Contents

1. Editorial ................................................................. 1
2. Amur Tiger Conservation, Roads and Human Disturbance in the Russian Far East ........................................ 2
3. The Enigma Surrounding Tigers in Tapan Valley, West Sumatra ................................................................. 3
4. Indo-Bangladesh Agreement on Protecting Sundarban ........... 5
5. Tiger Enters Hut and Falls Asleep with Farmer’s Family .......... 5
6. Lioness Enchanted by Oryx Calves ................................ 6
7. Deep Snows Threaten Last Far Eastern Leopards ............... 6
8. The Leopard in Sri Lanka: A Secretive Predator ................. 7
9. Black Leopard Study in South Africa ................................ 9
10. More Leopard News ................................................ 9
12. Wild Jaguar Photographed in Arizona ........................... 11
13. Jaguar Conservation ............................................... 12
14. Feasibility Study on Re-Introduction of Cheetah in Turkmenistan ......................................................... 13
15. Spanish Government Conservation Plan for Iberian Lynx ....... 15
16. Reintroduction of Canada Lynx in Colorado ............... 15
17. Canada Lynx Similar Over Wide Range .......................... 16
18. Lesser Cats in Central India ......................................... 16
19. Manul Sighting in Qinghai, China ................................ 18
20. Marbled Cat Pair in Northeastern Thailand ...................... 19
21. Andean Cat Photographed in Southwest Bolivia .............. 19
22. Pampas Cat in Argentina: Is it Absent from the Pampas? .... 20
23. Pampas Cat Photographed in the Argentine Andes ........... 22
24. Guigna and Geoffroy’s Cat in Patagonian Mountain Forest .... 23
25. Crackdown on Illegal Trade in Big Cats in USA .......... 24
26. Photo Page: Rare Cats of the High Andes ..................... 25
27. Photo Page: Cats in the Patagonian Rain Forest, Argentina .... 26
28. Illegal Trade in the UK ............................................. 27
29. Chinese Wildlife Smugglers Arrested ......................... 27
30. Indian Businessmen Fined One Million Rupees on Poaching Charge ......................................................... 27
31. India Sets Wildlife Conservation Strategy ...................... 28
32. India’s Wildlife Conservation Strategy 2002 .................. 28
33. Snow Leopard Survival Summit .................................. 29
34. Book Reviews
   - The Algarve Tiger .................................................. 30
   - Tigers (UK); The Way of the Tiger (US) ....................... 30
   - Beyond the Last Village .......................................... 31
   - Le Chat domestique errant ou haret .......................... 32
35. Cat Specialist Group Online Library ........................... 33
36. Cat Specialist Group – May 2002 ................................ 34
37. Cats on the Web .................................................... 39
38. Appendix – African Lion Database .............................. 41

Cover: Sri Lankan Leopard in Ruhunu National Park (see p. 7)
Photo: Jehan Kumara

Disclaimer: Material and geographic designations in Cat News do not represent any opinion whatsoever on the part of the IUCN Cat Specialist Group and/or contributors concerning the legal status of any country, territory, or area, or concerning the delimitation of frontiers or boundaries.
Editorial

An Overview of the Lion in Africa

The African Lion Database (see Appendix) is the first time a continental overview of the lion has been carried out. It suggests that there are likely to be 18,000-27,000 lions. There are no valid earlier estimates on which to speculate on how great a decline in the population has occurred, but it is clear that there were many, many more lions in Africa in the past than live there today.

The African Lion Database represents a landmark in lion conservation, a matter of satisfaction to many who have been worried that the visibility of Africa's renowned great cat had led to complacency about its status. Concern about the lion’s status was the result of several factors: the spread of human settlement into the home of the lion in formerly wild lands; poorly regulated trophy hunting, which could affect lion status and ecology; and lion killing by farmers because of the loss of livestock. These were the reason that Sarel van der Merwe, Curator of the Bloemfontein Zoo in South Africa, promoted the formation in late 2000 of the African Lion Working Group (ALWG), which now numbers over 30 leading lion specialists, with Sarel as Chairman.

Affiliated to the IUCN Species Survival Commission’s Cat and Conservation Breeding Specialist Groups, the ALWG made the compilation of the database its priority project. Because reports indicated that lions were likely to be in trouble in west and central Africa, a workshop was held in Cameroon, attended by country representatives as well as other lion specialists, to collect basic information on lion status and to organise investigation into the situation. Meanwhile, a questionnaire survey and enquiries by lion experts in all countries inhabited by lions, provided information to prepare the African Lion Database. All involved recognise that it is only a first step, and that refining the database is a priority. It is hoped that in due course an international symposium on the lion in Africa will be convened and provide the material, such as the reports on current research projects, for a major publication, similar to Riding the Tiger: Tigers in human-dominated landscapes (Cambridge University Press 1996), which documented the status of research on the tiger.

Photographs of Cats in the Wild

This issue of Cat News has two pages (25-26) with photos of rarely seen South American cats. They provide solid evidence of the presence of the cats in locations that have been little explored in the past. The Andean cat, living at altitudes of over 4,000 m, has only been photographed three times previously – twice in Sala de Surire National Park in northern Chile, and once in northern Argentina. Last year Lilian Villaba and her colleagues had the extraordinary good luck to find and view an Andean cat with kittens in a small cave in Bolivia. Returning in 2002, they set up a phototrap and, on the third night, obtained two photos of the cat, which also show the barren landscape in which it lives.

South in Argentina, Arturo and Patricia Canedi hoped to photo-trap an Andean cat too, but, to their surprise, their film showed a pampas cat, an important record of its presence in the high Andes. The photo is an adjunct to the report on the distribution of the pampas cat in Argentina by Javier Pereira, Diego Varela and Natalia Fracassi.

Mauro Lucherini and his team from the Universidad del Sud in Bahia, Argentina, continued their research on the guigna and Geoffroy's cat and have been able to obtain photographs of these species in Patagonia. These achievements are the culmination of intensive and tedious research, that has been doggedly continued despite the scanty successes in finding evidence of the wild cats.

Congratulations

The Cat Specialist Group congratulates the ALWG on the database and the South American scientists on their photos; their achievements will encourage all who are working to conserve the world’s wild cats.

Peter Jackson

CHAIR: URS AND CHRISTINE BREITENMOSER, KORA, Thunstrasse 31, CH-3074 Muri b. Bern, Switzerland
Tel: ++41 (31) 951-9020; Fax: ++41 (31) 951-9040, Email: <urs.breitenmoser@iuv.unibe.ch>; <ch.breitenmoser@kora.ch>

ADVISER, AND EDITOR, CAT NEWS: PETER JACKSON, CH-1172 Bougy, Switzerland
Tel/Fax: ++41 (21) 808-6012; Email <pjackson@sefanet.ch>
Roads and associated human disturbances can have detrimental effects on large carnivore populations through increased mortality from vehicle collisions and poaching, and through increased encounters with humans, resulting in aggressive interactions with people or disturbance while hunting, at kills, or at dens.

Road density and traffic volumes are increasing within the habitat of Amur tigers' (*Panthera tigris altaica*) in the Russian Far East (RFE) as vehicle numbers increase and foreign demand for forest products increases during the current period of economic instability. Tigers often use roads as travel corridors and roads provide humans access into forested lands, leaving tigers vulnerable to traffic collisions, poaching, and other negative encounters with humans. We examined data collected from 25 radio-collared tigers on and near the Sikhote-Alin Biosphere Zapovednik (SABZ), 1992-2000, to determine the effects of roads and associated human disturbances on tigers.

We compared survivorship and reproductive success of tigers living in areas bisected by primary roads (roads maintained throughout the year, which connected human population centers), secondary roads (unmaintained and requiring 4-wheel drive during at least part of the year), and roadless areas.

Adult female survival was greatest ($O^* = 12.2, df = 2, p = 0.002$) for radio-collared tigers in roadless areas. All adult female tigers in roadless areas survived their tenure in those locations ($n = 2$), whereas all died or disappeared prematurely (i.e., were likely poached and their transmitters destroyed) from those areas with primary roads ($n = 6$).

Cub survival was lower in areas with primary and secondary roads than in roadless areas ($\chi^2 = 10.9, df = 1, p < 0.009$) than in areas without roads (90%, $n = 10$ cubs and four litters). Of about nine cubs that died in areas with primary roads, one was hit by a vehicle, four were removed from the wild when their mother (F02) was poached along the road, we presumed about one died of starvation at 3.5 months-old when their mother (F15) was poached, and three died of unknown causes. Thus, roads and associated human activities resulted in decreased survival and reproductive success for tigers.

Perhaps more disturbing is that about two cubs born in the eastern portion of SABZ where it is transected by a primary road survived to dispersal between 1991 and 2000 ($n = 14$ cubs from five litters). Because it is protected, the SABR supports a greater abundance of prey and higher tiger densities than surrounding unprotected areas and should act as a source population, i.e. a population that provides a surplus of tigers, which disperse to fill unprotected lands where reproductive rates are often lower than mortality rates. However, the presence of a primary road through SABZ effectively reduces the number of females contributing offspring to the overall population because tigresses and their cubs died prematurely as a result of their proximity to the road. Indeed, the portion of SABZ bisected by a primary road has become a sink because 4 tigresses were poached and only 1 or 2 cubs survived to disperse.

We also examined the effects of human disturbance of tigers at kills and found that tigers abandoned 63% of 24 kills when they were disturbed by people, whereas tigers not disturbed by people ate an average of 97% of the meat from their kills. Tigers also spent less time and consumed less meat at kills when disturbed, causing them to move greater distances and kill more often. These results imply that frequent disturbance of individual tigers may increase their energetic demands and their risk of hunting injuries because tigers are forced to eat less from each kill and spend more time hunting and less time resting.

Tigers may become habituated to human disturbance (some radio-collared tigers returned to kills after being disturbed), but habituation may lead to increased aggressive encounters with people, resulting in death of tigers and people and weakened public support for tiger conservation in the Russian Far East. Although our data were not suitable to relate disturbance at kills to vicinity to roads, it is reasonable to assume that such disturbance will rise with increased road access to tiger habitat.

Successful conservation of Amur tigers must include a pro-active approach to managing protected areas as source populations and reducing human impacts in both protected and unprotected areas. We and others have suggested that one key to this approach is the establishment of landscape-scale planning which maximizes tiger habitat while still providing for the needs of local people. Our results demonstrate the importance of maintaining roadless areas with minimal and regulated human access in areas throughout the Amur tiger’s range to avoid tiger mortalities due to auto collisions and poaching, and to minimize human contact with tigers. This is particularly important in areas, such as *zapovedniki* (protected scientific research areas), *zakazniki* (limited land-use areas preserving natural ecosystems and species), and national parks (nature protection areas allowing scientific, educational, recreational and cultural activities) that are designated as source populations. We strongly suggest that whenever possible, existing roads should be closed at night and slow speed limits should be strictly enforced on roads through protected areas.

Although our study focused on protected tiger habitat, the implications of our results may be most important in unprotected areas where human access to tiger habitat is unrestricted and human behaviour more difficult to regulate. We are developing a program for closing secondary roads and we strongly encourage restricting construction of new primary and secondary roads through tiger habitat as an important measure to protect Amur tiger...
populations. We believe that recognition of the importance of these findings will be an important step forward in developing responsible management regimes on both protected and unprotected lands that are important tiger habitat in the RFE.

Although the concept of road closures is relatively new in the Russian Far East, it has already been demonstrated to have dramatic successes in North America and Europe. There, as in Russia, people will tear down blockades, find ways around road closures, and expend large amounts of effort to retain access to their favourite poaching areas. Persistence in rebuilding gates, and providing personnel to enforce closures are key to long-term success.

We have already begun experimenting with some of these techniques.

1. Starting in 1998 we have worked with Terney Hunter and Fisherman’s Society and the NGO, Terney, Taiga, Tiger, to close down roads in two important drainages within the Terney hunting lease, which borders SABZ. We constructed a guarded gate on one road and bulldozed others. Not surprisingly, an unnamed party brought their own bulldozer to reopen one road, and so it was necessary a second time to “deconstruct” this road. At the time of writing, the road remains closed.

2. The Wildlife Conservation Society has signed an agreement to support the construction of roadblocks and guard cabins on the three primary drainages that provide access to Nezhinskoe Hunting Lease in south-western Primorski Krai. This area, within easy driving distance of Vladivostok and Ussurisk, has in the past incurred heavy losses to poaching, but is key habitat, not just for the Amur tiger, but for the even more endangered Far Eastern leopard (P. pardus orientalis). Working with the Naval Hunting Society and the Institute for Sustainable Use of Natural Resources, we are hopeful that Nezhinskoe Hunting Lease can be a model example of how to control poaching, provide quality hunting opportunities for the licensed hunter, and provide adequate prey densities for both hunters and large carnivores.

3. The Tavisa region, just north of Terney, is an area historically considered a key wintering area for ungulates, and home to the first tiger collared by the Siberian Tiger Project. However, with easy access via either of two roads from Terney, and no control on hunting, this region has become devoid of ungulates in the past few years. Recently, the local Terney Administration requested that the Wildlife Conservation Society join efforts with the Administration and Tiger Inspection specialist B. I. Litvinov, to reverse the negative trends in this region. The present plan calls for destroying one of these roads, and to control access via the second by building a guard station and road gate.

Reference

* Hornocker Wildlife Institute and Wildlife Conservation Society, 2023 Stadium Drive, Suite 1a, Bozeman, Montana, USA, 59715
** Sikhote-Alin Biosphere Zapovednik, Terney, Primorye Krai, Russia, 692150.

The Enigma Surrounding Tigers in Tapan Valley, West Sumatra

by Matthew Linkie* and Jeremy Holden**

During a mast fruiting event in an area of lowland rain forest bordering Kerinci Seblat National Park (KSNP), Sumatra, photo-trapping provided an insight into an enigmatic situation where 10 tigers were recorded in an area of 64 km². These tigers may be supported by an increase of bearded pigs, but local villagers claim they enter into this area for an entirely different reason: to eat the durian (Durio spp.), a large fruit, famous for its unpleasant smell but popular taste.

KSNP has been designated of the highest priority for tiger conservation because it still contains sufficient habitat that supports a viable tiger population (Wikramanayake et al., 1998). In 1996, Fauna & Flora International (FFI) conducted a photo trapping survey to determine more accurate estimates of tiger numbers for KSNP as part of a wider biological diversity survey (Holden 1997). One of the locations on which the study focused that produced particularly interesting findings was Tapan Valley.

Tapan Valley (2.13°S, 101.12°E) is an area of lowland rain forest (125-400m asl) bordering KSNP. An asphalt road running through the valley bisects the park. Before this study, the valley had not been surveyed for tigers, although frequent tiger sightings and reports of secondary signs (pugmarks, scrapes and faeces) by local villagers had stimulated an interest in this area as good tiger habitat. In November 1996, photo trapping took place over a 23-week period with 9-15 operative traps. The total effort was 31,000 trapping hours, from which 10 individual tigers were recorded, composing seven adults (three males, four females) and three cubs of indeterminate sex (from two females). During trapping, the number of new individuals caught increased in a linear fashion with cumulative effort, until after about 10,000 hours of trapping, when it reached a plateau suggesting that all individuals had been recorded. If so, then this would translate into an adult density of 0.11 tigers/km² for the 64 km² sampling area. This density, accentuated in part by the small sampling area, is high and would require an abundant prey base to support it, which a lowland rain forest habitat would not be able to support under normal circumstances (Eisenberg, 1980). However, photo-trapping was conducted during a durian and jackfruit (Artocarpus spp.) mast fruiting period.

The larger prey species, such as sambar (Cervus unicolor), wild boar (Sus scrofa), and muntjac (Muntiacus muntjac), were encountered at low levels in Tapan Valley. This is possibly because photo-traps were set on trails for tigers, which these ungulates use less frequently. Smaller prey, such as porcupine (Thecurus sumatrensis) and pig-tailed macaque (Macaca
nemestrina), were recorded at high levels. The resident ungulate populations would not have been expected to increase dramatically during the mast fruiting, unlike nomadic species, such as bearded pig (Sus barbatus), which increase their populations through movement and reproduction (Curran & Leighton, 2000). Bearded pigs and piglets were recorded in Tapan Valley towards the end of the mast fruiting period (one photo-trap recording an adult and 10 piglets). These would have provided a supplementary prey base for the inflated tiger population.

It is unlikely that all tigers were resident, given the small area and the generally low prey base recorded over the trapping duration. Territorial markings were observed, but Tapan Valley probably formed the edge of one or several tigers' home range. Tigresses with cubs would have been expected to inhabit a less disturbed range in which to mate and to sire offspring. Villagers often observed tigers crossing the road, suggesting that it did not act as a boundary. In fact, a tiger crossing the road unsaddled a passenger on the back of a travelling motorbike.

The high occurrence of tigers in such a small area might be attributed to commercial logging, through the displacement of tigers from their ranges, causing a temporary overlap and thus higher concentration. Yet, tiger were often recorded on ridge trails less than 1 km from logging roads.

Local villagers claim that tigers always move into this area during mast fruiting periods in Tapan Valley. The durian mast fruiting periods usually occur during November-December. This coincides with the Islamic calendar's bulan raya (royal month), which is when tiger activity is reported as being much greater in the forest.

Photo-trapping was conducted during a durian flood season, a very heavy durian fruiting event, which occurs every three years. For one month every year during this period bearded pigs are also reported as entering the forest. In Tandai, another area studied in KSNP, tiger tracks were recorded closely following the routes of bearded pigs through forest. The villagers in Tapan Valley, however, attribute the unusual tiger presence directly to the durian.

In Tapan Valley, there are wild and cultivated durian. Customary law stipulates that the collector becomes the owner of wild fallen fruit. Villagers in the valley therefore wait under fruiting trees. Once the majority of wild fruits have been collected the remaining few are left and it is believed that tigers then occupy any arising vacancies to stake their claim on the fruit because pugmarks are often encountered around these trees. Villagers also search for fallen fruit and often find signs that a tiger has already opened some of the fruit. Tiger claw marks are observed on the tough outer shell where entry to the fruit has been made and seeds, which are reported as not being ingested, are also found. Sun bear (Helarctos malayanus) also prize open durian with their claws, but villagers report their marks as being different.

MacKinnon (1997) mentions tiger affiliation towards durian, and tigers have been reported in durian orchards from Kampung Tepoh, Malaysia, possibly because of prey occurrence. Similar reports from Ketambe research station in Gunung Leuser National Park, Sumatra, also claim that tigers enter durian orchards during these mast fruitings, but with the intention of eating the durian (Gonda Nisam pers. comm.).

Tigers, which are obligate carnivores, were not photo-trapped eating durian in Tapan Valley, but neither were sun bear that have been photo-trapped eating durian in the primary hill forests of Siporak, KSNP.

The local villagers claim of a temporary increase in tigers during the fruiting season was supported by photo-trapping results. A sudden change in tiger presence was recorded after the mast fruiting period, with only one tiger and no secondary signs being recorded in the eight weeks succeeding, where previously nine tigers were recorded and pugmarks encountered every day. In contrast, resident Asian tapir (Tapirus indicus), another large bodied mammal, were recorded at a very high density in Tapan Valley during and after the mast fruiting period (Holden et al., in prep).

The situation in Tapan Valley is still unclear and further photo-trapping over subsequent fruiting and non-fruiting periods would be required for a fuller understanding, but commercial and illegal logging, mining and ensuing subsistence farming activities have cleared the majority of forest surrounding previous trap locations thus ensuring that Tapan Valley remains an enigma.

References


* The Durrell Institute of Conservation and Ecology, University of Kent at Canterbury, United Kingdom. <ml33@ukc.ac.uk>

** Fauna & Flora International, Sungai Penuh, Sumatra, Indonesia. <pop@padang.wasantara.net.id>
Indo-Bangladesh Agreement on Protecting Sundarban

India and Bangladesh have agreed to work together to protect the ecology of the Sundarban mangrove forest, the largest left in the world, and home to a large population of endangered tigers.

The agreement was reached at a conference presided over by United Nations' officials in Dhaka, the Bangladesh capital on 11-12 May.

The main tiger areas on both sides of the frontier are World Heritage Sites because of their outstanding natural beauty and conservation importance.

An Indian delegate at the meeting, Atann Kumar Raha, said Delhi and Dhaka had now pledged to meet again later in Calcutta to finalise the agreement, which will provide significant protection for the forest.

"We feel that such an eco-system can be conserved only through a joint effort; otherwise, what happens? An initiative in one country may have an adverse effect on the Sundarban of the other side," Mr Raha said.

"This project has helped us come together and to think of managing it as a single eco-system, if not fully then at least on a partial level."

Officials in charge of both the tiger reserves have already had joint meetings to discuss cooperation.

The Sundarban nominally covers an area of 10,000 km²; two-thirds of which is in Bangladesh, but the actual forest area today is much reduced. The World Heritage Sites, which cover the tiger reserves, have areas of 2,585 km² in India and 1,400 km² in Bangladesh. As the Sundarban is the delta of the Ganges and Brahmaputra and other rivers, about a third or more of these areas consists of rivers and creeks.

"Bangladesh and India currently use different approaches to protect the same eco-system, but we are trying to unite it under one project," Professor Ansarul Karim, chairman of Bangladesh's Environmental Conservation Management Centre, said at a seminar in Dhaka. He continued: "The Sundarban's biodiversity and eco-system have been threatened by climatic changes and sea level rise, over-exploitation of resources, decrease in freshwater flow and increased salinity, oil pollution from the nearby Mangla port and top-dying disease of trees," Karim said.

