striving to conserve the cheetah, that politics and personal agendas are put to one side and that workable, sustainable plans will emerge that will ultimately mean that our children's children can see cheetah roaming free. As a fundraiser by profession, I hope that we will also develop strategies to raise significant money to enable us to do more releases, programmes, education and research.

▪ In the past 30 years, politics has always been present in cheetah conservation. I would like to see cooperation between all groups, concentration on the existing wild cheetah and gaining cooperation from farmers in the areas where cheetah occur.

- New ideas for partnership that benefit cheetah conservation and managements on *in situ* and *ex situ* populations, but including those that stress capacity building (training and education).
- Allow more communication and collaboration between researchers in the wild and the captive breeding programmes.
- Coherent, sustainable, practical conservation plan taking into consideration ongoing inputs from all role players.
- Global programmes – develop an action plan with steps to tackle the issues facing cheetah survival *in situ* and *ex situ*. Respect, cooperation and honesty, keeping the cheetah at the forefront of our actions using a multi-disciplinary strategy.
- To develop strategies for more links between *in situ* and *ex situ* populations for collaborative research and communication.
- Finding out about and learning from other cheetah field research and conservation projects across Africa – building an African-wide cheetah conservation and information network.
- To share thoughts on measures to breed cheetah in captivity and also on their welfare in captivity.
- Strengthening of bonds between cheetah conservation groups in the SADC region, and a realistic set of objectives for global cheetah conservation.
- I hope that this workshop will address the disease threats of free-ranging cheetah populations, will come up with an approach to investigating current disease threats and management interventions that will enhance viable cheetah populations. Also, to develop some useful collaborations.
- To create the necessary links to share with each other what we know about cheetah, especially captive breeding and dealing with cheetah in the wild.
- That an awareness can be created of the importance of Zimbabwe as a player in the conservation of wild cheetah, that Zimbabwean conservation efforts can be synergised with international efforts and to find a solution for the Zimbabwean cheetah problems.
- To gain a better understanding of the cheetah conservation issues to direct my institution's resources for maximum benefit.
- To develop a strategy for gaining more accurate information regarding the status and distribution of wild cheetah populations, and to come up with management programmes including both the *in situ* and *ex situ* schemes, that will enhance the long-terms survival of the cheetah in the wild.
- To bring more conservation in!! Expand on workable models. i.e. Namibia, South Africa, to resolve conflict between landowners / farmers and free-ranging cheetah. To devise strategies and models for near-extant population censusing of free-ranging cheetah and to devise strategies and models for sustainable utilisation of free-roaming cheetah.
- Channelling all the good conservation energy of the different fields into a well planned strategy to ensure the survival of the species.
- Regional cooperation between facilities and reserves managing cheetah, in the areas of nutrition and disease management, reproduction and biomaterials collection and banking, and making these biomaterials available to the global

research and management community – using a multidisciplinary approach to answering pertinent questions.

- I would like to see addressed the problems associated with cheetah conservation in game farming areas in South Africa, Namibia and Zimbabwe, and the conservation of cheetah in North Africa and Asia.
- To gain knowledge, improved communication and cooperation between stakeholders with regard to problem cheetah and cheetah in protected areas and to understand more about the genetic status of the cheetah and how management can enhance their status.

APPENDIX III

PROBLEMS, ISSUES AND THEMES AFFECTING SUCCESSFUL COLLABORATIVE MANAGEMENT OF CHEETAH, BOTH *IN SITU* AND *EX SITU*

EDUCATION AND COMMUNICATION
- Awareness of cheetah in general
- Conservation of wild cheetah
- Strengthen political will ("bio-politics")
- *Ex situ* conservation
- Development of education packages to show the value of wild populations to human populations, including conservation projects
- Guide people to be the solution (education, capacity building, awareness)
- The realization that resolving political problems lies in "us" not "them"
- Funding strategies
- Education resource package development
- *In situ* policy and law formulation and implementation nationally and internationally
- Lack of cooperation amongst stakeholders (sharing of information, materials and expertise)
- How to achieve good, long-term collaboration between all parties
- Training a generation of African scientists of colour interested in conservation