The exact number of tigers in the Sundarban is not known. Estimates by the Indian and Bangladesh authorities, based on methodologies that are challenged by scientists, suggest there could be as many as 600 tigers. But recent research on tiger density in the Indian tiger reserve by an Indian scientist suggests that there may be fewer than 200.

The first tiger research programme in the early 1970s was cut short by the Indo-Pakistan war that resulted in Bangladesh's independence from Pakistan. Since then research has been limited until an ecological study began in Bangladesh in 2001.

Sundarban tigers have a centuries-old reputation as aggressive man-eaters. A French traveller in the 17th century, François Bernier, described tigers swimming out to seize fishermen in their boats, and the record of thousands of human deaths in the past is still being added to; a Calcutta NGO reported that 56 people were killed in tiger attacks in the Indian Sundarban in the period June 1999 to April 2001. Most of the victims are fishermen and honey collectors who knowingly take the risk of entering the area.

Bangladesh Bans Felling Trees in Sundarban

Bangladesh has banned felling trees in its Sundarban mangrove forest, Forest and Environment Minister Shahjahan Siraj announced on 22 May.

"We must protect our natural forests and animals to balance the bio-diversity," Siraj declared, adding that only collection of wild honey would be allowed.

He said illegal logging to collect timber for firewood and making furniture was causing serious damage to the ecological balance, as well as disturbing the natural habitat of endangered species.

Siraj pointed out that the forest provided the country with a natural shield against tropical storms and cyclones.

"The Sundarban is a God-given wealth to the nation, and it is the government's prime responsibility to protect it for the benefit of people and the country," Siraj said.

Tiger Enters Hut and Falls Asleep with Farmer's Family

An Indian farmer, sleeping in his hut with his wife and three children, woke up to find a tiger sleeping with them.

The newspaper, Pragati (12 February 2002), said the farmer, Prasun Kalita, found the tiger "sleeping like a baby". The family crept out quietly without waking the tiger.

Kalita called the forest department, and a team arrived, which tranquillised the tiger and released it in the forest.

"We are happy there were no casualties. The tiger had strayed far from its natural habitat and was probably too tired to even bother about the sleeping people," an official said.

"It's a miracle we didn't end up as dinner for the tiger," Kalita declared. "We can only thank the goddess Durga that he slept through the night and did nothing to us."

The incident occurred on the edge of the Sundarbans mangrove forests, on the shore of the Bay of Bengal, where tigers have reputation for aggression against people.
Lioness Enchanted by Oryx Calves

A lioness in Kenya's Samburu Game Reserve has adopted calves of Beisa oryx (Oryx gazella) four times in recent months instead of eating them.

The lioness was first seen with a baby oryx in mid-December. Occasionally, she allowed the mother oryx to come and feed her calf before chasing her away. The lioness and the calf would lie down to rest together during the hot afternoons. She was very protective, and drove away a threatening leopard and a family of cheetahs. But early in January, when she took the oryx calf to a river to drink, she fell asleep, and a male lion killed and ate it. A local man said the lioness was angry and circled the lion, roaring loudly.

Two weeks later she was reported to be following an oryx herd and eventually she adopted another new-born calf (on 14 February, St. Valentine's Day). Reserve staff mounted a round-the-clock watch to guard the odd pair from other lions, but were concerned that the calf was not getting much needed mother's milk. Eventually, they retrieved the calf while the lioness went hunting.

Soon after that, the lioness was again seen following an oryx herd. She adopted a calf at Easter, but it was older and stronger than the earlier adopted calves, and it left her of its own volition and joined its herd after a few days.

When another calf was born, on 23 May, she adopted it. This time the oryx mother retrieved her baby the next day, taking advantage of the lioness's absence. Then the lioness was not seen for several days, according to Samburu reserve staff.

Daphne Sheldrick, a conservationists who runs a sanctuary for wild animals in Kenya, said that cases of lionesses showing maternal affection for animals they would normally see as prey were not unprecedented. A baby zebra had once been brought to her orphanage after it was found in the company of a lioness that had devoured its mother the day before.

"Lions, like all the other species, including human beings, have this kind of feelings for babies," she declared.

(Source: Kenyan press via <http://www.allafrica.com>)

Deep Snows Threaten Last Far Eastern Leopards

by D. G. Pikunov*, D. G. Miquelle** and P. Fomenko***

Two heavy snowfalls in January 2002 created unusually severe winter conditions in southwest Primorski Krai, habitat for the last remaining population of Far Eastern (Amur) leopards (Panthera pardus orientalis). Snow depths exceeding one meter covered the region, making movement nearly impossible for key prey species of the leopard – roe deer (Capreolus capreolus) and sika deer (Cervus nippon). Reports of deer floundering in the snow, incapable of escaping from approaching humans, indicated that a potentially disastrous die-off could result from a combination of starvation and excessive poaching.

While it is generally considered that the Far Eastern leopard is not as well adapted to snow as the sympatric Amur tiger (Panthera tigris altaica) and consequently never occurred as far north as the tiger, it is still unclear exactly what impact this snow might have on the leopard population. If leopards could navigate the snow, there would likely be a short-term abundance of carcasses and easy prey. However, collapse of the sika deer and roe deer populations could have long-term disastrous consequences for this leopard population that numbers somewhere between 25 and 40 individuals.

The Wildlife Conservation Society (WCS) and World Wide Fund for Nature (WWF) both contributed emergency funds in an attempt to alleviate the situation in two wildlife refuges and privately managed hunting leases that represent key leopard habitat. Funds were allocated for ploughing roads to provide deer with a movement corridor; cutting browse; and bringing in hay as food sources. Approximately 12 tons of forage were carried into ungulate habitat along 150 km of cleared travel ways, and browse from trees and bushes was cut to make it available to deer. Additionally, more intensive patrols by anti-poaching teams were initiated to prevent illegal hunting of animals concentrated at feeding sites. Available information suggests that where roads were ploughed and browse cut, survival rates of deer were higher, but unfortunately these areas represented only a portion of the total range of leopards.

Two surveys (one in early January, one in March) conducted by D. G. Pikunov in

Spring 2002
the Borisovkoe Plateau region (in conjunction with the yearly tiger monitoring program) provided an indication of the extent of losses. An estimated 90% of the roe deer population moved down into the valley bottoms in response to the deep snows, where, in January, track densities averaged 16.5 tracks/10 km (estimated over 220 km of routes). However, these animals were highly vulnerable to hunting, and consequently, over these same routes, 24 sites were located where hunters killed roe deer (some percentage of these were legal kills, as the hunting season ended on January 15. Pikunov was able to approach roe deer to within 2-3 meters, as they were incapable of running away in the deep snow. Consequently, poachers had an easy time killing deer along the main road and even along the railway tracks, where deer could not escape from the cleared “trench.” Local people used skis to walk down weakened animals in the deep snow. Even in Barsovy Wildlife Refuge there were ski tracks on many of the fresh roe deer tracks, suggesting poachers were at work.

Pikunov’s second survey, conducted in the first week of March, suggested that roe deer numbers had plummeted 80-90% (only 1.5 tracks/10 km). While it is possible that animals could have moved into different areas (as snow depth subsided), evidence suggests that a combination of winter die-off and intensive illegal harvest may have decimated the roe deer population as roe deer moved down valleys towards villages and primary roads, greatly increasing their vulnerability.

Sika deer, larger in body size, are probably more capable of dealing with deep snow, but while roe deer exhibit great flexibility in adjusting movement patterns to weather conditions, sika deer tend to show high fidelity to specific sites, and thus are incapable of responding to such extreme conditions. Despite this behavioral quirk, evidence suggests that die-off in sika deer was mainly associated with young of the year, who were incapable of travelling in the deep snow. For instance, in one 10 km stretch of the Ananyevka River, we recorded carcasses of 28 young sika deer. Across three river valleys, a total of 71 sika deer carcasses were counted, and aging of 40 of these indicated that 88% were yearlings, and only 10% stags. Since surveys were conducted only in the valleys, no information exists on the slopes or upper plateaus of this region, where die-off could also have been extensive. It is likely that there will probably be virtually no recruitment into this population from last year’s cohort, thus aggravating a situation in which the sika deer of this region have been decreasing for at least the past four years.

To address this problem, we recommended to the Primorye provincial administration, and to the State Hunting Department, that a ban on hunting be imposed on this region of Primorski Krai for at least one year to allow prey populations an opportunity to recover. The Hunting Dept agreed to ban hunting this summer (usually there are licenses for hunting of stags in velvet) and to consider the proposal for banning in the coming winter.

At a recent meeting, local members of the Far Eastern Leopard Steering Committee agreed that this is a minimum first step that must be taken. A hunting ban must be just one part of a comprehensive response to this problem, which should include support to local hunting organizations that depend on income derived from hunting fees, establishment of farming easements to grow forage specifically to increase productivity of these deer herds, and closer contacts with local communities to explain the necessity of these measures.

We are hopeful that this crisis situation can be used to implement a more effective and comprehensive approach to ungulate management in the region, including, perhaps, development of a special emergency fund to deal with such situations. WCS has been working for several years to improve management of ungulates on privatized hunting leases in the region, and WWF is in the process of developing an expansive ungulate recovery program — both efforts are part of the long-term plan for conservation of the Far Eastern leopard and Amur tiger.

---

* Institute of Geography, Far Eastern Branch of the Russian Academy of Sciences
** Wildlife Conservation Society
*** World Wide Fund for Nature

---

The Leopard in Sri Lanka: A Secretive Predator

by Jehan Kumara* and Ravi Samarasinghe

In a recent DNA based genetic study on the Sri Lankan leopard (Panthera pardus kotiya) carried out by Mitthropala et al (1996), the Sri Lankan leopard, which is the island’s apex predator, was deemed to be a distinct sub-species.

The leopard was widespread throughout Sri Lanka at the beginning of the 20th century. However, despite the country’s forest cover being reduced to less than half of what it was a century ago, leopards are still found in most of the protected national parks, as well as in many areas where large tracts of forest and scrub jungle remain.

While contemporary population estimates range from 300–600 animals, a credible census has been accomplished. Previous studies have been mere guesses, at best, based on an approximation of prey densities for a particular habitat. This figure is then generally applied to the various habitats of the island, assuming uniform densities. No study has yet used identification of individual leopards as a part of their methodology. It has been largely assumed that viable populations exist only in protected areas. However, reports of leopard sightings outside protected areas are not rare and it is quite likely that viable populations do exist in many areas where large tracts of natural forest with suitable prey remain (especially in the north-east of the island).

Being leopard enthusiasts and frequent visitors to Block 1 of the Ruhunu National Park in south-eastern Sri Lanka, we endeavoured to answer questions that had become more than a mere curiosity to us, and which remained unanswered. Were we seeing the same leopard? How many leopards are there?

To answer these questions it became necessary to adopt a method of identifying individual leopards. We decided to use spot patterns above and below the eyes, along with those in the moustache area,
as the most practical and accurate method available to us. Miththapala et al (1989) had proven the accuracy of this methodology in her studies with captive leopards.

Our information came from Block 1 of the Ruhunu National Park (commonly known as Yala). Yala is 14,100 ha in extent. It is bordered by the Menik Ganga (river) in the north and east; by the Indian Ocean to the south; and by scrubland and villages to the west.

The coastline is made up of numerous brackish lagoons and sand dunes where herbivores, such as spotted deer (Axis axis) and sambar deer (Cervus unicolor), and buffalo (Bubalus bubalis), are found. The vegetation consists of dry mixed evergreen forest and thorn scrub with the dominant tree species being Palu (Anilkara hexandra), Weera (Drypetes seperia) and Malithan (Salvadora persica). Larger trees line the banks of the river forming a strip of riparian forest. Dispersed throughout the park are many large rocky outcrops with rock pools and caves.

From 1994 to 2000, we collectively spent over 1,100 days in Yala and were fortunate enough to have more than 1,000 leopard sightings in the two thirds of Block 1 (Yala) on which we largely concentrated.

From January 1994 to December 2001, we individually identified the following number of leopards.

<table>
<thead>
<tr>
<th>Adults</th>
<th>Male</th>
<th>07</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(a)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>Females</td>
</tr>
<tr>
<td>Cubs</td>
<td>Male</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>(a)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>(c)</td>
<td>Sex unknown</td>
</tr>
</tbody>
</table>

In the adult category, during this period, we are certain that more females existed in the observation area than we were able to positively identify. Given the females more elusive nature we were not able to obtain clear enough photos or video footage of the less habituated females.

In the cubs' category, we often followed them to independence, but were unable to determine the success of their survival; in most cases, they seemed to disappear from the area of observation.

We found the leopards to be active during daylight especially on dull and overcast days. Their most active periods were the 1½ hours following dawn and preceding dusk.

In Yala, prey species included spotted and sambar deer, wild boar (Sus scrofa), buffalo, mouse deer (Tragus venus), langur (Presbytis entelus), peafowl (Pavo cristatus), jungle fowl (Gallus lafayetti), monitor lizards (Varanus bengalensis), pangolin (Manis crassicaudata), porcupines (Hystrix indica) and other small mammals, such as black-naped hare (Lepus nigricollis) and rodents. The existence of domestic cattle and stray dogs around the periphery of the park, and sometimes inside, indicated that leopards normally feed on their preferred prey species and deviate only if forced to do so. It was rare that domestic cattle and dogs were preyed upon, despite the high density of leopards in the park.

The leopards preferred-prey appears to be the spotted deer, followed by buffalos calves during the calving period. Large prey, such as adult sambar and sub-adult buffalo are also tackled. Carcasses are difficult to locate because they are dragged away from the roads and often hidden by dense undergrowth. Leopards rarely took carcasses up into trees, probably due to their less hazardous environment compared to that of leopards in most of Africa, where other predators and scavengers may take their prey.

Leopards often scavenged off carcasses of animals that appeared to have died of natural causes. Leopards have even been seen scavenging off dead elephant carcasses. Males also seem to scavenge females' kills. In one instance, we observed a large male feed off a female's kill in the presence of the female and her cub. He even allowed the cub to feed alongside him.

Females in Yala appear to have very small home ranges with considerable overlap. They seem to be more social and tolerant of each other. An example of this was when a male was seen on a rocky outcrop displaying courtship behaviour to two females. At no stage, during this ritual, was there any evidence of aggression between the females.

While our observations do not constitute a complete scientific study, we have enough information to show that leopards in Sri Lanka may be unique in many other aspects. We strongly feel that the few data that exist are largely inaccurate and dated. The past five years have seen a growing interest in the Sri Lanka leopard both domestically and internationally. A BBC documentary titled “Leopard Hunters”, produced by Mike Birkhead, has also been instrumental in increasing international awareness. A group of us are contributing to a book entitled “For the Leopard – A tribute to Sri Lanka’s Leopards”, which will be published in May 2002, by the Harith Perera Trust for the Conservation of the Sri Lankan Leopard, which was formed in memory of our friend, who was our mentor in the pursuit for the conservation of the Sri Lankan leopard.

While the interest in our leopard is at an all-time high, so are the threats facing its survival. The increasing number of leopards being seized recently around Yala and other parts of the island, reflect an upsurge in poachers targeting leopards. The increasing demand for leopard bone as a substitute for tiger bone is also cause for grave concern. The Department of Wildlife, lacking sufficient staff and funds, are in not a position to provide adequate protection to Sri Lanka’s leopards. In addition, the absence of accurate information and the lack of scientific research on our leopard, make it difficult to formulate the best possible management strategy. This, and the expanding loss and fragmentation of habitat, point to an extremely uncertain future for the Sri Lankan leopard. It is our urgent responsibility to protect this unique component of our island's natural history for future generations before it's gone; gone forever.

References


* 77/5, Barnes Place
    Colombo 7, Sri Lanka
    Tel: ++94 (1) 699 92 96;
    777 780 699 mobile
    Fax: ++94 (1) 59 53 92
    <ksport@eureka.lk>
Black Leopard Study in South Africa

The Development Bank of Southern Africa (DBSA) has donated Rand 150,000 (USD50,000) for study and conservation of recently discovered black leopards in Mpumalanga District of South Africa, close to the Kruger National Park.

News of seven sightings of black leopards in 2001 near Lydenburg surprised wildlife specialists because there have been few confirmed records of black leopards in Africa, although they are common in parts of tropical Asia. But Mpumalanga Parks Board scientist Gerrie Comacho, who started to track the leopards last year, said it had now been learned that local people had spotted black leopards off and on for up to 15 years.

“That would indicate a fairly large breeding population – which would be unique,” he added.

Rangers intend banning non-lethal traps for the leopards, so that they can be examined and radio-collared. Information from tracking will be used to determine the leopards’ hunting ranges, which are believed to cover at least 5,000 hectares each.

Local farmers and other residents have been urged to alert rangers if they spot the rare animal in their vicinity.

(Source: BuaNews/All Africa Global Media via COMTEX)

More Leopard News

Leopards Return to Beijing Forests

Leopards have returned to the forested hills around Beijing, reports Gao Wu, a biology professor at Capital Normal University. Gao’s team of zoologists found footprints, fresh excrement, hair and prints of 10 leopards during a recent wildlife survey of the area. There had been no sign of the cats since 1990.

Local people have handed in their hunting rifles and cooperated with a government campaign to protect wildlife in Beijing’s underrated forest reserves.

“Of course they are not wandering among the skyscrapers,” Gao said.

“But it’s true that big wild animals like leopards, boars and wolves have made their homes in the city. I believe it is possible for the population of wild leopards to increase to 30, the figure of 50 years ago,” he declared.

(Source: Xinhua, 4 December 2000)

Leopard Enters Indian Embassy in Kathmandu

A leopard entered the Indian embassy premises in Kathmandu, triggering panic in the area, embassy sources said. Efforts were made to trap the animal, but it disappeared after killing two stray dogs.

The embassy grounds spread over 20 hectares and include some forest.

(Source: Press Trust of India 13 December 01)

Leopard Rescued from Well

A leopard which fell into a well in a tribal hamlet in the Kalakkad-Mundanthurai Tiger Reserve in the southern Indian state of Tamil Nadu was rescued alive in a three-hour operation.

The leopard, which strayed out of the reserve forest, fell into the five-metre deep well through a damaged portion of the parapet wall. On hearing the leopard’s cries, villagers informed the reserve staff.

A forest department squad, accompanied by fire service personnel and veterinary doctors, with huge nets, tranquilisers and a cage, arrived to find the leopard sitting calmly on the rocky bottom of the well, which had only a little water. The rescue team made a temporary ladder from long bamboo and dropped it into the well in a slanting position. The leopard slowly climbed the first step and rested for a while before climbing the ladder with ease. It jumped across a nearby ditch and vanished into the nearby forest.

(Source: The Hindu 5 December 01)

Jaguar Predation and Jaguar Hunting in Costa Rica

by Carlos Esteban Payán* and Roberval Almeida*

There has been a moderate number of field studies on the jaguar (*Panthera onca*): notably Schaller & Crawshaw (1980) and Crawshaw & Quigley (1991) in Brazil’s Pantanal region; Rabinowitz & Nottingham (1986) in Belize; and Emmons (1987) in Peru. Jaguar populations face problems that threaten them with local extinction, mainly habitat loss by logging and cattle ranching; hunting by humans due to domestic livestock attacks; sheer fear of the powerful cat; and prey competition by human hunters (Jorgenson & Redford 1993). Their ecology makes them an excellent umbrella species, good biodiversity indicators and a common charismatic flagship species. In 1988, Terborgh found that big predators of the Neotropics act as key regulators.
Jaguars are extremely secretive animals and are very difficult to see in the wild, in fact many researchers spend months at work in the field, even years, without direct observation, but people who live in the jungle have seen them and what they have to say should be taken into account. Much of the published scientific data is derived from indirect information, such as carcasses, tracks, scrapes and faeces. Here we use predation cases and local information from rural people to understand more of jaguar ecology and behaviour. Bear in mind that this is informal information and should not be treated as scientific data, just as a reference for future confirmation.

The information was collected in June through August 2000 during an ongoing felid field research project directed by the junior author at La Amistad Biosphere Reserve, Costa Rica. Fieldwork was conducted in an area called Las Tablas protected zone, with altitude ranging from 1,150 m to 2,050 m and consisted of premontane and montane rainforest.

Predation on cattle on one of the two ranches inside the reserve was very common and some cases were well documented. There was one case of jaguar predation on an adult cow at the time of the study; its killer, a male adult jaguar, was poisoned when returning to feed on the carcass for a third time. This incident happened in a pasture surrounded completely by prime jaguar habitat some 3.8 km (2,050 m altitude) from the ranch house, where previous attacks (two during the past year) had occurred. The dead cow was moved from the open field to a swampy area with forest and plantain plants. The cow was disembowelled and the gut not eaten, but the tongue, muscle tissue and apparently the heart were consumed. Similar behaviour was found by Schaller and Vasconcelos (1978) in jaguar predation on capybara (Hydrochoerus hydrochaeris). Previous to our presence there had been three attacks by jaguar on cattle at night in the previous two months. Two cases occurred on pastures very near the ranch house, the first within less than one km and the second attack 3.14 m distant; both ended in the death of two female sub-adult (300-450 kg) cattle. The attacker(s) presumably came from the forest surrounding the pasture fields some 300 m away. One carcass was taken to a nearby gorge and fed on only during the night of the kill. The other was also moved, but under a fallen log. The jaguar returned to this kill only on a second night, because on the third night the carcass had been poisoned, and the only result was dead carrion birds. In both cases the jaguars ate only muscle tissues. The third incident was a hunting attempt at night by a big jaguar very near the ranchhouse; it scared the cattle into a small lake, but fled when the rancher appeared. The dead livestock were healthy and nearly adult, according to the owner.

Jaguar peels and skulls from two cattle killers were found in perfect shape and the peels did not show any heavy scars or wounds, unlike the findings of Rabinowitz (1986) and Hoogesteijn et al. (1993), implying that healthy jaguars hunt cattle and that healthy cattle are taken by jaguars in this area. Reconstructing a ten-year-old record of jaguar hunting and cattle predation on this ranch, we saw that during this time five "problem" jaguars had been killed and there has not been one year free of cattle predation.

The logical conclusion is that measures other than hunting should be taken. We have no doubt that with cattle management techniques (see Nowell & Jackson 1996), such as keeping calves away from forested areas, fencing, patrolling, keeping only adult bulls with horns on distant pastures and maintaining abundant wild prey, predation incidents would be bound to decline. Fencing and patrolling have an economic element that cannot be afforded by small ranchers, but they are the most affected by predation. The present information also supports the need for nature reserves, reserved only for wild animals.

According to the testimony of a reliable hunter and rancher (who preferred to stay unnamed) a jaguar he was hunting had a hair containing bones and meat in a decomposing state, producing a putrid odour that could be smelt from meters away, challenging the common notion of clean lairs with absence of prey remains.

**Jaguar Hunting**

Jaguar hunting with foot snares bought in the USA is also employed in the area and in one case a trapped jaguar uprooted the tree the trap was tied to and walked uphill for 12 hours, leaving behind a trail of trodden earth and plants. He was found alive and shot. This hunting technique causes pain and mental anguish to the cat. Hunters declare that tired or hunted jaguars will always travel uphill.
Wild Jaguar Photographed in Arizona

Scientists working for the Wildlife Conservation Society (WCS) in Arizona have obtained a photo of a jaguar, a rare visitor to the United States. The picture, taken by a camera trap placed near the U.S.-Mexican border, is the first image of this largest of New World felines in the U.S. since August 1996.

"This photo is a significant development for the conservation of jaguars in the northern part of their range," said Howard Quigley, director for WCS’s Global Carnivore Program. "The individual in the photo is probably dispersing from the population south of the border. We’re initiating some work in the Sonora region of Mexico to see if this population will persist and perhaps repopulate parts of the southwestern United States."

Although never plentiful in the south-western US, jaguars did inhabit the area before being largely eliminated as a result of human persecution. Fewer than 20 sightings of jaguars have been confirmed since the mid-1800s. Jaguars have lost more than half of their former habitat, a sprawling range stretching from southern Arizona to northern Argentina, during the past century, according to a recent published paper in Conservation Biology.

The WCS-led study identifies 51 key jaguar areas in 30 different ecological types, the result of a prioritising exercise using GIS software and data from across the jaguar’s entire range. WCS has begun to implement this range-wide program, funded by the car company, Jaguar North America, over a five-year period. The program has brought together experts from throughout Latin America and North America to coordinate the ground efforts to save jaguars.

Working in tandem with WCS researchers, scientists from the Arizona Game and Fish Department initiated the monitoring project in response to the jaguar photo from 1996. Since that time, the jaguar has been listed in the U.S. as an endangered species; this listing does not entail a "critical habitat" designation, since habitat in the U.S. is not necessary for the jaguar’s survival.

(8-Feb-2002, WCS)

Big Cat Roamed South of Tucson

The Arizona Daily Star (5 February 2002) said the jaguar had been photographed in early December south of Tucson. The Arizona Game and Fish Department would not reveal the location of the December sighting to protect the jaguar, but the Star said the photo was taken in an oak wood at 5,000 ft (1,500 m).

The last known photographs of a jaguar in Arizona were taken in 1996, one in the Baboquivari Mountains west of Tucson and one in the Peloncillo Mountains, along the New Mexico border near San Simon.

The new photograph was taken by a remote, motion-activated camera that was set to monitor potential jaguar corridors near the border. Such cameras have been in place since 1997, but until now none had recorded a jaguar.

A team of biologists hopes more photos like the December one will help pinpoint the location of a jaguar. The plan is to capture one, attach a collar with a radio transmitter, then return the jaguar to the wild and monitor its movement.

Arizona is believed to be at the northern end of the jaguar's historic range, which once covered nearly all of Latin America. Now, the closest known population to Tucson is 135 miles south, deep in the Sierra Madre of Mexico, according to Arizona Game and Fish.

David Hodges, executive director of the Tucson-based Sky Island Alliance, said the jaguar was photographed in a large, roadless area with abundant deer that was previously identified as prime habitat for reintroduction of wolves.

"This points to the importance of large roadless areas if we’re going to have species like jaguars and wolves as permanent residents," he said.

Hodges stated that there was evidence that the jaguar photographed in December had taken up residence in the area because several campers had sighted "a large spotted cat" in the previous few months. Game and Fish officials say they routinely field calls about possible jaguar sightings, but many people misidentify a bobcat or mountain lion.
Jaguar Conservation

New research shows that the jaguar (Panthera onca) is in trouble in two-thirds of its historic range. Part of the problem is that jaguars live in 18 countries and there is no coordinated plan for conserving them – such wide-ranging species need conservation plans that transcend political boundaries.

"Biological conservation plans often respect political boundaries more than ecological ones," say Eric Sanderson of the Wildlife Conservation Society in Bronx, New York, and six co-authors in the February 2000 issue of Conservation Biology.

Jaguars once ranged from the southwestern U.S. to northern Argentina.

Threats to the big cats include poaching, habitat loss and competition with people for peccaries (Tayassu spp.), tapirs (Tapirus spp.) and other prey. Another threat to jaguars is that there is no consensus for how to conserve them.

"Most countries do not have endangered species legislation of any kind, and if they do, laws are unlikely to be consistent across the 18 nations where the jaguar is currently found," say Sanderson and his colleagues.

To help shift the focus from politics to ecology, 35 jaguar experts from 12 countries were brought together by the Wildlife Conservation Society and the Institute of Ecology at the National Autonomous University of Mexico. The experts conducted a range-wide assessment of the jaguar's long-term survival prospects, and set priorities for jaguar conservation areas. They accounted for factors including the areas' sizes and connectivity, and the extent of hunting of both jaguars and their prey.

The bad news is that the jaguar has lost more than half of its range since 1900, mostly in the southern U.S., northern Mexico, northern Brazil and southern Argentina. The good news is that the jaguar is likely to survive over the long-term in 70% of its current known range.

The big cats are doing best in the middle of their range, in and around the Amazon Basin. But that's not enough. Conserving wide-ranging species means protecting them in a wide variety of habitats.

"Presumably, the ecology of jaguars in tropical moist lowland forest is significantly different from that in xeric deserts because of differences in, for example, prey base," say Sanderson and his colleagues.

The experts identified and prioritised 51 jaguar conservation areas in 16 countries that are important to the species' long-term survival. These areas represent 30 of the 36 regions where jaguars live.

"The goal is not to determine the most important site for jaguar conservation overall, or the most important site in a given country, but rather to find the most important sites for ecologically distinct populations of jaguars," say Sanderson and his colleagues. "If we are to retain broadly-distributed species into the next century, we need to plan explicitly for their survival across their entire geographic range."

Funded by a $1 million grant from Jaguar Cars, North America, the Wildlife Conservation Society has created a range-wide conservation program for jaguars.

Sanderson's co-authors are: Kent Redford, Cheryl-Lesley Chetkiewicz, Alan Rabinowitz, John Robinson and Andrew Taber, all of the Wildlife Conservation Society in Bronx, New York; and Rodrigo Medellín of the Universidad Nacional Autonoma de Mexico in Mexico City.

Website WCS Save the Jaguar <http://www.savethejaguar.org>

Spring 2002
Feasibility Study on Re-Introduction of Cheetah in Turkmenistan

by Urs Breitenmoser*

Introduction

The Asiatic cheetah (Acinonyx jubatus venaticus) persisted in Turkmenistan until the late 1970s. Atamuradov et al. (1999) and Lukarevsky (2001) mention some unconfirmed reports from the 1980s and even in the 1990s for the Ustjurt Plateau in the north of the country, but all authors consider the cheetah to be extinct today.

Soon after the cheetah finally vanished, wildlife biologists and nature conservationists started to discuss possible reintroduction (e.g. Borodin 1984, Atamuradov et al. 1999; see also contributions in Cat News 8 and 9, 1988). Turkmenistan was the last of the former Soviet republics where the cheetah existed, and it was especially important for the Asiatic cheetah because the country linked the cheetah habitat in the Central Asian steppe around Lake Aral with the cheetah population in Iran.

Viktor Lukarevsky, a renowned cat specialist and a long-term resident in Turkmenistan, recently revived the initiative in favour of the cheetah in Turkmenistan. He submitted a proposal for a feasibility study to WWF International and to the IUCN Cat Specialist Group. A central point of the proposal was an expedition to the Ustjurt Plateau in the triangle of Turkmenistan, Kazakhstan and Uzbekistan to assess the habitat quality and the prey base for the possible return of the cheetah. I was invited to take part in this expedition, which took place in May 2002. I will briefly summarise the findings, my personal impression, and the recommendations of the Cat Specialist Group regarding the reintroduction of the cheetah in Turkmenistan.

The Areas Visited

We first visited the south-eastern part of Turkmenistan, a steppe area bordering Iran and Afghanistan. This region has two large protected areas, the Maena Chaacha and the Batchys, and was generally described as an area rich in wildlife.

Maena Chaacha reserve (36°47’N/60°34’E, area 1 in Fig. 1) is not a fully protected area. It is still used for sheep husbandry, but the stock has declined from 300,000 to 45,000 over the past 10 years. This relieves the area from overgrazing and increases the capacity for wild grazers. A kulan wild ass (Equus hemionus onager) reintroduction project is ongoing. Cheetahs were still observed until the mid-1950s, when the border fence to Iran was built. This fence, situated several kilometres inside Turkmenistan, still divides the Maena Chaacha steppe and prevents wildlife migration between the flat lands in Turkmenistan and the foothills of the Kopetdag in Iran. Gazelles (Gazella subgutturosa), which would likely be the main prey of cheetah, exist nowadays only outside the fence. The reason for the absence of the gazelle in the main part of Maena Chaacha is said to be poaching, but also the fact that they are cut off from the hills, which are seasonally important when the flats dry out.

Batchys reserve (35°53’N/61°46’E, area 2 in Fig. 1) is a zapovednik, a fully protected area with restricted access. The originally huge reserve is now reduced to an area of 877 km², but the surroundings of Batchys includes also two zakazniks (partly protected areas) and steppe with extensive agricultural use, which can be incorporated into a conservation strategy. The reserve was world-famous for its large populations of kulan, gazelle and urial (Ovis orientalis arkal). This former wealth is gone, reduced through poaching by locals and the military, but also trophy hunting by foreign hunters. Atamuradov et al. (1999) still reported a population of 7,300 kulan, when, in fact, the population was already reduced to 300-400 animals. Today, the Ministry of Nature Protection, in collaboration with WWF and other NGOs, is making big efforts to regain control and the populations are starting to recover. However, the increase is very slow, probably also as a consequence of the drought of the past years.

The cheetah disappeared from the southeast of Turkmenistan in the 1950s, when large carnivores were still persecuted as pests. The herbivore populations steadily increased and reached their peak in the late 1980s. At that time, the herbivore abundance in the Batchys area obviously exceeded the carrying capacity of the habitat, and the reintroduction of a large predator, such as the cheetah, would have been possible in the light of the local ecological conditions. In the difficult years after Turkmenistan’s independence, overharvesting and illegal hunting reduced the herbivore populations to critical levels. Today, the authorities are regaining control, supported by non-governmental conservation organisations. The armed forces in the Batchys area now co-operate with conservationists, and poaching by locals is diminishing. The kulan population is increasing slowly. Trophy hunting inside the reserve has been stopped, but a concept for the sustainable use of the game populations by local and foreign hunters outside the reserve is still lacking.

Ustjurt Plateau with the Gaplangyr reserve (40°53’N/56°60’E, area 3 in Fig. 1) was the last resort for the cheetah in Central Asia. We visited the Gaplangyr zapovednik and then the southern part of the Ustjurt Plateau, westwards parallel to the border with Uzbekistan and Kazakhstan. The habitat is steppe, but the dominating landscape features are escarpments and large saltpans. The steppe was used to graze large domestic sheep flocks in Soviet times, but the sheep are gone.

The southern Ustjurt Plateau is the winter range of the saiga antelope (Saiga tatarica). The escarpments and the steppe are the living space of urial and gazelle, respectively, and kulan have been reintroduced into the Gaplangyr. However, we did not spot any large mammals during the whole trip, even though the open landscape is easy to view. We found tracks and droppings of urial, gazelle and kulan, but not frequently and rarely fresh. The region is not inhabited and very remote. Nevertheless, tracks of cars and motorcycles, even far away from the few roads, and inside the reserve were abundant. Hunting or poaching seems to be important even in these regions far away from the nearest settlements. Not only residents hunt in this area. An officer of an army post told us that an Arab hunting party, with at least 70 four-wheel drive vehicles, roamed the area in December 2001.
Our Ustjurt expedition came to an early end when the team was deported from the Kazakh border by a military patrol in spite of our permits from the Ministry of Nature Protection. But even from this relatively short visit, the verdict was clear: There is no prey base for a reintroduction of the cheetah in the north-west of Turkmenistan.

Conclusions and Recommendations

Turkmenistan can play an important role in the conservation of the Asiatic cheetah. It is a neighbour of Iran, which has the last Asiatic cheetahs. Turkmenistan has the potential habitat to host a cheetah population, and it offers a corridor to the central Asian steppes in the vicinity of Lake Aral, which used to be the home of this fascinating cat. Nevertheless, the prey base for a reintroduction is totally insufficient. For the years to come, Turkmenistan should give high priority to the protection, the recovery, and the proper management of the herbivore populations.

These years can be used for an in-depth discussion of many important and problematical aspects of reintroduction of cheetahs in Central Asia. The reintroduction of any (large) cat is a difficult endeavour — and should be carried according to the IUCN Guidelines for Reintroductions — and in the case of the Asiatic cheetah, where the potential source population itself is Critically Endangered, it is especially delicate. Among others, the following points or requirements must be considered before any detailed planning can start:

1. Ecological prerequisites. Suitable cheetah habitat is available in the north-west as well as in the south-east of Turkmenistan, both within and outside protected areas. The protected areas might be a centre for a population, but any viable population will stretch far beyond the reserves. As a consequence of the considerable decrease in domestic stock, wild herbivores, if properly managed, might expand into these areas. At the moment, the prey base is poor even in the zapovedniki.

2. Wildlife management and law enforcement. The Ministry of Nature Protection of Turkmenistan has made a strong commitment regarding wildlife protection. But there can be no doubt that years of hard work for training staff, building infrastructure and public education lie ahead to implement the laws on nature protection. Most of the protected areas in Turkmenistan are remote and consequently difficult to survey. Furthermore, proper wildlife management for the long-term conservation of all wildlife and sustainable harvest of game species outside the protected areas is needed.

3. Project background. Any reintroduction programme needs adequate preparation and monitoring of the released animals. This requires a well-trained team and an adequate infrastructure. A project team can be assembled, but the infrastructure will be a problem. Whereas in the south, in the Maena Chaacha or Batchys area, a certain infrastructure is already in place, in the north, in the Galangyr/Ustjurt region, nothing is available. A close surveillance of released animals would be very difficult or very expensive. The two areas differ, among other things, in regard to their distance from the remaining cheetah population in Iran. A reintroduction in the north would have no immediate consequences for the conservation of the cheetah in Iran; any reintroduction in the south must involve consideration of the situation and the conservation strategy in the neighbouring country.

4. Availability of cheetahs. Any reintroduction programme in Turkmenistan must be considered in the context of the conservation of the Asiatic cheetah. Former projects proposed to get animals from Iran or to use African cheetahs. Nowadays, the cheetah population in Iran is too weak to act as a source, and there is only one Asiatic cheetah known to be in captivity.

The release of African cheetahs would be problematic, and controversial. Asiatic cheetahs are listed as a different subspecies. An assessment of the species' taxonomy based on genetic differences is currently under way (S: O'Brien, pers. Com.). Even if the genetic separation turns
out to be minimal, it would still have to be tested whether African cheetahs can adapt to the cold Central Asian winter. It is clear that any proposal to release African cheetahs in Asia would provoke a fundamental dispute within the conservation society. We must however bear in mind that we might face the alternative of losing the cheetah from Asia or supplementing the remaining gene pool with African animals.

Any decision regarding a cheetah reintroduction programme in Turkmenistan is premature at the moment. However, on behalf of the Cat Specialist Group, I propose that all governmental and private institutions involved continue to create the conditions needed for the return of this charismatic creature and integrate the proposal for a reintroduction of the cheetah in Turkmenistan within the wider context of saving the Asiatic cheetah.

Acknowledgements

This invitation offered me the opportunity not only to look into the cheetah project, but also to learn more about Turkmenistan, and to meet many local nature conservation specialists. I am grateful to the Turkmen Ministry of Nature Protection (Vice-Minister Dr Makhdam Kuli Aknurov) and to WWF International (Dr Hartmut Jungius and Dr Olga Pereladova) for the invitation and support in obtaining the visa; to Dr Viktor Lukarevsky and his team for the professional organisation of the trips in Turkmenistan; and to Dr David Mallon, who provided a lot of baseline information and helped me with the Russian literature in preparing for the journey.

References


* Joint Chair, IUCN Cat Specialist Group. <urs.breitenmoser@iv.unibe.ch>

Spanish Government Conservation Plan for Iberian Lynx

The Spanish government has announced a US$7 million plan to save the Iberian lynx (Lynx pardinus), the most endangered cat species, which is now thought to number fewer than 300 in the wild.

Environment Minister Jaume Matas said on 27 March that the aim was to raise lynx in captivity and to protect the mountainous scrubland refuges in central and south-western Spain where the wild survivors live in heavily fragmented habitat. Only four lynx are in captivity and there has been no breeding of the endangered cats.

Loss of the Iberian lynx would be the first extinction on record of a cat species for at least 2,000 years.

Ten years ago the lynx, once found throughout the Iberian peninsula, was estimated to have declined to 1,200 confined to south-western Spain, with a few in neighbouring Portugal. The decline is attributed to the crash in the population of its main prey, the rabbit, due to the introduced virus myxomatosis, followed by viral Haemorrhagic Fever.

Weighing 10-13 kg, the Iberian lynx is little more than half the size of the Eurasian lynx (Lynx lynx) found from western Europe to the Russian Far East. It is more heavily spotted.

The government plan involves cooperation with non-governmental organisations, such as WWF, and also aims to improve access to water for the scattered populations as well as removing man-made obstacles to movement, such as roads. An increase in road networks in Spain and improvements that have led to faster moving traffic has led to many deaths of lynx as they crossed. A few days after the government announcement, two were killed on roads close to the Doñana National Park, near Seville, one of its last sanctuaries.

Some funds will also go toward cameras and DNA testing to monitor the survival of lynx populations.

As part of the plan, the Environment Ministry will also help finance a project to raise lynx cubs in captivity at Jerez Zoo in the south of Spain. Inigo Sanchez, director of the zoo, is seeking 12 healthy animals to initiate an effective reproduction programme. Two female kittens have been captured, but no males are available at present.

Last year a third female was found close to death in Doñana and brought to the zoo. Although not expected to survive, she now weighs 9 kg and has been moved to the El Acebuchec Centre in Doñana, home to two ageing female lynxes, which may now be past reproduction.

Reintroduction of Canada Lynx in Colorado

Colorado wildlife officials are pleased with the progress of their programme to reintroduce Canada lynx to the state. State biologist Gene Byrne said the overall mortality rate among from the total of 96 lynx received in the winters of 1999 and 2000 from Alaska and British Columbia and the Yukon was what was expected at the outset. There was, however, a great improvement in survival rates in the second year, once wildlife officials had a better understanding of the cats.

"We are still tracking 44 of them on a regular basis and there are 13 missing, but that does not mean they are dead," Byrne said in an interview with the Whitehorse Star. The missing lynx might have wandered out of the study area; their radio collars might have stopped working, or both.

Of 39 confirmed deaths, nine were from starvation, five were killed on the roads; five were shot illegally and one was killed by another predator, probably a bobcat. Byrne said
that although the bobcat and lynx were close in size, he suspected that the bobcat was a "little scrappier".

The causes of death of 10 of the cats remains unknown. Three, including two Yukon females, died of the bubonic plague, which arrived in the U.S. about 100 years ago on the backs of flea-infested rats aboard a European ship, Byrne explained.

Colorado declared the lynx an endangered species in 1971, and the last known cat was trapped illegally in 1973. Byrne said there was a possibility the deadly bacteria transmitted through fleas were a factor in the demise of the lynx, but if it was, it was only a contributing role.