CENSUS
- Need to identify forces and driving trends and develop strategies to manipulate these
- Standardize data collection and archival system
- Census of marginal wild populations
- *In situ* population modelling – meta - and total-population
- How to gain accurate baseline data on wild populations (census, trends, etc.)
- Reliable population estimates
- *In situ* knowledge, especially what determines wild population dynamics in different areas
- Standardized census methods
- Lack of good, accurate data on wild populations
- Lack of baseline data for wild populations
- Maintain viable habitat
- Funding strategies
- Conservation of wild cheetah
- Standardized monitoring techniques for comparability
- Implementation of a universally accepted census technique
- Accurate census techniques to monitor population trends

HEALTH
- Investigating disease in free-ranging cheetah and comparing this to the situation in captive populations
- How can all facilities researching cheetah health and management issues in the captive community pool resources and share information with all facilities holding cheetah
- Genetic future both *in situ* and *ex situ*
- Increasing the number of cheetah reproducing in captivity
- Health of captive population / individuals
- Conservation of wild cheetah
- We need to identify common captive problems and solutions and define a common husbandry protocol
- *Ex situ* disease and understanding management
- Assisted reproduction for population management
- Management / action plans to ensure the long-term survival of free-ranging cheetah outside formal conservation / protected areas
- Renal and gastric disease of captive and wild cheetah relating to diet
- More information on management of captive and wild cheetah (health, reproduction nutrition)
- Health issues and how we are going to pool data/work
- Management of cheetah during capture, recapture, translocation and captivity
- Coordinating medical research
- Funding strategies

MANAGEMENT AND CONSERVATION ISSUES OUTSIDE OF PROTECTED AREAS
- Sound ecological data and habitat protection
- How to manage habitat and prey in order to allow cheetah to survive
- *In situ* – conflict resolution models in Eurocentric countries
- Human-cheetah conflict (attitudes, livestock loss, management)
- Conservation of wild cheetah
- Governmental conservation areas are too small
- Need the private sector involved to ensure the cheetah's survival
- Protection of cheetah outside protected areas
- Need to motivate landowners/communities to buy into predator conservation
- Creating more habitat for wild cheetah

COORDINATING COLLECTION AND ANALYSING DATA *IN SITU* AND *EX SITU*
- Captive conservation breeding
- Improve communication and better facilitate the movement of cheetah between captive facilities globally
- Networking of captive breeding/conservation programmes and increasing reproduction/management
- Cango as a role player in research of captive animals
- Conservation of wild cheetah
- More cooperation between zoos trying to breed cheetah in captivity
- Coordination of reintroduction and translocation projects

- Identifying *in situ* projects that need support
- How can we enhance the conservation of the cheetah in North Africa and Asia?
- Research and resources into North/West/Central African and Iranian cheetah
- A dynamic network that identifies all the needs then links together all the *in situ* and *ex situ* players appropriately
- Cooperation between local and regional parties involved often is lacking
- Cooperation and communication between all stakeholders (government, NGOs, captive breeding holding)
- How can range countries promote cooperation for both *in situ* and *ex situ* conservation considering the limitations of both?
- What immediate steps can individual institutions take to aid *in situ* organisations?
- What can we, as captive institutions, do immediately to aid *in situ* organisations?
- How do we link *in situ* / *ex situ* with clearly defined goals for *in situ* programmes to allow us to assist with funding and expertise?

APPENDIX IV

FACILITATED DISCUSSION ADDRESSING THE CONFLICT AMONG FIELD BIOLOGISTS AND VETERINARIANS IN TERMS OF ROLE OF DISEASE IN CHEETAH POPULATIONS

The group began by determining a number of points on which they agreed. The group agreed that:

- this is a contentious issue.
- there are entrenched dichotomies.
- we are unlikely to change people's attitudes within this 1-hour discussion so our goal will be for people to understand each other's perspectives.
- the presence of disease is a normal, natural phenomenon, and that additional problems have been brought into play by additional human caused pressures.
- the extent of disease (as well as other factors, e.g., human factors, persecution, climate, etc.) and the various interactions of these factors on the viability of wild populations is not known.
- there is a range of factors affecting wild population viability, including human induced factors and others, as well as disease.
- disease is a bigger issue than just in the context of conservation.
- there is insufficient understanding of the transmission and aetiology of disease among wild populations and domesticated animals.
- identifying and understand disease status and dynamics in the wild is different from whether action is required to treat disease. The presence of disease does not necessarily mandate action to treat it.

Some of the problems identified were:
1. When disease is discovered or identified in wild populations, communication between health and field staff is not taking place, and decisions for action are not carried out by consensus.

2. Field biologists believe that disease related problems are treated from a uni-disciplinary veterinary perspective rather than from an ecological perspective.