While the surviving 44 transplanted adults appear to be doing well, Byrne and other wildlife officials are concerned because there has been no evidence of offspring. Evidence of successful reproduction is required before more lynx are translocated to augment the reintroduced population.

Meanwhile, following the crash of the snowshoe hare population in the Yukon that began a couple of years ago, the lynx population is in its crash mode, a natural phenomenon resulting from the lynx's overwhelming dependence on the hares for food. Furbearer technician Helen Slama of the Department of Renewable Resources said records showed that when the Yukon's lynx population is thriving, it can reach densities of one cat for every five to 10 km². At the bottom of the crash, the density can drop to one-tenth of the peak.

From field observations, Slama believes the decline in the hare population began in the winter of 1998-99. Trappers are now reporting that lynx numbers are plummeting.

Of 41 lynx that arrived in the winter of 1999, 58 per cent or 24 eventually died. But of the 55 cats that arrived in 2000, the mortality rate fell to 27 per cent, or 15 from the 55.

Byrne said the approach in 2000 was to keep the lynx longer — up to four months — to increase their body weight, and to ensure their health was prime before their release.

(Source Whitehorse Star, 2 March 2002)

Canada Lynx
Similar Over Wide Range

A new study* of the Canada lynx (Lynx canadensis) shows that isolated populations are genetically very similar despite being separated by thousands of miles. The finding suggests that because the threatened species wanders thousands of miles to breed, government-sponsored programs to reintroduce it in western states of the USA do not have to rely on capturing animals with specific bloodlines to successfully repopulate an area.

Genetic evidence at the University of Montana suggests that every 10 years or so, lynx from as far away as northern Alaska tend to breed throughout the Canadian Rockies and into the north-western United States. Previously, scientists were split over the belief that lynx populations did not widely mix and were highly adapted to local environments.

(The only recognized North American sub-species are Lynx c. canadensis and L.c. subsolanus, the latter found in Newfoundland on the east coast of Canada).

The Montana researchers mapped lynx populations from northern Alaska through western Canada and into Montana and Washington State. Genetic analysis of lynx from 17 collection sites showed the animals did not vary significantly over distances up to 1,860 miles apart.

Radio tracking showed that lynx regularly travelled hundreds of miles to hunt and breed, often across glaciers and other forbidding natural barriers. They tended to roam even more than bears, wolves or coyotes, the researchers said.

They recommend that conservation efforts focus on preventing roads and development from pinching off the wild corridors that the lynx uses.

"Gene flow for the lynx is the highest yet found for any carnivore," said the study's lead author, Michael Schwartz. "Joint international efforts should be initiated to ensure that connectivity between northern and southern lynx populations is sustained."


Lesser Cats in Central India

by Shekhar Kolipaka

Study Area

Central India is made up of the states of Madhya Pradesh, Chattisgarh, eastern Rajasthan, southern tips of Uttar Pradesh, northern Maharashtra and north-eastern Andhra Pradesh. There are three principal forest types: tropical moist deciduous forest, tropical dry deciduous forest, and tropical thorn forest. (Champion and Seth, 1968). This diverse habitat supports a variety of fauna and flora, including cats.

This study covered parts of Madhya Pradesh (MP), the second largest state in India, which has an area of approximately 308,000 km² with just over 50% (155,400 km²) forested.

<table>
<thead>
<tr>
<th>Large cats</th>
<th>Small cats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiger (Panthera tigris)</td>
<td>Caracal (Caracal caracal)</td>
</tr>
<tr>
<td>Leopard (Panthera pardus)</td>
<td>Jungle cat (Felis chaus)</td>
</tr>
<tr>
<td></td>
<td>Fishing cat (Prionailurus viverrinus)</td>
</tr>
<tr>
<td></td>
<td>Rusty spotted cat (Prionailurus rubiginosus)</td>
</tr>
<tr>
<td></td>
<td>Leopard cat (Prionailurus bengalensis)</td>
</tr>
<tr>
<td></td>
<td>Asiatic wildcat (Felis silvestris omata)</td>
</tr>
</tbody>
</table>

Spring 2002
Status of the Cats

The jungle cat was recorded from almost all the areas where the study was carried out, although the frequency of sightings differed from place to place. For instance, jungle cats were very often seen at dusk in tropical dry deciduous forests of Satna and Panna districts of MP, but they were not so frequently seen in the Kanha Tiger Reserve in the Satpura range. Sightings of the jungle cat were more frequent outside protected areas than in them.

Two instances of jungle cats being chased and killed by feral dogs were recorded and one jungle cat was found dead on a highway, run over by a speeding vehicle. A farmer near the town of Ajaygadh in Panna district led us to the decaying carcass of a jungle cat, which was supposedly chased by his dogs and killed. He said these were common occurrences.

Jungle cats were sighted twice close to human settlements in the Chambal ravines in 10 days' searching with a spotlight.

It is evident that in Central Indian jungle cats are more common in the northern areas than the eastern or the western sides.

The Asiatic wildcat was seen only in Panna Tiger Reserve, where a sighting in 1997 had been reported (Yoganand 1999). This does not necessarily rule out the possibility of its occurrence in other areas.

The leopard cat was sighted once in Panna Tiger Reserve, close to the village of Lalari at around 6:20 p.m. It was crossing a dirt road and the lights of a motorcycle froze it for a few seconds before it retreated hurriedly into the bushes. Other scientists working around Panna, Kanha and Bandhavghar Tiger Reserves, and in Pench Tiger Reserve, also reported seeing leopard cats.

Sightings of leopard cats were not very common, but the cats exist in a variety of habitats in Central India.

Fishing cats were reported from Pench Tiger Reserve, which contains a large fish-rich lake, and nowhere else in Central India. However, they may exist elsewhere. Two wildlife sanctuaries and a National Park are planned in the forest districts of Khandwa and Harda in the south of MP, bordering Maharashtra. There are large water bodies and the habitat has a rich prey base of ground birds, small mammals and reptiles. These areas could harbor populations of lesser cats.

The rusty spotted cat was sighted in the Panna Tiger Reserve, where it had also been reported by Digveerendarsinh (1995). Reports of sightings have also been collected from the Pench Tiger Reserve. Only detailed studies can give the exact distribution of these cats in Central India.

The first phase of a study of the status of the caracal was carried out between the districts of Rewa and Shivpuri in northern and western MP. Preliminary studies were also carried out in parts of the Satpura mountains. Caracals were sighted in two locations in Satna and Bhind districts in the northern and northwestern parts of central India, where the last caracal sighting was reported in 1989. But caracals do exist in the dryer, thorny forest habitats and in the ravines of the Chambal area.

Conclusions

The actual status of these cats has yet to be determined and detailed studies to understand their behavior in the wild and their adaptation to changing habitats need to be undertaken. Many questions await answers: e.g. the tribes living in and around certain protected areas fail to recognize some species of cats and give the same name to a variety of lesser cats. So how do we monitor these animals? On the other hand, some forests are dense and thick but there is very little wild life in them. Why such a difference?

With the help of Dr Jim Sanderson of Conservation International we plan to study areas in Central India covering all the habitat types and establish pictorial evidence of the lesser cats. In another study we plan to photograph the elusive rusty-spotted cat in the Western Ghats (a designated biological hotspot) to establish proof of its existence.

References


* Indian Institute of Forest Management
Bhopal, India.
<shekhar_k_s@yahoo.com>
Manul Sighting in Qinghai, China

by David Mallon*

Although the manul or Pallas’ cat (*Otocolobus manul*) has a wide distribution across central Asia and was sufficiently numerous until the 1980s to allow annual harvests for fur numbering in the thousands in several countries (Nowell and Jackson, 1996), reports of field sightings are relatively few.

Two manuls were observed during the course of field work on the Qinghai-Tibet Plateau, China, on 12 November 2001. The locality lay in the valley of the Ton Tien He (upper Yangtze) in Chumalai county, Qinghai (34°00’N/95°48’E), at an altitude of 4,087m. The habitat consisted of undulating alpine meadow-steppe broken by low rock outcrops, gullies and talus slopes. The surrounding area contained numerous colonies of black-lipped pika (*Ochotona curzoniae*).

One manul was flushed near the roadside as our vehicle drove past. A search on foot located it about 200m away, crouched in a concrete-lined irrigation channel. It remained motionless for about a minute then moved off steadily along the water’s edge before disappearing from sight under a bridge, 250m away. At the same time, a second animal appeared on the opposite bank, and after watching us for a few seconds, first ran off, then slowed to a walk up a shallow gully and eventually sought refuge in a pile of large boulder scree.

The approach of another person along the line of the irrigation channel then caused the first animal to bolt from its hiding place in a hollow in the bank below the bridge. It moved back towards us, paused at a distance of about 150m away, then jumped into the water and swam across the two metre wide channel. It scrambled up the opposite concrete bank, stopped to shake off excess water and ran away up the slope towards the point where the other manul had disappeared. The first manul was slightly smaller than the second one and was presumed to be an almost fully-grown young individual accompanying the parent female.

We had very clear views of both animals, which were easily identifiable as *O. manul* by their generally greyish coat, long hair on the lower part of the body reaching down to the ground, rusty colour on the legs, especially prominent on the hind legs, and a short, thick tail with a prominent dark tip. They had a stocky build, a rather flattened head and face, and small, rounded, low-set ears.

The only possible species of a similar size with which it could be confused are Chinese mountain cat (*Felis bieti*) and Asiatic wildcat (*F. silvestris ornata*), but the manul can be distinguished by the features listed above. *F. bieti* has a brownier coat, several rings on the tail, more pointed ears and lacks the obvious rusty or rufous on the lower leg. *F. s. ornata* has a slimmer build, more prominent, pointed ears and a spotted, light-brown coat.

Although the ranges of these species, especially Chinese mountain cat and Asiatic wildcat, are not precisely known, and there seems to have been some confusion with the manul at times, it appears that their ranges hardly overlap on the Qinghai-Tibetan Plateau. *O. manul* is widely distributed across the Qinghai-Tibet Plateau and other parts of NW and N China (Xinjiang, Gansu, Inner Mongolia, Hebei and west Sichuan); *F. bieti* is known in northeastern Qinghai, from where a number of captive specimens have originated, and eastern Sichuan, i.e. the northeast and eastern margins rather than the higher elevations of the plateau, and *F. s. ornata* also occurs in Xinjiang and Ningxia, north of the Qinghai-Tibet Plateau (Wang Sung, 1998; Zhang Yongzu, 1997).

Manul numbers in China, as measured by the number of skins obtained, have declined; 500-700 skins were purchased annually in some counties of Tibet in the mid-late 1970s, down to no more than 100 in the 1980s. It is still threatened by uncontrolled hunting (Feng Zuojian, 1998). It is listed in the second category of the State Key Protected Wildlife List and classified as vulnerable in the Chinese Red Data Book (Feng Zuojian, 1998).

Another threat is posed by large-scale poisoning campaigns aimed at eradicating colonies of pikas (*Ochotona spp*), which are perceived to have reached pest proportions. These may affect manuls directly by local eradication of a major prey source or indirectly through accumulation of toxins, although the impact is at present unknown.

Local people in our project area recognised the manul (which they called *chil*) from descriptions and photographs and described it as widespread in the area, but not common. They also referred to another kind of "cat" in the area, known in the local vernacular as ‘foul-smelling cat’. From its description this was clearly the steppe polecat (*Mustela eversmanni*). Snow leopard (*Uncia uncia*) and lynx (*Lynx lynx*) also occur in the area.

References

* 3 Acre Street, Glossop, Derbyshire SK13 8JS, UK. <wolife@zoo.co.uk>
Marbled Cat Pair in Northeastern Thailand

by Lon L. Grassman Jr.* and Michael E. Tewes**

The marbled cat (Pardofelis marmorata) is one of the least studied small cats in southeast Asia. Ecological data on this species is sparse, consisting only of Grassman Jr. and Tewes’ (2000) brief radio-tracking study of one female in Thailand, and Holden’s (2001) camera tracking effort in Sumatra, Indonesia. We report on the first-ever documented observations of a pair of marbled cats in the wild in Phu Khieo Wildlife Sanctuary, Thailand (PKWS).

On January 19, 2002, a pair of adult marbled cats was observed and photographed for approximately three minutes in a saltlick in central PKWS (lat. 16°27' N, long. 101°36' E). The saltlick is situated at 800 m asl in rugged primary hill evergreen forest. This large (100 x 60 m) saltlick is frequented daily by gaur (Bos gaurus) and other ungulates. The photographer, Narong Suwannarong, was concealed in a blind on the ground at the edge of the lick.

At 11:30 two marbled cats were first observed entering the saltlick from the south, travelling north. The similar-sized cats were walking slowly side by side. Although both cats were easily identified as marbled cats, their pelage was remarkably dissimilar. One cat was mottled red/brown with a vague marbled pattern, while the other individual was of a lighter shade with distinct marbled veining. The former individual closely resembled the marbled cat in Grassman and Tewes’ (2000) study. After entering the saltlick approximately 50 m, the cats separated to walk along the edge. After two minutes of slow walking and stopping they rejoined at the northern edge of the lick.

As the cats began to come together five photos were taken from 10 m in quick succession. Upon hearing the noise of the camera shutter one of the marbled cats leaped approximately 1.5 m up onto a large tree trunk, looked towards the blind, hissed and then quickly jumped down and walked rapidly away. The other marbled cat ran into the forest and was no longer visible.

Marbled cats, as with most small cats, are generally assumed to be solitary (Nowell and Jackson, 1996). It is not known whether this observed pair was together only for breeding; represented an established pair; were siblings; or were solitary cats brought together by chance. Marbled cats may form extended or life-long pairings in the wild as has been theorized for clouded leopards (Neofelis nebulosa) (Guggisberg, 1975; Green, 1991; P. Andrews pers. comm.). Clearly, much more research is needed into the natural history of this mysterious feline.

Acknowledgments
We are grateful to the Cat Action Treasury (CAT) and the Bosack and Kruger Foundation, Columbus Zoo, Sierra Endangered Cat Haven, Hexagon Farms, Mountain View Farms, Parco Faunisticos La Torbiera and Point Defiance Zoo for financial support of this long-term carnivore community project.

References

* Department of Forest Biology, Faculty of Forestry, Kasetsart University, Bangkok, Bangkok 10900, Thailand. <longgrassman@hotmail.com>
** Feline Research Center, Caesar Kleberg Wildlife Research Institute MSC 218 Texas A&M University – Kingsville, Kingsville, TX 78363, USA. <michael.tewes@tamuk.edu>

Andean Cat Photographed in Southwest Bolivia

by Lilian Villalba*

On 19 October 2001, as a part of an Andean cat project, Eliseo Delgado, Teofilo Bernal and Justino Esquivel, park guards of the “Eduardo Avaroa” National Andean Fauna Reserve (REA), Segundina Delgado (Eliseo’s wife) and I were exploring a rocky hill in search of the Andean cat (Oreailurus jacobita).

Around 10:00 hrs, Segundina, who was on the lower slope, called to say that she had spotted a wild cat stalking a mountain viscacha (Lagidium viscacia) in the upper part of the rocky site. Eliseo and Teofilo, who were exploring the rocky plateau near the edge, were alerted by Segundina and tried to follow the cat, but it ran away to the southeast. After this sighting all the team met near where Segundina had seen the cat. There were a lot of footprints, mainly going in opposite directions.

After a rest and calming down (all the team were very excited), Eliseo continued following the tracks because some of them disappeared at the edge. At two or three meters below the edge he found a small cave and was able to see a cat inside. With the help of a mirror we were able to illuminate the cave and to see the cat; it was indeed an Andean cat and there were two kittens, which the park guards said were probably 10 or 15 days old. The cat seemed very quiet, but probably was frightened by our presence. However, it remained with the kittens and did not try to escape.

We placed one camera trap facing the cave and another one at the edge of the rocky plateau. We prepared a scent station, baited with bobcat urine, for a second camera trap. When we went to the site next morning to check the cameras, there were no
footprints and no pictures had been taken. However, we were able to see the cat again in the cave.

[Editor’s Note: Villalba and her colleagues returned later to where they had seen the cat and kittens, and on 1 May 02, obtained two pictures of an Andean cat with a camera trap (see page 25).] 

The zone is known as Khastor (22°16.9'S-67°00.75'W) and is 60 km from Quetena Chico, a small village situated at the southeastern border of the Eduardo Avaroa Reserve. The area is a high and small valley with bofedales (high mountain peat bog, with permanent and stagnant water throughout the year) at the bottom and flanked by rocky hillocks with steep and high walls (up to 50-60 meters high) topped by a rocky plateau. At the bottom of these walls we found many latrines in small caves.

The upper slopes are less steep, covered mainly with the small trees of quefoa (Polylepis sp.) and isolated groups of smaller rocks. The cover provided by these trees is less on the medium slopes and bunch grasses predominate on the lower slopes. There are three lagoons in the area. The average elevation of the plateau is 4,650 meters above sea level.

Three previous records of the Andean cat from Khastor consist of museum skins, which were collected in 1988 and 1989. This new sighting is remarkable because it confirms that the species is still present in one of the only three localities where Andean cat occurrence has been confirmed in Bolivia (Villalba and Bernal, 1999). Besides, this finding adds some information about the reproductive season of the species.

Acknowledgments

Sponsors of the Andean cat project include Cat Action Treasury, the Bosack and Kruger Foundation, WildCRU (Oxford University), the Wellcome Trust and the Colección Boliviana de Fauna (La Paz, Bolivia). I appreciate the support that the REA Director and administrative employees give to the project and the assistance with the fieldwork from the park guards. I especially thank Ing. Alvaro Baez (chief park guard) for facilitating all the work within the REA and surrounding area.

* Fellowship of Wildlife Conservation Research Unit (Wild CRU), Oxford University, UK. Associate Researcher of Colección Boliviana de Fauna (CBF), La Paz, Bolivia

Pampas Cat in Argentina:
Is it Absent from the Pampas?

by Javier Pereira, Diego Varela and Natalia Fracassi*

The pampas cat (Lynx rufus paje) is a small South American felid (4-7 kg) which ranges from Central Ecuador and Central Brazil to southern Patagonia in Argentina (Nowell & Jackson 1996). Its appearance resembles that of the European wild cat (Felis silvestris), with pointed ears and broad face, but with a high geographic variability in the colour pattern and the length of the fur (Cabrera 1961). Almost no information is currently available about its ecology, behaviour and population status in the wild. However, this species is listed by IUCN as Least Concern (not threatened in the wild) (Hilton-Taylor 2000). Locally, the Argentinean Society for the Study of Mammals (SAREM) has listed it as a vulnerable species (Diaz & Ojeda 2000).

Pampas cat distribution has never been subjected to a thorough study in South America, and the information available on this topic is scarce and mostly of anecdotal nature. On the other hand, distribution maps available today were drawn based on information on suitable cat habitat and a few presence records. For this reason, its distribution is a controversial subject in recent bibliography, and several authors have published different views about it (Cabrera 1961, Olrog & Lucero 1981, Garcia-Perea 1994, Nowell & Jackson 1996).

In this paper, we report the distribution of pampas cat in Argentina based on presence records collected since April 1999 to date.

Data was collected from four main sources: (1) field surveys, (2) interviews with qualified informants (generally field researchers, park rangers, recognized naturalists and hunters), (3) skins and skulls given to museums and private systematic collections, and (4) bibliographic data. For the data obtained by means of methods described in point 2, the reliability of the information was taken into account and only those records well documented through furs, photos or descriptions that were clear of any doubt were included. The analysis of record reliability was an important point of this study because there is a high ambiguity in different parts of Argentina with respect to the common names of small wild cats: the name “gato del pajonal” is also given to Geoffroy’s cat (Oncifelis Geoffroyi) and to jaguarundi (Herpailurus yaguarondi) in large areas of the northern region of the country; and the names “gato monte” and “gato del pajonal” are given to spotted and melanistic Geoffroy’s cats, mainly in the Parana Delta eco-region and in most of the Argentinean Pampas.