The group further discussed that:
- When a disease related problem occurs, all relevant disciplines need to be involved, but the field ecologist should play the primary role, along with agencies, farmers, veterinarians, etc.
- Disease is a monitoring tool (sentinel) within natural ecological processes. It is one index among many disciplines that can help monitor trends.

- The relationship of land use issues needs to be taken into account, with the involvement of multiple stakeholders (land owners, regulatory personnel, field ecologists, veterinarians, etc.). Decision-making is context-specific.
- Policy makers are making decisions based on economic factors (largely based on the importance of livestock and related issues) rather than on wildlife-based information. It is difficult to overcome these barriers.
- Many veterinary regulations are carried over from a time when livestock was the most important issue. We need to encourage discussion to determine the real effect of diseases now, because the value of wildlife has changed.
- We need to take into consideration human-induced factors, as well as disease, when examining the effects of manipulations of wild animals (translocation, radio collaring, etc.).
- Disease may be one index among many that can help us monitor trends and that there needs to be a multi-disciplinary approach.
- There is a need to appreciate the contributions of each discipline and strength that comes from combining forces.
- One way of overcoming this fracture is to combine efforts between field biologists and veterinarians to conduct collaborative hypothesis-driven research and joint projects.
- Additionally, veterinarians believe it is important to collect data opportunistically because it is important to create data bases that will be important for the future. A long-term context is needed.
- Veterinarians often are seen to be reactive, because many situations are presented as crises, with no long-term context or perspective provided by the people contacting / involving them.
- Field ecologists believe that veterinarians have a more influential voice and describing the impact of phenomena that are related to disease when it comes to influencing decision-making. The field ecologists need the veterinarians to take into account ecological data in order to strengthen their voices as well as to provide a broader, more interdisciplinary approach.
- The veterinarians need the field ecologists to understand the broad set of skills that veterinarians offer and how they can interface.

NEEDS / POTENTIAL SOLUTIONS:
- One potential long-range solution is to train veterinary students in 'disease ecology' (this is occurring at the University of California at Davis) and to expose field ecologists to the contributions that veterinary medicine can provide for conservation.
- Communicate/meet when problems arise. Both groups must facilitate open/honest dialogue when situations to be addressed arise and ask for interdisciplinary approaches to problem solving.
- There needs to be more involvement in and input from field ecologists in disease related issues, in providing valuable historical information and in providing samples.
- There needs to be better communication and open dialogue.
- Multi-disciplinary teams could be formed to address problems as they arise and also to develop hypothesis-driven research projects.

- Veterinarians need to provide training and equipment to the field ecologists to collect samples / data. They also need to provide prompt information back to the field ecologists on the results of the sampling.
- Ensuring integration of results (for example, planning ahead of time how to deal with samples between field veterinarians and field ecologists).
- There have been some successes (e.g., Marker and Munson collaborations), which can be built upon.
- There is a need for field ecologists and veterinarians to get together now to deal with policy related issues.
- Veterinary science is only one of many disciplinary tools in conservation biology.
- We need to look at approaches in an overall ecological manner that takes into account the whole milieu.

APPENDIX V

CHEETAH INTEREST GROUP DISCUSSION NOTES

A small group pf participants met after the workshop to discuss the formation of a Cheetah Interest Group. Not all participants were able to be part of this discussion as they had left or has other commitments, there the group comprised the following people:

Vanessa Bouwer (South Africa), Jack Grisham (USA), Yolan Friedmann (South Africa), Deon Cilliers (South Africa), Bruce Davison (Zimbabwe), Laurie Marker (Namibia), Annie Beckhelling (South Africa), Thys De Wet (South Africa) and Sean McKeown (UAE).

And others who were interested but could not attend included: Dave Wildt (USA), Linda Munson (USA), Steve Hines (USA) and Diana Reuter-Twining (USA).

GENERAL ROLE OF THE CHEETAH INTEREST GROUP (CIG)

The group agreed that the general role of the CIG is to "keep the process alive" – implying that the communications, resolutions and action steps initiated at the Cheetah Action Planning workshop should be kept dynamic and progressive through the activities of the CIG. The CIG will, in brief:

- Facilitate and foster open and effective communication between workshop participants and other cheetah conservationists worldwide
- Educate and inform the general public and other stakeholder groups on matters relating to cheetah conservation
- Facilitate dynamic, interactive collaboration and information exchange between various stakeholders in cheetah research and conservation, worldwide
- Facilitate fundraising for cheetah research and conservation and channel funds into needy projects
- Encourage and support sound scientific research on cheetah
- Encourage an holistic approach to the conservation and management of cheetah
- Provide a link between *ex situ* and *in situ* cheetah conservation programmes
- Act as a forum through which obstacles facing effective cheetah research and conservation can be addressed and dealt with
- Provide a forum for channelling queries and requests for information or participation from cheetah conservationists, as well as members of the public, to the appropriate organisations / individuals
- Act as a neutral mouthpiece for cheetah conservation organisations worldwide

- Keep the processes initiated at the Global Cheetah Master Planning workshop "alive" and dynamic

The Cheetah Interest Group will achieve this by the undertaking following:

ACTION STEP 1:
Establish a web site through which information on projects, working group discussions and resolutions can be accessed by interested parties.
RESPONSIBLE: Steve Hines to recruit webmaster and oversee development of the web site.

ACTION STEP 2:
Update the web site regularly and keep the site dynamic and topical
RESPONSIBLE: CIG secretariat
TIMELINE: Once the web site is established and the secretariat is appointed
ACTION STEP 3:
Communicate with workshop participants regularly in order to report back on results, assist and provide support when needed, create a forum for continued discussions and communications and explore the possibility of establishing a CIG listserve for members.
RESPONSIBLE: CIG secretariat

ACTION STEP 4:
Facilitate the channelling of funding to projects as approved by the CIG.
RESPONSIBLE: CIG Committee
TIMELINE: Ongoing once CIG established

CHEETAH INTEREST GROUP STRUCTURE

ACTION STEP 1:
The CIG will try to obtain full recognition by the IUCN along the lines of the African Lion Working Group.
RESPONSIBLE: Laurie Marker to assist.
TIMELINE: Once CIG established and committee and secretariat appointed

ACTION STEP 2:
Appoint CIG secretariat: The CIG will be chaired by a secretariat who would be responsible for management of the web site, regular communications, reports and other duties as determined by the committee. It was agreed that the secretariat needs to be a neutral, central body based in Africa.
RESPONSIBLE: As yet undecided but Yolan Friedmann offered to stand in as interim secretariat.
TIMELINE: Follow-up meeting to be held in Summer 2002.

ACTION STEP 3:
Appoint coordinating committee: The CIG will be coordinated by a committee who will communicate electronically and meet where possible and appropriate to discuss issues relating to the role of the CIG, funding, projects etc. It was decided that the committee need not be too large as input will be gained from all CIG members on most issues, therefore it will not be necessary to have a large, fully representative committee. The committee members need to be those with the time and means to provide regular and relevant input into the functioning of the CIG and the secretariat.
RESPONSIBLE: Members thus far based on members of this meeting but will be thrown open for discussion / selection once the CIG is properly established.

ACTION STEP 4:
Collaborative efforts will be required to secure funding for the secretariat, the website and other expenses related to management of the CIG. US$10 000 per annum for three years would be required.
RESPONSIBLE: Steve Hines and Jack Grisham committed to finding funding to develop the web site and maintain it for the first year. Funding required for website development is US$ 3,500. Balance of core funding to be raised separately at a later stage.
TIMELINE: October 2001

APPENDIX VI.

PRELIMINARY LIST OF CHEETAH CONSERVATION PROJECTS AND UNMET FUNDING NEEDS AS IDENTIFIED AT THE GLOBAL CHEETAH CONSERVATION ACTION PLAN WORKSHOP (08/02)

Project Title	Organisation	Principal Investigator	Brief Project Description	Unmet Funding Need	Timeline
INTERNATIONAL PROJECTS					
Website for the Cheetah Interest Group	Cheetah Interest Group (CIG)	D. Reuter-Twining, S. Hines	To develop a website which will serve as a central disseminating platform for the CIG. After this development, the site will be turned over to the CIG secretariat. Once it is developed, hosting will be turned over to an African-based web company. Budget includes development and one year's maintenance.	$3,500 **TOTAL NEED $3,500**	1 year **First year funded by AZA Cheetah SSP**
Development of a database to store information on conflict resolution between landowners and cheetah.	Marwell Zimbabwe Trust	D. Purchase	Develop a database that will share information on resolving conflict between landowners and cheetah throughout range states. This information will then be available to all people working on resolving conflict.	$2,000 $2,400/yr **TOTAL NEED $4,500**	Start up costs Ongoing annual DB maintenance Plus ongoing
Global Cheetah Survey Workshop	Cheetah CAP Census Working Group	P. Stander, S. Durant	Conducting a workshop for field biologists in cheetah range states to share information and develop techniques for censusing wild cheetah populations and determining their status	$12,000 **TOTAL NEED $12,000**	Dec. 2002