Another aspect considered in the

Spring 2002
### Table 1. Main features of the Eco-regions of Argentina and the number of pampas cat records for each of them

<table>
<thead>
<tr>
<th>Eco-region</th>
<th>Area (millions of ha.)</th>
<th>Main Vegetation type</th>
<th>Annual Rainfall (mm)</th>
<th>Temperature °C Win / Sum</th>
<th>Conservation Status (**)</th>
<th>Number of Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monte</td>
<td>38.2</td>
<td>Scrubland</td>
<td>80 – 200</td>
<td>13° – 17°</td>
<td>Vulnerable</td>
<td>66</td>
</tr>
<tr>
<td>Patagonia</td>
<td>54</td>
<td>Scrubland and herbaceous steppe</td>
<td>120 – 500</td>
<td>5° – 13°</td>
<td>Vulnerable</td>
<td>43</td>
</tr>
<tr>
<td>Espinal</td>
<td>32.5</td>
<td>Xerophitic forest</td>
<td>400 – 1000 (from S to N)</td>
<td>15° – 20°</td>
<td>Vulnerable</td>
<td>15 (*)</td>
</tr>
<tr>
<td>High Andes</td>
<td>14.8</td>
<td>Rocky grasslands</td>
<td>Very low</td>
<td>&lt; 8°</td>
<td>Vulnerable</td>
<td>9</td>
</tr>
<tr>
<td>Punta and Pre-puna</td>
<td>12.4</td>
<td>Herbaceous steppe</td>
<td>100 – 200</td>
<td>7.5° – 10°</td>
<td>Vulnerable</td>
<td>9</td>
</tr>
<tr>
<td>Yungas</td>
<td>4.9</td>
<td>Montane cloud forest</td>
<td>700 – 3000</td>
<td>14° – 26°</td>
<td>Endangered</td>
<td>15 (*)</td>
</tr>
<tr>
<td>Atlantic Forest</td>
<td>2.7</td>
<td>Subtropical rain forest</td>
<td>1600 – 2000</td>
<td>20° – 21°</td>
<td>Critical</td>
<td>0</td>
</tr>
<tr>
<td>Chaco</td>
<td>65.0</td>
<td>Dry forest and wet savanas</td>
<td>450 – 1200 (&gt;from W to E)</td>
<td>20° – 23°</td>
<td>Vulnerable</td>
<td>5 (*)</td>
</tr>
<tr>
<td>Paraná River Delta</td>
<td>3.6</td>
<td>Gallery forest and marshes</td>
<td>1000</td>
<td>15° – 22°</td>
<td>Endangered</td>
<td>0</td>
</tr>
<tr>
<td>Subantarctic</td>
<td>2.0</td>
<td>Moist temperate</td>
<td>1000 – 4000</td>
<td>5° – 10°</td>
<td>Endangered</td>
<td>0</td>
</tr>
<tr>
<td>Forest</td>
<td>45.5</td>
<td>Mixed forest</td>
<td>600 – 1100 (from S to N)</td>
<td>13° – 17°</td>
<td>Critical</td>
<td>8 (*)</td>
</tr>
</tbody>
</table>

(*) Source: BSP/C/ITNC/WCS/WRI/WWF 1995

### Further Description

Analysis, in order to avoid the use of incorrect information, was the similarity in the coloration pattern that this species exhibits with the Andean cat (*Oreailurus jacobita*) and some feral cats (*Felis catus*). For the former species, this similarity was previously referred to by García-Perea (1999), who made an identification key to compare both species based on their external and skull morphology and fur colour pattern.

The total amount of records obtained for this secretive cat species in Argentina was 192, but 22 were eliminated because they involved doubtful information. The 170 records considered for this study represent 154 different localities throughout the country. A percentage of 55.3% (n=94) of the records are the result of our own field surveys and personal communications of other people (sightings, animals killed on the roads, furs, etc). 23.5% (n=40) are from public museums or private collection specimens; and 18.8% (n=32) correspond to bibliographic information, not only from web-documented inventories, but also from scientific papers or technical reports. The remainder 2.4% (n=4) are Argentine zoo specimens kept in captivity at least in 1995-2000. Only in 80.1% of the cases (n=141) could we obtain the date of the record (estimated or precise). Of those dated records, 79.4% (n=112) were obtained after 1980, so the data could be considered relatively updated.

The distribution of pampas cat in Argentina is highly coincidental with the semi-arid climatic strip that enters northwestern Argentina as a continuation of the Andes mountains and which expands further to the south towards the coastal areas by the Atlantic Ocean. Over 80 percent (83.5%) of the records (Table 1) were concentrated along this axis, characterized by habitats ranging from scrublands, rocky grasslands and herbaceous steppe to low xerophitic forest (included in Monte, Patagonia, Western and Southern Espinal, High Andes, Puna and Pre-Puna eco-regions). This mosaic of natural units shares an annual rainfall of less than 500 mm and sometimes extreme temperatures, not only in absolute values (below –20°C in the Puna in winter) but also due to seasonal or daily variations or the presence of snow. The remaining 16.4% of the records are outside the aforementioned eco-regions, but even in these areas there is still a similar trend towards the open and relatively dry areas.

In the pampas eco-region, most records were concentrated in the south (the driest area of this eco-region, with 600 mm annual rainfall and hilly landscapes or grasslands close to it) and just a few isolated records in the western portion, where the original vegetation is still relatively well conserved. Since Azara's first records in 1801 for pampas grasslands, no new reliable evidence of this species has been published or found in the region, and this is also reflected in the absence of pampas cat museum specimens coming from the pampas.

In the Chaco eco-region, records were only found for the western area, either in the eco-tonal belt with the Monte eco-region as well as in the transition forests towards the Yungas. Since the description of the subspecies *L. pajeros crespoi* for the Chaco by Cabrera (1957), there have been very few records and it is probably the most threatened of the four subspecies that have been described for Argentina (García Perea 1994).

Other records for the Yungas eco-region were also obtained from high altitude...
grasslands that exist over 2,400 m.a.s.l.

Interestingly enough, there is a lack of reliable records for the flooded grasslands of the Mesopotamia region (provinces of Entre Ríos and Corrientes framed by rivers Uruguay and Paraná). All data obtained for this area (n=6) was somewhat doubtful and, as in the pampas region, there are no scientific collection samples originally from Mesopotamia. Should the existence of the species in this area be proven, it would be interesting to study its systematic identity as it could probably result in a form closer to those animals found to the south of Brazil than to others found in Argentina, given the habitat characteristics.

No records have been obtained for dense and moist forestlands, such as sub-Antarctic forests, the Atlantic or Paranaean Rainforest, the gallery forests of the Paraná River and the clouded forests that are typical of the Yungas.

Regarding altitude, the records varied between sea level on the Patagonia coast to the south to nearly 5,000 m asl. in the Andes in the northwest.

For all of the protected areas that are managed by the Argentine National Parks Administration, the presence of this species has only been detected in 13 of them (Cafélegua, El Rey, Los Cardones, Los Alisos, Quebrada del Condorito, Sierra de las Quijadas, Lihue Calel, Laguna Blanca, Nahuel Huapi, Perito Moreno, Los Glaciares, Monte León and Bosques Petrifieds) and there are a few doubtful records from Lanín and El Palmar. Pampas cats could be present also in numerous provincial and private protected areas (Heinonen Fortatb & Chebé 1997), although lack of records and inventories makes it impossible for us to know its true situation.

We have recently started a specific and thorough search of records from the pampas grasslands to gain a more precise and detailed understanding of its situation in the most emblematic ecosystem of Argentina. Paradoxically, it seems as if the pampas cat no longer inhabits the grasslands of the pampas that gave it its name.

Acknowledgements
Our thanks to all those who kindly sent us their records, and to Anne Blanchard and Marcela Uhart for assistance with the English translation.

References


* Asociación para la Conservación y el Estudio de la Naturaleza – Association for the Conservation and Study of Nature (ACEN), Julián Alvarez 2414 7º “D” (1425) Capital Federal – Argentina. <gatosdelmonte@yahoo.com>

---

Pampas Cat Photographed in the Argentine Andes

by Patricia Pasini Canedi* and Arturo Canedi*

At 4,000m in the Argentine Andes, Patricia and Arturo Canedi set up a photo-trap hoping to get an Andean cut and were rewarded with pictures of the Pampas cat

Landscapes of unmatched, stark beauty, a dreary grey solitude, except for bursts of green after rain squalls, are the domain of the Andes' most widespread small predators, where the rarest appear to survive in a delicate balance within this harsh environment. In early 2000, in line with a 1996 recommendation by the IUCN Cat Specialist Group (Nowell and Jackson 1996), we launched an attempt to confirm the presence of two of the rarest and the least known wild cat species: the Andean cat (Oreailurus jacobita) and the Pampas cat (Lynchailurus colocolo).

The huge study area, encompassing the region known as desert puna – a remote wilderness in the west of Argentina's Jujuy province- includes parts of several regional ecosystems. It stretches from the western mountains of Lari Chico to the tiny adobe settlement of eastern Susques, blending into the uniform brown landscape. The borders of the gas pipeline of Atacama in the northern and eastern area and the southern boundary is given by International Route 16 which connects to Chile.

The little high mountain town of Susques in a bleak windswept terrain of parched scrub, located at 3,700m above sea level served as the starting point of our field survey. The hours we spent outside in remote and beautiful setting were invaluable. The amount of data we collected in that bitterly cold, high altitude desert was the result of 1,000 hours of field observation.

22

Spring 2002
Not only would the astute observer notice a wide variety of topography and biotic communities on beautiful sand dunes during a field survey, but the influence of the unpredictable annual rhythm of seasonal precipitation, along with prolonged periods of drought and freezing temperatures, obviously has a severe impact on most terrestrial vegetation patterns and on the wildlife sharing this harsh environment.

This vast region, characterized by strange piroclastic rock formations, volcanic in origin, made our work interesting and taught us to expect the unexpected. Walking in the rugged conditions of rocky, wild cat habitat on the rooftop of the world, a world 4,000 m above sea level that literally takes your breath away for the lack of oxygen in the excessively dry air, demands an outstanding effort, our deepest enthusiasm and boldest risk.

At the outset of this survey, in search of wild felids, we came upon the first indirect signs — prints of an adult cat in dry mud, apparently travelling alone in the south-west corner of Susques. The clay ground helped us to trace the cat track. The clay cast of the cat’s front footprint revealed a pad width of nearly 3.5 cm and length of 4 cm. The four toes were arranged asymmetrically around the thick pad with a lead toe extending beyond the others. There were no impressions left by the fifth toe in the wet clay. We assume that, the fifth toe, or dewclaw, did not make contact with the ground as it rides high on the carpal joint (the cat’s wrist). Because footprint dimensions do not vary with the behaviour of the animal (whence running or flexing causes toes to spread), we used the footprint patterns described by a handful of reports for size comparison analyses. The footprint dimension of Andean cat registered on earlier studies coincided with those we found.

With the assumption of *Oreailurus jacobita* presence, and based on the questionnaire results, we turned our attention to a rocky plateau in the arid zones of the high Andes near Vegas, an area watered by surface flow, to select the potential study area and thus to increase the chance of cat encounters.

We found a deep crevice sunk in narrow steep canyons where wedges of limestone 20m high shaped the rocky walls of the cave’s entrance. Rodent sign led to the mouth of a cavern where on sandy substrate we found dry scats and scent trails used by cats.

The remoteness of the rocky, wild cat habitat impedes research, but the advent of photo-trap equipment has made possible the revelation of the mystery world of the elusive creatures of the high Andes, with no human pressure that may generate disturbance to the study animal.

Hoping to photograph the Andean cat, we set up a camera overlooking a trail, with the infrared detector beam parallel to the ground. When we returned a week later, we discovered that amongst various different animals wandering the area, the camera had caught an individual different from the small felid we had been searching for: it was a pampas cat (*Lynxailurus colocolo*). A month later, at the second sampling site within the study area, a different individual pampas cat had been photographed (see page 25).

Literally nothing is known about this little phantom of the Andes. Although there are no data on numbers in the wild, it is relatively widespread and is not included in the IUCN Red List of Threatened Species (Hilton-Taylor 2000). But there is surprisingly little data available on its ecology and the species is generally considered rare.

When this article was written, there had been no sightings of the Andean cat. Only a few widely scattered signs (scats and occasional footprints) suggested the persistence of a few individuals. However, what seems to be the first photo-trap picture of *Lynxailurus colocolo* in the high Andes gave us encouragement for our slowly expanding survey. The second phase of the project will involve applying lessons learned to other sampling sites across the vast range of both species.

**Acknowledgements**

Valuable funding for this study was provided by the Wildlife Preservation Trust International (USA) through a grant obtained by the Durrell Wildlife Conservation Trust. The authors wish to gratefully acknowledge them for the opportunity to prove the presence of the pampas cat as well as to assume the existence of the Andean cat in the region, produced by indirect evidence, thereby opening the way to natural history studies of these lesser cats. Further financial support was provided to this project by the authors’ own resources. Additional, they would also like to express gratitude to Mr. Daniel Saenz for his technical assistance in mapping and processing the collected data. Thanks are due also to Pablo Vasquez for his expertise in the field and dedicated willingness to assist at any time. Further funding resources are needed for the continuation of this project. Any suggestions on possible funding source and/or organization would certainly be welcome.

**References**


* Estación de Fauna Silvestre. Universidad Nacional de Jujuy, Argentina. <canedi@unju.edu.ar>

---

**Guigna and Geoffroy’s Cat in Patagonian Mountain Forest**

*by Mauro Lucherini, Diego Castillo and Mariano Ciuccio*

In December 2001, after some 45 more days of exhausting trapping in Los Alerces National Park, one of my colleagues found a cat in a trap baited with sardines. I (Mauro) ran to the site, impatient to know what we had caught and found a small (2.7 kg) cat, with a hairy, gray-brownish, spotted coat.

The little cat, a female, bravely threatened me from the box-trap, looking more like a guigna (*Onctéfela guigna*) than anything else, but she certainly had some traits reminding us of the Geoffroy’s cat we had trapped in January 2001. She was living proof of our ignorance of the taxonomy and phylogeny of these two cats.
Crackdown on Illegal Trade in Big Cats in USA

The US government has cracked down on illegal domestic trade in big cats with charges against 17 people for buying and killing tigers, leopards and snow leopards and selling their parts.

One of the accused, the operator of an Arkansas animal park was sentenced on May 20 to six months' home confinement, three years probation, and ordered to pay $10,000 to the Fish and Wildlife Fund's Save the Tiger Fund for violating the federal Endangered Species Act. Freddy Wilmuth was also sentenced to to serve two weekends in jail and pay a $25 special assessment.

Wilmuth, operator of Wild Wilderness Safari animal park in Gentry was charged with brokering the illegal sale of four protected tigers to buyers in Missouri, where they were killed. The hides and parts were sold. The buyers, Todd and Vicki Latz of Cape Girardeau, Missouri, pleaded guilty to conspiracy and Lacey Act violations and were scheduled for sentencing on 24 June.

Earlier Woody Thompson Jr of Three Rivers, Michigan, pleaded guilty to brokering the sale of three tiger skins and was sentenced to six months' home detention, fined $2,000 and ordered to pay $28,000 to the Save the Tiger Fund.

The cases were the result of an 18-month investigation by the Fish and Wildlife Service, called Operation Snow Plough*. In the first case, nine people in Missouri and Michigan were indicted for trucking four tigers from Arkansas to an animal park in Missouri, where they were shot the next day without ever being freed from their trailer, while other exotic animals roamed the open-to-the-public reserve. The tigers were gutted and their carcasses shipped to a black market.

In a second case, seven residents of Chicago, Wisconsin and Illinois were charged in May 2002 with violating various wildlife protection laws by trading and killing endangered species, primarily tigers and leopards, and trafficking in their skulls, hides and other parts.

Two of the indictments involve a total of 19 tigers, seven leopards, and a snow leopard, as well as an Asian swamp deer, all species protected under the Endangered Species Act. Seventeen of the tigers and one leopard were allegedly killed, including some that were shot in cages. During the investigation, federal agents purchased and rescued at least six tigers and leopards, which were to be killed.

Hides, meat, skulls and teeth of tigers, leopards and other big cats can fetch $5,000 to $20,000 from collectors, according to wildlife officials. Tiger bones, worth up to $250 a pound, go mainly to people who practice traditional Chinese medicine, both overseas and in major US cities with large Asian populations, according to TRAFFIC, the IUCN/WWF's wildlife trade-monitoring arm.

Owning live big cats violates no federal law, but selling them or their hides, parts or meat in interstate commerce is barred under the federal Lacey Act. When zoos transfer a big cat to another institution, it must be done as a donation rather than a sale.

The defendants include exotic animal exhibitors, taxidermists, "trophy" collectors and an exotic meat dealer, who allegedly bought tiger meat, mislabelled it as lion meat and sold it at his store.

The indictments are the results of a lengthy investigation by U.S. Fish and Wildlife Service agents into the illegal trade in protected tigers, leopards and other animals in the Midwest. In May 1999, Fish and Wildlife agents executed six search warrants and conducted simultaneous interviews in 10 states, resulting in the seizure of a warehouse full of wildlife mounts, hides, skulls, bones, weapons and documents. In November 2001, five defendants were indicted in Missouri, and four defendants were indicted on federal charges in Michigan. Each of the eight new defendants will be arraigned later in a U.S. District Court in Chicago.

The charges were made for violations of the Endangered Species Act, which makes it unlawful to harass, harm, hunt, shoot, wound or kill any endangered species, and felony and misdemeanor violations of the Lacey Act, which bans transport, sale, receipt, acquisition or purchase of wildlife, including parts or products, that are taken, transported or sold in violation of federal law.

Lacey Act violations each carry a maximum penalty of five years in prison and a $250,000 fine, while misdemeanours under the Lacey Act and Endangered Species Act carry a maximum penalty of one year imprisonment and a $100,000 fine. Smuggling carries a maximum penalty of five years in prison and a $250,000 fine.

(Sources: AP Online 1 February 02; Chicago Tribune 2 May 02; FWS Press Release 21 May 02)
Rare Cats of the High Andes

Fig. 1 Andean cat (*Oreailurus jacobita*) caught by photo-trap at 4,660 m asl at Khastor (22°16.0'S/67°00.75W) in the Bolivian Andes. Bobcat urine and gland lure, and faeces, probably from an Andean cat, were used as attractants. Photo: Lilian Villalba, Eliseo Delgado and Juan Carlos Esquivel (see p. 20)

Fig. 2 Pampas cat (*Lynxhallurus colocolo*) caught by photo-trap at 4,000 m asl (23°24'20.8''S/66°25'00.4'' W) in Argentinian Andes. Photo: Arturo and Patricia Canedi (see p. 23)
Cats in the Patagonian Rain Forest, Argentina

Guigna (*Oncifelis guigna*) heads for the forest after fitting with a radio collar in Patagonian rain forest, Los Alerces National Park, Chubut Province, Argentina. Photo: M. Ciuccio (see p. 24)

Geoffroy's cat (*Oncifelis guigna*) photographed in Patagonian rain forest in Los Alerces National Park, Chubut Province, Argentina. Photo: M. Ciuccio (see p. 24)
Illegal Trade in the UK

Some of the world's most endangered animals are being pushed towards extinction by British traffickers who are encouraged by weak wildlife laws, according to a report by WWF and the trade monitoring organisation TRAFFIC.

Nick Ross, a WWF Ambassador who is the presenter of a TV programme called CrimeWatch, said: "We like to think of ourselves as a nation of animal lovers, but this report exposes a lot of humbug. I really had assumed that we were quite tough on traffickers of endangered species, but on the contrary, the UK has become a world centre for crimes that are wiping out the world's natural history".

The report includes a "rogue's gallery" of wildlife criminals from across the UK, Europe and the US. The UK comes out a poor second to the US, where fines are higher and significant custodial sentences are often given to wildlife trade offenders. It clearly shows that UK laws act as little deterrent to the increasingly organised criminals who continue to flout them.

The report highlights the weaknesses of the Control of Trade in Endangered Species (Enforcement) Regulations 1997 (COTES), which governs the trade of globally rare species, such as tigers, rhinos and elephants within the UK. Offences are not arrestable under this law, making it very difficult to investigate crimes effectively. In contrast, a criminal caught trading rare species native to the UK can be arrested under the Wildlife and Countryside Act 1981 (WCA).

In one example, police raided the premises of a British business and confiscated 138 shahtoosh shawls, produced from the hair of the Critically Endangered Tibetan antelope. Even though around 1,000 antelopes would have died to make the shawls, which were priced at a total of $515,000, the company was fined only $2,175.

"At the moment, the sentences handed down don't act as a deterrent to the organized criminals who conduct this trade. They weigh up the risks, and yet still they think it worthwhile to carry on," said Crawford Allan of TRAFFIC.

In the last six years, British customs have seized more than one million items which roughly fell under the illegal animal trade umbrella, ranging from two-week-old stuffed tiger cubs to obscure Chinese medicines.

However, Allan said this haul represented "just the tip of the iceberg" in a global trade whose value ran into the billions of dollars.

Disparity in Penalties

A further disparity between wildlife trade laws concerns maximum penalties. COTES has a maximum penalty of two years' imprisonment, whereas the Customs and Excise Management Act 1979 (CEMA), which governs the smuggling of wildlife across UK borders, carries a maximum penalty of seven years.

The report highlights a lack of awareness among magistrates and judges of the serious nature of these offences. When sentencing offenders they consider old cases and fines, but this system of precedent-based guidance is insufficient.

According to the report, two steps are necessary. Firstly, sentencing guidelines for wildlife trade offences should be drawn up. Secondly, judges and magistrates should be encouraged to use the full range of their powers.

A TRAFFIC investigator stated "The penalties imposed just do not act as a deterrent. For example, how can a trader in the world's rarest wildlife be merely fined half of one per cent of the value of the illicit haul they were caught dealing in? The recent UK case, involving shahtoosh shawls, shows that being caught is simply a slight irritation to profit margins, not an incentive to go straight."

(Sources: WWF UK press release 2 May 2002; Reuters 9 May 2002)

Chinese Wildlife Smugglers Arrested

Police arrested three men smuggling the pelts of tigers, leopards and sea otters over the border from Myanmar (Burma) into southeast China's Yunnan province, according to China Central TV (27 November 01).

Forest police in Baoshan city, 350 km (200 miles) from Yunnan's provincial capital, Kunming, stopped a Chinese driver but allowed him to proceed to neighbouring Xiaguan city in order to catch the buyers meeting the truck. Police found the hides of 23 tigers, 33 leopards and 134 sea otters, which fetch high prices as luxury items at illegal markets in Chinese cities.

China Central Television showed the men, two Chinese nationals and one from Myanmar, standing handcuffed next to the hides of Bangladeshi tigers discovered on their truck. The men pretended their cargo was jellyfish, CCTV said.

CCTV did not say what charges the men faced in the case, which was still under investigation. China had launched a new crackdown on the illegal trade in endangered wildlife owned as pets or consumed as gourmet dishes, CCTV said.

(Source: Reuters 28 Nov. 01)

Indian Businessmen Fined One Million Rupees on Poaching Charge

A group of wealthy Indian businessmen was fined one million rupees (US$208,550) in November 2001 after being arrested with weapons and ammunition in a wildlife area in the northern state of Uttar Pradesh.

Although they had not killed any animals, the businessmen confessed that they had visited the area to poach. They paid half of the fine and were released on promising to pay the rest within a week. Their weapons and ammunition were seized.

"The fine was imposed on them as a group and was the highest ever in the country in view of the fact that the culprits were affluent businessmen," the state's Chief Wildlife Warden, R.L. Singh, told Reuters.

India's Wildlife Protection Act empowers forestry officials to fine poachers, taking into account their financial status.

Tiger Skin Seizures

A Wildlife Trust of India spokesman said its database recorded seizures of 37 tiger skins in Uttar Pradesh and Uttarakhand States in 2001 whereas the figure for 2000 had been 10 plus 132 tiger claws.
India Sets Wildlife Conservation Strategy

In a landmark speech in January 2002, at the first meeting of the Indian Board for Wild Life (IBWL), in five years, Prime Minister Atul Behari Vajpayee declared that the relative neglect of wildlife conservation in India in recent years would be ended.

"Wildlife conservation is too important a task to be treated lightly or ritualistically. After all, human beings have an ethical responsibility towards other species created by Mother Nature. One of the yardsticks of the progress of human civilisation is how well we care for the beasts of the jungle and the seas," he declared.

The Board approved a detailed Wildlife Conservation Strategy for India (see below), which stated that wildlife and forest should be declared a priority sector at the national level, for which funds should be earmarked.

Mr Vajpayee, who chaired the board meeting, said: "We have to admit that there is a big chasm between the exalted place that animals occupy in our cultural and religious traditions on the one hand and, on the other, the actually condition of wildlife in India today. Almost every God and Goddess in our pantheon is associated with some or other animal. And that animal is venerated almost as much as the deity itself. Our folklore and our arts and crafts reflect our love and reverence for the animal world. Sadly, the reality is otherwise.

"India's biodiversity is still very rich. However, what we should remember today is that it was richer yesterday, and may indeed become alarmingly poorer tomorrow. We must wake up before it is too late. Often the imperative of wildlife conservation, as also the protection of the environment, is seen as a hurdle to faster economic growth. The truth is that the two are not antithetical to one another. Rather, sustained development demands that we pursue both objectives simultaneously by striking the right balance between the two.

The Prime Minister's speech and the Board's approval of the National Wildlife Action Plan won praise from conservationists. But a leading environmental NGO, Kalpvriksh, complained in an editorial in its newsletter that the situation of 3-4 million people living within wildlife reserves had not been dealt with.

"Does the IBWL seriously expect them all to move out to eke a living? And that too in a country where land is at a premium, and the government has been consistently unsuccessful in resettling more than one or two villages?" We urban conservationists zealously protect our own turf when it is threatened. For our water and electricity, highways and expressways, we scream blue murder when the government does not deliver. At the same time we have no problem denying even the basic resources for survival to people who have lived for generations in an area.

"The longer we hide these issues under the carpet, the trickier the problem will become. More and more communities will turn against wildlife conservation, and get more and more politicians on their side to demand denotification (abolition of a reserve). No amount of guns and guards can protect wildlife habitats if local people decide to turn against them. And we are not even talking of the fundamental issues of social justice that are involved.

"It is time that the IBWL accepted the reality of people's interaction with natural resources inside protected areas, and boldly strode in the direction that many other tropical countries have already taken: of centrally involving local people in conceiving, managing, and receiving benefits from protected areas".

--

India's Wildlife Conservation Strategy 2002

(Approved by the Indian Board for Wild Life, 21 January 2002)

1. Wildlife and forests shall be declared priority sector at the national level for which funds should be earmarked.

2. Law enforcement agencies must ensure that those engaged in poaching, illicit trade in wildlife and wildlife products, destruction of their habitat, and such other illegal activities are given quick and deterrent punishment.

3. We should fully tap the potential in wildlife tourism and at the same time take care that it does not have adverse impact on wildlife and protected areas. The revenue earned from increased tourism should be used entirely to augment available resources for conservation.

4. Protecting interests of the poor and tribals living around protected areas should be handled with sensitivity and with maximum participation of the affected people. They should have access to the minor forest produce, in the forest outside of national parks and sanctuaries. Employment and means generation for these people is crucial for maintaining symbiosis between the forests, wildlife and the people. People should be encouraged to take up afforestation and conservation in new areas.

5. While strengthening protective measures against traditional threats to wildlife, we should also respond to newer threats, such as toxic chemicals and pesticides.

6. There should be greater governmental as well as societal recognition and support for the many non-governmental organisations engaged in wildlife conservation. Mainstream media to better highlight their activities as also successes of governmental initiatives that have worked.

7. Creatively produced Television Programmes on wildlife and ecology are widely appreciated by young and old as seen from the popularity of dedicated T.V. channels like, Discovery, National Geographic and Animal Planet. It is proposed that Prasar Bharati and our private channels along with with agencies like WWF for Nature should collaborate and increase original Indian content in different languages on our television.

8. No diversion of forest land for non-forest purposes from critical and ecologically fragile wildlife habitat shall be allowed.

28
9. Lands falling within 10 km. of the boundaries of National Parks and Sanctuaries should be notified as eco-fragile zones under section 3(v) of the Environment (Protection) Act and Rule 5 Sub-rule 5(viii) & (x) of the Environment (Protection) Rules.
10. Removal of encroachments and illegal activities from within forest lands and Protected Areas.
11. No commercial mono-culture to replace natural forests.
12. The settlement of rights in National Parks and Sanctuaries should not be used to exclude or reduce the areas that are crucial and integral part of the wildlife habitat.
13. More than 2000 vacant posts in the frontline staff of Protected Areas shall be filled immediately and provided basic infrastructure for efficient discharge of duties. Ban on recruitment of staff against vacant post should be lifted on lines with the Police Department. Innovative initiative such as redeployment of surplus employees in other departments, hiring local people on voluntary or honorarium basis, raising donations from business houses and other members of the public in return for a greater role for them in implementing programmes need to be explored.
14. Every protected area should be managed by forest officers trained in wildlife management.
15. Mitigation measures for human-animal conflict and mechanism for crop insurance, as also expeditious disbursements of ex-gratia payments, should be instituted by States.
16. Forest Commission should be set-up to look into restructuring, reform and strengthening the entire forest set up and affiliated institutions in the country.
17. A working group shall be constituted to monitor implementation of the Wildlife Action Plan.
18. Most importantly let us all resolve that we should end the relative neglect of wildlife conservation in recent years. To begin with Board should meet more often. Wildlife conservation is too important a task to be treated lightly or ritualistically.

Snow Leopard Survival Summit

by Tom McCarthy*

Leading world specialists on the snow leopard (Uncia uncia) met in Seattle on 21-25 May to develop a survival strategy for the endangered species.

The gathering was hosted by the Seattle-based International Snow Leopard Trust (ISLT) and the Woodland Park Zoo. Fifty-two experts from 17 countries, including representatives from 12 snow leopard range states (Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan) came together with the goal of developing a comprehensive strategy to save the species.

The group deliberated on topics ranging from regional prioritization of threats, research and information needs, as well as appropriate and effective conservation tactics. The group also initiated a knowledge mapping program to better define the species range and ‘hot spots’.

For more than a year conservationists, researchers, educators, resource managers and others worked together to provide input to the Draft Survival Strategy. When the aftermath of the terrorist attacks in the USA on September 11 forced postponement of the planned Summit last autumn, the specialist group moved to an internet-based forum to continue information gathering and early drafting of the Strategy. Summit participants then came well prepared to debate and reach consensus on key elements of the Strategy. The next draft of the Snow Leopard Survival Strategy will be completed this summer.

To put the SLSS to use, workshop participants determined steps required to follow up with individual country action plans or other methods of putting recommended programs in place in each range-country. Recognizing the need to maintain close contact, continued mutual support, and cross-border cooperation, participants also established a formal group to be known as the Snow Leopard Network (SLN).

Tom McCarthy, ISLT’s Conservation Director, will chair the group for the first two years and will be joined by a seven-member steering committee with four seats allocated to range-state representatives. The SLN will explore the possibility and advantages of becoming an official working group of the Cat Specialist Group.

Another potential early activity of the Snow Leopard Network will be to develop snow leopard conservation agreements with range state governments under various international treaties, such as the Bonn Convention.

A comprehensive assessment of the results of the Summit will soon be available on the ISLT website:

* Conservation Director, International Snow Leopard Trust.
<tmccarthy@snowleopard.org>
**The Algarve Tiger**

by Siobhan Mitchell & Eduardo Gonçalves

with photos by António Sabater

Vista Iberica Publicações, Lagoa, Portugal

48 pp.

The "Algarve Tiger" of the title is the Iberian lynx (*Lynx pardinus*), which could become the first feld species known to go extinct since prehistoric times. Recent official estimates put the number surviving at fewer than 300, almost all in Spain, with a few in Portugal, including the southern region of the Algarve. That is a massive decline since 10 years ago, when the population was estimated to be 1,200 -- already then only a remnant of the former peninsular-wide population.

Despite the alarm expressed by scientists and NGOs over the years, little has been done to save the species. Only in March 2002 did the Spanish government announce a plan to spend Euro 8 million (US$7 million) to save the species by raising lynx in captivity and protecting the mountainous, scrubland refuges in central and south-western Spain, where most of the cats still live.

A South American virus, *myxomatosis*, introduced in Europe to reduce the rabbit population, was largely responsible for sounding the death knell of the Iberian lynx, because rabbits are its principal prey. Later, Viral Haemorrhagic Fever wrought further havoc for the lynx by killing more rabbits. At the same time, lynx were being illegally shot; caught in rabbit snares, which killed or crippled them; run over by vehicles on the growing number of roads; and losing large areas of natural habitat converted to human use. These threats still exist. What hope remains for the Iberian lynx?

As the authors state: "The Iberian lynx has reached its current situation because it is virtually unknown, and hence forgotten and neglected."

In this small book, which has spectacular photos of the richly-spotted lynx by António Sabater, they tell the story of the lynx's decline and appeal for people to support their initiative to save it. For further information visit their website <http://www.soslynx.org>. Information is also available on the website of the Large Carnivore Initiative for Europe, a group including leading cat specialists <http://www.lcie.org>.

Although the authors refer to the lynx as Europe's "tiger", it is similar in size to the American bobcat (*Lynx rufus*) and the Canada lynx (*Lynx canadensis*), only about twice the size of a domestic cat, but half the size of its northern cousin, the Eurasian lynx (*L. lynx*). Given the great concern and efforts to save tigers and so many other species in other parts of the world, it would be a major disgrace for Europe to lose the Iberian lynx, largely because the governments of Spain and Portugal, and the European Union, have shown so little interest in its conservation as part of their natural heritage until it is almost too late.

*Peter Jackson*

---

**Tigers (UK); The Way of the Tiger (US)**

by K. Ullas Karanth

Colin Baxter Photography

Grantown-on-Spey, Scotland

ISBN 1-84107-081-5

132 pp.

US price $29.95; UK Price £20

Ullas Karanth is a leading tiger scientist, whose studies in India have been a major contribution to our knowledge of the great cat. He has now laid his expertise before the general public in "Tigers" (The Way of the Tiger in the USA) and made a strong case for conservation.

After an introduction telling of a dramatic meeting with a tigeress and her cubs on a misty morning in his principal study area, Nagarahole National Park in southern India, he plunges straight into the big question -- Why Save Tigers?

"Saving tigers in an overpopulated world now means locking productive farmland in wildlife reserves, and suffering occasional depredations by the big cat on livestock and even human beings...Why should we try to save tigers when so many other urgent human problems demand our attention?"

Scientists have long explained the importance to human existence of biodiversity, the linkage between the myriad living species. Karanth quotes population biologist Paul Ehrlich, likening the loss of species to the removal of rivets holding the wings on an aircraft -- while no single rivet's removal leads at first to a crash, ultimately a single rivet surely will. The tiger may not be that fatal rivet overall, but it is certainly has a key rivet in the tropical forest ecosystems of Asia.

As Karanth points out, those forests are tiger habitats that are also watersheds of major Asian river systems, which are critical to the welfare of millions of farmers, and one should add, all the downstream inhabitants. That alone is a primary reason for conserving those ecosystems, which are centres of biodiversity. Karanth describes their destruction by humans as "like a mob of illiterates bent on burning down an ancient library".

---

Spring 2002
Karanth writes of the “broad consensus” of the scientific community, conservation agencies and a wide section of the public on the global necessity of saving rare species. He includes “most governments”, but in my view it is an unfortunate fact that those of the tiger’s homelands have mostly shown too little interest, and they are key players. Of course, the situation changes with governments – Indira Gandhi, as a dominant ruler of India in the 1970s, launched Project Tiger, which undoubtedly gave the tiger a new lease of life in her country. But after her assassination, and that of her son and successor, Rajiv, India’s rulers have shown little sign of appreciation of the importance of nature conservation and of the tiger’s role, despite occasional statements to the contrary. Most other range countries have been equally disinterested. Even scientists, except for Karanth and those whose ecological studies in Nepal’s Chitwan National Park laid the foundation of our present understanding of the tiger, seem to have been complacent until the 1990s when the eruption of large-scale poaching of tigers awoke the world to crisis.

Since then scientists have done excellent work in providing and expanding knowledge of the tiger and its place in important forest ecosystems. Non-governmental organisations have won public support for provision of funds, equipment and other aid for dedicated conservationists in the range countries. Some non-range country governments, too, have made important contributions. It is true, as Karanth remarks, that the tiger has survived, despite the gloomy predictions of those of us who spoke of possible extinction, or “virtual extinction”, by the end of the last millennium. Nevertheless, the tiger hangs on a narrow thread as poaching continues (crucially of tiger prey, not just the tiger, as Karanth stresses) and its homeland is whittled away.

While conservation issues are an important part of Karanth’s book, he also provides a broad survey of the tiger’s evolution and its behaviour, as well as discussing the burning issue of how many tigers actually exist in the wild. He explains the different methods used to try to achieve estimates of numbers, but declares that it is almost impossible to answer this simple question because tigers are very difficult to count. The emphasis of scientists like Karanth has shifted largely to obtaining estimates of tiger density in various areas using photo-traps and statistical methods, although others still strive for a “head count” by studying tiger pugmarks. But the truth is that we do not know exactly how many tigers live in any protected area, let alone elsewhere.

The chapter entitled “Tigers in Retreat” provides an excellent account of the reasons for the tiger’s massive decline. Loss of forest habitat caused by humans is well known, but Karanth details the various reasons it has happened, and is happening at an accelerated rate. He also writes about the toll taken by killing of tigers, legal in the past, and illegal nowadays. But Karanth stresses another cause of decline.

“The single most important reason appears to be the destruction of the tiger’s prey base, rather than direct killing of tigers,” he declares, pointing out that the vast majority of rural and forest people in Asia are meat eaters and hunt mainly for food for themselves and their families. He describes the many ingenious methods used for hunting and trapping wildlife.

He explains that to survive the average tiger needs to kill 50 large hoofed animals, such as deer, every year – while a tigress with cubs has to kill 70. This, he points out, means that “for every 50 deer hunted (by humans) in a year, there is room for one less tiger on this earth”.

The impressive array of photographs makes it a coffee-table book. That means that it is expensive. A popular edition, with fewer photographs, would carry Karanth’s message to a much wider audience, particularly in tiger range countries, where public support for conserving tiger is most needed.

Beyond the Last Village
by Alan Rabinowitz
Island Press/
Shearwater Books
Washington,
Covelo London
ISBN 1-55963-799-4
300 pp.

This is an extremely personal book. As Rabinowitz explains: “This trip for me was not just about saving wildlife. It was a last-ditch effort to convince myself that I still cared enough to try to make a difference in the world. That I still gave a damn.”

The book is sub-titled “A journey of discovery in Asia’s forbidden wilderness”. That wilderness is the north of Myanmar (Burma), where it is flanked by India and China – very much the “back of beyond”. Political problems, which have virtually isolated Myanmar from the rest of the world for decades, have prevented outside investigation of its natural wealth and resources.

Rabinowitz recalls that the explorer Louis Agassiz declared in 1867: “The time for great discoveries is past. No student of nature should go out now expecting to find a new world”.

Agassiz was wrong. In the following 130 years explorers revealed many new areas. Even in the past decade, as Rabinowitz points out, scientists uncovered a biological “lost world” in the Annamite mountains of Indo-China, with evidence of five new mammal species and rediscovery of living members of two species thought to be extinct.

Preparing any expedition is a major task, but in this case it was preceded by what could have been an insurmountable problem – how to get into Myanmar and persuade the reluctant authorities to permit entry into the remotest part of the country. It took four years, but persistence paid off; Rabinowitz received a
one-week visa for a visit to the capital, Yangon (Rangoon), and things started to move.

A key member of the government, General Chit Swe, Minister of Forestry, had checked up on the Wildlife Conservation Society and read Rabinowitz’s work. When they met, in 1993, the General recognised Rabinowitz’s commitment. The door to Myanmar opened.

In due course, after conducting training courses for Forest Department staff, with whom he explored the central area of the country, Rabinowitz got permission to move into the remote north. The book is the account of that arduous exploration of a land seldom visited by westerners, who know it mainly from the explorations of the botanist, Frank Kingdon Ward, in the first half of the 20th century.

Much of the account tells of the local peoples, living brutally hard lives, in whom Rabinowitz had an intense interest. Whenever possible, the expedition provided them with food, and especially salt, a substance that dominates the region’s economy. In fact, it appears that lust for salt, as an exchange, plays a major part in promoting trade in wildlife with China.

Hunters were encouraged to bring in their spoils so that Rabinowitz could identify the species roaming the area, and collect specimens. In particular, the hunters were catching a deer, which Rabinowitz recognised as the smallest known true deer. It was called the “leaf deer”, and turned out to be a new species, which he named *Muntiacus putaoensis*. The new species could lead to understanding the origin and evolution of deer and other large vertebrates.

But, in addition, the expedition extended the known range of blue sheep, stone marten, and black muntjac, which had not been formally recorded in Myanmar. Of great importance was the Government’s agreement to establish the vast Hkakabo Razi National Park in the north, with a participatory management scheme to woo local people from hunting the wildlife to extinction. A key factor was to provide salt for the people.

As already said, this is a very personal book, and Rabinowitz describes the agonising problem of being away from his Thai wife, Salisa, especially when one pregnancy had failed, but another flourished leading to the birth of their first child, a son, Alexander. Nevertheless, Salisa was able to accompany him on one of the expeditions to the north.

---

**Le chat domestique errant ou haret**

*Felis catus*, Linnaeus 1758  
(*Felis silvestris catus*)

by Marc Artois, Marie-José Duchene, Jean-Marie Pericard et Vincent Xemar

Encyclopédie des Carnivores de France, Société Française pour l’Etude et la Protection des Mammifères, no. 18  
Musée d’Histoire Naturelle, Parc Saint Paul, 18000 Bourges, France / 50p. / 10 Euros

Some years ago, the French Mammal Society started an encyclopaedia on wild carnivores found in France. It was decided to include the feral cat and dog, because they are often linked to their pet counterparts; they could indeed be seen as wild populations with a real ecological impact.

Data came from different parts of the world, although original data linked to studies and surveys performed in different parts of France are also included.

The questions linked to feral cats are different according to where they are. On remote islands they can eradicate endemic wildlife and act as a strong factor in biodiversity loss. In urban parks, hospitals grounds or graveyards, where they are fed and nursed by local people, they play a real social role. In villages they are efficient predators of native wildlife. They are studied by biologists, conservationists, veterinarians, and sociologists in these various situations, but they are all the same.

Their adaptability is really amazing. In fact, these cats are a good example of a research field where animal welfare protectionists and wildlife conservationists should work together, at least to understand each other better.

That is one of the aims of this volume. The questions asked and the research direction proposed should lead to understanding our own cats a little better.

François Moutou
Cat Specialist Group Online Library

The Cat Specialist Group Library is now available online. It is temporally located at a web backup service called "iBackup", but will be incorporated into the Cat Specialist Group website <http://lynx.uio.no/catfolk> as soon as funding to improve our website is available.

The ultimate goal of the Cat SG Library is to provide wide access to relevant publications and documents about cat conservation. The basis was the private reprint collection of Peter Jackson, former Chairman of the Cat SG. The library covers not only scientific publications, but also unpublished reports and documents not easily available through libraries. More than 2,500 references are already included.

You can access the library through the following link: <http://www.ibackup.com>.
Login: username “catsglib” and password “catsglib”
Within the Cat SG Library, you will find two folders:
- <1_instructions and database>, and <pdf files>, which contains the instructions, the library database and the PDF files arranged in alphabetical ordered folders according to the name of the first author.

Instruction and database

We use the programme Reference Manager by ISI ResearchSoft as a reference database. The current version is 10. For more information on this software, see http://www.refman.com.