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Project Title	Organisation	Principal Investigator	Brief Project Description	Unmet Funding Need	Timeline
Global Cheetah Survey	Cheetah CAP Census Working Group	P. Stander	Development of a reliable, cost-effective census methodology, in order to gain accurate data regarding wild cheetah population density in range states.	$12,000 Tanzanian study **TOTAL NEED $12,000**	$4,000 needed by Jan.2002 and remainder by April 2002
Financial support for a Cheetah Interest Group Secretariat	Cheetah Interest Group (CIG)	To be determined	To provide a salary and administrative support for a part-time (1 week/month) individual who will coordinate the activities of a Global Cheetah Interest Group with a base of operation in Africa. Responsibilities will include maintaining a web site, disseminating information, liaising with the IUCN Cat Specialist Group and general duties to be determined.	$10,000/yr **TOTAL NEED $30,000**	3 years
Wild Cheetah Disease Surveillance	Kenya Wildlife Service and the University of California	Elisabeth Wambwa Linda Munson	Provide training and equipment for conducting necropsies and archiving samples from wild cheetahs	$15,000 for workshop $4,000 for equipment	1 year

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Project Title	Organisation	Principal Investigator	Brief Project Description	Unmet Funding Need	Timeline
Global Retrospective Disease Survey	University of California	Linda Munson	Conduct global retrospective pathology survey on archived slides and reports in Europe, Australia, Japan, and South Africa to determine the types and prevalences of diseases that impact population viability and link existing disease databases. Funds are needed for travel and partial salary for PI	$25,000	Over 1 year
Building pride in African natural heritage in teachers and learners using the cheetah as an ambassador species.	Cheetah Outreach, Smithsonian Institution, Fossil Rim Wildlife Centre	A. Beckhelling, J. Buff	Conduct annual teacher training workshops in disadvantaged communities, building curriculum-specific lessons and overcoming logistical challenges (e.g., animal phobias). "Star" teachers to be afforded advanced EE training in the US. The overall goal is a cascade effect within the black and coloured communities for a greater appreciation of wildlife heritage.	$25,000/yr **TOTAL NEED $75,000**	3 years
IRAN					
Cheetah conservation in Iran: assisting regional development of community-based programmes.	Cheetah Conservation Fund	L. Marker	A 2-week information-gathering trip to understand the needs that need to be met to assist cheetah conservation in Iran.	$5,000 **TOTAL NEED $5,000**	
KENYA					
Masai Mara Cheetah Project	Kenya Wildlife Service	M. Mulama, B. Ngoru	The project is aimed at establishing the general distribution of cheetah and to assess their threats in the Masai Mara ecosystem. The project also will initiate photographic recognition of cheetah and matching.	$12,000/yr **TOTAL NEED $24,000**	Over 2 yrs

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Project Title	Organisation	Principal Investigator	Brief Project Description	Unmet Funding Need	Timeline
Cheetah Conservation in Kenya: assisting regional development of community-based programmes	Cheetah Conservation Fund	L. Marker, M. Wykstra	Understanding the role of the cheetah in the Kenyan ecosystem focusing on the interdependence of predators and prey with human issues. This is a community-based information-gathering project to assist in understanding the balance necessary for the benefit of the co-existence of wildlife and humans.	$25,000 $25,000 **TOTAL NEED $50,000**	Year 1 Year 2
NAMIBIA					
Capacity building in Namibia	Cheetah Conservation Fund	R. Jeo, L. Marker	Teaching a 3-month conservation biology course in cooperation with the University of Namibia. Funding is needed to support food, housing and travel for students and professors.	$10,000 **TOTAL NEED $10,000**	1 yr.
Namibia Cheetah Study (Khomas Hochland study site)	Okatumba Wildlife Research	B. Fórster H. Fórster	The project is an intensive study (3 years) on free-roaming cheetah: reliable population estimates, population dynamics, predation and other issues are investigated using radiotelemetry (aircraft and vehicle), counting spoor frequencies, direct observations, etc. Funds are needed for equipment and petrol.	$15,000/yr **TOTAL NEED $45,000**	Over 3 yrs