If you use the same software, you can download the files <1_catlib.ris> and <1_catlib.rmx> to make use of the full search functions and to use all other features of a professional reference database.

As an alternative, you can download the database as a text file and import it into another reference database, either from the RIS format (<1_catlib_ris.txt>) or as a comma-delimited file (<1_catlib_del.txt>). Also use this function if you are working with a version of Reference Manager older than version 10.

For detailed instructions see the files <0_readme.txt> and <1_manual.txt>. Information regarding the newest additions to the library are to be found in <0_last_update*** - New files.txt>.

PDF Files

The publications in the Cat SG Library are PDF files. To read PDFs, you need to install the Adobe Acrobat Reader programme. The current version is 5.0. You can download a free version from the following website: http://www.adobe.com/products/acrobat/readstep.html.

Most of the PDFs at present are scans. Consequently, many of the files are large and you will need some patience to download a file, especially if your connection is via a modem.

The file names of all documents follow a common nomenclature:
"<First_author> "Year" "Running_head".pdf"


They are arranged in order of the first author in folders <A> to <X,Y and Z>.

You can open and/or download all documents from the Cat SG Library. But...

Please do not delete, upload or rename any files!

If you wish to download the whole library to your harddisk, use the function SmartIB (for instructions, see <1_download functions.doc>) or <1_download functions.txt>.

Your contributions to the Cat SG Library will be most welcome! Please send documents (scientific articles, reports, etc.) to be included into the Cat SG Library to the following email address: <catsglib@kora.ch>.

Use this same address for any feedback and comments regarding the Cat SG Library — but please note that this is not an online service! We are interested to learn about any problems you might have and will do our best to help you to solve them, but to answer your mails may take some days.

Seraina Klopstein & Urs Breitenmoser
Cat Specialist Group

May 2002

Abdukadir, Ablimit, Chinese Academy of Sciences, Xinjiang Inst. of Ecology and Geography, Urumqi 830011, China, T: +86 (991) 383-7374, F: +86 (991) 383-5459, ablimt@ms.xjb.ac.cn

Andrén, Henrik, Grimsö Wildlife Research Station, Swedish University of Agricultural Sciences, SE-730 91 Riddarhyttan, Sweden, T: ++46 (581) 697-302, F: ++46 (581) 697-310, henrik.andren@nbv.slu.se

Aranda, Marcelo, Instituto de Ecología, Xalapa, Apartado Postal 63, Veracruz 95700, Mexico, T: ++52 (28) 421-843, F: ++52 (28) 187-809, arandam@ecologia.edu.mx

Artois, Marc, Ecole Nationale Vétérinaire de Lyon, Unité Microbiologie et P., BP No. 83, F-69280 Marcy l'Etoile, France, T: ++33 (478) 872-774, F: ++33 (478) 872-774, martois@vet-lyon.fr

Asadi, Hormoz, Africa Ave., West Gohbadian Str., Technical & Engineering Colleges, P.O. Box 19395-4734, Tehran, Iran, T: +98 (911) 248-7088, F: +98 (21) 440-9927, saraba@safine.net

Austin, Sean C., 3336 P St. NW #3, Washington DC 20007, U.S.A., T: ++1 (202) 338-7281, seancaustin@hotmail.com

Bailey, Theodore N., 36915 Hakala Crive, Soldotna AK 99669, U.S.A., T: ++1 (907) 262-5129, tmbailey@alaska.net

Belden, Robert, Wildlife Research Laboratory, Florida Fish & Wildlife Conservation, 4005 South Main Street, Gainesville, FL 32601, U.S.A., T: ++1 (352) 955-2230, F: ++1 (352) 376-5339, belden@fw.state.fl.us

Beltrán, Juan F., Universidad de Seville, Dep. Fisiología y Zoología, Lab. de Vertebrados, Avda. Reina Mercedes 6, 41071 Seville, Spain, T: ++34 (5) 455-7101, F: ++34 (5) 423-3480, beltran@us.es

Berry, Hu, Ministry of Environment & Tourism, Project Box 4195, Vineta, Swakopmund 4195, Namibia, T: ++264 (64) 404-576, F: ++264 (64) 403-236, ecoguide@swk.namib.org

Bertram, Brian C. R., Fieldhead, Amberley, Stroud, Glos, GL5 5AG, United Kingdom, T: ++44 (117) 970-6176, F: ++44 (117) 973-6814, bbbertram@bristolzoo.org.uk, bbbert14444@aol.com

Bhatnagar, Yash Veer, Wildlife Inst. of India, P.O. Box 18, Dehradun 248001, India, T: +91 (135) 640-112, F: +91 (135) 640-117, yash@wiwi.in

Blomqvist, Leif, Helsinki Zoo, Korkeasaari, P.O. Box 4600, 00099 Helsinki, Finland, T: ++358 (9) 169-5936, F: ++358 (9) 169-5990, leif.blomqvist@kolumbus.fi, zool@hel.fi

Bothma, Jacobus du Plessis, Centre for Wildlife Management, University of Pretoria, Pretoria 0002, South Africa, T: ++27 (12) 420-2627, F: ++27 (12) 362-2034, bothma@wildlife.up.ac.za

Breitenmoser, Urs and Christine, KORA, Thunstr. 31, CH-3074 Muri b. Bern, Switzerland, T: ++41 (31) 951-9020, F: ++41 (31) 951-9040, urs.breitenmoser@ivw.unibe.ch, ch.breitenmoser@kora.ch

Brooks, Daniel M., Curator of Vertebrate Zoology, Houston Museum of Natural Science, 1 Hermann Circle Drive, Houston, TX 77030-1799, U.S.A., T: ++1 (713) 639-4776, dbrooks@hmns.org

Can, Oe. Emre, Turkish Society for the Conservation of Nature, PK 599 06250 Ulus, Ankara, Turkey, T: ++90 (312) 310-3303, F: ++90 (312) 310-6642, emre.can@dbkd.org

Capt, Simon, Centre suisse de cartographie et de la faune, Terreux 14, CH-2000 Neuchâtel, Switzerland, T: ++41 (32) 725-7257, F: ++41 (32) 717-7969, simon.capt@ccsf.unige.ch

Caro, Tim, Wildlife and Fisheries Dept., University of California – Davis, One Shields Avenue, Davis CA 95616-8855, U.S.A., T: ++1 (916) 752-0596, F: ++1 (916) 752-4154, tmcaro@ucdavis.edu

Cas, Arturo, Proyecto sobre los Felinos, Silvestres de Mexico, Bosques 144-B, Lomas del Chairel, Tampico, Tamps 89360, Mexico, T: ++52 (12) 272-059, F: ++52 (12) 272-059, acaso2@terra.com.mx

Cerveny, Jaroslav, Institute of Vertebrate Biology, Czech Academy of Sciences, Kvetná 8, Brno CZ 60365, Czech Republic, T: ++420 (5) 4342-2548, F: ++420 (5) 4342-1346, jardarys@cerntrum.cz

Chapron, Guillaume, Laboratoire d’Ecologie, Ecole Normale Supérieure, 46 rue d’Ulm, F-75230 Paris Cedex 05, France, gcchapron@carnivoreconservation.org

Chavda, Divyabhanusinh, 519 Fore Desert Colony, Vaishali Marg, Jaipur 302 021, India, T: ++91 (141) 352-278, F: ++91 (141) 354-673

Christie, Sarah, Staff Flat, Zoological S. London, London Zoo, ZSL, Regent’s Park, London NW1 4RY, United Kingdom, T: ++44 (207) 449-6455, F: ++44 (207) 722-2852, sarah.christie@zsl.org

Chundawat, Raghunandan, Wildlife Institute of India, P.O. Box 18, Chandra Bani, Dehradun, Uttar 248 001, India, T: ++91 (7731) 271-584, rppitiger@mantraonline.com

Crawshaw, Peter G., CENAP/IBAMA, a/c Imovens Pellin, Av. Wenceslau Escobar, 3304- B.Triste, Porto Alegre, RS CEP 91900-001, Brazil, T: ++55 (54) 244-1347, F: ++55 (54) 244-1347, pccrawshaw@uol.com.br

Delibes, Miguel, Estacion Biologica de Donana, Apdo. 1056 Pabellon del Peru, Avenida de Maria Luisa s/n, 41080 Seville, Spain, T: ++34 (5) 423-2340, F: ++34 (5) 462-1125, ecastro@ebd.csic.es

Dickman, Amy, Cheetah Conservation Fund, P.O. Box 1755, Otjiwarongo, Namibia, T: ++264 (67) 306-225, F: ++264 (67) 306-247, cheeta@afriacat.org

Doi, Teruo, Fac. Science, Kyusyu University, Hakozaki, Higashi-ku, Fukuoka 812-8581, Japan, T: ++81 (92) 642-2625, F: ++81 (92) 642-2645, t.teru@mbbox.nc.kyushu-u.ac.jp

Dragesco-Joffé, Alain M., Villa La Rousserie, Chapelle de Rousset, F-64110 Juranco, France, T: ++33 (5) 5921-7456, F: ++33 (5) 5921-6511, dragescojoffe@aol.com

Dunishenko, Yuri, Wildlife Foundation, 70 October 12, str. 34 apart, p/o Berezovka, Khabarovsk 680 049, Russia, T: ++7 (4212) 211-298, F: ++7 (4212) 220-410, institute@mail.kht.ru

Dunstone, Nigel, Dep. of Biological Sci., Centre for Tropical Ecology, University of Durham, South Road, Durham, DH1 3LE, United Kingdom, T: ++44 (191) 374-3348, F: ++44 (191) 374-2417, nigel.dunstone@durham.ac.uk

Durant, Sarah, Institute of Zoology, Zoological Society of London, Regent’s Park, London NW1 4RY, United Kingdom, T: ++44 (207) 449-6688, F: ++44 (207) 883-2237, s.durant@uel.ac.uk, cheetah@habari.co.tz
Cats on the Web

Cat Specialist Group: http://lynx.uio.no/catfolk is based on the book Wild Cats: Status Survey and Conservation Action Plan, compiled and edited by Kristin Nowell and Peter Jackson (IUCN 1996), newsletter Cat News, and other information about the group

IUCN-The World Conservation Union: http://www.iucn.org covers all activities of the Union

IUCN Red List of Threatened Species: http://www.redlist.org has the 2000 edition of the Red List. The site will have a major up-date annually

Species Survival Commission: http://www.iucn.org/themes/ssc covers SSC activities and has a complete list of specialist groups, their chairs and contact persons

Cat Action Treasury (CAT): http://www.felidae.org reports the activities of the CAT, an American non-profit, IRS-certified 501(c)(3) non-governmental organization established in August 1995 to promote and support wild cat research and conservation projects approved by the Cat Specialist Group


TRAFFIC: http://www.traffic.org Wildlife trade monitoring organization sponsored by IUCN and WWF

World Conservation Monitoring Centre: http://unep-wcmc.org.uk provides access to databases on species and protected areas, Red Lists etc.

Tiger Information Centre: http://www.5tigers.org/ put up by the Minnesota Zoo is a mine of data about tigers. The site also carries the contents lists of all issues of Cat News, as well as reproducing all the newsletter’s items on tigers

Project Tiger, India: http://www.nic.in/envfor/pt is the official web site of the Indian tiger conservation programme

Save China’s Tigers http://www.savechinastigers.org is dedicated primarily to the South China tiger

Hornocker Wildlife Institute: http://www.hwi.org/covers Amur tiger studies and conservation, as well as on mountain lion (cougar) work in the USA

Wildlife Conservation Society: http://www.wcs.org/covers Amur, Indo-Chinese and Sumatran tiger projects, as well as other projects worldwide

Tigris: http://web.inter.nl.net/users/tigers dedicated to saving the Amur tiger and Amur leopard


African lion research: http://www.lionresearch.org, Research reports by Professor Craig Packer, University of Minnesota

Asiatic Lion Information Centre: http://www.asiatic-lion.org/

Kingdom of Lions: http://home.worldonline.nl/~rlion/lkindex.htm

Jaguar conservation: http://www.savethejaguar.org posted by the Wildlife Conservation Society, which is coordinating jaguar conservation


http://www.fujairah.com/leopard.htm

International Snow Leopard Trust: http://www.snowleopard.org

Snow Leopard Conservancy http://www.snowleopardconservancy.org deals especially with methods to diminish snow leopard predation on livestock
Clouded leopard project: http://www.cloudedleopard.org/.
Namibia-based, the CCF covers cheetahs worldwide.

Namibia-based, AfriCat covers lions, cheetahs and leopards in Namibia.

Florida Panther Society: http://www.atlantic.net/~oldfla/panther/panther.html
Reports on one of the world's most endangered cats.

Mountain Lion Foundation: http://mountainlion.org/

World Lynx: http://lynx.uio.no/on/lynx/lynxhome.htm
Has information on all four lynx species, including the species accounts from Wild Cats.

Eurasian and Iberian lynx: www.large-carnivores-icie.org
Website of the Large Carnivores Initiative for Europe.


Cats: Wild to Mild: http://www.nhm.org/cats
Put up by the Los Angeles County Museum.

Carnivore Conservation: www.carnivoreconservation.org
A good source of news about cats and other carnivores, providing links to key sites and posting abstracts from important papers.

Mammal Species of the World: http://www.nmnh.si.edu/msw
Provides access to Mammal Species of the World (Smithsonian 1993) taxonomy.

World Commission on Protected Areas: http://wcpa.iucn.org

Natural History Book Service: http://www.nhbs.co.uk
An excellent book service for all interested in natural history.
THE AFRICAN LION WORKING GROUP (Est. 1999)

THE AFRICAN LION DATABASE

Compiled by:

Hans Bauer*, Sarel van der Merwe†

* Centre of Environmental Science, Leiden University, PO Box 9518, 2300 RA Leiden, The Netherlands

† African Lion Working Group (IUCN/SSC), PO Box 12451, Brandhof 9324, Bloemfontein, Republic of South Africa

Published May 2002.
<table>
<thead>
<tr>
<th>REGION</th>
<th>COUNTRY</th>
<th>DEFINED REGION</th>
<th>APPROX. AREA Sq. km’s</th>
<th>METHOD</th>
<th>ESTIMATED LION POPULATION</th>
<th>ESTIMATED MINIMUM</th>
<th>ESTIMATED MAXIMUM</th>
<th>SOURCE OF INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Africa</td>
<td>Burundi</td>
<td>National</td>
<td>28,000</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td>Aarhaug/Bauer (2001)</td>
</tr>
<tr>
<td>Central Africa</td>
<td>Cameroon</td>
<td>Benoue ecosystem</td>
<td>29,000</td>
<td>6</td>
<td>200</td>
<td>100</td>
<td>400</td>
<td>Bauer (2001)</td>
</tr>
<tr>
<td>Central Africa</td>
<td>Cameroon</td>
<td>Waza NP</td>
<td>1,600</td>
<td>6</td>
<td>50</td>
<td>30</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Central Africa</td>
<td>Central African Republic</td>
<td>National (1)</td>
<td>623,000</td>
<td>5</td>
<td>300</td>
<td>200</td>
<td>500</td>
<td>Scholte (2002)</td>
</tr>
<tr>
<td>Central Africa</td>
<td>Chad</td>
<td>Remainder (2)</td>
<td>1,284,000</td>
<td>5</td>
<td>100</td>
<td>50</td>
<td>150</td>
<td>Scholte (2002)</td>
</tr>
<tr>
<td>Central Africa</td>
<td>Chad</td>
<td>Zakouma ecosystem (incl-rem)</td>
<td>5</td>
<td>50</td>
<td>38</td>
<td>63</td>
<td>Scholte (2002)</td>
<td></td>
</tr>
<tr>
<td>Central Africa</td>
<td>Congo</td>
<td>Odzilia NP* (3)</td>
<td>342,000</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>Anderson (1989-90) / Aveling (2002)</td>
</tr>
<tr>
<td>Central Africa</td>
<td>D.R. of Congo</td>
<td>National</td>
<td>2,345,000</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td>Anderson (1989-90)</td>
</tr>
<tr>
<td>Central Africa</td>
<td>Eq. Guinea</td>
<td>National</td>
<td>28,000</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Nowell &amp; Jackson (2001)</td>
</tr>
<tr>
<td>Central Africa</td>
<td>Gabon</td>
<td>National</td>
<td>268,000</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>CENTRAL AFRICA</strong></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>700</strong></td>
<td><strong>418</strong></td>
<td><strong>1208</strong></td>
<td></td>
</tr>
<tr>
<td>West Africa</td>
<td>Benin</td>
<td>Pendjari ecosystem (incl. Buffer)</td>
<td>6,505</td>
<td>4</td>
<td>50</td>
<td>38</td>
<td>63</td>
<td>Tehou</td>
</tr>
<tr>
<td>West Africa</td>
<td>Benin</td>
<td>Remainder</td>
<td>4</td>
<td>20</td>
<td>15</td>
<td>25</td>
<td>25</td>
<td>Tehou</td>
</tr>
<tr>
<td>West Africa</td>
<td>Burkina Faso</td>
<td>National</td>
<td>274,000</td>
<td>5</td>
<td>75</td>
<td>49</td>
<td>101</td>
<td>Bauer (2002)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Cote d’Ivoire (Ivory Coast)</td>
<td>Camee NP</td>
<td>322,000</td>
<td>5</td>
<td>30</td>
<td>20</td>
<td>40</td>
<td>Bauer (2002)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Gambia</td>
<td>National</td>
<td>11,000</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Bauer (2002)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Ghana</td>
<td>Gbele Reserve</td>
<td>4</td>
<td>10</td>
<td>8</td>
<td>13</td>
<td>13</td>
<td>Ghana Wildlife Society</td>
</tr>
<tr>
<td>REGION</td>
<td>COUNTRY</td>
<td>DEFINED REGION</td>
<td>APPROX. AREA (Sq. km's)</td>
<td>METHOD</td>
<td>ESTIMATED LION POPULATION</td>
<td>ESTIMATED MINIMUM</td>
<td>ESTIMATED MAXIMUM</td>
<td>SOURCE OF INFORMATION</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------------------------</td>
<td>-------------------------</td>
<td>--------</td>
<td>---------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>West Africa</td>
<td>Ghana</td>
<td>Mole NP</td>
<td>4</td>
<td>20</td>
<td>15</td>
<td>25</td>
<td></td>
<td>Ghana Wildlife Society</td>
</tr>
<tr>
<td>West Africa</td>
<td>Guinea</td>
<td>National</td>
<td>246,000</td>
<td>4</td>
<td>200</td>
<td>150</td>
<td>250</td>
<td>Fai (2001)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Guinea-Bissau</td>
<td>Duolombi / Boo NP</td>
<td>1,500</td>
<td>4</td>
<td>30</td>
<td>23</td>
<td>38</td>
<td>Oulare</td>
</tr>
<tr>
<td>West Africa</td>
<td>Liberia</td>
<td>National</td>
<td>111,000</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Garnett &amp; Utas (2000)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Mali</td>
<td>National</td>
<td>1,240,000</td>
<td>5</td>
<td>50</td>
<td>33</td>
<td>68</td>
<td>Moriba</td>
</tr>
<tr>
<td>West Africa</td>
<td>Mauritania</td>
<td>National</td>
<td>1,031,000</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Nowell &amp; Jackson (1996)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Niger</td>
<td>&quot;W&quot; NP</td>
<td>2,977</td>
<td>3</td>
<td>70</td>
<td>60</td>
<td>81</td>
<td>Moussa &amp; Gay (2002)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Nigeria</td>
<td>National (23)</td>
<td>924,000</td>
<td>5</td>
<td>200</td>
<td>130</td>
<td>270</td>
<td>Jenkins (2002)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Senegal</td>
<td>Niokola Koba NP complex** (Incl. Faleme Hunting Zone and Kalounayes Forest)</td>
<td>20,000</td>
<td>6</td>
<td>60</td>
<td>20</td>
<td>150</td>
<td>Burnett/Di Sylvestre/Diop</td>
</tr>
<tr>
<td>West Africa</td>
<td>Sierra Leone</td>
<td>National</td>
<td>72,000</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Garnett &amp; Utas (2000)</td>
</tr>
<tr>
<td>West Africa</td>
<td>Togo</td>
<td>Keran N.P. and National</td>
<td>1,636</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Anderson (1990), Nowell &amp; Jackson (2001)</td>
</tr>
</tbody>
</table>

**WEST AFRICA TOTAL**: 815,558,112

<p>| East Africa | Djibouti     | National                | 22,000                  | 6      | 0                         | 0                 |                   | Nowell &amp; Jackson (2001)  |
| East Africa | Ethiopia     | Bable - Darkata &amp; Webe Shebelle valley | 6,982 | 4 | 300 | 225 | 375 | Williams / Sillero / Zubiri (2001) |
| East Africa | Ethiopia     | Bale - Sof Omar (4)     | 2,471                   | 4      | 50                        | 38                | 63                | Williams / Sillero / Zubiri (2001) |</p>
<table>
<thead>
<tr>
<th>REGION</th>
<th>COUNTRY</th>
<th>DEFINED REGION</th>
<th>APPROX. AREA Sq. km's</th>
<th>METHOD</th>
<th>ESTIMATED LION POPULATION</th>
<th>ESTIMATED MINIMUM</th>
<th>ESTIMATED MAXIMUM</th>
<th>SOURCE OF INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Africa</td>
<td>Ethiopia</td>
<td>Borana - L. Stephanie - Northern L. Turkana</td>
<td>54,000</td>
<td>4</td>
<td>100</td>
<td>75</td>
<td>125</td>
<td>Williams / Sillero / Zubiri (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Ethiopia</td>
<td>Gambella</td>
<td>5,061</td>
<td>4</td>
<td>150</td>
<td>113</td>
<td>188</td>
<td>Williams / Sillero / Zubiri (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Ethiopia</td>
<td>Omo NP, Mago NP (5)</td>
<td></td>
<td></td>
<td>Present, not estimated</td>
<td></td>
<td></td>
<td>Williams / Sillero / Zubiri (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Ethiopia</td>
<td>Remainder (6)</td>
<td>766</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>15</td>
<td>Williams / Sillero / Zubiri (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>East of Rift Valley to the East of the Matthews, Ndotos &amp; Mt Nyiru (6)</td>
<td>5,000</td>
<td>5</td>
<td>150</td>
<td>98</td>
<td>203</td>
<td>Williams (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Galana Game Ranch</td>
<td></td>
<td></td>
<td>Present, not estimated</td>
<td></td>
<td></td>
<td>Heath (2002)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Isiolo, Barsalina, Wamba &amp; Shaba</td>
<td>Shaba=743</td>
<td>4</td>
<td>100</td>
<td>75</td>
<td>125</td>
<td>Williams (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Kora National Reserve (13)</td>
<td>6,000</td>
<td>5</td>
<td>40</td>
<td>40</td>
<td>54</td>
<td>Jenkins (2002)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Laikipia Plateau</td>
<td>10,000</td>
<td>2</td>
<td>120</td>
<td>108</td>
<td>132</td>
<td>Frank (2002)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Masai Mara NP (11)</td>
<td>1,510</td>
<td>2</td>
<td>558</td>
<td>502</td>
<td>614</td>
<td>Ogutu (1990-2)</td>
</tr>
<tr>
<td>REGION</td>
<td>COUNTRY</td>
<td>DEFINED REGION</td>
<td>APPROX. AREA Sq. km’s</td>
<td>METHOD</td>
<td>ESTIMATED LION POPULATION</td>
<td>ESTIMATED MINIMUM</td>
<td>ESTIMATED MAXIMUM</td>
<td>SOURCE OF INFORMATION</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>--------</td>
<td>---------------------------</td>
<td>------------------</td>
<td>-------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Meru NP and Bisanadi NR***(7)</td>
<td>6,100</td>
<td>5</td>
<td>80</td>
<td>60</td>
<td>108</td>
<td>Jenkins (2002)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Nairobi NP</td>
<td>117</td>
<td>2</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>Cavanaugh / Packer (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Northern Kenya - east of Rift Valley, north of Tana river to Ethiopia/Somali borders</td>
<td>200,000</td>
<td>5</td>
<td>650</td>
<td>423</td>
<td>878</td>
<td>Williams (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Remainder *(8)</td>
<td>6</td>
<td>Present, not estimated</td>
<td></td>
<td></td>
<td></td>
<td>Williams (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Kenya</td>
<td>Tsavo NP *(12)</td>
<td>20,812(buffer=40,000)</td>
<td>5</td>
<td>675</td>
<td>439</td>
<td>911</td>
<td>Packer / Heath (2002)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Rwanda</td>
<td>Akagera NP</td>
<td>26,000</td>
<td>4</td>
<td>25</td>
<td>19</td>
<td>31</td>
<td>Williams (1999)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Somalia</td>
<td>National</td>
<td>638,000</td>
<td>6</td>
<td>n/a</td>
<td></td>
<td></td>
<td>Steenhouwer</td>
</tr>
<tr>
<td>East Africa</td>
<td>Sudan</td>
<td>National</td>
<td>2,506,000</td>
<td>6</td>
<td>Present, not estimated</td>
<td></td>
<td></td>
<td>Steenhouwer</td>
</tr>
<tr>
<td>East Africa</td>
<td>Tanzania</td>
<td>Lake Natron GCA</td>
<td>Present, not estimated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vlioen (2002)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Tanzania</td>
<td>Manyara NP</td>
<td>4</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>Packer (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Tanzania</td>
<td>Protected buffer zone surrounding Selous GR</td>
<td>49,000</td>
<td>5</td>
<td>750</td>
<td>500</td>
<td>1000</td>
<td>Creel (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Tanzania</td>
<td>Selous GR** *(22)</td>
<td>43,000</td>
<td>5</td>
<td>3750</td>
<td>3000</td>
<td>4000</td>
<td>Creel (2001) / Nicholson (1973)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Tanzania</td>
<td>Serengeti Ecosystem: Serengeti NP, Maswa GR, Loliondo GR, Ikronogo, Grumeti GR's</td>
<td>40,000</td>
<td>3</td>
<td>2500</td>
<td>2125</td>
<td>2875</td>
<td>Packer (2001)</td>
</tr>
</tbody>
</table>
# AFRICAN LION DATABASE

<table>
<thead>
<tr>
<th>REGION</th>
<th>COUNTRY</th>
<th>DEFINED REGION</th>
<th>APPROX. AREA Sq. km's</th>
<th>METHOD</th>
<th>ESTIMATED LION POPULATION</th>
<th>ESTIMATED MINIMUM</th>
<th>ESTIMATED MAXIMUM</th>
<th>SOURCE OF INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Africa</td>
<td>Tanzania</td>
<td>Tarangire (16), Ruaha, Katavi, Mkomazi and Moyowosi</td>
<td>62,000</td>
<td>6</td>
<td>Present, not estimated</td>
<td>25</td>
<td>23</td>
<td>Packer (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Uganda</td>
<td>Kideto Valley NP</td>
<td>1,400</td>
<td>2</td>
<td></td>
<td>25</td>
<td>23</td>
<td>Sieffert/Driciru (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Uganda</td>
<td>Murchison Falls NP, and adjacent reserves</td>
<td>5,072</td>
<td>2</td>
<td></td>
<td>350</td>
<td>315</td>
<td>Sieffert/Driciru (2001)</td>
</tr>
<tr>
<td>East Africa</td>
<td>Uganda</td>
<td>Queen Elizabeth Park</td>
<td>2,343</td>
<td>2</td>
<td></td>
<td>200</td>
<td>180</td>
<td>Sieffert/Driciru (2001)</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>11,123</td>
<td></td>
<td>8794</td>
<td>12,990</td>
<td></td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Angola</td>
<td>National</td>
<td>1,247,000</td>
<td>4</td>
<td></td>
<td>450</td>
<td>338</td>
<td>Van Hoven</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Botswana</td>
<td>Kalahari: Central Kalahari GR**</td>
<td>54,843</td>
<td>6</td>
<td></td>
<td>312</td>
<td>166</td>
<td>Funston / DWNP (2000-2001)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Botswana</td>
<td>Kalahari: Kgalagadi Transfrontier Park</td>
<td>36,208</td>
<td>6</td>
<td></td>
<td>458</td>
<td>428</td>
<td>Funston(2001)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Botswana</td>
<td>Kalahari: Southern Kgalagadi WMA's**</td>
<td>36,400</td>
<td>6</td>
<td></td>
<td>225</td>
<td>200</td>
<td>Funston(2001)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Botswana</td>
<td>North: (15) Okavango Delta (20)</td>
<td>14,741</td>
<td>3</td>
<td></td>
<td>1438</td>
<td>1178</td>
<td>Winterbacs / Kat / Sechele (2001)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Botswana</td>
<td>Pans: Nxai Pan</td>
<td>6</td>
<td>40</td>
<td>20</td>
<td>60</td>
<td>Hemson (2001)</td>
<td></td>
</tr>
<tr>
<td>REGION</td>
<td>COUNTRY</td>
<td>DEFINED REGION</td>
<td>APPROX. AREA Sq. km's</td>
<td>METHOD</td>
<td>ESTIMATED LION POPULATION</td>
<td>ESTIMATED MINIMUM</td>
<td>ESTIMATED MAXIMUM</td>
<td>SOURCE OF INFORMATION</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>----------------</td>
<td>-----------------------</td>
<td>--------</td>
<td>---------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Botswana</td>
<td>Tuli Block</td>
<td>686</td>
<td>6</td>
<td>10</td>
<td>0</td>
<td>20</td>
<td>Winterbotsch (2002)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Lesotho</td>
<td>National</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Nauda (2002)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Malawi</td>
<td>National</td>
<td>118,000</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Mozambique</td>
<td>Manica Gaza</td>
<td>4</td>
<td>25</td>
<td></td>
<td>19</td>
<td>31</td>
<td>Anderson</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Mozambique</td>
<td>Niassa &amp; Cabo Delgado</td>
<td>15,000</td>
<td>4</td>
<td>175</td>
<td>19</td>
<td>31</td>
<td>Anderson</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Mozambique</td>
<td>Remainder</td>
<td>4</td>
<td>25</td>
<td></td>
<td>19</td>
<td>31</td>
<td>Anderson</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Mozambique</td>
<td>Zambezi Valley</td>
<td>19,970</td>
<td>4</td>
<td>175</td>
<td>19</td>
<td>31</td>
<td>Anderson</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Namibia</td>
<td>Etosha NP</td>
<td>22,270</td>
<td>6</td>
<td>230</td>
<td>191</td>
<td>266</td>
<td>Stander (1991)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Namibia</td>
<td>Remainder</td>
<td>3</td>
<td>680</td>
<td></td>
<td>578</td>
<td>782</td>
<td>Stander (1991)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>South Africa</td>
<td>Eastern Cape: Addo Elephant Park*, Kwande, Shamwari</td>
<td>40,000</td>
<td>1</td>
<td>13</td>
<td>12</td>
<td>1</td>
<td>Slotow / Van Dyk (2001)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>South Africa</td>
<td>Kruger NP** ecosystem (19)</td>
<td>22,000</td>
<td>6</td>
<td>2200</td>
<td>2200</td>
<td>2200</td>
<td>Mills (2002)</td>
</tr>
<tr>
<td>REGION</td>
<td>COUNTRY</td>
<td>DEFINED REGION</td>
<td>APPROX. AREA Sq. km’s</td>
<td>METHOD</td>
<td>ESTIMATED LION POPULATION</td>
<td>ESTIMATED MINIMUM</td>
<td>ESTIMATED MAXIMUM</td>
<td>SOURCE OF INFORMATION</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>--------</td>
<td>---------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>South Africa</td>
<td>Limpopo: Venetia Limpopo Mine</td>
<td>1,100</td>
<td>1</td>
<td>110</td>
<td>109</td>
<td>111</td>
<td>Van Dyk (2001)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>South Africa</td>
<td>North West Province: (Madikwe &amp; Pilanesberg)</td>
<td></td>
<td>1</td>
<td>110</td>
<td>109</td>
<td>111</td>
<td>Van Dyk (2001)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>South Africa</td>
<td>Northern Cape: Kgalagadi Transfrontier Park</td>
<td>See Botswana</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Hunter</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>South Africa</td>
<td>Northern Cape: Tswalu</td>
<td></td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>Hunter</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>South Africa</td>
<td>Waterberg Region: (Mabula, Entabeni, Shambala, Welgevonden, Makalali)</td>
<td></td>
<td>1</td>
<td>54</td>
<td>54</td>
<td>54</td>
<td>Slotow / Van Dyk (2001)</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Swaziland</td>
<td>Hlane Royal NP</td>
<td></td>
<td>6</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>Naudé (2001)</td>
</tr>
<tr>
<td>COUNTRY</td>
<td>REGION</td>
<td>APPROX. AREA Sq. km.</td>
<td>DEFINED REGION</td>
<td>METHOD POPULATION</td>
<td>ESTIMATED MAXIMUM</td>
<td>ESTIMATED MINIMUM</td>
<td>SOURCE OF INFORMATION</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>Southern Africa</td>
<td>221,532</td>
<td>Zambia</td>
<td>Present, not estimated</td>
<td>6</td>
<td>1500</td>
<td>Villemen (2002)</td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Southern Africa</td>
<td>1,530</td>
<td>Northern Province</td>
<td>Present, not estimated</td>
<td>4</td>
<td>30</td>
<td>50 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>Southern Africa</td>
<td>2,094</td>
<td>Chete-Stariya</td>
<td>4</td>
<td>40</td>
<td>40</td>
<td>125 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Southern Africa</td>
<td>3,622</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>100</td>
<td>75</td>
<td>75 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>Southern Africa</td>
<td>1,536</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>40</td>
<td>30</td>
<td>63 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Southern Africa</td>
<td>8,500</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>40</td>
<td>35</td>
<td>44 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>Southern Africa</td>
<td>130</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>130</td>
<td>130</td>
<td>143 Menhram (2001)</td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Southern Africa</td>
<td>8,500</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>80</td>
<td>90</td>
<td>150 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Southern Africa</td>
<td>14,000</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>60</td>
<td>60</td>
<td>76 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>Southern Africa</td>
<td>4,400</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>40</td>
<td>46</td>
<td>50 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Southern Africa</td>
<td>1,392</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>30</td>
<td>30</td>
<td>50 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>Southern Africa</td>
<td>10,500</td>
<td>Chirwaoro Safar</td>
<td>4</td>
<td>30</td>
<td>30</td>
<td>31 Monks (2001)</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL (ROUNDED TO NEAREST 100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAY 2002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FOOT NOTES

* New populations in the process of being established.
** Disputed / queried / questioned
n/a Not available

1. Rapidly declined from 1000 about 10 years ago.
2. Chad estimated between 100 and 200 less than the 50 of Zoukama.
3. Reported "present in 'high' numbers" (1975) but last two were man eaters and shot by Eric Stockenström somewhere between 1990 - 1994. (Anderson / Aveling)
4. Bale-Sof Omar merges into Webe Shebelle population, present in disjointed distribution.
5. Mago and Omo: Lions are present in medium densities, exact numbers unknown.
6. SE Ethiopia: Limited lion populations, low densities, limited in part by water, not included in total.
7. Bisandi is adjacent to Meru. 60 - 80+ means 60 minimum, 80 average ±35%.
8. Densities higher in south and around mountain areas. North and east very low densities, excluded from water, and killed by pastoral people.
9. Lions rarely, if ever call, despite other signs of their presence (tracks etc) and almost completely nocturnal in areas with pastoral people, makes estimating difficult. Interesting, but typical human induced begavioural changes. In all unprotected areas lions are killed by pastoral people using techniques such as poisoned carcasses, spearing, and even ambushing lions at water holes with various automatic and semi-automatic weapons.
10. Aberdares NP includes moorlands and part of forest of Aberdare Mountains. (most part over 3000m) Isolated (reintroduced) population with no long term future as a result of marginal habitat. They sometimes venture above the tree line and according to literature are hairier and more spotted??
11. 22 Prides + 74 nomads (78% males) Average 22 lions per pride. Density possibly the highest in Africa. (Apart form Lake Manyara Tanz which is negligible). Largest pride 4M, 17F and 27 Sub-A, and Cubs = 48!
12. Packer estimated between 750 and 1000. Heath estimated 600, none very sure, so the average of 675 was used as estimate.
13. About the size of Meru and Bisanadi combined. Thornbush plains. Where George Adamson lived and died. 40+ means 40 minimum.
14. Various sources combined on one fax, submitted by Joel Hancock on request of Johan Kruger. Census methods varied between known individuals thru regular sightings.
15. Northern Botswana slit in three units that is not according to Game Reserves or National Parks. It includes Moremi, Savuti, Chobe etc. (Winterbachs)
16. There are lions in Tarangire, Ruaha, Katavi, Mkomazi and Moyowosi, but no figures given (Packer).
17. 15 Lions in Phinda (Slotow) + 1 of 2 left in St Lucia. Numbers not known or insignificant for other parks.
18. Lower Zambezi abuts on Mana Pools in Zimbabwe, so overlaps might occur. (Stuart)
19. 2000 for Kruger and 200 for adjacent reserves are pure guestimates based on surveys conducted in the 70's in different areas of the park, no confidence limits (Mills) Four other tourism brochures between 1988 and 1999 mention only 1500. Van der Merwe recalls 2500 back in the 70's before TB took its toll.
20. Lethal PAC = Low, Sustainable (<2%, 25/year) (Winterbach, Kat, Sechele)
21. Lethal PAC = High (14%, 14 in 2 years) (Hemson)
22. Selous's figures disputed (Scott, Packer) but accepted, as no better data could be presented. Nicholson (park warden 1950 - 1973) confirmed possibility of between 3000 - 4000
23. Quoted as "very rare" from literature (1988)
24. Phinda has 13 lions, and 6 have been moved to Tembe (to be released in a couple of months). There are no lions at St Lucia or Ndumu. Similarily, lions are proposed for Addo but it is nothing more than a proposal at the time being. 'Theoretical populations' omitted until action actually takes place. (Hunter 2002)
25. LiGwalagwala (Mpumalanga): They allledgedly shot most (all?) of their lions because of TB and it was reported that they had none. This still needs clarification. (Hunter 2002)

Figure 1: Lion dispersion in Africa
Figure 2: Demarcation of four sub-shara regions

Figure 3: Proportional dispersion per region
<table>
<thead>
<tr>
<th>METHOD</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(PRP= 5%) Individual recognition, total count. All lions in an area are individually known by features such as whisker spots, scars, nose color, usually achieved with the aid of calling stations.</td>
</tr>
<tr>
<td>2</td>
<td>(PRP=10 %). Data from sample areas are extrapolated; confidence limits are not significantly different if the sample covers at least 20% of the area (PRP=3%; ibid.). If sampling rate was lower or unknown, data was treated as category 3.</td>
</tr>
<tr>
<td>3</td>
<td>(PRP=15%) Indirect observation. This category includes counting lion tracks, use of radio collars and tourist picture databases; (Stander, 1998; Creel &amp; Creel, 1997).</td>
</tr>
<tr>
<td>4</td>
<td>(PRP=25%) Estimate based on fieldwork. An informed guess by residents with intimate knowledge of an area, preferably based on prey censuses.</td>
</tr>
<tr>
<td>5</td>
<td>(PRP= 35%) Guesstimate based on short visits or based on secondary data, such as prey or hyena numbers, area size, rainfall, etc.</td>
</tr>
<tr>
<td>6</td>
<td>Other methods or information obtained under special circumstances. Confidence interval specified by the source.</td>
</tr>
</tbody>
</table>

Table 1: Methods used to determine accuracy of data.
Contents

1. Editorial .................................................................................. 1
2. Amur Tiger Conservation, Roads and Human Disturbance
   in the Russian Far East .............................................................. 2
3. The Enigma Surrounding Tigers in Tapan Valley, West Sumatra .... 3
4. Indo-Bangladesh Agreement on Protecting Sundarban ................. 5
5. Tiger Enters Hut and Falls Asleep with Farmer's Family .............. 5
6. Lioness Enchanted by Oryx Calves ......................................... 6
7. Deep Snows Threaten Last Far Eastern Leopards ...................... 6
8. The Leopard in Sri Lanka: A Secretive Predator ...................... 7
9. Black Leopard Study in South Africa ....................................... 9
10. More Leopard News ............................................................ 9
12. Wild Jaguar Photographed in Arizona ..................................... 11
13. Jaguar Conservation .......................................................... 12
14. Feasibility Study on Re-Introduction of Cheetah in Turkmenistan ... 13
15. Spanish Government Conservation Plan for Iberian Lynx ........... 15
16. Reintroduction of Canada Lynx in Colorado ........................... 15
17. Canada Lynx Similar Over Wide Range .................................. 16
18. Lesser Cats in Central India .................................................. 16
19. Manuel Sighting in Qinghai, China ........................................ 18
20. Marbled Cat Fair in Northeastern Thailand ............................ 19
21. Andean Cat Photographed in Southwest Bolivia ..................... 19
22. Pampas Cat in Argentina: Is it Absent from the Pampas? .......... 20
23. Pampas Cat Photographed in the Argentine Andes .................. 22
24. Guigna and Geoffroy's Cat in Patagonian Mountain Forest ......... 23
25. Crackdown on Illegal Trade in Big Cats in USA ...................... 24
26. Photo Page: Rare Cats of the High Andes ............................. 25
27. Photo Page: Cats in the Patagonian Rain Forest, Argentina ........ 26
28. Illegal Trade in the UK ...................................................... 27
29. Chinese Wildlife Smugglers Arrested ................................... 27
30. Indian Businessmen Fined One Million Rupees on Poaching Charge 27
31. India Sets Wildlife Conservation Strategy .............................. 28
32. India's Wildlife Conservation Strategy 2002 .......................... 28
33. Snow Leopard Survival Summit .......................................... 29
34. Book Reviews
   - The Algarve Tiger ............................................................ 30
   - Tigers (UK); The Way of the Tiger (US) ............................... 30
   - Beyond the Last Village ................................................... 31
   - Le chat domestique errant ou hâtre .................................. 32
35. Cat Specialist Group Online Library ...................................... 33
36. Cat Specialist Group – May 2002 ........................................ 34
37. Cats on the Web ............................................................. 39
38. Appendix – African Lion Database ....................................... 41

Cover: Sri Lankan Leopard in Ruhuna National Park (see p. 7)
Photo: Jehan Kumara

Disclaimer: Material and geographic designations in Cat News do not represent any opinion whatsoever on the part of the IUCN Cat Specialist Group and/or contributors concerning the legal status of any country, territory, or area, or concerning the delimitation of frontiers or boundaries.