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Project Title	Organisation	Principal Investigator	Brief Project Description	Unmet Funding Need	Timeline
Namibian cheetah study (Omitara study site)	Okatumba Wildlife Research	B. Fórster H. Fórster	The project is an intensive study (3 years) on free-roaming cheetah: reliable population estimates, population dynamics, predation and other issues are investigated using radiotelemetry (aircraft and vehicle), counting spoor frequencies, direct observations, etc. Funds are needed for equipment and operating costs.	$20,000/yr **TOTAL NEED $60,000**	Over 3 yrs
Namibia Cheetah Study (Okapuka study site)	Africat Foundation	L. Hanssen	To establish true density of cheetah within the study site and work on indirect indices to monitor the population in other areas. This project is part of a greater study covering a number of study sites. Funding is needed for radio tracking costs by vehicle and aircraft, which will allow establishing home range size, which will facilitate reliable density estimates.	$20,000/yr **TOTAL NEED $60,000**	Over 3 yrs

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	Project Title	Organisation	Principal Investigator	Brief Project Description	Unmet Funding Need	Timeline
TANZANIA						
		Zoological Society of London, Tanzania Wildlife Research Institute	S. Durant	Continuation of long-term study of individually known cheetah in the Serengeti. Assessments of suitability of Masailand for cheetah. Use of tourist photographs for long-term monitoring of cheetah across protected areas in Tanzania.	$5,000 shortfall $14,000/yr $15,000 office bldg. $20,000 set up costs $20,000/yr. Salaries/ operation **TOTAL NEED $74,000**	2001/2002 over 2 yrs 2002 2002 Ongoing (plus ongoing salary/ops costs)

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	Project Title	Organisation	Principal Investigator	Brief Project Description	Unmet Funding Need	Timeline
SOUTH AFRICA						
	DeWildt Cheetah and Wildlife Trust Education and Outreach Programme	DeWildt Cheetah and Wildlife Trust	V. Bouwer	Training of education officers tasked with specifically cheetah education in rural areas where cheetah conflict exists. These education officers will be from the black communities and therefore capacity will be built in communities that have never previously been focused on.	$18.000/yr	Ongoing project
USA						
	Risk Assessment of Management on Health	University of California	Linda Munson Ulf Tubbesing	Identify management conditions that may be risk factors for disease development in captured and captive cheetahs and conduct a risk factor analysis for those diseases identified in the global survey. Funding is needed for a PhD student salary and for the management survey.	$30,000/yr	Over 3 years
ZIMBABWE						
CAP Rec	**Distribution and status of cheetah in Hwange National Park, Zimbabwe**	Chipangali Wildlife Trust	V. Wilson	Undertake a detailed survey by using spoor surveys of cheetah and individual identification as recommended by the Census Group at the Cheetah CAP workshop	$3,000 $5,000 **TOTAL NEED $8,000**	2001 2002

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Project Title	Organisation	Principal Investigator	Brief Project Description	Unmet Funding Need	Timeline
Contribution to international and regional issues by Zimbabwe cheetah specialists	Zimbabwe Dept. of National Parks and Wildlife Management	B. Davison	Attending meetings relating to cheetah conservation between governments and NGOs. Requires external funding because of foreign exchange shortages in Zimbabwe. Funds are needed for travel, per diem and conference fees for three people for 1 year. Review DNPWLM capability to meet costs after 1 year.	$10,800 **TOTAL NEED $10,800**	1 year
Population ecology of cheetah in wildlife reserves and ranchlands in Zimbabwe	Zimbabwe Dept. of National Parks and Wildlife Management, Dept. of Zoology, University of Wyoming	B. Davison	As part of a Ph.D. project, investigation of the factors determining cheetah populations to find out whether and why ranchland areas are population sources, despite persecution, and why wildlife reserves are sinks for populations. Human effects on habitats and prey, persecution and intra-guild strife will be main focal areas.	$20,000 $10,000 **TOTAL NEED $30,000**	2002 2003

Identification of areas within the commercial and communal farming areas of Zimbabwe where cheetah are perceived to be a problem animal and experimentation of different land management practices within these areas.	Marwell Zimbabwe Trust	G. Purchase	Setting up a series of talks with landowners to assess attitudes. Enable landowners to report perceived and actual livestock losses as a result of cheetah predation to enable analysis of what characteristics correlate to problem areas. Persuade a representative number of landowners to experiment with land management techniques that can reduce livestock-cheetah conflict.	$21,500 $10,500 **TOTAL NEED $32,000**	Year 1 (2002) Year 2 (2003)